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THEORYHUB BOOK

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Edited by Savvas Papagiannidis

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CONTENTS

Cognitive Dissonance Theory

Cognitive dissonance theory aims to explain the relationships between the motivation, perceptions and cognitions of an individual.

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Theory Factsheet

Proposed By: Festinger, 1962

Related Theories: Social Exchange Theory, Force Compliance Theory, Fairness Theories, Self-perception Theory, Balance Theory, Cost-benefit Analysis, Self-discrepancy Theory, Confirmation Bias, Coping Behaviour Theories, Sensemaking, Echo Chambers, Resistance to Change

Discipline: Psychology

Unit of Analysis: Individual

Level: Micro-level

Type: Theory for Explaining

Operationalised: Qualitatively / Quantitatively

Introduction

Cognitive dissonance theory was first presented by Leon Festinger in 1957 in order to explain the relationships between the motivation, perceptions and cognitions of an individual (Festinger, 1962). It clarified the conditions that motivate individuals to change their opinions, attitudes, beliefs or behaviours. Festinger (Festinger, 1962) defined the 'cognition' as any piece of knowledge that an individual has about themself or their environment. The theory was based on the belief that people strive toward consistency within themselves and are driven to make changes to reduce or eliminate an inconsistency (Cooper, 2007). Cognitive dissonance theory began by postulating that pairs of cognitions can be either relevant or irrelevant to one another. If two cognitions are relevant and concurring, there is consonance. However, if two cognitions are relevant, but conflicting, the existence of dissonance would cause psychological discomfort and motivate the individual to act upon this. The greater the magnitude of dissonance, the greater the pressure for the individual to reduce the dissonance (Harmon-Jones & Mills, 2019). The existence of dissonance and the mechanisms that humans used to cope with it captured Festinger's interest in developing cognitive dissonance theory.

The concept of cognition was relatively new at the time of the introduction of cognitive dissonance theory. Before that, the relationship between human attitudes and behaviours was understood as a complex process that involved motivational, emotional, affective and perceptual factors (Krech, 2019; Rosenberg, 1966). Therefore, the theory was one of the breakthroughs for research in the psychology field as it revolutionised thinking about human psychological processes. More specifically, the theory explains how rewards affect attitudes and behaviours and how behaviours and motivations affect cognitions and perceptions (Harmon-Jones & Harmon-Jones, 2007). Although the concepts of harmony and conflict were not new and had been proposed earlier by Heider (Heider, 1946), Cognitive Dissonance theory made a major contribution to the concept of consistency (Cooper, 2007). The theory is different compared to other consistency theories as it defines dissonance and consonance in relation to a specific cognition, which usually is related to a behaviour (Harmon-Jones & Harmon-Jones, 2007). Cognitive Dissonance theory made it possible to identify the determinants of attitudes and beliefs, the internalisation of values, the consequences of decisions, the effects of disagreement among individuals and other important psychological processes (Mills & Harmon-Jones, 1999). Hence, the theory received good attention from scholars in its early days, due to its few fundamental and uncomplicated principles, which could make novel and non-obvious predictions.

Theory

Cognitive Dissonance theory has two basic underlying hypotheses:

The existence of a dissonance will cause mental discomfort and motivate the individual to reduce the dissonance and restore consonance To reduce the dissonance, the individual will try to reduce it as well as avoid situations or information that are likely to increase the dissonance

In simple terms, a dissonance is an inconsistency in cognitive elements, which can be knowledge, opinions, beliefs, or the behaviours of an individual. The existence of such inconsistency causes mental discomfort and motivates the individual to take some actions to reduce or eliminate it. We have millions of cognitions, many of which are in our awareness but most are not (Marx, 1976). Festinger (Festinger, 1962) theorised that a pair of cognitive elements may relate to each other in three ways. Firstly, two cognitive elements may be relevant and consonant. Secondly, two cognitive elements may be relevant but dissonant. However, identification of the relationship may also be difficult, as two elements may be dissonant in one context, but not in another (Festinger, 1962). Dissonance can arise from many sources, including, but not limited to, logical inconsistency, cultural differences, contradictions between specific opinions and their related general stand, and a disconfirmation of a past experience to a current situation (Westmeyer, 2012). Lastly, two elements can be irrelevant to each other. The is a case when a pair of cognitive elements does not imply anything concerning one another. Once again, it can be challenging to deduce such a relationship because two elements may be indirectly linked. Therefore, researchers have to consider or make a reference to other cognitions before deriving a conclusion (Festinger, 1962).

One of the features that distinguished cognitive dissonance theory from other consistency theories was the concept of dissonance magnitude. The magnitude of

dissonance depends on the number and importance of cognitions that the person experiences a consonance or dissonance with. Its calculation is summarised in the mathematical expression below (Festinger, 1962). The total tension of a dissonance is the proportion of the inconsistent cognitions to the consistent cognitions that one has, each weighted by its importance.

The formula conveys that the greater the amount or importance of dissonant cognitions and the smaller the number or importance of consonant elements the greater the magnitude of dissonance one experiences. The tension of a dissonance can fluctuate over time and does not follow a uniform pattern (Koller & Salzberger, 2012). However, the theory proposed that higher levels of dissonance can forcefully motivate a person to promptly address the psychological discomforts, while small levels of dissonance may not be as effective in encouraging the person to take an immediate action. The minimal tensions rather build up gradually over time before they are addressed (Festinger, 1962).

In general, there are four ways to reduce a dissonance. Referring to the dissonance magnitude formula above, the dissonance magnitude decreases if (i) the number of the dissonant cognitions decreases, (ii) the importance of the dissonant cognition decreases, (iii) the number of the consonant cognitions increases and (iv) the importance of the consonant cognition increases. In other words, an individual can reduce the mental discomfort by changing the inconsistent cognitions, reducing the importance of conflicting elements, acquiring new harmonious elements or increasing the importance of the existing consistent elements. Festinger used the case of a habitual smoker to demonstrate the theory (Festinger, 1962). A smoker who knows that smoking is bad for health will experience dissonance, which causes mental discomfort, because the habit of smoking and the knowledge of how harmful smoking is are conflicting. Hence, there are four ways that the smoker can reduce the dissonance. First, the person could remove the dissonant cognition by either changing his behaviour (stop smoking) or knowledge (believe that smoking is actually not bad for health). Second, the person could reduce the importance of the dissonant cognition by thinking that the risk of getting lung cancer from smoking is lesser than being in a car accident. Third, the person could increase the amount of consonant cognition by looking for positive effects of smoking. Lastly, the person could focus on the benefits of smoking as an important part of his or her life (Mills & Harmon-Jones, 1999).

As studies on dissonance reduction have grown, specific reduction strategies have been explored. A review has summarised and classified those strategies into seven categories (McGrath, 2017).

Attitude change: The changing of one's attitude is the strategy that has received the most empirical attention. Attitudes are recognised as more fluid and flexible when compared to other elements, and thus easier to change (Cooper, 2007). Researchers often use attitudinal change as an indicator of dissonance by measuring and comparing the affective state of participants before and after a particular event (e.g. (Auster, 1965; Vroom & Deci, 1971; Davis & Jones, 1960)). However, several researchers have pointed out that the overreliance on attitudinal change as a mere dissonance reduction strategy has limited our understanding about how individuals deal with dissonant experience (Devine et al., 1999;Leippe & Eisenstadt, 1999;Simon, Greenberg & Brehm, 1995;Wilder, 1992). Festinger (Mills & Harmon-Jones, 1999) has also stated that "in the ordinary world and if the

experimenter is not very careful, a little bit sloppy, there are lots and lots of avenues of dissonance reduction, and those have never been explored" (p. 384), as further discussed below.

Distraction and forgetting: A diversion of attention away from the dissonance and its negative effects helps individuals to reduce psychological discomfort. Zanna and Aziza (Zanna & Aziza, 1976) were the first to propose distraction as a dissonance reduction method. The results suggested that distraction is a more efficient strategy than attitudinal change because the latter could still remind the individuals about the dissonance. In line with this, Elkin and Leippe (Elkin & Leippe, 1986) explored forgetting as a dissonance reduction strategy and found that dissonance only declined when participants forgot about the dissonance but not when they changed their attitudes.

Trivialisation and self-affirmation: Although Festinger (Festinger, 1962) described trivialisation as a way to reduce psychological discomfort when introducing Cognitive Dissonance theory, the approach was not empirically examined until almost 40 years later. Simon et al. (Simon, Greenberg & Brehm, 1995) investigated the conditions that individuals would choose to minimise the importance of dissonant cognitions over attitudinal change to counteract the arising psychological discomfort. The study found that the participants preferred trivialisation when the pre-existing attitudes or an important issue were made salient. In addition, Simon et al. (Simon, Greenberg & Brehm, 1995) also proposed trivialisation as a process involving self-affirmation. Once someone reaffirms themselves about their important value, the person weakens the importance of a discrepant act and reasserts the sense of self-integrity (Steele & Liu, 1983).

Denial of responsibility: A sense of responsibility for one's cognitions triggers the experience of dissonance (McGrath, 2017). Gosling, Denizeau and Oberlé (Gosling, Denizeau & Oberlé, 2006) empirically investigated this mode of dissonance reduction and confirmed its effectiveness. The results of the study suggested that denial of responsibility could even be more efficient than trivialisation in dealing with dissonance, especially when it is associated with feelings of shame and guilt.

Adding consonant cognitions: Inconsistent behaviours may be rationalised by adding new consonant cognitions to one's belief system. A considerable number of empirical studies have demonstrated how people seek out new information and external justification to support their position. For example, participants searched for more supporting arguments after experiencing discomfort from writing a counter-attitudinal essay (Cotton & Hieser, 1980) or participating in a boring experiment (Brock & Balloun, 1967; Frey & Wicklund, 1978). Furthermore, overconfidence in one's position may also help add a consonant cognition and reduce dissonance (Knox & Inkster, 1968; Blanton et al., 2001).

Changing behaviour: Although Festinger (p. 384) (Mills & Harmon-Jones, 1999) suggested that "one of the major avenues of dissonance reduction is to change your behaviour", the approach often may not be the most convenient way. To be specific, behaviours can be difficult to change when they involve pain and loss, addiction or are simply irreversible (Festinger, 1962). However, many studies have successfully demonstrated a mechanism for positive behaviour change as a result of a dissonance arousal (DICKERSON et al., 1992;Focella et al., 2016;Fried & Aronson, 1995;Fointiat, 2004). Yet, limited research has investigated the behavioural change

together with other dissonance reduction strategies (McGrath, 2017). Therefore, it is unclear whether people will actually change their behaviour when other reduction modes are also available.

Act rationalisation: Act rationalisation has been discussed in previous research as an alternative behaviour reduction mode (Beauvois & Joule, 1996) (Joule & Beauvois, 1997). The approach concerns using a new problematic behaviour that is consistent with a previous action to reduce dissonance. For example, smokers who agreed to abstain from smoking for a short period tended to agree to a second and longer abstinence period (Beauvois, Joule & Brunetti, 1993). The participation in the longer abstinence period made the first abstinence period seem less problematic, and this reduced dissonance.

Only scant research has investigated multiple dissonance reduction strategies simultaneously (McGrath, 2017). However, in general, the likelihood that a particular cognition will change is determined by its resistance to change, which is based on its responsiveness to reality and the extent to which it is consonant with other cognitions (Harmon-Jones & Mills, 2019). Therefore, changes are more likely to happen in an element that is less resistant or less important (Cooper, 2007). However, an attempt to reduce a dissonance is not always successful. An individual may fail to restore a consonance, if there is a lack of social support and new harmonious elements, or the existing problematic element is too satisfying (Harmon-Jones & Harmon-Jones, 2007).

When cognitive dissonance theory was first presented, three experimental paradigms (namely decision justification, effort justification and induced compliance behaviour) were used to empirically test and provide evidence to support the theory.

Decision justification: Brehm (Brehm, 1956) applied the theory to examine dissonance in decision making. According to the theory, when an individual evaluates a decision, all of the cognitions that support the decision promote consonance, while cognitions that conflict with the selected choice trigger dissonance. The greater the amount and importance of the conflicting cognitions and the lesser the amount and importance of the supportive cognitions the higher degree of dissonance an individual would experience, and vice versa. Dissonance that is aroused when evaluating a decision can be reduced by viewing the selected choice as more attractive or the rejected alternatives as less attractive. Brehm also suggested that the degree of dissonance is more severe with a difficult decision when choices are close in attractiveness. An individual is more likely to change his or her attitude to be more negative towards the rejected alternatives after a difficult decision, while being unlikely to change the attitude if the attractiveness of the options is not comparable.

Effort justification: Dissonance arises when an individual invests a great amount of effort into a task, but gets an undesirable outcome. The more undesirable the outcome, the higher the degree of dissonance. The classic experimental design in effort justification was undertaken by Aronson and Mills (Aronson & Mills, 1959). In this study, the researchers divided the participants into groups and set them to undergo different levels of embarrassment to examine how they would deal with the experiment. The results showed that the participants who experienced mild embarrassment perceived the activity to be dull and boring, while the others who

underwent a severely embarrassing moment thought the activity was interesting. The experiment demonstrated that an individual could reduce the psychological discomfort by convincing him or herself that the task is interesting and the outcome is worthwhile to eliminate dissonance and achieve consonance.

Induced compliance behaviour: Festinger and CarlsmithFestinger & Carlsmith, 1959) used cognitive dissonance theory to study induced compliance behaviours. They set up an experimental study and asked participants to undertake a boring task for an hour. Then, the participants were rewarded either $1 or $20. The group that was compensated with a higher amount of money did not experience much dissonance, while the other group had to change their attitude and convinced themselves that the task was interesting to counter the aroused dissonance. In cognitive dissonance theory, monetary compensation can be viewed as a supportive cognition that promotes consonance. Therefore, an individual would experience minimal to no dissonance when the amount or importance of the supportive cognitions is great enough. On the other hand, if the supportive cognitions are not large or strong enough to counter the dissonance, the individual would be motivated to change attitude to be more positive as a justification for the counter-attitudinal behaviour.

Although many studies have focused on a single dissonance reduction strategy (Festinger & Carlsmith, 1959;Aronson & Mills, 1959;Brehm, 1956), it is important to note that people may simultaneously adopt multiple strategies to counter the dissonance. This practice is commonly studied in relation to coping strategies. For example, a recent study (Mahapatra & Mishra, 2021) showed that customers who faced post-consumption cognitive dissonance took multiple actions to negate the experienced psychological discomfort. They sought support from like-minded people and mentally disconnected from the negative situation to reduce the negative emotions.

In summary, Cognitive Dissonance theory has contributed to the concept of consistency in several ways. Firstly, Festinger integrated various concepts, including attitudes, beliefs, perceptions, value and behaviours, which had been considered separately as a single construct of cognition. This treatment made it possible for scholars to understand the psychological process as a whole. Secondly, Festinger viewed people's mental states in a social environment from an intellectual tradition, which was influenced by Kurt Lewin, rather than a Gestalt tradition as Heider did (Cooper, 2007). This intellectual tradition proposed that people navigated the world by motivational pushes and pulls, and therefore our behaviours were driven by psychological forces. Based on this intellectual tradition, Festinger was able to predict the magnitude of dissonance in different situations.

Applications

Cognitive dissonance theory has been successfully applied in many fields. It has been used to explain and predict the motivational nature of dissonance that led to attitude and behaviour changes at both the individual and organisational level.

The literature that is based on cognitive dissonance theory has broadly covered four phases of the process, namely, cognitive discrepancy, dissonance, motivation and

discrepancy reduction (Hinojosa et al., 2017). The cognitive discrepancy phase considered a conflict between two or more cognitive elements. The dissonance phase concerned the existence of a dissonance. The motivation phase focused on the motivational nature of dissonance to reduce the psychological discomfort. Lastly, the discrepancy reduction phase related to dissonance reduction mechanisms. The concept of dissonance is predominantly related to the post-decision or post-purchase situation (Oliver, 2009). The research on this phase commonly focused on the impacts of post-purchase touchpoints on product or service evaluation (Cohen & Goldberg, 1970), satisfaction (Engel, 1963) intention to repurchase (Hunt, 1970) and the back-out rate (Donnelly & Ivancevich, 1970) of customers. Negative emotion was another concept that has been closely invested with cognitive dissonance. Previous studies have examined the impact of anger, pain, guilt and regret on the strength of dissonance and customer coping mechanisms (Higgins, 1997; Marikyan, Papagiannidis & Alamanos, 2020; Harmon-Jones, 2004; Harmon-Jones, Harmon-Jones & Summerell, 2017; Gilovich, Medvec & Chen, 1995). Some studies also investigated moderators, such as income and product involvement (Gbadamosi, 2009), on consumer decision making. Dissonance can also be extended to other purchase phases, but its purposes will be different (Koller & Salzberger, 2009; Koller & Salzberger, 2012).

Organisational studies researchers have also applied cognitive dissonance theory to examine many issues, such as, emotional labour in the workplace (Bhave & Glomb, 2016), team dissonance (Stoverink et al., 2014), information search for decision making (Jonas & Frey, 2003) and employee job change (Boswell, Boudreau & Tichy, 2005). A review of cognitive dissonance theory at the organisation level was also conducted to integrate the relevant knowledge that was published from 2000 to 2016 (Hinojosa et al., 2017). The review revealed that most of the related studies focused on a specific stage rather than the whole process of cognitive dissonance, with the least coverage on the motivation phase. The two most studied phases of cognitive dissonance in the organisational context were the cognitive discrepancy and the discrepancy reduction phase. The cognitive discrepancy phase focused mainly on decision justification, effort justification and induced compliance behaviours as sources of dissonance in various situations, whilst the discrepancy reduction phase investigated methods that organisations used to reduce dissonance, including changes in attitudes, behaviours, values, information selection, as well as no dissonance reduction (Hinojosa et al., 2017).

Limitations

Cognitive dissonance theory has become popular among social psychology and social science researchers since its early days, due to its few tenets that are able to explain the complex process of dissonance. However, the parsimonious nature of its formulation and application made the theory subject to the paradox of simplicity and raised concerns about overlooking confounding variables (Festinger, 1957; Osgood, 1960; Zajonc, 1960). Since dissonance is not restricted to logical inconsistencies, but is also bounded by other psychological and cultural factors (Festinger, 1962), several scholars argued that dissonance was more complicated than as presented by the Cognitive Dissonance theory and not easy to create in an experiment, which also raised concerned over the experimental paradigms that have been used to demonstrate the theory (Chapanis & Chapanis, 1964; Marx, 1976). In response to the limitations of the theory, three revisions of cognitive

dissonance theory have been proposed. Firstly, the self-consistency model (Abelson, Aronson & McGuire, 1968; Aronson, 1999) addressed the paradox of the simplicity of the original theory by adding self-concept as a further explanation of dissonance. Secondly, the self-affirmation model (Berkowitz, 1988) focused on the overall self-image of moral and adaptive adequacy as an alternative explanation for attitude change. Lastly, the aversive consequences model (also commonly known as "a *new look at dissonance*") (Cooper & Fazio, 1984) also presented an alternative view on mental discomfort. This model proposed that the psychological stress was caused by the feeling of being self-responsible for inducing aversive consequences, rather than the inconsistency in cognitive elements.

Concepts

Cognition (Independent): An opinion, knowledge or belief about the environment, about oneself, or about one's behaviour. (Festinger, 1962)

Cognitive Dissonance (Dependent): The existence of non-fitting relations among cognitions. (Festinger, 1962)

Cognitive Dissonance Reduction (Dependent): The existence of dissonance causes psychological discomfort and motivates the individual to act upon this by changing their opinions, attitudes, beliefs or behaviours. (Festinger, 1962)

References

Abelson, B., Aronson, E. & McGuire, W. (1968). *Theories of cognitive consistency*. Rand McNally.

Aronson, E. & Mills, J. (1959). The effect of severity of initiation on liking for a group. *The Journal of Abnormal and Social Psychology*, 59 (2), 177-181.

Aronson, E. (1999). Dissonance, hypocrisy, and the self-concept. *Cognitive dissonance: Progress on a pivotal theory in social psychology.*, 103-126.

Auster, D. (1965). Attitude Change and Cognitive Dissonance. *Journal of Marketing Research*, 2 (4), 401-405.

Beauvois, J. & Joule, R. (1996). *A radical dissonance theory*. Taylor & Francis.

Beauvois, J., Joule, R. & Brunetti, F. (1993). Cognitive Rationalization and Act Rationalization in an Escalation of Commitment. *Basic and Applied Social Psychology*, 14 (1), 1-17.

Berkowitz, L. (1988). *Advances in Experimental Social Psychology: Social Psychological Studies of the Self*. Academic Press.

Bhave, D.P. & Glomb, T.M. (2016). The Role of Occupational Emotional Labor Requirements on the Surface Acting–Job Satisfaction Relationship. *Journal of Management*, 42 (3), 722-741.

Blanton, H., Pelham, B.W., DeHart, T. & Carvallo, M. (2001). Overconfidence as Dissonance Reduction. *Journal of Experimental Social Psychology*, 37 (5), 373-385.

Boswell, W.R., Boudreau, J.W. & Tichy, J. (2005). The Relationship Between Employee Job Change and Job Satisfaction: The Honeymoon-Hangover Effect. *Journal of Applied Psychology*, 90 (5), 882-892.

Brehm, J.W. (1956). Postdecision changes in the desirability of alternatives. *The Journal of Abnormal and Social Psychology*, 52 (3), 384-389.

Brock, T.C. & Balloun, J.L. (1967). Behavioral receptivity to dissonant information. *Journal of Personality and Social Psychology*, 6 (4, Pt.1), 413-428.

Chapanis, N.P. & Chapanis, A. (1964). Cognitive dissonance. *Psychological Bulletin*, 61 (1), 1-22.

Cohen, J.B. & Goldberg, M.E. (1970). The Dissonance Model in Post-Decision Product Evaluation. *Journal of Marketing Research*, 7 (3), 315.

Cooper, J. & Fazio, R.H. (1984). A New Look at Dissonance Theory. *Advances in Experimental Social Psychology*, 229-266.

Cooper, J. (2007). *Cognitive dissonance*. SAGE.

Cotton, J.L. & Hieser, R.A. (1980). Selective exposure to information and cognitive dissonance. *Journal of Research in Personality*, 14 (4), 518-527.

DICKERSON, C.A., Thibodeau, R., Aronson, E. & Miller, D. (1992). Using Cognitive Dissonance to Encourage Water Conservation1. *Journal of Applied Social Psychology*, 22 (11), 841-854.

Davis, K.E. & Jones, E.E. (1960). Changes in interpersonal perception as a means of reducing cognitive dissonance. *The Journal of Abnormal and Social Psychology*, 61 (3), 402-410.

Devine, P.G., Tauer, J.M., Barron, K.E., Elliot, A.J. & Vance, K.M. (1999). Moving beyond attitude change in the study of dissonance-related processes. *Cognitive dissonance: Progress on a pivotal theory in social psychology.*, 297-323.

Donnelly, J.H. & Ivancevich, J.M. (1970). Post-Purchase Reinforcement and Back-Out Behavior. *Journal of Marketing Research*, 7 (3), 399-400.

Elkin, R.A. & Leippe, M.R. (1986). Physiological arousal, dissonance, and attitude change: Evidence for a dissonance-arousal link and a "Don't remind me" effect. *Journal of Personality and Social Psychology*, 51 (1), 55-65.

Engel, J.F. (1963). Are Automobile Purchasers Dissonant Consumers?. *Journal of Marketing*, 27 (2), 55.

Festinger, L. & Carlsmith, J.M. (1959). Cognitive consequences of forced compliance. *The Journal of Abnormal and Social Psychology*, 58 (2), 203-210.

Festinger, L. (1957). *Contemporary Approaches to Cognition*. Harvard University Press.

Festinger, L. (1962). *A theory of cognitive dissonance*. Stanford University Press.

Focella, E.S., Stone, J., Fernandez, N.C., Cooper, J. & Hogg, M.A. (2016). Vicarious hypocrisy: Bolstering attitudes and taking action after exposure to a hypocritical ingroup member. *Journal of Experimental Social Psychology*, 62, 89-102.

Fointiat, V. (2004). "I KNOW WHAT I HAVE TO DO, BUT…" WHEN HYPOCRISY LEADS TO BEHAVIORAL CHANGE. *Social Behavior and Personality: an international journal*, 32 (8), 741-746.

Frey, D. & Wicklund, R.A. (1978). A clarification of selective exposure. *Journal of Experimental Social Psychology*, 14 (1), 132-139.

Fried, C.B. & Aronson, E. (1995). Hypocrisy, Misattribution, and Dissonance Reduction. *Personality and Social Psychology Bulletin*, 21 (9), 925-933.

Gbadamosi, A. (2009). Cognitive dissonance. *International Journal of Retail & Distribution Management*, 37 (12), 1077-1095.

Gilovich, T., Medvec, V.H. & Chen, S. (1995). Commission, Omission, and Dissonance Reduction: Coping with Regret in the "Monty Hall" Problem. *Personality and Social Psychology Bulletin*, 21 (2), 182-190.

Gosling, P., Denizeau, M. & Oberlé, D. (2006). Denial of responsibility: A new mode of dissonance reduction. *Journal of Personality and Social Psychology*, 90 (5), 722-733.

Harmon-Jones, E. & Harmon-Jones, C. (2007). Cognitive Dissonance Theory After 50 Years of Development. *Zeitschrift für Sozialpsychologie*, 38 (1), 7-16.

Harmon-Jones, E. & Mills, J. (2019). An introduction to cognitive dissonance theory and an overview of current perspectives on the theory. *Cognitive dissonance: Reexamining a pivotal theory in psychology (2nd ed.).*, 3-24.

Harmon-Jones, E. (2004). Contributions from research on anger and cognitive dissonance to understanding the motivational functions of asymmetrical frontal brain activity. *Biological Psychology*, 67 (1-2), 51-76.

Harmon-Jones, E., Harmon-Jones, C. & Summerell, E. (2017). On the Importance of Both Dimensional and Discrete Models of Emotion. *Behavioral Sciences*, 7 (4), 66.

Heider, F. (1946). Attitudes and Cognitive Organization. *The Journal of Psychology*, 21 (1), 107-112.

Higgins, E.T. (1997). Beyond pleasure and pain. *American Psychologist*, 52 (12), 1280-1300.

Hinojosa, A.S., Gardner, W.L., Walker, H.J., Cogliser, C. & Gullifor, D. (2017). A Review of Cognitive Dissonance Theory in Management Research. *Journal of Management*, 43 (1), 170-199.

Hunt, S.D. (1970). Post-transaction Communications and Dissonance Reduction. *Journal of Marketing*, 34 (3), 46-51.

Jonas, E. & Frey, D. (2003). Information search and presentation in advisor–client interactions. *Organizational Behavior and Human Decision Processes*, 91 (2), 154-168.

Joule, R. & Beauvois, J. (1997). Cognitive Dissonance Theory: A Radical View. *European Review of Social Psychology*, 8 (1), 1-32.

Knox, R.E. & Inkster, J.A. (1968). Postdecision dissonance at post time. *Journal of Personality and Social Psychology*, 8 (4, Pt.1), 319-323.

Koller, M. & Salzberger, T. (2009). Benchmarking in service marketing – a longitudinal analysis of the customer. *Benchmarking: An International Journal*, 16 (3), 401-414.

Koller, M. & Salzberger, T. (2012). Heterogeneous development of cognitive dissonance over time and its effect on satisfaction and loyalty. *Journal of Customer Behaviour*, 11 (3), 261-280.

Krech, D. (2019). *Theory and Problems of Social Psychology*. Forgotten Books.

Leippe, M.R. & Eisenstadt, D. (1999). A self-accountability model of dissonance reduction: Multiple modes on a continuum of elaboration. *Cognitive dissonance: Progress on a pivotal theory in social psychology.*, 201-232.

Mahapatra, S. & Mishra, A. (2021). *'Crying over spilt milk?' Effect of post-consumption dissonance on coping behaviour for online purchases.*

Marikyan, D., Papagiannidis, S. & Alamanos, E. (2020). *Cognitive Dissonance in Technology Adoption: A Study of Smart Home Users*.

Marx, M.H. (1976). *Theories in contemporary psychology*. Macmillan.

McGrath, A. (2017). Dealing with dissonance: A review of cognitive dissonance reduction. *Social and Personality Psychology Compass*, 11 (12), e12362.

Mills, J. & Harmon-Jones, E. (1999). *Cognitive dissonance*. American Psychological Association.

Oliver, R.L. (2009). *Satisfaction*. M.E. Sharpe.

Osgood, C.E. (1960). Cognitive Dynamics in the Conduct of Human Affairs. *Public Opinion Quarterly*, 24 (2, Special Issue: Attitude Change), 341.

Rosenberg, M. (1966). *Attitude organization and change*. Yale University Press.

Simon, L., Greenberg, J. & Brehm, J. (1995). Trivialization: the forgotten mode of dissonance reduction. *Journal of Personality and Social Psychology*, 68 (2), 247-260.

Steele, C.M. & Liu, T.J. (1983). Dissonance processes as self-affirmation. *Journal of Personality and Social Psychology*, 45 (1), 5-19.

Stoverink, A.C., Umphress, E.E., Gardner, R.G. & Miner, K.N. (2014). Misery loves company: Team dissonance and the influence of supervisor-focused interpersonal justice climate on team cohesiveness. *Journal of Applied Psychology*, 99 (6), 1059-1073.

Vroom, V.H. & Deci, E.L. (1971). The stability of post-decision dissonance: A follow-up study of the job attitudes of business school graduates. *Organizational Behavior and Human Performance*, 6 (1), 36-49.

Westmeyer, H. (2012). *Psychological Theories From a Structuralist Point of View*. Springer.

Wilder, D.A. (1992). Yes, Elliot, There Is Dissonance. *Psychological Inquiry*, 3 (4), 351-352.

Zajonc, R.B. (1960). The process of cognitive tuning in communication. *The Journal of Abnormal and Social Psychology*, 61 (2), 159-167.

Zanna, M.P. & Aziza, C. (1976). On the interaction of repression-sensitization and attention in resolving cognitive dissonance1. *Journal of Personality*, 44 (4), 577-593.

Configurational Theory

Configurational theorising is about transcending the qualitative-quantitative divide by formulating formal statements explaining how causally relevant conditions combine into configurations associated with the outcome of interest.

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Theory Factsheet

Proposed By: Ragin, 1989

Parent Theory: Set Theory

Related Theories: Fuzzy-Set Theory, Open Systems Theory, Set Theory, Complexity Theory

Discipline: Politics

Unit of Analysis: Individual, collective

Level: Micro-level/Macro-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

Configurational theorising shifts researchers' attention from the assessment of the "*net effects*" of causal variables to a more contextual understanding of the multiple possible ways in which causal conditions may combine to produce a given effect (Ragin, 2008). Configurational theorising revolves around three tenets: 1) Conjunctural causation: the effect of a single condition unfolds in combination with other conditions; 2) Equifinality: multiple configurations (or combinations) of conditions may lead to the same outcome; 3) Causal asymmetry: the causes leading to the presence of an outcome of interest may be quite different from those leading to the absence of the outcome. According to Dess et al. (1993: p. 776) "*a configuration contains relationships among elements or items representing multiple domains*". Therefore, configurational theorising moves the theoretical discourse forward because it is not confined to the study of net effects (i.e., the more X, the more Y). For example, "*linear regression examines the net effect of a variable on the outcome by holding other variables constant*" (El Sawy et al., 2010: p. 839). Configurational theorising instead studies the holistic effect stemming from a configuration (or combination) of causal conditions. QCA is probably one of the most formalised configurational, comparative methods that relies on Boolean

algebra rather than linear algebra, the logic of implication rather than covariation and conjunctural causation rather than simple interaction effects (Thiem, Baumgartner & Bol, 2016).

Theory

Configurational theorising is premised on the assumption that configurations (or combinations) of causally-relevant conditions should be linked to the outcome of interest. Since the focal unit is the configuration (rather than the individual variable), it follows that a given condition may have a different effect on the outcome depending on its combination with other conditions. This notion, in turn, fits with the idea of causal complexity. It implies that a causal condition may have opposite effects depending on its combination with other conditions, so much so that the same condition may contribute to the presence of the outcome when other conditions are present, but it may actually contribute to the absence of the outcome when other conditions are absent (Ragin, 1989). As a result, "*the researcher is urged not to "specify a single causal model that fits the data best" (the standard practice using statistical techniques)*" (Ragin, 2014: p. xxii). This, in turn, will spur researchers to discover multiple causal models that involve conjunctions of three or more conditions, thus moving beyond second-order or third-order interaction terms (Schneider & Wagemann, 2012).

Configurational theorising revolves around the following six principles (Ragin, 2014):

Sets rather than variables: standard statistical techniques are based on "variables", that is, units that can take on a range of values so as to sort, rank or array observations relative to one another. Instead, configurational theorising is based on sets, that is, groupings that entail membership criteria and have classificatory consequences. For example, "male" is a set that invokes a group of individuals (i.e., male individuals) whereas "gender" is a variable. Likewise, "Swedish" is a set that invokes a particular group (e.g., the Swedish population), but "nationality" is a variable (Pappas & Woodside, 2021). By the same token, "degree of democracy" is a variable, but "democratic" invokes a set such as the group of "democratic countries." Again, it is important to reiterate that sets are not simple nominal-scale classification (e.g., democratic versus not-democratic countries) because observations (e.g., countries) can vary in the degree to which they satisfy membership criteria. For example, a country can be a full member of the set (or group) of democratic countries (scored as 1.00) while another country can be a full non-member of this very same set (scored as 0.00) and yet another country can be neither in nor out of the set of democratic countries (scored as 0.5, the point of maximum ambiguity). *Calibration rather than measurement*: standard statistical techniques are based on variables that are measured by using valid and reliable scales or indicators. Observations "are evaluated relative to one another, based on inductively derived, sample-specific statistics such as the mean and standard deviation. For example, a "high" score is well above the mean score; a "low" score, is well below the mean score. All variation in an indicator is usually treated as

meaningful and taken at face value" (Ragin, 2014: p. xxiv). To this end, calibration is the process by which set membership scores are assigned to observations on the basis of external standards. For example, taking the uncalibrated variable of per-capita Gross National Product (GNP), it is possible to calculate membership in the set of rich countries by using three external standards, namely the score that would qualify a country as a full member in the set of rich countries (scored as 1.00), the score that would qualify it as a full non-member in the set of rich countries (scored as 0.00) and the cross-over point (where the country in question is scored as 0.50 because it is neither in nor out of the set of rich countries). *Qualitative outcomes instead of dependent variables*: standard statistical techniques revolve around dependent variables, so much so that "the goal of research is to explain cross-case and/or longitudinal variation in the chosen dependent variable" (Ragin, 2014: p. xxv). Configurational theorising instead focuses on qualitative outcomes, that is, observable changes or discontinuities. For example, instead of studying longitudinal or cross-case reduction in welfare spending, analysts should first define the concept of interest (i.e., the key features of welfare state retrenchment) and then calculate the countries' membership in the set of countries experiencing welfare state retrenchment (the outcome of interest). *Constructed populations rather than given populations*: again, standard statistical techniques use either given populations or random samples from these populations. Instead, configurational theorising entails constructing populations in the course of the investigation, by comparing both the presence and absence of the outcome of interest (i.e., positive and negative cases). *Set relations rather than correlations*: standard statistical analyses are based on correlations ("the more of X, the more of Y"). Correlational arguments are symmetric arguments ("if more X entails more Y, then less X implies less Y"). Configurational theorising on the other hand is based on asymmetric set relations. For example, "the assertion that "*the developed countries are democratic*" *does not require that the not-developed countries be not-democratic. There can be many not-developed countries that are democratic, and their existence does not count against the initial claim, which is asymmetric*" (Ragin, 2014: p. xxvi). Accordingly, standard statistical techniques parse matrices of bivariate correlations or their mathematical equivalents. Instead, configurational theorising uses truth tables that list different configurations of causally-relevant conditions. *Causal recipes rather than net-effects*: the standard statistical template revolves around net-effect thinking, that is, "the net effect and statistical significance of each causal variable are based on its unique (non-overlapping) contribution to explained variation in the dependent variable" (Ragin, 2014: p. xxvii). As such, configurational theorising is about how individual conditions combine to produce the outcome of interest, thus helping analysts formulate causal recipes that will lead to the outcome of interest. These recipes can be evaluated on the basis of their theoretical (i.e., consistency parameters) and empirical importance (i.e., coverage parameters). It is worth stressing that consistency and coverage (also known

as parameters of fit) "are analogous to the respective assessments of significance and strength in regression" (Misangyi et al., 2017: p. 269-270).

Although conditions are oftentimes selected in a deductive manner when deploying configurational theorising (Park, Fiss & El Sawy, 2020), it is possible to evaluate such theories by looking at the extent to which theoretical expectations overlap with empirical results. While the focus of standard hypothesis testing is to reject (or fail to reject) the null hypothesis (or a similar benchmark), the focus of theory evaluation in the context of configurational theorising is to evaluate hunches derived from theory *"by creating intersections of the Boolean expression describing the theory (T) and the empirical solution (S)"* (Schneider & Wagemann, 2012: p. 305). In other words: although configurational theories sit somewhere "*midway between exploratory and hypothesis-testing research*" (Kent, 2005: p. 226), the design is not appropriate to be used for hypothesis-testing, but rather for the creation of "propositions" which determine the membership in certain configurations (i.e. pathways). The intersection of Theory (T) and empirical solution (S) describes the part of the theory that is supported by empirical evidence. In the intersection of the lack of theory (NOT T), and the empirical solution (S), empirical findings overlap with those cases not expected by theory. The result of this intersection suggests an extension of existing theories. The intersection of theory (T) and the absence of empirical solution (NOT S) captures those cases for which theory predicts the occurrence of the outcome, but which our solution fails to capture. Hence, it suggests a delimitation of existing theories. Finally, the intersection of the lack of theory (NOT T) and the absence of empirical solution (NOT S) "*denotes a configuration of conditions that neither theory nor the empirical findings deem sufficient for the outcome*" (Schneider & Wagemann, 2012: p. 305).

Theory Updates/Extensions

Configurational theories have recently been updated with the use of set-theoretic multi-method research (Oana, Schneider & Thomann, 2021). In other words, configurational theorising becomes stronger when researchers add within-case evidence to bolster their understanding of causality. In addition, configurational approaches can be amended by qualitative, ex post follow-up research to go into more detail, especially with regard to the identified non-predicted cases (e.g., by means of hold-out samples). Set-theoretic, multi-method research is a formalised process of identifying the best available cases for within-case process tracing in a given data set. Cases are classified as either typical, deviant or individually irrelevant. Subsequently, the best-matching pairs of cases are identified in order to perform comparative analyses mimicking the Most Similar or Most Different case study design (George & Bennett, 2005). For example, the comparison of typical cases with other typical cases may provide useful inferences about the generalisability of underlying causal mechanisms. On the other hand, the comparison of typical cases versus deviant cases may provide useful inferences about omitted conjuncts (i.e., single conditions) or conjunctions (i.e., combinations of conditions). Likewise, the comparison of typical cases with the individual irrelevant cases may provide useful inferences about the causal properties of mechanisms (Oana, Schneider & Thomann, 2021).

Another extension is Necessary Condition Analysis (NCA). Championed by Dul and colleagues, NCA is a data analysis technique based on necessity logic that can be applied either with linear algebra (as in regression) or with Boolean algebra (as in

QCA) (Dul et al., 2010). Yet another extension is the study of temporal dynamics. While original formulations focused on time-related conditions, procedural variables, non-commutative sequences of conditions and the like (Fischer & Maggetti, 2017), more recent formulations have identified three distinct approaches aimed at tracking configurations over time: 1) *multiple time period, single configurational analysis*: the analyst performs one single configurational analysis by splitting cases into different time periods and then performs the analysis using a single truth table; 2) *multiple configurational analysis for different time periods*: the analyst performs multiple configurational analysis for the same sample of cases for different time periods; 3) *fuzzy-set ideal type analysis*: this approach calculates the cases' membership score in different truth table rows and identifies which cases score more than 0.5 in specific rows. *"The configuration in which a case has a membership of >0.5 is the ideal type it represents (sic) When calculating the case's ideal type for different periods in time, a researcher can analyse how cases move (or not) over time in the property space"*, that is, the truth table (Verweij & Vis, 2021: p. 105).

More recently, scholars have developed a trajectory-based configurational approach that conceptualises configurations dynamically, so that they express different development stages. Accordingly, scholars can now track qualitative variations occurring within single cases over time in order to show how cases can switch from one configuration to another configuration, thus tracking their trajectories, that is, their sequential movement over time (Pagliarin & Gerrits, 2020). Other approaches refer either to panel data or to time series. Whereas panel data approaches *"provide some diagnostic tools to assess a set-theoretic consistency and coverage both cross-sectionally and across time"* (Garcia-Castro & Ariño, 2016: p. 63), time series approaches incorporate time series variations (Hino, 2009).

Applications

Originally formulated within the Political Science and Sociology disciplines (Rihoux & Marx, 2013), the theory has been applied to other fields such as Business and Management (Harms, Kraus & Schwarz, 2009), International Relations (Ide & Mello, 2022), Sustainability (Meng, Yan & Xue, 2018), Marketing (Pappas, 2018), Education (Snelson-Powell, Grosvold & Millington, 2016) and Information Systems (Park, El Sawy & Fiss, 2017). Early publications appeared in leading Sociology journals. For example, Amenta et al. (1992) used the crisp-set version of the theory to study under what conditions the Townsend movement succeeded or failed to seek pensions for the aging population (Amenta, Carruthers & Zylan, 1992). Likewise, Roscigno and Hodson (2004) used the configurational approach in concert with quantitative methods to allow *"for the examination of unique configurations of organisational and interpersonal dynamics that either diminish or exacerbate collective and individual resistance"* (Roscigno & Hodson, 2004:p.15). Around that time, new publications appeared in the field of Business and Management, especially facilitated by the *Journal of Business Research* (Stokke, 2007) and in the area of International Business (Pajunen, 2008). Fiss (2007) argued that research on organisational configurations has been hindered by a mismatch between theories and methods, thus endorsing the configurational approach as a viable alternative (Fiss, 2007). Afterwards, Fiss (2011) complemented these early contributions by showing the relevance of the configurational approach for typology theorising and further developed the notion of core and peripheral conditions, depending on the strength of the evidence for a causal relation with the outcome of interest (Fiss,

2011). Around this time, configurational theorising was also introduced within the Information Systems field (El Sawy et al., 2010). More recently, many publications have appeared within the social sciences that draw either on quantitative data (Park, El Sawy & Fiss, 2017; Covin et al., 2020; Pappas, 2018), qualitative data (Aversa, Furnari & Haefliger, 2015;Iannacci & Cornford, 2018) or both (Mattke et al., 2021;Bouncken et al., 2020). Table 1 summarises an *exemplary* collection of such empirical contributions from different fields of research within the social sciences.

Table 1: Collection of empirical contributions

Paper	Area	Main argument	Implications
Amenta et al. (1992)	Sociology	It analyses under what conditions the Townsend movement (a social movement) succeeded in its effort of seeking pensions for the aging population.	It empirically demonstrates that there are multiple paths (or configurations) leading to both positive and negative outcomes
Aversa et al. (2015)	Business	It investigates business model configurations associated with high and low performance of Formula One racing teams in a longitudinal fashion.	It discovers two business model configurations associated with high performance that either revolve around selling technology to competitors or developing and trading human resources with competitors. It also argues that capability-enhancing complementarities are the engine that drives these two business model configurations.
Bouncken et al. (2020)	Management (Strategy)	It aims to inform research about configurations of above average value capture from coopetition (i.e. the	It empirically identifies configurations of consistently high and low firm-level value capture of small and

		simultaneous competition and collaboration between two firms).	medium-sized enterprises
Covin et al. (2016)	Management (Marketing/Innovation)	It argues that the configurational approach has not been used before in the context of innovation.	It empirically demonstrates that family and non-family firms have different combinations of marketing-related resources, leading to innovation success.
Covin et al. (2020)	Management (Entrepreneurship)	It shows that the configurational approach can also be deployed in an intra-organizational (i.e. employee) setting.	It empirically demonstrates that different configurations of individual (i.e. employee) factors can lead to (team) success.
Crilly et al. (2012)	Management	It investigates how firms facing identical pressures decouple their policy from practice in different ways and for different reasons	It uses fsQCA to reveal multiple equifinal configurations representing different ways of decoupling
Fiss (2011)	Management	It shows the relevance of the configurational approach for typology theorising by empirically investigating configurations based on Miles and Snow's framework.	It develops a midrange theory of causal processes based on the notion of core and peripheral conditions.

Greckhamer (2011)	Organisation Studies	It applies fsQCA to analyse country-level data encompassing four occupational groups (cleaners, secretaries, mid-level managers, and senior managers) from 44 countries	It shows configurations of cultural dimensions, development, and welfare state that are sufficient for a high compensation level and compensation inequality among these four occupations. It develops implications for cross-cultural research on compensation.
Iannacci and Cornford (2018)	Information Systems	It investigates success across multiple cases of information systems adopted for monitoring the disbursement and use of resources within the European Social Fund context.	It develops a typological theory of monitoring systems success that reveals overlapping typologies rather than exclusive typologies of cases.
Kraus et al. (2016)	Management (International Business)	It argues that the internationalisation success of family firms depends on the respective configuration of external resources (external ownership, presence of a non-family CEO, presence of non-family members on the advisory board, and international networks)	It identifies the optimal configurations of external (nonfamily) resources that allow family firms to internationalise successfully and explores the differences between different kinds of family firms with regards to their amount of familiness.
Mattke et al. (2021)	Information Systems	It combines qualitative data with configurational theorising to discover	It discloses non-trivial investment motivation configurations that

		how configurations of bitcoin-specific motivations explain bitcoin investment.	lay the groundwork for future studies of the role of cryptocurrencies in society.
Meuer et al. (2015)	Research policy	It draws on a novel combination of configurational and econometric analysis to analyse 384 Swiss firms	It identifies five co-existing innovation systems: two generic innovation systems, the autarkic and the knowledge-internalisation; one regional innovation system, the protected hierarchy; and two sectoral innovation systems, the public sciences and organised learning.
Pajunen (2008)	Business	It analyses how and why countries with different degrees of membership in different institutional constraints either attract or do not attract Foreign Direct Investments (FDI).	It shows that attracting FDI results from a combination of institutional conditions rather than single institutional factors, thus shedding new light on conflicting findings from the literature.
Pappas (2018)	Marketing	It uses fsQCA to show how trust in online vendors, privacy, emotions and experience combine to predict consumers' purchase intentions	It extends existing theories by showing how trust, privacy, emotions and experience combine to increase or mitigate intention to purchase. None of the examined factors are indispensable to explain purchase intentions.

Park et al. (2017)	Information Systems	It examines how IT's effect on agility is embedded in a configuration of organisational and environmental elements.	It discovers equifinal pathways to organisational agility within specific boundary conditions that determine the role that business intelligence and communication technologies play in achieving organisational agility.
Roscigno and Hodson (2004)	Sociology	It uses the configurational approach in concert with quantitative methods to allow *"for the examination of unique configurations of organisational and interpersonal dynamics that either diminish or exacerbate collective and individual resistance"*.	It shows that the configurational approach instils theoretical rigour in choosing variables that specify "potentially complex, conditional configurations."
Schneider et al. (2010)	Management (International Business)	It examines through fsQCA how institutional configurations, not single institutions, provide high tech companies with institutional capital for successful internationalisation.	It shows via country-level data for 19 OECD economies in the period 1990 to 2003 above all that a high proportion of university graduates and a large stock market are complementary institutions leading to high internationalisation success.

Snelson-Powell et al. (2016)	Education	It deploys fsQCA to examine the key organizational and strategic conditions under which business schools decouple their sustainability policies from their practices.	It find evidence that suggests that tight coupling is associated with small, prestigious business schools and that decoupling is associated with business schools that are large, wealthy, or lacking in expertise. It develops implications for business school legitimacy and institutional theory accordingly.
Stokke (2007)	Business	It applies the configurational approach as a strategy for improving the effectiveness of international regimes for resource management	It shows that this approach fits particularly well with small-to-intermediate samples where the number of cases is simultaneously too large for conventional qualitative methods and too small to support statistical procedures.
Wu et al. (2014)	Business	It applies both fsQCA and csQCA to test propositions from complexity theory in the context of customer assessments of services for beauty salon and spa treatments	It advances a nuanced theory of how customers' service evaluations relate to their assessments of overall service quality and intentions to use the service.

Limitations

Configurational theorising has raised several concerns that researchers should be aware of (Park & Mithas, 2020). In particular, researchers should be aware of ongoing concerns about the discovery of causal processes, the robustness of results under different assumptions, the ability to support theoretical exploration and testing of causal relationships and the ability to handle large samples and coarse-grained data. Some studies have argued that configurational theorising is designed in such a way to be sensitive to changes in consistency, frequency and calibration thresholds (Rutten, 2022). Accordingly, these scholars have advocated either a return to the cases (when dealing with a small sample size) or a return to the data (when dealing with a large sample size) to check the robustness of the original findings. A closely related issue is the issue of endogeneity (Meuer & Fiss, 2020). In particular, configurational theorising has been criticised with regard to the issue of omitted causal variables and invalid inferences. While this issue can be addressed when the number of cases (or observations) is relatively small, it is quite daunting in the context of a large number of cases (or observations), where researchers do not have in-depth case knowledge to ascertain the validity of their causal inferences. Nevertheless, procedures have recently been formulated for identifying the best available cases for within-case process tracing, even in the presence of large samples. Cases can be classified as either *typical*, *deviant* or *individually irrelevant*. Subsequently, the best-matching pairs of cases are identified in order to perform comparative analyses mimicking the Most Similar or Most Different case study design (George & Bennett, 2005). Despite recent developments with regard to the study of temporal dynamics, another criticism is the lack of a compelling approach for fully capturing the potential of temporal theorising and time-series configurational analysis (Meuer & Fiss, 2020). Hence, configurational theorising is so far still mostly silent on issues about configurational change and configurational process theories (Rihoux & Ragin, 2009).

In addition, configurational theorising has attracted criticism with regard to its relation to complexity theory. For example, it is not clear whether, and to what extent, the three pillars of conjunctural causation, equifinality and asymmetric causality closely correspond to propositions underlying systems theory and complexity theory (Meuer & Fiss, 2020). Another issue that has attracted significant criticism pertains to the solution being chosen. Although core texts have advocated choosing the intermediate solution (Ragin, 2008; Schneider & Wagemann, 2012), some scholars have recently voiced criticism of the intermediate solution by advocating a more parsimonious solution (Thiem, 2022). "This debate is in progress and reflects several inconclusive aspects of the current state of the art. In particular, it is characterised by the use of different criteria for evaluating the solution types, implicitness about these criteria and the required background assumptions for drawing causal inferences, and/or, more fundamentally, different analytical goals" used in the context of configurational theorising (Haesebrouck & Thomann, 2022: p. 2).

Concepts

Calibration (Concept): Process in which set membership scores are assigned to cases. Calibration can be based on the direct method (i.e., a logit function revolving around the three qualitative anchors 0, 0.5 and 1 assigned

by researchers) and the indirect method (i.e., a semi-automatic procedure establishing a fractional logic model between the preliminary fuzzy-set membership scores assigned by researchers) (Schneider & Wagemann, 2012)

Causal Condition (Independent): Factor which is used to explain the outcome. This factor can be either necessary (if the outcome cannot occur in the absence of the condition, that is, the condition is a superset of the outcome) or sufficient (if the condition or combination of conditions is a subset of the outcome, that is, whenever the condition is present, the outcome is also present even though the outcome can occur in the absence of this condition) (Schneider & Wagemann, 2012)

Configuration (Independent): Combination of conditions which describes a group of empirically observed or hypothetical cases (Schneider & Wagemann, 2012)

Conjunctural Causation (Independent/Dependent): Situation in which the effect of a single condition unfolds in combination with precisely specified other conditions (Schneider & Wagemann, 2012)

Causal Asymmetry (Concept): Causes leading to the presence of an outcome of interest may be quite different from those leading to the absence of the outcome (Fiss, 2011)

Consistency Sufficiency/Consistency Necessity (Concept): Consistency sufficiency expresses the percentage of cases' set-membership scores in two sets that is in line with the statement that one of the two sets is a subset of the other. Consistency necessity on the other hand expresses the percentage of cases' set-membership scores in two sets that is in line with the statement that one of the two sets is a superset of the other (Schneider & Wagemann, 2012)

Coverage Necessity/Coverage Sufficiency (Concept): Coverage necessity is better understood in terms of the relevance and trivialness of a necessary condition. Coverage sufficiency expresses how much of the outcome overlaps with and, therefore, is covered by the sufficient condition (Schneider & Wagemann, 2012)

Equifinality (Concept): Multiple configurations of conditions leading to the same outcome. Hence, the final outcome may be reached from different initial conditions and in different ways. (Schneider, 2012)

Fuzzy Set (Concept): Set which allows for partial membership, in addition to full membership (1) and full non-memberships (0). Crisp Sets can be perceived as special cases of Fuzzy Sets because they allow only for full membership (1) and full non-membership (0) (Schneider & Wagemann, 2012)

Outcome (Dependent): Variable to be explained by the configurations of conditions (Rihoux & Ragin, 2009)

QCA (Concept): One of the most formalized set-theoretic methods based on formal logic and Boolean algebra in the analysis of truth tables. QCA aims at establishing necessary or sufficient conditions, integrating parameters of fit (i.e., consistency and coverage). QCA has three variants (i.e., crisp-set QCA, fuzzy-set QCA and multi-value QCA) that can be integrated under the generalized-set QCA (gsQCA). (Schneider & Wagemann, 2012)

Parsimonious, Intermediate and Complex Solution (Concept): Solutions derived from the minimisation process, that is, the process aimed at reducing complex expressions into a minimal formula. Each solution refers to the result or end product of a truth table analysis. Each solution usually consists of several configurations of conditions joined by logical OR. Depending on the search strategies deployed for retrieving remainders to include in the truth table analysis to minimize away redundant conditions, three solutions can be identified, namely, the Parsimonious, Intermediate and Complex (aka Conservative) solutions. The Parsimonious solution is the solution derived with the aid of remainders without any evaluation of their plausibility. The Intermediate solution is the solution derived with the aid of only those remainders that are consistent with the researcher's theoretical and substantive knowledge. The Complex solution is the solution derived without the aid of any remainders. Although there is a debate in the literature between a pro-intermediate versus a pro-parsimonious solution type, researchers advocating the Intermediate solution now distinguish those attributes among the reported solution that are core from those that are contributing (or peripheral) conditions (Misangyi et al., 2017)

Remainders (Concept): Configurations that lack empirical instances. Usually, truth tables display rows (or configurations) without enough empirical evidence because the number of cases travelling along these rows (or configurations) falls below the minimum (frequency) thresholds defined by researchers according to standards of good practice. Among researchers, it has now become conventional to report the results obtained with the aid of remainders through a process called "counterfactual analysis", which entails conjecturing the effect that an unobserved configuration of conditions would exhibit if it did exist. (Rihoux & Ragin, 2009)

Solution Formula (Concept): A statement about one or multiple combinations of conditions joined by logical AND (*). It may refer to a single configuration or several configurations joined by logical OR (+) (Rihoux & Ragin, 2009)

Truth Table (Concept): This contains the empirical evidence gathered by the researcher by sorting cases into one of the 2k logically possible combinations, aka truth table rows, of k conditions. Each row linked to the outcome can be interpreted as a statement of sufficiency (Schneider & Wagemann, 2012)

Variants (Concept): QCA Variants (Schneider & Wagemann, 2012)

References

Amenta, E., Carruthers, B.G. & Zylan, Y. (1992). A Hero for the Aged? The Townsend Movement, the Political Mediation Model, and U.S. Old-Age Policy, 1934-1950. *American Journal of Sociology*, 98 (2), 308-339.

Aversa, P., Furnari, S. & Haefliger, S. (2015). Business model configurations and performance: A qualitative comparative analysis in Formula One racing, 2005-2013. *Industrial and Corporate Change*, 24 (3), 655-676.

Bouncken, R., Ratzmann, M., Barwinski, R. & Kraus, S. (2020). Coworking spaces: Empowerment for entrepreneurship and innovation in the digital and sharing economy. *Journal of Business Research*, 114, 102-110.

Bouncken, R.B., Fredrich, V. & Kraus, S. (2020). Configurations of firm-level value capture in coopetition. *Long Range Planning*, 53 (1), 101869.

Covin, J.G., Eggers, F., Kraus, S., Cheng, C. & Chang, M. (2016). Marketing-related resources and radical innovativeness in family and non-family firms: A configurational approach. *Journal of Business Research*, 69 (12), 5620-5627.

Covin, J.G., Rigtering, J.C., Hughes, M., Kraus, S., Cheng, C. & Bouncken, R.B. (2020). Individual and team entrepreneurial orientation: Scale development and configurations for success. *Journal of Business Research*, 112, 1-12.

Crilly, D., Zollo, M. & Hansen, M.T. (2012). Faking It or Muddling Through? Understanding Decoupling in Response to Stakeholder Pressures. *Academy of Management Journal*, 55 (6), 1429-1448.

Dess, G., Newport, S. & Rasheed, A. (1993). Configuration Research in Strategic Management: Key Issues and Suggestions. *Journal of Management*, 19 (4), 775–795.

Dul, J., Hak, T., Goertz, G. & Voss, C. (2010). Necessary condition hypotheses in operations management. *International Journal of Operations & Production Management*, 30 (11), 1170-1190.

El Sawy, O.A., Malhotra, A., Park, Y. & Pavlou, P.A. (2010). Research Commentary—Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango. *Information Systems Research*, 21 (4), 835-848.

Fischer, M. & Maggetti, M. (2017). Qualitative Comparative Analysis and the Study of Policy Processes. *Journal of Comparative Policy Analysis: Research and Practice*, 19 (4), 345-361.

Fiss, P.C. (2007). A set-theoretic approach to organizational configurations. *Academy of Management Review*, 32 (4), 1180-1198.

Fiss, P.C. (2011). Building Better Causal Theories: A Fuzzy Set Approach to Typologies in Organization Research. *Academy of Management Journal*, 54 (2), 393-420.

Garcia-Castro, R. & Ariño, M. (2016). A General Approach to Panel Data Set-Theoretic Research. *Journal of Advances in Management Sciences & Information System*, 2, 63-76.

George, A. & Bennett, A. (2005). *Case Studies and Theory Development in the Social Sciences (BCSIA Studies in International Security)*. The MIT Press.

Greckhamer, T. (2011). Cross-cultural Differences in Compensation Level and Inequality across Occupations: A Set-theoretic Analysis. *Organization Studies*, 32 (1), 85-115.

Haesebrouck, T. & Thomann, E. (2022). Introduction: Causation, inferences, and solution types in configurational comparative methods. *Quality & Quantity*, 56 (4), 1867-1888.

Harms, R., Kraus, S. & Schwarz, E. (2009). The suitability of the configuration approach in entrepreneurship research. *Entrepreneurship & Regional Development*, 21 (1), 25-49.

Hino, A. (2009). Time-Series QCA: Studying Temporal Change through Boolean Analysis. *Sociological Theory and Methods*, 24 (2), 247-265.

Iannacci, F. & Cornford, T. (2018). Unravelling causal and temporal influences underpinning monitoring systems success: A typological approach. *Information Systems Journal*, 28 (2), 384-407.

Ide, T. & Mello, P.A. (2022). QCA in International Relations: A Review of Strengths, Pitfalls, and Empirical Applications. *International Studies Review*, 24 (1).

Kent, R. (2005). Cases as Configurations: Using Combinatorial and Fuzzy Logic to Analyse Marketing Data. *International Journal of Market Research*, 47 (2), 205-228.

Kraus, S., Mensching, H., Calabrò, A., Cheng, C. & Filser, M. (2016). Family firm internationalization: A configurational approach. *Journal of Business Research*, 69 (11), 5473-5478.

Mattke, J., Maier, C., Reis, L. & Weitzel, T. (2021). Bitcoin investment: a mixed methods study of investment motivations. *European Journal of Information Systems*, 30 (3), 261-285.

Meng, J., Yan, J. & Xue, B. (2018). Exploring Relationships between National Culture and Infrastructure Sustainability Using QCA. *Journal of Construction Engineering and Management*, 144 (9).

Meuer, J. & Fiss, P.C. (2020). *Qualitative Comparative Analysis in Business and Management Research*.

Meuer, J., Rupietta, C. & Backes-Gellner, U. (2015). Layers of co-existing innovation systems. *Research Policy*, 44 (4), 888-910.

Misangyi, V.F., Greckhamer, T., Furnari, S., Fiss, P.C., Crilly, D. & Aguilera, R. (2017). Embracing Causal Complexity. *Journal of Management*, 43 (1), 255-282.

Oana, I., Schneider, C.Q. & Thomann, E. (2021). *Qualitative comparative analysis using R*. Cambridge University Press.

Pagliarin, S. & Gerrits, L. (2020). Trajectory-based Qualitative Comparative Analysis: Accounting for case-based time dynamics. *Methodological Innovations*, 13 (3), 205979912095917.

Pajunen, K. (2008). Institutions and inflows of foreign direct investment: a fuzzy-set analysis. *Journal of International Business Studies*, 39 (4), 652-669.

Pappas, I.O. & Woodside, A.G. (2021). Fuzzy-set Qualitative Comparative Analysis (fsQCA): Guidelines for research practice in Information Systems and marketing. *International Journal of Information Management*, 58, 102310.

Pappas, I.O. (2018). User experience in personalized online shopping: a fuzzy-set analysis. *European Journal of Marketing*, 52 (7/8), 1679-1703.

Park, Y. & Mithas, S. (2020). Organized Complexity of Digital Business Strategy: A Configurational Perspective. *MIS Quarterly*, 44 (1), 85-127.

Park, Y., El Sawy, O.A. & Fiss, P.C. (2017). The Role of Business Intelligence and Communication Technologies in Organizational Agility: A Configurational Approach. *Journal of the Association for Information Systems*, 18 (9), 648-686.

Park, Y., Fiss, P.C. & El Sawy, O.A. (2020). *Theorizing the Multiplicity of Digital Phenomena: The Ecology of Configurations, Causal Recipes, and Guidelines for Applying QCA*.

Ragin, C.C. (1989). *Comparative Method*. University of California Press.

Ragin, C.C. (2008). *Redesigning social inquiry*. University of Chicago Press.

Ragin, C.C. (2014). *The Comparative Method*. University of California Press.

Rihoux, B. & Marx, A. (2013). QCA, 25 Years after "The Comparative Method". *Political Research Quarterly*, 66 (1), 167-235.

Rihoux, B. & Ragin, C.C. (2009). *Comparative methods*. Sage.

Roscigno, V.J. & Hodson, R. (2004). The Organizational and Social Foundations of Worker Resistance. *American Sociological Review*, 69 (1), 14-39.

Rutten, R. (2022). Applying and Assessing Large-N QCA: Causality and Robustness From a Critical Realist Perspective. *Sociological Methods & Research*, 51 (3), 1211-1243.

Schneider, C.Q. & Wagemann, C. (2012). *Set-Theoretic Methods for the Social Sciences*. Cambridge University Press.

Schneider, M.R., Schulze-Bentrop, C. & Paunescu, M. (2010). Mapping the institutional capital of high-tech firms: A fuzzy-set analysis of capitalist variety and export performance. *Journal of International Business Studies*, 41 (2), 246-266.

Snelson-Powell, A., Grosvold, J. & Millington, A. (2016). Business School Legitimacy and the Challenge of Sustainability: A Fuzzy Set Analysis of Institutional Decoupling. *Academy of Management Learning & Education*, 15 (4), 703-723.

Stokke, O.S. (2007). Qualitative comparative analysis, shaming, and international regime effectiveness. *Journal of Business Research*, 60 (5), 501-511.

Thiem, A. (2022). Beyond the Facts: Limited Empirical Diversity and Causal Inference in Qualitative Comparative Analysis. *Sociological Methods & Research*, 51 (2), 527-540.

Thiem, A., Baumgartner, M. & Bol, D. (2016). Still Lost in Translation! A Correction of Three Misunderstandings Between Configurational Comparativists and Regressional Analysts. *Comparative Political Studies*, 49 (6), 742-774.

Verweij, S. & Vis, B. (2021). Three strategies to track configurations over time with Qualitative Comparative Analysis. *European Political Science Review*, 13 (1), 95-111.

Wu, P., Yeh, S., Huan, T.(. & Woodside, A.G. (2014). Applying complexity theory to deepen service dominant logic: Configural analysis of customer experience-and-outcome assessments of professional services for personal transformations. *Journal of Business Research*, 67 (8), 1647-1670.

Diffusion of Innovations

Diffusion of innovation studies aim to understand what stimulates the adoption of a resource, such as an idea or product, and how such a decision can affect a social structure and context.

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Theory Factsheet

Proposed By: Rogers, 1962

Related Theories: Technology organisation environment (TOE) framework

Discipline: Innovation

Unit of Analysis: Innovation, individuals, firms, clusters, social networks, and countries

Level: Macro-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

Rogers (Rogers, 2003) is credited with observing a series of general, common elements across early diffusion research from different disciplines. Accordingly, although Diffusion of Innovations is a communications theory, it drew upon different rational theories of organisational life, such as from economics and sociology (Ardis & Marcolin, 2017). In his 1962 seminal work on "Diffusion of Innovations", Rogers first proposed significant and universal factors that help explain how social change takes place. Rogers's observations and propositions on the diffusion of ideas and products have undergone different iterations and expansions as the Diffusion of Innovations theory has evolved and developed.

Theory

An innovation is any idea, practice, or object that is viewed as new by an individual or another unit of adoption such as a firm. Innovators can be individuals, firms, clusters, social networks, and even countries. (Meyer, 2004; Rogers, 2003) proposed five attributes of innovation. Individuals' perceptions of these attributes determine an innovation's rate of adoption, which shows the relative speed with which an

innovation is adopted by individuals of a social system. The five perceived attributes of innovations are:

 Relative advantage - refers to whether an innovation is viewed as better than the idea it supersedes. Compatibility - is the degree to which an innovation is viewed as consistent with the current values, previous experiences, and needs of prospective adopters. Complexity - is whether an innovation is perceived as relatively difficult to understand and to use. Trialability - refers to the degree to which an innovation may be experimented with on a restricted basis. Observability - represents the degree to which the outcomes of an innovation are visible to others.

Relative advantage, compatibility, trialability and observability of an innovation are positively related to its rate of adoption (Rogers, 2003). Complexity is the only factor that is negatively related to the rate of adoption.

Beside the perceived attributes of an innovation, other factors can also affect its rate of adoption. They include: the (a) type of innovation-decision, (b) the nature of the communication channels diffusing the innovation at different stages in the innovation-decision process, (c) the nature of the social system; and (d) the change agent, each of which are explained below.

Having an impact on the rate of adoption of innovation, the innovation-decision can be of different types: the first type is optional innovation decisions, which refer to choices to adopt or reject an innovation made by an individual, independent of the decisions of other individuals of the system. The second type is collective innovation-decisions, which are choices to adopt or reject an innovation made by consensus among the individuals of a system. The third type is authority innovation-decisions, which are choices to adopt or reject an innovation made by relatively few people in a system, who have power, status, or technical experience. There is also a fourth type that includes a sequential mixture of two or more of these three types of innovation decisions: Contingent innovation-decisions, which are choices to adopt or reject made only after a previous innovation-decision (Rogers, 2003).

Another factor that can also have an effect on the rate of adoption of innovation is the communication channel. This refers to the way through which messages about the innovation are transmitted from one person to another (Chakrabarti, Feineman & Fuentevilla, 1983). Individuals often assess an innovation not based on scientific research by experts, but through the subjective evaluations of near peers who have adopted the innovation. Such near peers represent a role model, whose innovation behaviour tends to be imitated by other individuals in their system. A distinguishing aspect of diffusion is that at least some degree of heterophily is usually present in communication about innovations. Heterophily represents the extent to which two or more individuals are different in certain characteristics, such as beliefs, education, and social status. The opposite of heterophily is homophily - the extent to which two or more individuals are similar in certain traits. The level of similarity among group members across which an innovation diffuses tends to accelerate the ease and speed with which the diffusion occurs. For instance, innovations spread faster among homophilous groups than among heterophilous groups (Cain, 2002).

One of the factors also impacting the rate of adoption of innovation is the social system. This represents a set of interrelated units that are involved in joint problem

solving to attain a common objective. A system has a structure, defined as the patterned arrangements of the units in a system, which provides stability and regularity to individual behaviour in a system. The social and communication structure of a system facilitates or hinders the Diffusion of Innovations in the system. In fact, the communication structure represents the differentiated elements that can be recognised in the patterned communication flows in a system. Such a structure includes the cliques within a system and the network interconnections among them that are provided by ties and links. Accordingly, individuals are identified as belonging to cliques based on the communication proximity, which means the extent to which two linked individuals in a network have personal communication networks that overlap. A personal network includes those interconnected individuals who are related by patterned communication flows to a specific individual. Personal networks that are radial are more open to an individual's environment, and, thus, play a more important role in the Diffusion of Innovations. The information exchange potential of communication network links is negatively related to their degree of (1) communication proximity and (2) homophily. This generalisation represents Granovetter's theory of "the strength-of-weak-ties". People tend to be linked to others who are close to them in physical distance and who are relatively homophilous in social traits (Rogers, 2003).

Another aspect to highlight in relation to social structure is norms, the established behaviour patterns for the members of a social system. For instance, opinion leaders (individuals who are able to affect other individuals' attitudes or behaviour in a desired manner with relative frequency) conform more closely to a system's norms in comparison to their followers. When a social system's norms favour change, opinion leaders are especially innovative.

Finally, change agents aim to affect the innovation adoption decisions of individuals in the system in a direction considered desirable by the agent. There are 7 functions performed by change agents: creating a need for change on the part of clients; developing an information exchange relationship; diagnosing problems; developing an intent to change in the client; translating intentions into action; stabilising adoption and preventing discontinuance; and attaining a terminal relationship with clients. Change agents operate interventions, as actions with a coherent goal to bring about behaviour change with the purpose of generating identifiable outcomes. Targeting, which is based on customising the design and delivery of a communication program on the basis of the characteristics of an intended audience segment, is one way of segmenting a heterogeneous audience. Through this aforementioned approach, customised messages that fit each individual's situation are delivered. In terms of a change agent's relative success in ensuring the adoption of innovations by clients, it is positively related to factors such as the extent of the change agent's effort in contacting clients, a client orientation, rather than a change agency orientation, the level to which the diffusion program complies with clients' needs, and increasing clients' capability to assess innovations (Rogers, 2003).

DOI represents the process through which an individual moves from first knowledge of an innovation towards forming an attitude to it, to a decision to adopt or reject it, to implementation of the new idea, and to confirmation of this decision. The innovation decision process includes 5 phases (Rogers, 2003): knowledge, when the individual is exposed to the innovation's presence and understands how it works persuasion, when the individual creates a favourable or unfavourable attitude towards the innovation decision, when the individual gets engaged in activities that

result in a choice to adopt or reject the innovation implementation, when the individual puts an innovation to use confirmation, when the individual seeks reinforcement for an innovation-decision already made, but may reverse the decision, if exposed to conflicting messages about it.

DOI makes it possible to take a process view of the innovation adoption, moving from pre-adoption, adoption decision, and post-adoption (Damanpour & Schneider, 2006). These stages are usually known as intention (persuasion stage), adoption (decision stage), and routinisation (implementation stage) (Chong & Chan, 2012;Zhu, Kraemer & Xu, 2006). The intention stage develops the baseline for the individual to move towards the effective adoption. In turn, the adoption results in its routinisation (Chan & Chong, 2013). In fact, as the individual becomes more competent and learns from the experience acquired through the intention phase to reap the advantages of the innovation effectively, they enter the adoption stage. Once integration is complete and full-scale deployment of the innovation across the adopter's different activities within the system is assured, the ?nal stage, routinisation, is reached (Martins, Oliveira & Thomas, 2016). Still, it is not always the case that an innovation will be utilised in the long term. In some cases, there may be a discontinuance. This represents the decision to reject an innovation after having previously adopted it. There are two types of discontinuance: the replacement discontinuance, when an idea is rejected with the purpose of adopting a better idea which superseded it, and the disenchantment discontinuance, when an idea is rejected due to dissatisfaction with its performance.

The adoption of an idea occurs in an S-shaped curve (Cain, 2002; Rogers, 2003). More specifically, the adoption distribution exhibits an S-shaped curve over time and approaches normality. In fact, an innovation is firstly adopted by a few individuals or firms. As more use it, others observe its use, and if the innovation is better than what went previously, others start to adopt and use it. When the diffusion reaches a level of critical mass, it proceeds fast. The critical mass takes place at the point at which enough individuals in a system have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining (Cain, 2002; Rogers, 2003). Accordingly, it is based on such adoption behaviours that the S-curve and bell-shape curve are developed, and that (2003) grouped the adopters.

In particular, there is a typical shape for a diffusion curve when innovations are developed successfully and stay undisturbed in a social system. At the outset, the adoption rate is low, but it then increases gradually and decreases again towards the end. If it is presented graphically as a curve of percentages, it normally takes the form of an S-curve (Figure 1 below). If the rates of adoption are taken as an absolute number of adopters per unit of time rather than in percentages, the outcome is a bell-shaped or wave curve, similar to a normal distribution (Figure 2 below).

Figure 1: The Diffusion S-curve. / Adopted from Rogers (2003)
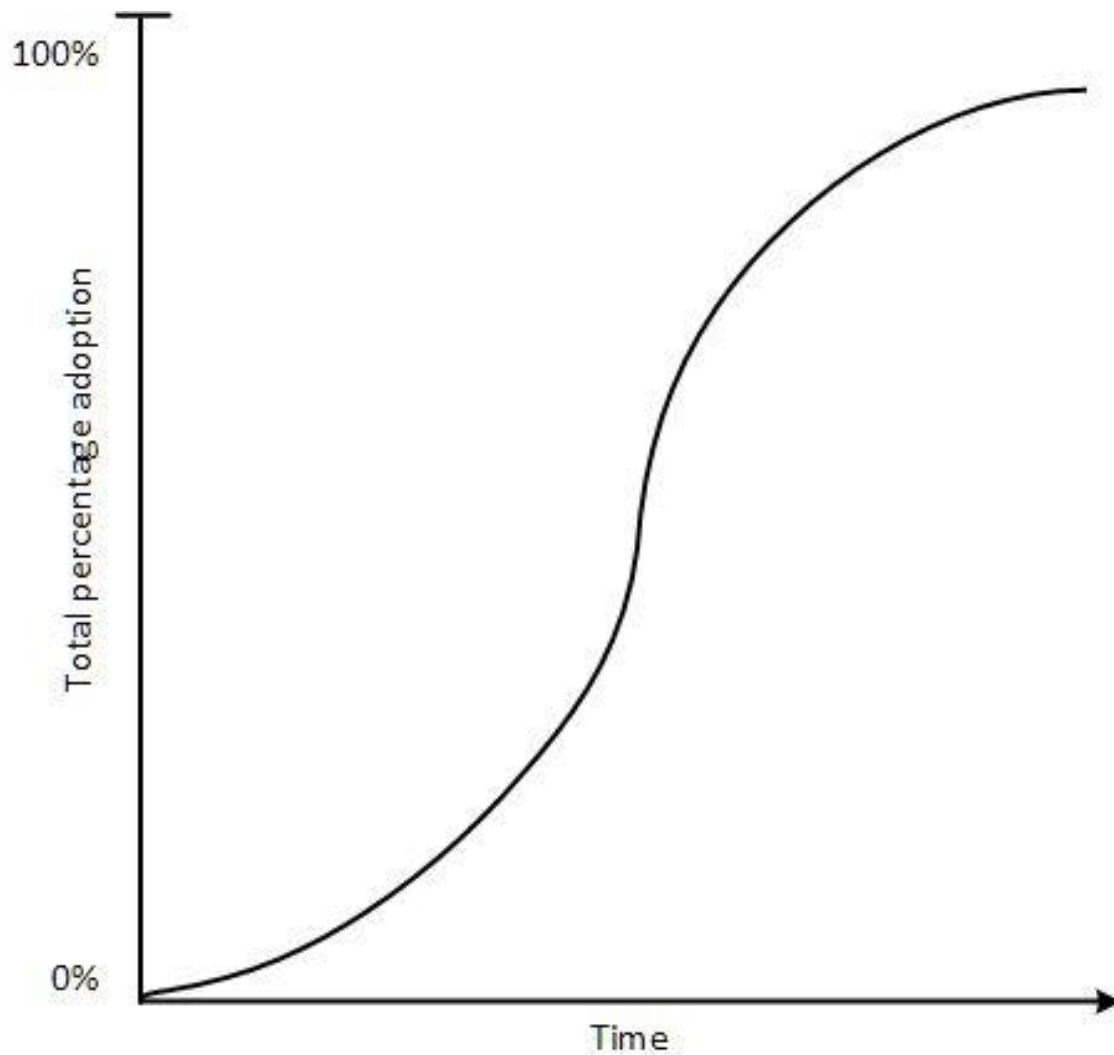
Classified according to the rates of adoption of innovations, the adopter categories represent the classifications of the members of a social system in relation to the level to which an individual or other unit of adoption is relatively earlier in adopting new ideas in comparison to other members of a system. These five adopter categories are the innovators, early adopters, early majority, late majority and laggards. Starting with the innovators, they are among the first 2.5% in the population to adopt the innovation and show an adventurous, cosmopolitan nature. As for the early adopters, they fall into the next 13.5% of adopters and are closely integrated into the social network. They are often opinion leaders. The early majority are the next 34% of adopters, viewed as deliberate followers. The late majority are the next 34%, who are often sceptical of the innovation at first. However, they eventually succumb to peer pressure. The laggards are the final 16%. They tend to be more traditional and isolated in comparison to early adopters. People who are among the last to adopt an innovation often demonstrate the longest decision-making processes before choosing to adopt the innovation. In addition, late adopters are more likely to discontinue innovations than are early adopters. Early knowers of an innovation, when compared to late knowers, are characterised by more formal education, higher social status, higher exposure to mass media channels of communication, higher exposure to interpersonal channels of communication, as well as higher

change agent contact, higher social participation, and higher cosmopolitanness. Early adopters are also different from late adopters in terms of personality factors. They have more empathy, less dogmatism, a higher capability to deal with abstractions, higher rationality, higher intelligence, a more favourable attitude toward change, a higher capacity to deal with uncertainty and risk, a more favourable attitude toward science, less fatalism, higher self-efficacy, higher aspirations for formal education, and higher-status roles. It is worth noting that the distinct characteristics of the five adopter categories indicate that these adopter categories can be helpful in audience segmentation, a strategy in which several communication channels and/or messages are referred to, to reach each sub-audience (Rogers, 2003).

Figure 2: (1) The innovator as trouble maker (2) The critical phase (3) Transition to self-sustaining process (4) Final phase of the wave / Adopted from Rogers (2003)
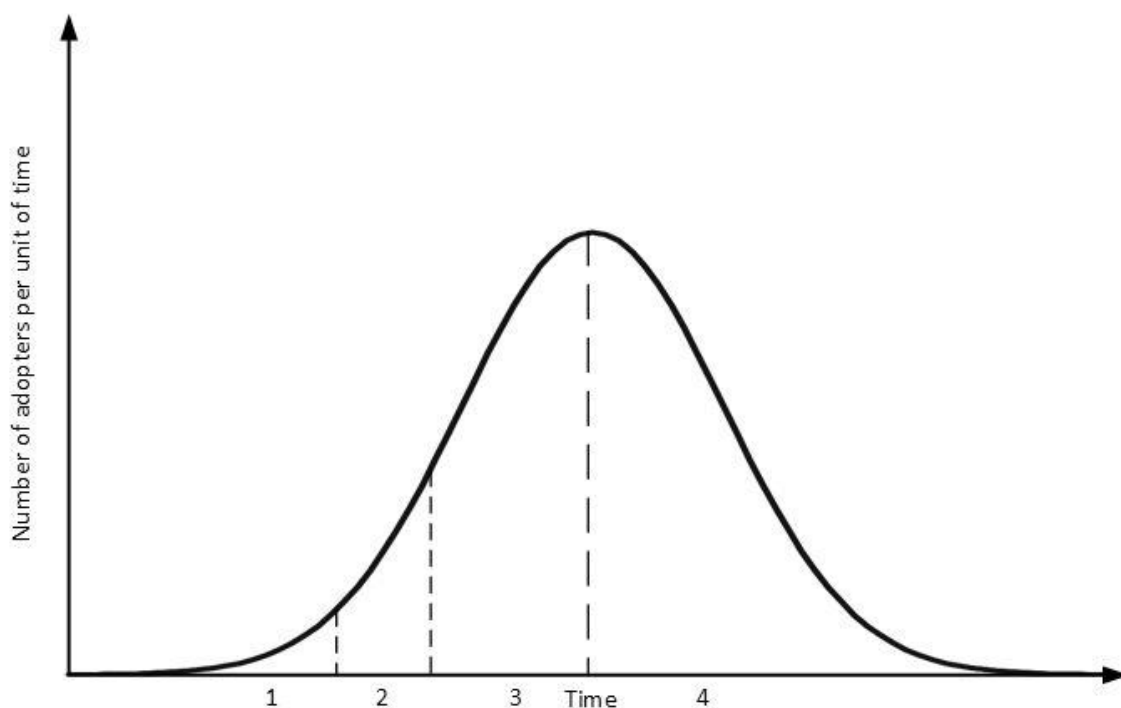
Applications

DOI has been applied empirically across different disciplines over the years, evolving and continuing to be applied to emerging innovations and social issues (Dearing, 2009). The different disciplines where DOI has been applied include, for instance, agriculture, medicine, education, communication, and marketing (Greenhalgh et al., 2005). In the education context, for example, Cervero and Rottet (1984) studied the effectiveness of continuing professional education, while (Raman et al., 2021) studied DOI in the adoption of online software to monitor university students' screens in online exams during COVID-19. In the health care context, researchers investigated the adoption and use of new drugs by doctors (Leslie & Rosenheck,

2002). Also, within the health care context, they studied DOI in intervention development (Dearing, 2009), and in laparoscopic colectomy adoption and diffusion in England (Barrenho et al., 2021).

DOI has also been applied to studies related to energy, such as the adoption of renewable heating systems (Franceschinis et al., 2017). In addition, DOI has been used in information systems studies. For instance, prior research has considered the 5 innovation characteristics in the adoption and diffusion of Internet-based technologies (Koenig- Lewis, Palmer & Moll, 2010; Papies & Clement, 2008). DOI has also been applied to cloud computing adoption studies (Alshamaila, Papagiannidis & Li, 2013; Sayginer & Ercan, 2020; Carreiro & Oliveira, 2019), and to different studies on mobile applications such as mobile banking adoption (Al-Jabri and Sohail, 2012) and transportation (Min, So & Jeong, 2019; Nordhoff et al., 2021).

Limitations

When discussing the limitations in relation to the DOI theory, it is worth discussing first the limitations or shortcomings of the diffusion research itself, based on which some limitations of the theory itself can be understood and explained, as below.

The four major criticisms of diffusion research discussed by Rogers are:

The pro-innovation bias: the implication of most diffusion research is that an innovation should be diffused to and adopted by all individuals of a social system, that it should be diffused rapidly, and that the innovation should be neither re-invented nor rejected. This indicates that the way innovation is diffused, communicated, and the way people are convinced to adopt it, tends to create some bias. Accordingly, people will miss the chance to express their opinion (advantages/disadvantages) about the innovation. The individual-blame bias: the tendency to hold individuals responsible for their problems of not having sufficient understanding about the innovation, rather than the system of which the individual is a part. The recall problem in diffusion research, which can result in inaccuracies when respondents are asked to remember the time at which they adopted a new idea. However, this particular criticism is more a "research design" concern. The issue of equality in the Diffusion of Innovations, as socio-economic gaps among the members of a social system are often widened due to the spread of new ideas and how they are adopted by different groups.

Ardis and Marcolin (2017) state that researchers have to carefully identify the complex, networked, and learning intensive aspects of technology. They should also understand the role of institutional regimes, putting emphasis on process aspects (involving histories) and the main players in the diffusion area. They have to create multi-layered research designs that factor out mappings between different layers and locales. Also, they have to utilise different viewpoints involving political models, institutional models and theories of team behaviour. They have to use different time scales when crafting accounts of what happened and what the reason behind it is. DOI theory does not provide specific variables to deal with collective adoption behaviours (e.g., the critical role of standards, critical mass, network externalities, sunk costs, path dependence). The Diffusion of Innovations researchers have to be

cautious when examining the role of institutional policies and regimes, the effect of the industrial policies and strategies, and the significance of the installed base and learning inertia.

Concepts

Relative Advantage (Independent): The degree to which an innovation is viewed as better than the idea it supersedes. (Rogers, 2003)

Compatibility (Independent): The degree to which an innovation is viewed as consistent with the current values, previous experiences, and needs of prospective adopters. (Rogers, 2003)

Complexity (Independent): The degree to which an innovation is viewed as relatively difficult to understand and to use. (Rogers, 2003)

Trialability (Independent): The degree to which an innovation may be experimented with on a restricted basis. (Rogers, 2003)

Observability (Independent): The degree to which the outcomes of an innovation are visible to others. (Rogers, 2003)

Innovation-decision Type (Independent): The innovation-decision type refers to whether this is an optional, collective, or authority innovation-decision. (Rogers, 2003)

Communication Channels (Independent): A communication channel is the way through which a message gets from a source to a receiver. (Rogers, 2003)

Rate of Adoption of Innovations (Dependent): The relative speed with which an innovation is adopted by individuals of a social system. (Rogers, 2003)

Timing of Adoption (Dependent): The measurement of how early a given subject adopts new ideas relative to other individuals of their social system. (Rogers, 2003)

References

Alshamaila, Y., Papagiannidis, S. & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England. *Journal of Enterprise Information Management*, 26 (3), 250-275.

Ardis, M.A. & Marcolin, B.L. (2017). Erratum to: Diffusing Software Product and Process Innovations. *Diffusing Software Product and Process Innovations*, E1-E1.

Barrenho, E., Miraldo, M., Propper, C. & Walsh, B. (2021). The importance of surgeons and their peers in adoption and diffusion of innovation: An observational study of laparoscopic colectomy adoption and diffusion in England. *Social Science & Medicine*, 272, 113715.

Cain, M. (2002). *Diffusion of innovation in health care (Ihealth reports)*. California HealthCare Foundation.

Carreiro, H. & Oliveira, T. (2019). Impact of transformational leadership on the diffusion of innovation in firms: Application to mobile cloud computing. *Computers in Industry*, 107, 104-113.

Chakrabarti, A.K., Feineman, S. & Fuentevilla, W. (1983). Characteristics of sources, channels, and contents for scientific and technical information systems in industrial R and D. *IEEE Transactions on Engineering Management*, EM-30 (2), 83-88.

Chan, F.T. & Chong, A.Y. (2013). Determinants of mobile supply chain management system diffusion: a structural equation analysis of manufacturing firms. *International Journal of Production Research*, 51 (4), 1196-1213.

Chong, A.Y. & Chan, F.T. (2012). Structural equation modeling for multi-stage analysis on Radio Frequency Identification (RFID) diffusion in the health care industry. *Expert Systems with Applications*, 39 (10), 8645-8654.

Damanpour, F. & Schneider, M. (2006). Phases of the Adoption of Innovation in Organizations: Effects of Environment, Organization and Top Managers1. *British Journal of Management*, 17 (3), 215-236.

Dearing, J.W. (2009). Applying Diffusion of Innovation Theory to Intervention Development. *Research on Social Work Practice*, 19 (5), 503-518.

Franceschinis, C., Thiene, M., Scarpa, R., Rose, J., Moretto, M. & Cavalli, R. (2017). Adoption of renewable heating systems: An empirical test of the diffusion of innovation theory. *Energy*, 125, 313-326.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O. & Peacock, R. (2005). Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review. *Social Science & Medicine*, 61 (2), 417-430.

Koenig- Lewis, N., Palmer, A. & Moll, A. (2010). Predicting young consumers' take up of mobile banking services. *International Journal of Bank Marketing*, 28 (5), 410-432.

Leslie, D.L. & Rosenheck, R.A. (2002). From Conventional to Atypical Antipsychotics and Back: Dynamic Processes in the Diffusion of New Medications. *American Journal of Psychiatry*, 159 (9), 1534-1540.

Martins, R., Oliveira, T. & Thomas, M.A. (2016). An empirical analysis to assess the determinants of SaaS diffusion in firms. *Computers in Human Behavior*, 62, 19-33.

Meyer, G. (2004). Diffusion Methodology: Time to Innovate?. *Journal of Health Communication*, 9 (sup1), 59-69.

Min, S., So, K.K.F. & Jeong, M. (2019). Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. *Journal of Travel & Tourism Marketing*, 36 (7), 770-783.

Nordhoff, S., Malmsten, V., van Arem, B., Liu, P. & Happee, R. (2021). A structural equation modeling approach for the acceptance of driverless automated shuttles based on constructs from the Unified Theory of Acceptance and Use of Technology and the Diffusion of Innovation Theory. *Transportation Research Part F: Traffic Psychology and Behaviour*, 78, 58-73.

Papies, D. & Clement, M. (2008). Adoption of New Movie Distribution Services on the Internet. *Journal of Media Economics*, 21 (3), 131-157.

Raman, R., B, S., G, V., Vachharajani, H. & Nedungadi, P. (2021). Adoption of online proctored examinations by university students during COVID-19: Innovation diffusion study. *Education and Information Technologies*, 26 (6), 7339-7358.

Rogers, E. (1962). *Diffusion of Innovations*. Free Press.

Rogers, E.M. (2003). *Diffusion of innovations*. Free Press.

Sayginer, C. & Ercan, T. (2020). Understanding determinants of cloud computing adoption using an integrated Diffusion of Innovation (DOI)-Technological, Organizational and Environmental (TOE) model. *Humanities & Social Sciences Reviews*, 8 (1), 91-102.

Zhu, K., Kraemer, K.L. & Xu, S. (2006). The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on E-Business. *Management Science*, 52 (10), 1557-1576.

Equity Theory

Equity Theory explains the individual's perception of fairness in social exchange relationships, based on the perception of one's input into relations and the output of those relations compared against the ratio of the input and output of other people

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Theory Factsheet

Proposed By: Adams, 1963

Parent Theory: Social Exchange Theory, Cognitive Dissonance Theory, Social Comparison Theory, Relative deprivation Theory

Related Theories: Fairness Theory, Equity Sensitivity Theory

Discipline: Psychology

Unit of Analysis: Individual

Level: Micro-level

Type: Theory for Explaining and Predicting

Operationalised: Quantitatively

Introduction

Equity Theory was introduced by John Stacey Adams in 1963 (Adams, 1963), originally, for application in the organisational context. The theory was developed against the lack of theoretical explanation of the psychological basis of inequity perception (Adams, 1963). The inability to explain the perception of fairness was the primary concern for employers and governments, because it underlined the employees' behaviour and attitudes towards organisations (Adams, 1963). By 1963, Adams drew sufficient evidence from prior literature in sociology and psychology to propose that equity/inequity is not a matter of being overpaid, underpaid or fairly paid, neither is it the subject of an evaluation by purely economic measurements. The evaluation of equity is socially dependent, which entails complex psychological and cognitive processes. The development of the theory was needed to help understand how the fairness of exchange between an employer and employee is formed and propose ways to regulate the outcome of relations. The theory aimed to have organisational and social implications. On the one hand, the theory had commercial importance for organisations in terms of reducing financial consequences resulting from the negative behaviour of employees. On the other

hand, the research had social importance, in terms of promoting social justice (Adams, 1963; Adams & Freedman, 1976).

Equity Theory was based on three theories of social science and psychology, namely, Social Exchange Theory, Social Comparison Theory and the Theory of Cognitive Dissonance (Huseman, Hatfield & Miles, 1987; Adams, 1963). Social Exchange Theory postulates that social relations are rooted in subjective evaluation of the costs and benefits of participating in relations (Blau, 1986; Homans, 1961). Social Comparison Theory explains the mechanism through which people evaluate the degree to which the distribution of costs and rewards is fair or unfair in social exchange relations. The rationale for using the social comparison principle in Equity Theory stemmed from prior evidence. It was found that the evaluation of perceived fairness by employees of different groups in one division in an organisation made it possible to conclude that the rewards were not considered to be fair if input was higher compared to that of other colleagues (Adams, 1963). The literature on social comparison distinguishes two popular comparison approaches, which are downward comparison and upward comparison. Downward comparison means that people look at more disadvantaged members of the group to evaluate their own input and output. Thus they may perceive the distribution of rewards to be fair to themselves. Upward comparison means that people look at other more advantaged members of the group with the aim of evaluating their rewards (Wills, 1981). Cognitive Dissonance Theory explains the behaviour of people when they experience stress induced by contradictory cognitions and the motivation of people to reduce stress by passive or proactive measures (Festinger, 1962). The utilisation of Cognitive Dissonance Theory contributed to the understanding of the emotional and behavioural consequences of relations evaluating costs and benefits. These three theories formed the theoretical underpinning of Equity Theory, making it possible to explain the nature of relations between people, the mechanisms underpinning the cognitive evaluation of the outcomes of relations, and people's reaction to such outcomes of relations.

There were two primary objectives of the Equity Theory. First, the theory aimed to explain how people evaluate the degree to which interpersonal relations are fair. The second objective of the theory was to explain the effect of inequitable relations. To realise the objectives, the determinants/main elements that people consider when they evaluate equity were conceptualised (Adams, 1963; Adams & Freedman, 1976). The conceptualised elements were output, input, person and others. Input and output derived from the Social Exchange Theory to refer to costs/contributions that people make and the benefits/rewards of those relations. Input may denote different objects and forms, such as education, experience, skills, social status and effort among other attributes of the person, such as personal characteristics, the level of attractiveness etc. Those variables determine what people bring into relations. Hence, they were defined as inputs. Those inputs are perceived by the contributors and should be measured against their relevance to the particular social exchange situation and should be recognisable by the parties of exchange. Outputs referred to financial rewards, intrinsic outcomes of behaviour, social and symbolic benefits and status among a few. Similar to inputs, outputs were characterised in terms of recognition and relevance. Person and others derived from the Social Comparison Theory. Person is an individual evaluating to what degree the relations are fair, while others can be any referent people against whom equity is compared. It can be even the person himself/herself, but at another point in time/situation/circumstances. Having identified the variables involved in the

evaluation of inequity, inequity was conceptualised as a misbalance between the personal input/output of relations and the observed input/output of relations of other people (Adams, 1963). Drawing on supporting evidence and the theoretical framework of cognitive dissonance (e.g. Wills, 1981; Festinger, 1962)) the effects of inequitable relations and the ways to cope with them were proposed (Walster, Berscheid & Walster, 1973; Adams, 1963; Adams & Freedman, 1976). The proposed theoretical framework of equity in the social exchange context aimed to contribute to the literature on social psychology. It meant to be a comprehensive framework, which would incorporate and explain a number of mini-theories in social psychology, such as Learning Theory, Cognitive Consistency Theory, and Freudian Theory, which had been vaguely explained before. Although rigorous research had been carried out to support the assumptions of those theories, it had not been clear as to how those theories related to each other. Equity Theory embraced the prior knowledge under one umbrella to explain individuals' motivation to perform a particular behaviour and individuals' responses to relations. Beside the explanatory robustness, the goal of the theory was to be able to predict how individuals may behave by assessing the relative outcomes of relations (Walster, Berscheid & Walster, 1973).

Theory

There are five main principles postulated by the theory. First, the relations of people are built on an equity norm (i.e. the expectation that their contributions will be rewarded) (Adams, 1963). Individuals are profit-driven per se and expect the outcome to be equal rewards minus costs. In the group context, equitable relations between members of the group are expected to benefit other members. Hence, members of the group will reward fellow members, who treat others equitably and punish those who treat others inequitably (Walster, Berscheid & Walster, 1973). People in different societies strive for equitable relations. Although the original works on equity did not explore individual differences in the evaluation of equity, it was pointed out that the perception of what equitable relations are varies for different people (Walster, Berscheid & Walster, 1973; Lund, Scheer & Kozlenkova, 2013).

Second, the evaluation of equity results from the assessment of personal inputs/outputs against inputs/outputs of other people in the social exchange relations (Figure 1). Equity is perceived when the ratio of input/output is equal to the input/output of other people. Individuals either refer to a specified referent person or a generalised other to draw the comparison. The specified person can even be oneself, which means that the person refers to their own experience in the past in terms of the rewards received for their contributions. Generalised comparison assumes comparing one's input/output ratio against the commonly accepted standards or predefined social norms (Greenberg, 1987). In addition, specified or generalised others can be external (from different social groups) or internal (people within the same social group) (Scholl, Cooper & McKenna, 1987). The example of generalised internal standards is when employees use referent bonus targets set by the company to evaluate the fairness of bonus payments (Voußem, Kramer & Schäffer, 2016). Specified internal standards are salient for organisational leaders, who base their judgement about reward distribution on personal equity norms (Rus, van Knippenberg & Wisse, 2010). Specified external standards can play a role when an employee in one organisation compares his/her payment to the payment of a

specific individual working for another organisation (Shore, Tashchian & Jourdan, 2006).

Third, unequal distribution of rewards against contributions leads to inequity perception. For example, in the organisational context, inequity happens whenever employees' inputs (education, qualification, responsibilities) and outputs (bonuses, salary and job security) are psychologically obverse to what an employee thinks that other people receive (Festinger, 1962; Voußem, Kramer & Schäffer, 2016; Kim, Edwards & Shapiro, 2015). In the family context, inequity results from under-benefiting or over-benefiting a party in relations (Sprecher, 2018). When it comes to shopping behaviour, inequity happens when consumers receive benefits and services that have not been anticipated (Oliver, Shor & Tidd, 2004).

Fourth, inequity results in the psychological discomfort due to the inconsistency between personal outcomes and the referent others (Table 1). Negative inequity (the perception that an individual received fewer rewards compared to contributions) and positive inequity (which is the perception that rewards are greater than the contributions) triggers distress associated mostly with the feeling of anger and guilt. The greater the inequity, the stronger is the distress that people feel (Walster, Berscheid & Walster, 1973; Adams, 1963). In family relations, the misbalance in the benefits and treatment between the parties causes psychological stress and dissatisfaction with relations (Sprecher, 2018).

Fifth, if any of the forms of inequity are perceived, the person aims to restore inequity either psychologically or physically in pursuit of eliminating the emotional tensions associated with inequity perception. Psychological and physical mechanisms to cope with distress are directed at either redistributing personal or others' input/output to eliminate discrepancy, cognitively change the perception or attitude to the input/output (Scholl, Cooper & McKenna, 1987; Walster, Berscheid & Walster, 1973; Adams, 1963). The theory distinguishes seven specific forms of coping mechanism: 1) compensation for inequity, 2) self-deprivation, 3) devaluation of the input of the other party of relations, 4) self-affirmation, 5) denial of responsibility for the act, 6) justification of inequity, and 7) retaliation against the party of relations causing inequity. Although the theory has not examined the effect of personality factors, it assumes that the response to inequity may differ depending on personality factors (Walster, Berscheid & Walster, 1973). Compensation is manifested as an increase of rewards to another party. It is a common practice in organisational management, when underpaid employees get motivated through compensation schemes to improve inter-organisation relations and performance (Shin, 2016). Self-deprivation refers to the decrease of personal rewards to equate with the reward of another party. In response to the performance of a negative behaviour towards another party, an individual can seek punishment from other people (Walster, Berscheid & Walster, 1973). The devaluation of the input of the other party and self-affirmation that rewards are inequitable are the two psychological techniques that are used to rationalise the unfavourable outcome of relations (Walster, Berscheid & Walster, 1973;Davies et al., 2018). These equity restoration responses have been examined to explain the perception of gender-based inequality and social biases in relation to disadvantaged social groups as a way to justify the disparity of benefits in society (Davies et al., 2018; Davies et al., 2018). The denial of responsibility for the act is a way to neutralise the feeling of moral obligation (Walster, Berscheid & Walster, 1973). It is a popular response to unethical behaviour, which could be the non-compliance to company policies (Harrington, 1996), in-group violence (Iqbal & Bilali,

2018) or bullying behaviour (Zhang & Leidner, 2018). When it comes to retaliation strategy, in abusive behaviour, it is a victim's response to inequitable relations through either physical (e.g. request for compensation) or psychological means (justification) (Walster, Berscheid & Walster, 1973).
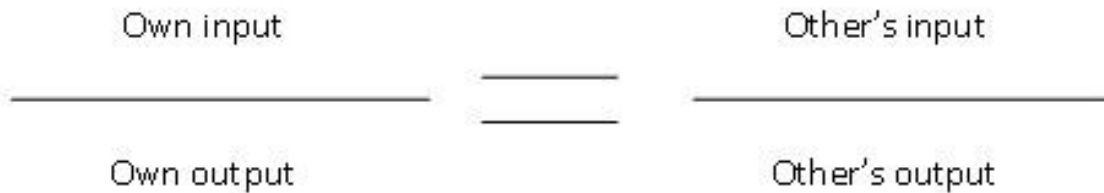
Figure 1: Input/output ratio in equity perception

Table 1: Equity evaluation compared to referent others

	Individual		**Referent Others**
Equity	Output/Input	=	Output/Input
Negative inequity	Output/Input		Output/Input

Applications

Equity Theory has become widely used across disciplines and has been tested in different geographical contexts. The major body of knowledge has been generated in the domain of organisational psychology. For example, the principles of Equity Theory were used to examine the effect of fairness perception on employees' negative and positive behaviour (Janssen, 2001; Moorman, 1991; Greenberg, 1990). The framework was applied to explain the relationship between the employees' perception of fair procedures and rewards distribution on organisational citizenship behaviour. It was found that positive behaviour of employees can be secured by subjecting employees to fair procedures irrespective of the equitable distribution of rewards compared to other employees in the organisation (Moorman, 1991). Also, Equity Theory was used to explore the moderation effect of fairness perception on the relationship between job demands, job performance and job satisfaction. It was confirmed that in the condition of fair effort-reward allocation, people tend to perform better and feel more satisfied (Janssen, 2001). When employees are paid for performance, though, the evaluation of reward can be detrimental to employees' positive performance. Performance-related pay schemes pose a threat to organisations, as there is no clear relationship between earnings and job grade, which makes the workers' perception of rewards distribution highly subjective (Rubery, 1995; Ederer & Manso, 2013). In addition, the theory was applied to explain

employees' negative behaviour, such as theft, as the response to redistributing rewards (i.e. compensation for pay cuts) and the mechanism used to lessen the perception of inequity. The results supported the predictions of Equity Theory in terms of likely responses to underpayment and the coping role of negative behaviour in situations of perceived inequity (Greenberg, 1990).

Equity Theory has also underpinned research in economic psychology. There was a study proposing a fair wage-effort hypothesis and discussing implications for the labour market. It was suggested that when the actual wage falls short of employees' fair wage, employees tend to engage in withdrawal behaviour. The hypothesis was consistent with observed wage differentials and unemployment patterns, which confirmed the power of the theory in explaining economic indexes (Akerlof & Yellen, 1990). In another example, a study used the theory in order to investigate the firm-level consequences entailed by CEO underpayment in an emerging economy. It was found that underpayment reduced firm value in poorly-governed firms, while overpayment had no effect on firm value (Gyapong, Khaghaany & Ahmed, 2020). Also, the principles of Equity Theory were applied to predict socio-economic events (Kim, Evans & Moser, 2005; Ocampo & Vallejo, 2012). For example, scholars found a correlation between perceived inequity in a tax payment system (i.e. high tax rates) and taxpayers' decisions to report a lower amount of income (Kim, Evans & Moser, 2005). In addition, the insight into the economic dynamics of developing countries demonstrated that despite the increase in public-sector social spending, the unequal distribution of socio-economic benefits among the society significantly impedes countries' economic development (Ocampo & Vallejo, 2012).

The application of the theory was also found in research on intimate relations (Canary & Stafford, 1992; Sechrist et al., 2014). The balanced exchange of support between family members was confirmed to determine the quality of relations (Sechrist et al., 2014). Equity Theory was adopted to investigate the role of perceived relationship power in dating relations. The principles of equity theory were partially confirmed. Particularly, in line with the theory, the equal distribution of power correlated with a stronger feeling of happiness. However, in contrast to the theory, respondents with more power in relations than their partner (positive inequity) generally were more satisfied with the relationship and had a greater trust in their current partner (Hall & Knox, 2019). Similar findings derived from another study testing the effect of positive and negative inequity in relations. It was concluded that under-benefiting inequity led to distress and dissatisfaction, whereas such an outcome was not observed in cases of equity or over-benefiting inequity (Sprecher, 2018). Researchers also explored responses to inequity in relations, which take the form of the denial of responsibility for causing harm, victim-blaming and self-affirmation (Scott & Straus, 2007; Burn & Brown, 2006; Iqbal & Bilali, 2018). The responses to aggressive behaviour were different across respondents, calling for more in-depth insights into the gender and psychological/cognitive differences among people underpinning equity restoration strategies (Scott & Straus, 2007).

Equity Theory has also been used when it came to studying users' interaction with information systems. For example, the equitable needs fulfilment suggested by the theory, successfully predicted information systems implementation (Au, Ngai & Cheng, 2008). The perception of online justice indirectly affects value co-creation behaviour, mediated by the sense of a virtual community (Chou, Lin & Huang, 2016). Price fairness increases the perceived quality of a product/service and deal value, motivating consumer behaviour (Darke & Chung, 2005; Darke & Dahl, 2003). Also,

scholars applied Equity Theory to explaining the responses to inequity in relations mediated by technology (Harrington, 1996;Oliver, Shor & Tidd, 2004). Specifically, there is evidence that procedural and distributive justice in web purchasing induces a positive emotional state and leads to future purchase intention (Oliver, Shor & Tidd, 2004). Another body of research explored psychological responses to the unethical use of Information systems, manifested as the denial of responsibility for the misuse of technology (Harrington, 1996) or the consequences of the unethical use of technology (Cooper & Blumenfeld, 2012; Allison & Bussey, 2017).

Equity Theory has been tested in different geographical contexts, producing inconsistent results. For example, a comparison of the reactions of automotive dealers to positive inequity in the Netherlands and the US demonstrated that Dutch dealers perceived both negative and positive inequity unfavourably, while US dealers negatively reacted only to negative inequity (Scheer, Kumar & Steenkamp, 2003). Another piece of research demonstrated that the importance of fairness perception differed depending on culture (Lund, Scheer & Kozlenkova, 2013). The research shed light on the role of individualist and collectivist cultures in customers' reactions to cross-cultural price comparisons (Bolton, Keh & Alba, 2010). However, the countries with a collectivist culture can also vary by the degree of distributive fairness perception, as suggested by a study exploring comparison strategies and the evaluation of rewards/inputs by employees in China, Japan and South Korea (Kim, Edwards & Shapiro, 2015). Japanese workers perceive overpayment to be unfair, in contrast to Chinese and South Korean employees, which can be explained by the stronger materialism ideology embedded in the social system of the latter two countries (Kim, Edwards & Shapiro, 2015). Mixed findings of fairness perception make it possible to conclude that it is not a universal concept, as it is largely moderated by cultural and ideological differences (Lund, Scheer & Kozlenkova, 2013; Bolton, Keh & Alba, 2010; Kim, Edwards & Shapiro, 2015).

Limitations

Equity Theory has been criticised for oversimplifying the normative foundation of individuals' behaviour in the social exchange context. It has been argued that social relations cannot be reduced to a simple evaluation of inputs and outputs, due to the difference in the nature of relations, the resources being exchanged, the context and personality factors (Romer, 1977; Romer, 1979; Huseman, Hatfield & Miles, 1987; Cropanzano & Folger, 1989; Leventhal, 1980).

The major critique arose due to Equity Theory not being able to explain all instances of social relations. Equity theorists have been criticised for claiming the applicability of the theory to a broader domain, without, though, providing justification for such assumptions. Specifically, it has been argued that Equity Theory mostly refers to situations with a more economic nature and a context denoting competitive relations (Romer, 1977). Such a conclusion comes from the first assumption of the theory, which postulates that people in social exchange relations strive to maximise personal benefits, disregarding the cooperative relations people may engage in (Walster, Berscheid & Walster, 1973; Adams, 1963). To provide insight into the role of social factors in cost-benefit evaluation, a recent study was conducted, which found a strong positive impact of social group identity on equity evaluation (Davlembayeva, Papagiannidis & Alamanos, 2021). In addition, it was suggested that the application of Equity Theory is bounded to limited resource situations,

whereby the rewards are subjected to the division between members of relations. Such situations do not take into consideration psychological unlimited rewards, which cannot be measured and divided (Romer, 1979).

The second limitation of the theory is that it does not take into account personal and cultural differences, which may affect the perception of equity (Walster, Berscheid & Walster, 1976). It was found that the behavioural approach to restoring inequity (Feldman, 1968) and equity perception (Weick, Bougon & Maruyama, 1976) varies across cultures, and the personal profit-maximization norm may not hold true universally for all people (Huseman, Hatfield & Miles, 1987). To address the limitation in prior research, Huseman et al. developed an equity sensitivity construct, which explains the difference in the perception of equity depending on the personal norm (Huseman, Hatfield & Miles, 1987). By measuring individuals' equity sensitivity, it is possible to differentiate three types of people: equity benevolents, equity sensitive people and entitleds (Huseman, Hatfield & Miles, 1987; King & Miles, 1994). Equity benevolents tend to accept a negative distribution of rewards in relation to themselves. For them, the likelihood of getting a satisfactory outcome of relations is high, as the input of resources that they invest in exchange relations can exceed the output (Huseman, Hatfield & Miles, 1987). In contrast to benevolents, entitleds are intolerant of unfair rewards allocation and prefer to receive more than they contribute to relations (King & Miles, 1994). For equity sensitive people, the evaluation of fairness depends on the proportional ratio of output against the inputs contributed to relations. The equity sensitivity variable has been widely applied in research to explain the deviation of the perception of rewards and inputs in relations, based on individuals' psychometric characteristics (Bourdage et al., 2018; Davlembayeva, Papagiannidis & Alamanos, 2021). Another approach to exploring individuals' differences in equity/inequity perception was provided by Norman Anderson (1979), who developed a model of cognitive algebra to explain how people integrate information to form their judgement. The model can be a useful tool in analysing individuals' cognitive differences underpinning equity evaluation (Farkas & Anderson, 1979).

Another limitation concerns the principles of the theory related to responses to inequity. It has been argued that the response to under-reward may be different to what is predicted by the theory, if the person chose to be under-rewarded (e.g. turning down a lucrative job in a pursuit of another career with a lower salary). In such situations, people may be more intrinsically motivated to improve the performance of the task, rather than decrease the input (Cropanzano & Folger, 1989). Employees can withhold from responding to inequity to maintain relationships or obtain gains from other aspects of relationships.

Finally, Equity Theory has been criticised for its unidimensional measurement, whereby rewards implied different resources, disregarding the processes that people may evaluate. As a response to this limitation, further research categorised fairness into several dimensions, such as the most widely used procedural and distributive justice (Leventhal, 1980). Perceived distributive justice refers to the perception that the amount of reward for the input in exchange is fair. Perceived procedural justice refers to the degree to which an individual perceives the means of rewards distribution to be fair (Folger & Konovsky, 1989). Researchers have provided evidence confirming that both procedural and distributive justice lead people to believe that the outcome of relations is favourable for them (Rubenstein, Allen & Bosco, 2019; Chan & Lai, 2017). These beliefs trigger positive emotions and behaviour

(Ming Chiu & Walker, 2007; Chan & Lai, 2017), while the perception of injustice contributes to emotional exhaustion (Piccoli & De Witte, 2015).

Concepts

Equity Sensitivity (Independent): Individuals react in consistent but individually different ways to both perceived equity and inequity because they have different preferences for (i.e., are differentially sensitive to) equity. (Huseman, Hatfield & Miles, 1987)

Equity (compared To Oneself) (Independent/Dependent): The change in equity status of self. (Joshi, 1991)

Equity (compared To A Referent Person) (Independent/Dependent): The fair sharing of profits (benefits) between self and the employer. (Joshi, 1991)

Equity (compared To Generalised Others) (Independent/Dependent): The asymmetry in the impact on equity when compared with other users in the reference group. (Joshi, 1991)

Input (Independent): The participant's contributions to the exchange, which are seen (by a scrutineer) as entitling him to rewards or costs. (Walster, Berscheid & Walster, 1973)

Output (Independent): The positive and negative consequences that a scrutineer perceives a participant has incurred as a consequence of his relationship with another. (Walster, Berscheid & Walster, 1973)

Other (Independent): Any individual or group used by Person as a referent when he makes social comparisons of his inputs and outcomes. (Adams, 1963)

Person (Independent): Any individual for whom equity or inequity exists. (Adams, 1963)

Reference Person (Independent): The reference person or group used in evaluating the equity of one's own exchange relationship. This reference source may be a co-worker, relative, neighbour, group of co-workers, craft group, industry pattern, profession, and so on. (Adams & Freedman, 1976)

Psychological Restoration of Inequity (Dependent): A person may psychologically distort his inputs and outcomes, increasing or decreasing them as required. (Walster, Berscheid & Walster, 1973)

Physical Restoration of Inequity (Dependent): The redistribution of personal or others' input/output (Walster, Berscheid & Walster, 1973)

Self-deprivation (Dependent): The harm-doer could voluntarily reduce his own relative outcomes to the victim's level; one could curtail his own outcomes from the relationship or increase his inputs (Walster, Berscheid & Walster, 1973)

Derogation of A Victim (Dependent): A person who has harmed another can persuade himself that his act was equitable is by devaluating the victim's inputs (Walster, Berscheid & Walster, 1973)

Self-affirmation (Dependent): Convincing oneself that relationships are equitable (Walster, Berscheid & Walster, 1973)

Denial of Responsibility (Dependent): The harm-doer can perceive that it was not his behaviour but rather the action of someone else (e.g., the experimenter or fate) that caused the victim's suffering (Walster, Berscheid & Walster, 1973)

Retaliation (Dependent): A victim's response to inequitable relations through either physical (e.g. request of compensation) or psychological means (justification) (Walster, Berscheid & Walster, 1973)

References

Adams, J.S. & Freedman, S. (1976). Equity Theory Revisited: Comments and Annotated Bibliography. *Advances in Experimental Social Psychology*, 43-90.

Adams, J.S. (1963). Towards an understanding of inequity. *The Journal of Abnormal and Social Psychology*, 67 (5), 422-436.

Akerlof, G.A. & Yellen, J.L. (1990). The Fair Wage-Effort Hypothesis and Unemployment. *The Quarterly Journal of Economics*, 105 (2), 255.

Allison, K.R. & Bussey, K. (2017). Individual and collective moral influences on intervention in cyberbullying. *Computers in Human Behavior*, 74, 7-15.

Au, Ngai, & Cheng (2008). Extending the Understanding of End User Information Systems Satisfaction Formation: An Equitable Needs Fulfillment Model Approach. *MIS Quarterly*, 32 (1), 43.

Blau, P.M. (1986). *Exchange and power in social life*. Transaction Books.

Bolton, L.E., Keh, H.T. & Alba, J.W. (2010). How Do Price Fairness Perceptions Differ across Culture?. *Journal of Marketing Research*, 47 (3), 564-576.

Bourdage, J.S., Goupal, A., Neilson, T., Lukacik, E. & Lee, N. (2018). Personality, equity sensitivity, and discretionary workplace behavior. *Personality and Individual Differences*, 120, 144-150.

Burn, M.F. & Brown, S. (2006). A review of the cognitive distortions in child sex offenders: An examination of the motivations and mechanisms that underlie the justification for abuse. *Aggression and Violent Behavior*, 11 (3), 225-236.

Canary, D.J. & Stafford, L. (1992). Relational maintenance strategies and equity in marriage. *Communication Monographs*, 59 (3), 243-267.

Chan, S.H.J. & Lai, H.Y.I. (2017). Understanding the link between communication satisfaction, perceived justice and organizational citizenship behavior. *Journal of Business Research*, 70, 214-223.

Chou, E., Lin, C. & Huang, H. (2016). Fairness and devotion go far: Integrating online justice and value co-creation in virtual communities. *International Journal of Information Management*, 36 (1), 60-72.

Cooper, R.M. & Blumenfeld, W.J. (2012). Responses to Cyberbullying: A Descriptive Analysis of the Frequency of and Impact on LGBT and Allied Youth. *Journal of LGBT Youth*, 9 (2), 153-177.

Cropanzano, R. & Folger, R. (1989). Referent cognitions and task decision autonomy: Beyond equity theory. *Journal of Applied Psychology*, 74 (2), 293-299.

Darke, P.R. & Chung, C.M. (2005). Effects of pricing and promotion on consumer perceptions: it depends on how you frame it. *Journal of Retailing*, 81 (1), 35-47.

Darke, P.R. & Dahl, D.W. (2003). Fairness and Discounts: The Subjective Value of a Bargain. *Journal of Consumer Psychology*, 13 (3), 328-338.

Davies, S.G., McGregor, J., Pringle, J. & Giddings, L. (2018). Rationalizing pay inequity: women engineers, pervasive patriarchy and the neoliberal chimera. *Journal of Gender Studies*, 27 (6), 623-636.

Davlembayeva, D., Papagiannidis, S. & Alamanos, E. (2021). Sharing economy platforms: An equity theory perspective on reciprocity and commitment. *Journal of Business Research*, 127, 151-166.

Ederer, F. & Manso, G. (2013). Is Pay for Performance Detrimental to Innovation?. *Management Science*, 59 (7), 1496-1513.

Farkas, A.J. & Anderson, N.H. (1979). Multidimensional input in equity theory. *Journal of Personality and Social Psychology*, 37 (6), 879-896.

Feldman, R.E. (1968). Response to compatriot and foreigner who seek assistance. *Journal of Personality and Social Psychology*, 10 (3), 202-214.

Festinger, L. (1962). *A theory of cognitive dissonance*. Stanford University Press.

Folger, R. & Konovsky, M.A. (1989). Effects of Procedural and Distributive Justice on Reactions to Pay Raise Decisions. *Academy of Management Journal*, 32 (1), 115-130.

Greenberg, J. (1987). A Taxonomy of Organizational Justice Theories. *Academy of Management Review*, 12 (1), 9-22.

Greenberg, J. (1990). Employee theft as a reaction to underpayment inequity: The hidden cost of pay cuts. *Journal of Applied Psychology*, 75 (5), 561-568.

Gyapong, E., Khaghaany, M.M.R. & Ahmed, A. (2020). The asymmetric role of corporate governance in CEO pay determination: evidence from South Africa. *Applied Economics*, 52 (7), 671-693.

Hall, S.S. & Knox, D. (2019). Perceived relationship power in emerging adults' romantic relationships. *Journal of Family Studies*, 25 (4), 385-396.

Harrington, S.J. (1996). The Effect of Codes of Ethics and Personal Denial of Responsibility on Computer Abuse Judgments and Intentions. *MIS Quarterly*, 20 (3), 257.

Homans, G.C. (1961). *Social behavior*.

Huseman, R.C., Hatfield, J.D. & Miles, E.W. (1987). A New Perspective on Equity Theory: The Equity Sensitivity Construct. *Academy of Management Review*, 12 (2), 222-234.

Iqbal, Y. & Bilali, R. (2018). The impact of acknowledgement and denial of responsibility for harm on victim groups' perceptions of justice, power, and intergroup attitudes. *European Journal of Social Psychology*, 48 (4), 397-411.

Janssen, O. (2001). Fairness Perceptions as a Moderator in the Curvilinear Relationships Between Job Demands, and Job Performance and Job Satisfaction. *Academy of Management Journal*, 44 (5), 1039-1050.

Kim, C.K., Evans, J.H. & Moser, D.V. (2005). Economic and equity effects on tax reporting decisions. *Accounting, Organizations and Society*, 30 (7-8), 609-625.

Kim, T., Edwards, J.R. & Shapiro, D.L. (2015). Social Comparison and Distributive Justice: East Asia Differences. *Journal of Business Ethics*, 132 (2), 401-414.

King, W.C. & Miles, E.W. (1994). The measurement of equity sensitivity. *Journal of Occupational and Organizational Psychology*, 67 (2), 133-142.

Leventhal, G.S. (1980). What Should Be Done with Equity Theory?. *Social Exchange*, 27-55.

Lund, D.J., Scheer, L.K. & Kozlenkova, I.V. (2013). Culture's Impact on the Importance of Fairness in Interorganizational Relationships. *Journal of International Marketing*, 21 (4), 21-43.

Ming Chiu, M. & Walker, A. (2007). Leadership for social justice in Hong Kong schools. *Journal of Educational Administration*, 45 (6), 724-739.

Moorman, R.H. (1991). Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship?. *Journal of Applied Psychology*, 76 (6), 845-855.

Ocampo, J.A. & Vallejo, J. (2012). Economic Growth, Equity and Human Development in Latin America. *Journal of Human Development and Capabilities*, 13 (1), 107-133.

Oliver, R.L., Shor, M. & Tidd, S.T. (2004). Induced Over-Benefiting and Under-Benefiting on the Web: Inequity Effects on Feelings and Motivations with Implications for Consumption Behavior. *Motivation and Emotion*, 28 (1), 85-106.

Piccoli, B. & De Witte, H. (2015). Job insecurity and emotional exhaustion: Testing psychological contract breach versus distributive injustice as indicators of lack of reciprocity. *Work & Stress*, 29 (3), 246-263.

Romer, D. (1977). Limitations in the equity-theory approach: Toward a Resolution of the "negative-inputs" controversy. *Personality and Social Psychology Bulletin*, 3 (2), 228-231.

Romer, D. (1979). Further Limitations in the Equity Theory Approach: A Reply to Samuel. *Personality and Social Psychology Bulletin*, 5 (2), 249-252.

Rubenstein, A.L., Allen, D.G. & Bosco, F.A. (2019). What's Past (and Present) Is Prologue: Interactions Between Justice Levels and Trajectories Predicting Behavioral Reciprocity. *Journal of Management*, 45 (4), 1569-1594.

Rubery, J. (1995). Performance-related pay and the prospects for gender pay equity. *Journal of Management Studies*, 32 (5), 637-654.

Rus, D., van Knippenberg, D. & Wisse, B. (2010). Leader power and leader self-serving behavior: The role of effective leadership beliefs and performance information. *Journal of Experimental Social Psychology*, 46 (6), 922-933.

Scheer, L.K., Kumar, N. & Steenkamp, J.E.M. (2003). Reactions to Perceived Inequity in U.S. and Dutch Interorganizational Relationships. *Academy of Management Journal*, 46 (3), 303-316.

Scholl, R.W., Cooper, E.A. & McKenna, J.F. (1987). Referent selection in determining equity perceptions: Differential effects on behavioral and attitudinal outcomes. *Personnel Psychology*, 40 (1), 113-124.

Scott, K. & Straus, M. (2007). Denial, Minimization, Partner Blaming, and Intimate Aggression in Dating Partners. *Journal of Interpersonal Violence*, 22 (7), 851-871.

Sechrist, J., Jill Suitor, J., Howard, A.R. & Pillemer, K. (2014). Perceptions of Equity, Balance of Support Exchange, and Mother-Adult Child Relations. *Journal of Marriage and Family*, 76 (2), 285-299.

Shin, T. (2016). Fair Pay or Power Play? Pay Equity, Managerial Power, and Compensation Adjustments for CEOs. *Journal of Management*, 42 (2), 419-448.

Shore, T.H., Tashchian, A. & Jourdan, L. (2006). Effects of Internal and External Pay Comparisons on Work Attitudes. *Journal of Applied Social Psychology*, 36 (10), 2578-2598.

Sprecher, S. (2018). Inequity Leads to Distress and a Reduction in Satisfaction: Evidence From a Priming Experiment. *Journal of Family Issues*, 39 (1), 230-244.

Voußem, L., Kramer, S. & Schäffer, U. (2016). Fairness perceptions of annual bonus payments: The effects of subjective performance measures and the achievement of bonus targets. *Management Accounting Research*, 30, 32-46.

Walster, E., Berscheid, E. & Walster, G.W. (1973). New directions in equity research. *Journal of Personality and Social Psychology*, 25 (2), 151-176.

Walster, E., Berscheid, E. & Walster, G.W. (1976). New Directions in Equity Research. *Advances in Experimental Social Psychology*, 1-42.

Weick, K.E., Bougon, M.G. & Maruyama, G. (1976). The equity context. *Organizational Behavior and Human Performance*, 15 (1), 32-65.

Wills, T.A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, 90 (2), 245-271.

Zhang, S. & Leidner, D. (2018). From improper to acceptable: How perpetrators neutralize workplace bullying behaviors in the cyber world. *Information & Management*, 55 (7), 850-865.

Evolutionary Economic Theory

Evolutionary economics explains change over time with respect to economic development.

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Theory Factsheet

Proposed By: Nelson & Winter, 1982

Parent Theory: Evolutionary theory, General Darwinism

Related Theories: Neoclassical Economic Theory

Discipline: Economics

Unit of Analysis: Organisation, Institution

Level: Meso-level

Type: Theory for Analysing

Operationalised: Qualitatively / Quantitatively

Introduction

Economic theory is the study of how economies work. Evolutionary economics is broadly concerned with how economic change occurs, and is focused on innovation and entrepreneurship, industrial and institutional dynamics (as opposed to profits), and on patterns and trends as they relate to economic growth and development (Hodgson, 2019). Fundamental to the ideology of evolutionary economics is that innovation and economic change are intertwined (Ayres, 2000; Ayres, 1953). Theorists employing an evolutionary economic approach are typically concerned with economic growth, productivity, and stakeholder interactions. Planners that adopt principles of evolutionary economics are concerned with infrastructural, structural, and institutional changes and impacts over time. Practitioners, on the other hand, most of whom manage technology development, focus on innovation processes and systems of innovation and technological change as it might impact on economic development (Nelson, 2008; Schot & Steinmueller, 2018). Central to evolutionary economics is the notion that the world is complex and dynamic. Accordingly, Metcalfe (1998:8) proclaims: *"innovation-driven economic processes are open-ended with the economy never in equilibrium, or even close to equilibrium… Outcomes are to be discovered, not presumed in advance of an*

event". Thus, evolutionary economics is said to be non-directed, lacking predetermination to a given endpoint (i.e., it is not teleological). As innovation (i.e. technological change) is considered on a continuum over time and as a phenomenon that is unfolding, stakeholders are engaged in a practice of co-evolution where they are building together a knowledge program through the exchange of thoughts and imagination (Witt, 1998; Dopfer, 2001).

In this innovation environment, technologies impact the way supplies are procured, and goods are produced, and consequently, organisations and citizens have to co-evolve in larger processes to observe technologies in continuity (or discontinuity, if fit is not achieved). Co-evolution comes into practice when several evolving domains or areas within a socio-economic system reciprocally impact one another's innovation, reproduction and/or choices. In effect, co-evolution can be analysed as a process at a global level, demonstrating dynamic co-determination toward shared agreement between stakeholders (Almudi & Fatas-Villafranca, 2021). The interdependencies and interconnections between "clusters" of stakeholders yield the creative ability to co-create (Potts et al., 2008; Pitelis, 2012).

Evolutionary economic theory has made possible the reinterpretation of microeconomics and macroeconomics using evolutionary concepts and ideas (Dopfer, 2001). It proposes that economic and industrial processes emerge over time, driven by humans who assemble into communities within society at large and for the greater part they self-organise (Andriani, 2001). It is humans who together are able to conceive of new innovations that can be designed and implemented (Witt, 2001). The study of evolutionary economics is wide-ranging and may be located in any number of disciplines or schools, e.g., within business, sociology, innovation studies, science and technology studies, demonstrating its interdisciplinarity and reach in terms of influence and inspiration. It is closely related to other social sciences where economics may feature as a joint focus, such as in the study of economic sociology, economic anthropology, and the political economy.

Theory

Background: Evolutionary Theory Basis

The parent theory of evolutionary economic theory is evolutionary theory, attributed to Charles Darwin, who published *On the Origin of Species* in 1859, focused on natural selection (Cordes, 2015:431-432). General Darwinism (GD), also known as universal Darwinism or universal selection theory (Cordes, 2015; Witt, 2008), is when the Darwinian concept of natural selection is applied outside of the biological sciences, for example, in the fields of economics, psychology, medicine and culture (Hodgson & Knudsen, 2008). Many fundamental principles of GD were applied to the field of economics toward the end of the 1800s.

Relevant to evolutionary economic theory, Thorstein Bunde Veblen (1857-1929) is widely considered the founding father of the evolutionary-institutional paradigm (Elsner, Heinrich & Schwardt, 2015; Lewis & Steinmo, 2012), and to whom can be attributed the first coining of the term "evolutionary economics" in English (Hodgson, 1994). Veblen did not believe that neoclassical economics could be considered a modern science, since it pre-dated Darwinian thinking (Elsner, Heinrich & Schwardt, 2015). Neoclassical economics is concerned with the production function (Solow,

1957), viewing advances in technology (i.e., a fixed capital factor of production) as fuelling economic growth "*by lowering the cost of making an output*" (O'Neill, 2001:1526). Veblen recognised that the fundamental weakness of neoclassical economics was that "*only prices and volumes matter*" (Edquist, 1997:48). He applied evolutionary biological concepts to economics and noted that the process of change, in the definitive formulation of knowledge, was a gradual one (Veblen, 1898). Veblen was considered a radical economist by many for his views on the "*predatory business culture*" (Elsner, 2014:329), which he believed caused major inefficiencies and waste in the economy due to vested interests (Veblen, 1898).

Unlike traditional economics, which used rational choice theory, Veblenian evolutionary economics argued that human nature, namely anthropological and psychological factors, were the key drivers of the economy (Elsner, Heinrich & Schwardt, 2015). Veblen had determined that the industrial process had been usurped by individual financial investors and financial organisations, and the very wealthy, who sought to maximise profits for short-term gain, even at the expense of provisioning for society at large (Elsner, Heinrich & Schwardt, 2015). Veblenian evolutionary economics today is an interdisciplinary paradigm in the social sciences with great influence on the study of complexity in economics (Elsner, Heinrich & Schwardt, 2015; Frenken, 2006).

Definition of Evolutionary Economic Theory

Scholarship in the field of evolutionary economic theory emanated from Simon (1955), Cyert and March (1963), and Penrose (2009), among others (Cordes, 2015). Evolutionary economic theory is defined in the seminal work of Nelson and Winter (1982), and is now part of mainstream economics (Friedman, 1998), developed as an alternative to neoclassical theory, which was strongly inspired by Schumpeter's *Theory of Economic Development* (Schumpeter, 1934; Nelson, 2008). Nelson and Winter claimed that "*firms are not profit maximizers but follow rather rigid rules or routines, and agents, including managers, are only boundedly rational*" (Cordes, 2015:432).

In the context of innovation, evolutionary economic theory views technical change as something other than an attempt to maximise profits and is characterised by the concepts of reproduction, variety and selection (Edquist, 1997). Technological advancement is considered a key driver in evolutionary economic theory, co-evolving through the interaction of firms and industry structures and supporting governing institutions (Hall & Rosenberg, 2010). It is also about the manner in which technological development can lead to assimilation, as countries lagging behind the frontier attempt to catch up to achieve fundamental wellbeing for all, as opposed to being preoccupied with investments and human capital leading to accumulation (Nelson, 2008). The advantage of evolutionary economics over neoclassical economics is in its level of analysis, whereby the key players, i.e., the agents, are not individual persons but groups of people, identified as "*firms*" or other "*organisational units*" at the level of "*industries, sectors, branches, markets or whole economies*" (Vromen, 2012: 738). Evolutionary economics "*acknowledges heterogeneity within industries between firms. But it seems to pay considerably less attention to the heterogeneity within firms between firm members*" (Vromen, 2012: 739).

Evolutionary economic theory is characterised by three underlying pillars: (1) system dynamics, typified by a continuous process of innovation, where conditions emerge from within the economic system endogenously; (2) time (as in the historical element), which indicates a given irreversible path dependency (lock-in); and (3) the process of innovation, from invention to diffusion (Witt, 1987). The first pillar of evolutionary economics notes that innovation is not a matter of *"chop and change"* but is related to the *"very structure and function of the object"* (Sahal, 1981:64). It is not about measuring discrete events to identify how change happens, but change is a continuous process (Sahal, 1981). Due to the randomness and time-consuming nature of innovation processes, evolutionary models of technological change are more realistic when it comes to understanding innovations than the models provided by neoclassical economics, thus overcoming an obvious limitation (Nelson, 1981). The second pillar of evolutionary economic theory pertains to the element of time and the historical choices that determine a particular way forward. Edquist (1997:6) affirms that *"…technological change is an open-ended and path-dependent process where no optimal solution to a technical problem can be identified"*. The third and final pillar of evolutionary economic theory pertains to the process of innovation (Metcalfe, 1998:3). In effect, it is the activity of organisations and associated actors or agents, coming together to learn, share, and produce knowledge that may lead to an innovation that will have an impact on the economy and on humans as they adopt technologies (i.e., products and processes). Technical change was thus declared an evolutionary process in the 1980s (Nelson, 1987) and supported by well-known evolutionary economists and several journal publication outlets dedicated to the field (Vromen, 2012), among them the *Journal of Evolutionary Economics*.

Foundational Concepts

Evolutionary economics is typified by the distinguishing principle of selection (Knudsen, 2002). Humans demonstrate goal-directed behaviour, which renders selection, variation, and inheritance as interdependent mechanisms. Economic agents thus choose between alternatives, products, ideas, in one off selections, according to a criterion of preference (Cordes, 2007). According to Lindley (1997:25), "*(t)he selection environment acts to influence the path of innovation and the rate of diffusion generated by any given innovation, and at the same time generates feedback to strongly influence the direction and type of R&D programs that firms might invest in*". Importantly, the selection environment does not discount technologies co-existing, mutating or recombining to form new products through processes of innovation (Michael, 2003).

Another fundamental concept of evolutionary economics is that of technological trajectories, also known as natural trajectories, defined as a pattern of innovation (Dosi, 1982). Citing von Hippel (1988), Breschi and Malerba (1997:144) defined technological trajectories as the "*continuous improvements of products in terms of performance and reliability and in the tailoring of products to specific users' needs, within specific application contexts*". Each firm follows a technological trajectory in search of continuous improvements to their existing products (Edquist, 1997), in pursuance of "*a single technical option… committed to a single technological trajectory*" (Saxenian, 1996:112; Murmann & Frenken, 2006).

Path dependency is closely associated with the concept of technological trajectory. Ontologically, individuals produce knowledge by self-organising with one another, forming informal and formal groups, and creating new entities by enacting change (Mueller & Cantner, 2000). When these groups interact, in a path-dependent sequence of economic changes, temporal events can influence outcomes by chance rather than being driven by what is known as "systematic forces" (David, 1985:332). The basic design of a technological innovation acts as a guidepost charting the course of future innovation activity along a dependent path (Wijnberg, 1994; Nooteboom, 1999). One or two early models of a product or process usually stand out above all the others in the history of an industry and their design becomes the foundation for the evolution of many other innovations (Sahal, 1981). Following on from this, the concept of creative symbiosis is the case where "*two or more technologies combine in an integrative fashion such that the outline of the overall system is greatly simplified... when it happens, totally new possibilities for further evolution present themselves*" (Sahal, 1981:75). The related notion of creative destruction is that which fuels economic change via the introduction of new patterns of behaviour, be it technological, organisational, or social, which are particularly linked to decentralised and distributed practices that are regenerative, away from the former centralised models (Metcalfe, 1998; Raworth, 2018).

The above-mentioned presentation of the foundational concepts in evolutionary economic theory revolve around technical change, at the heart of which is the historical element (Saviotti & Metcalfe, 2020). Firms innovate along a given path, making use of guideposts, and over time a single dominant design develops on a technological trajectory. When there is more than one choice of innovation, a selection environment exists whereby stakeholders provide feedback to influence the direction of research and development. Technologies can also combine toward creative symbiosis. Understanding systems phenomena demands knowledge of the interactions at the component level as product and service innovations emerge. When new patterns of innovation form, causing a shift in the way things are done from a variety of perspectives, creative destruction is said to take place, giving birth to new ways (practices and procedures in production) and new things (products and services in application).

Theory Updates/Extensions

Extensions to evolutionary economics can be theoretical and methodological in nature (Witt & Chai, 2018).

Theoretical

Until recent times, evolutionary economics has been concerned predominantly with supply side economic activity (Nelson, 2013). However, the "*new evolutionary economics*", as it has been touted, has sought to rebalance this endeavour by emphasising the importance of those factors affecting the demand side (Schlaile et al., 2018). In posing the question "where do we go from here?", there is a need for "*better treatment of how households respond to an economic world that is constantly changing around them, as they themselves change*" (Dopfer & Nelson, 2018:216). The challenge for evolutionary economists is: "*to construct a theory of demand and supply and their interaction on markets that are not changing too*

erratically that is consistent with the basic tenets of evolutionary theory" (Nelson, 2013:19).

An important focus is the study of consumer reaction to a growing choice of goods and services, which heavily influences a pattern of evolution. This emphasis to theory opens up new horizons for evolutionary economics (Nelson, 2013). To be concerned with the supply and demand sides alone, as we generally conceive them, is not enough. We require the incorporation of an "*adequate theory (that) needs to recognize the rich mix of institutions that are involved in economic activity*", inclusive of the various roles of government, beyond the firm, households and markets, toward co-evolution of technologies in use and associated institutions that regulate these (Nelson, 2008). One such study investigated the social and cultural demand side factors within the context of the development of automatic identification and location-based services (Michael, 2009). Additionally, the study incorporated the role of public research institutions and auxiliary actors in propelling innovation at the technological level. Successful economic development involves the co-evolution of technologies, appropriate firm and industry structures, as well as broader economic institutions. In addition, government policies and programmes are essential to this process of change (Nelson, 2008).

Methodological

In methodology, early studies typically gave verbal descriptions of national innovation patterns, while the number of utilized indicators of innovative activity was small (Balzat & Hanusch, 2004). These studies have been largely characterised by descriptive and policy-oriented research with the development of analytical models to accomplish more comparative capabilities between nations, despite attempts at numerical performance comparisons, such as the calculation of index numbers (Balzat & Hanusch, 2004). Simulation models may also be helpful in the future, especially through formal evolutionary models that run in parallel to empirical work (Nelson & Winter, 2002:39). These simulation models offer formal methods that are explicit as well as analytical toward proofs that may help to shed light on dynamic systems, explaining economic growth with a focus on the size distribution of firms. Closely linked to the evolutionary modelling efforts described here is a class of formal models at the level of the individual organization, typically focused on "*related issues of structure, coordination and organizational learning*" (Nelson & Winter, 2002:41).

One reason found in the literature for a somewhat retracted adoption and application of evolutionary economics has been the lack of simplified and abstract "formal" methods, in comparison, for instance, to neoclassical treatments of price theory. Nelson's hope was to raise awareness of the benefits of what he calls "appreciative" theory to lay the foundations for knowing "what is really going on" before developing "*an evolutionary-economics-compatible price theory built on the same set of assumptions about economic behavior and economic contexts that characterize the rest of evolutionary theory*" (Nelson, 2013:19). The difference between "appreciative theory" (i.e., mostly expressed verbally) and "formal theory" was that the latter was closer to empirical details of the subject matter, which are often abstracted in the form of a mathematical model for logical exploration and manipulation (Nelson, 2008:19). Nelson and Winter (2008:19) "*argued that in economics most of the empirical research and interpretation of empirical*

phenomena was structured by appreciative theory". A great deal of evolutionary economics has dealt with empirical observations, though this has not been the case for all researchers in this domain, some more aligned with pragmatic realism (Dopfer & Nelson, 2018). Modern evolutionary theory provides a framework that is helpful in the analysis of economic dynamics (Nelson, 2008:19). It is in this regard that there is a stark distinction between the scholars who have held strongly to neoclassical theory, without acknowledging the contributions of the evolutionary economists.

Nelson (2008:13) wrote that theory should be able to take advantage of both qualitative and quantitative approaches, such as those found in the accounts of economic historians, also maintaining that "*a satisfactory theory needs to specify correctly the basic processes driving economic growth*". Both deductive and inductive research is performed by evolutionary economists (Boschma & Frenken, 2006) and empirical studies take the form of varied approaches, including social network analysis, chain-link modelling, distributed process modelling, development block theory, agent-based modelling, evolutionary game theory, among others. Further, existing analytical techniques have been applied to evolutionary economic studies in novel ways (Edquist & Hommen, 1999; Carlsson et al., 2002; McMaster & Watkins, 2012). While rigorous mathematical models have their place in economics, evolutionary economists prefer scalable design questions that would enable ways forward using historical analysis.

Applications

One stand-out characteristic of "*modern evolutionary economics*" has been its attempt to be a bridge builder across the borders of an organisation, across disciplines, across generations, and across societies, particularly because history matters (Nelson & Sampat, 2001:1). This has meant that interdisciplinarity has been increasingly embraced by theorists working in the evolutionary thinking space, particularly in the field of evolutionary economics. Take for example, how evolutionary economics has been a catalyst for bringing aspects of sociology, psychology, network science, evolutionary biology, nonlinear dynamics, and chaos theory together, among other areas (Schlaile et al., 2018). When evolutionary economics is adopted, "*(t)he particular intellectual barriers attributable to differing rationality assumptions are lowered significantly (although many other barriers remain)*" (Nelson & Winter, 2002).

In its essence, evolutionary economics was an evolutionary mechanism of systems, organisations, and technology, requiring a transdisciplinary approach for evolutionary controversies to be better understood (Japan Association for Evolutionary Economics & Aruka, 2001). The result is significant levels of interdisciplinary engagement (Nelson & Winter, 2002). The advantages that evolutionary economics offers begin with interdisciplinary dialogue, as it "*has open frontiers, lives with other disciplines in what is recognizably the same intellectual world and has much to offer and to gain from trade*" (Nelson & Winter, 2002:42). However, the field to date has suffered from specialisation, and to an extent fragmentation (Hodgson & Lamberg, 2018). A unified theory of evolutionary economics should be presented to demonstrate the superiority of the approach over neoclassical economics (Shiozawa, 2004).

Methodologically, studies in evolutionary economic theory have varied widely in terms of approaches. Some evolutionary economists utilise evolutionary theory analogously, borrowing from the core concepts in metaphor (Nelson & Winter, 2002), while others directly apply concepts and models from the theory (Metcalfe, 1994). This has led to vastly different approaches to data collection, depending on the goal of the research. A great number of national innovation systems studies, for example, utilise empirical data through survey instruments, or factual descriptive statistics, or even pragmatic sources of evidence (Foster & Hölzl, 2004). This is not to say that some evolutionary economic studies were not also in some instances wholly exploratory, conceptual, and appreciable by nature (Sharp, 1985). A mixed methods approach using case studies containing quantitative and qualitative data is also common, especially when related to presenting national innovation systems.

National Systems of Innovation: A Comparative Study, edited by Nelson and Rosenberg (1993), was a seminal contribution propelling innovation thought and application forward. A case study methodology to investigate the national systems of innovation of fifteen countries was used. The book was intended to emphasise empirical evidence first and confirm theory second. Findings from the case studies suggested that thinking of systems of innovation at a national level was appropriate, although there were challenges with identifying national borders (Nelson, 1993), with varying economic and political circumstances. As noted in the literature possible directions were to extend the national innovation systems (NIS) approach with a future research focus toward both sectoral and regional perspectives, inclusive of cluster theories (Balzat & Hanusch, 2004; Geels, 2004). Systems of innovation have become central to "*shifting the research agenda*" asking "*what does history mean in relation to (envisaged?) future options? How can the system itself be informed reflexively with respect to its self-organizing capacities?*" (Leydesdorff, 2001:13753; Leydesdorff, 1995 :296). A selection of readings is provided in Table 1, representing innovation systems conceptual and empirical cases at the national, regional, sectoral, technological, and local innovation systems levels.

Table 1: Levels of Systems of Innovation

Source	Level of Innovation System	Location	Industry Type
(Carlsson, 2012)	Technological	N/A	Factory automation
(Capron, Meeusen & Muller, 2000)	National	Belgium	Any
(Chung, 2002)	National, regional	General	Any

(Cooke & Morgan, 2014)	Regional	Baden–Württemberg, Germany	Automotive, optics, software, mechanical engineering
(de la Mothe & Paquet, 2012)	Local, regional	General	Any
(Dodgson et al., 2008)	National	Taiwan	Biotechnology
(Doloreux, 2002)	Regional	General	Any
(Edquist, Eriksson & Sjgren, 2000)	Regional	East Gothia (Sweden)	Product innovation with emphasis on manufacturing firms
(Franco & Mani, 2009)	Sectoral	Developing countries	Actors, structure, evolution
(Grubler et al., 2012)	Technological	N/A	Energy sector
(Herstatt et al., 2008)	National	India	Corporate
(Intarakumnerd, Chairatana & Tangchitpiboon, 2002)	National	Thailand	Any
(Leydesdorff & Strand, 2013)	Regional, national	Sweden	Knowledge economy
(MacDowall, 1984)	Technological	Japan	Product innovations
(Motohashi, 2005)	Technological	Japan	Technology firms
(Mowery, 1992)	National	USA	Any

(Nelson, 1993)	National	Comparative	Any
(Niosi, 2000)	National	Canada	Any
(Sun, 2002)	National	China	Any
(Lall & Urata, 2003)	Technological	East Asia	Technology sector
(Wieczorek et al., 2013)	Technological	N/A	Wind innovation
(Zhu & Tann, 2005)	Regional	Zhongguancun, China	Any

Limitations

From the very start, evolutionary economics was oriented to the "*system level (or the 'population' level)*" (Winter, 2014:629). Two paramount aspects when studying innovation systems that require further research are: (1) complexity; and (2) the incorporation of non-market institutions (e.g. university and public research systems, scientific and technical societies and government programmes) (Nelson, 2008:12). The "*lack of a system view*" is a significant problem, and not just for evolutionary economics but for society at large (Winter, 2014:639). For Winter, looking at the economy through the lens of a "system" usually equated to sound economic policy, even though the economics discipline in general required an intervention. One of these interventions came in the form of an "*analytical framework for evolutionary economics with a micro–meso–macro architecture*" (Dopfer, Foster & Potts, 2004:263). The micro was defined as the "*individual carriers of rules and the systems they organize, and macro consists of the population structure of systems of meso... The upshot is an ontologically coherent framework for analysis of economic evolution as change in the meso domain… and a way of understanding the micro-processes and macro-consequences involved*" (Dopfer, Foster & Potts, 2004:263). Another complementary intervention beginning in the early 1990s was how evolutionary economic themes were brought together in the concept of a (national) system of innovation; "*that set of distinct institutions which contribute to the development and diffusion of technologies and which provides the framework within which policies are implemented*" (Metcalfe, 1994:940). Consider also that there are a variety of theories of change, and evolutionary economic theory captures only one of these; other basic theories of change in organisations include dialectical, life cycle, and teleological (van de Ven & Poole, 1995).

One of the strengths of evolutionary economic theory is arguably one of its weaknesses. The new breed of evolutionary economists are revolutionaries and not merely revisionists like those practising "evolutionary theorizing", taking a radically different stance to "*standard theoretical approaches in economics*" (Vromen, 2012:739-740). Not all economists perceive the theory favourably, although it is considered "*mainstream economics*" (Friedman, 1998; Hodgson, 1999; Hodgson, 2007). For example, evolutionary economics has continued to migrate between "*departments of economics to business schools, institutes of innovation studies and elsewhere*" (Hodgson, 2019:1). It is not a single discipline with a single disciplinary location within academia, which, depending on perspective, can be perceived as a limitation, despite the fact that today interdisciplinary and transdisciplinary research is encouraged. To critics of evolutionary economic theory, there is an acknowledgment that the theory has greatly inspired a variety of fields in business and social sciences but that it is too specialised. According to some, evolutionary economics "*lacks a sufficiently-developed core theory that might promote greater conversation across these fields*" (Hodgson, 2019:1). It is time to develop the field of evolutionary economics further, so that a more unified and integrated research community emerges with "*shared conceptual narratives and common research questions, to promote conversation and synergy between diverse clusters of research*" (Hodgson & Lamberg, 2018:167).

Concepts

Path Dependency (Concept): The process of technological change that is open-ended, where no optimal solution to a technical problem can be identified, and where historical events/ decisions may impact future events/ decisions in the development of an innovation. (Nelson, 1987)

Technological Guidepost (Concept): The basic design of a technological innovation that acts as a sign charting the course of future innovation activity. (Sahal, 1981)

Technological Trajectory (Concept): Also known as natural trajectory. A pattern of innovation and the continuous improvement of products in terms of performance and reliability. (Dosi, 1982)

Selection (Concept): Distinguishing principle whereby humans demonstrate goal-directed behaviour which renders choice, variation, and inheritance as interdependent mechanisms. (Cordes, 2007)

Selection Environment (Concept): The choice between a number of innovations in the same firm/industry which acts to influence the path of innovation and the rate of diffusion generated by any given innovation. (Lindley, 1997)

Creative Symbiosis (Concept): Two or more technologies combining in an integrative fashion such that the outline of the overall system is greatly simplified. (Sahal, 1981)

Creative Destruction (Concept): The introduction of new patterns of behaviour that determine winners and losers at the organisational level while positively propelling an economy forward through innovation. (Schumpeter, 1943)

Emergence (Concept): The phenomenon whereby the complex interactions of subsystems form an observed system. (Herrmann-Pillath, 2001)

Systems of Innovation (Concept): A holistic and interdisciplinary approach that explains the process of innovation as a complex and dynamic phenomenon. Explains how innovation comes about, and includes organisational, institutional, political, cultural, historical, cognitive, and economic determinants. (Nelson & Winter, 2002)

Complexity (Concept): A dynamic state of interaction between one or more actors in the economy. (Dopfer, 2011)

Stakeholder Clusters (Concept): Also known as agent groups. These include stakeholders who are brought together through a high degree of intersecting interests. (Duggan, Farnsworth & Kraak, 2013)

Co-evolution (Concept): A practice involving stakeholders building together a knowledge program through exchange of thoughts and imagination. (Witt, 1998)

References

Almudi, I. & Fatas-Villafranca, F. (2021). *Coevolution in Economic Systems*. Cambridge University Press.

Andriani, P. (2001). Diversity, knowledge and complexity theory: Some introductory issues. *International Journal of Innovation Management*, 05 (02), 257-274.

Ayres, C. (1953). The Role of Technology in Economic Theory. *The American Economic Review*, 43 (2), 279-287.

Ayres, C. (2000). *Theory of Economic Progress a Study of the Fundamentals of Economic Development and Cultural Change*. Schocken Books.

Balzat, M. & Hanusch, H. (2004). Recent trends in the research on national innovation systems. *Journal of Evolutionary Economics*, 14 (2), 197-210.

Boschma, R.A. & Frenken, K. (2006). Why is economic geography not an evolutionary science? Towards an evolutionary economic geography. *Journal of Economic Geography*, 6 (3), 273-302.

Capron, H., Meeusen, W. & Muller, W.A. (2000). *The National Innovation System of Belgium (Contributions to Economics)*. Physica-Verlag Heidelberg.

Carlsson, B. (2012). *Technological Systems and Economic Performance*. Springer London, Limited.

Carlsson, B., Jacobsson, S., Holmén, M. & Rickne, A. (2002). Innovation systems: analytical and methodological issues. *Research Policy*, 31 (2), 233-245.

Chung, S. (2002). Building a national innovation system through regional innovation systems. *Technovation*, 22 (8), 485-491.

Cooke, P. & Morgan, K. (2014). The regional innovation system in Baden–Wurttemberg . *International Journal of Technology Management*, 9 (3-4), 394-429.

Cordes, C. (2007). Turning Economics into an Evolutionary Science: Veblen, the Selection Metaphor, and Analogical Thinking. *Journal of Economic Issues*, 41 (1), 135-154.

Cordes, C. (2015). Evolutionary Economics. *International Encyclopedia of the Social & Behavioral Sciences*, 430-436.

Cyert, R. & March, J. (1963). *A Behavioral Theory of the Firm*. Prentice-Hall.

David, P. (1985). *The American Economic Review*, 75 (2), 332-337.

Dodgson, M., Mathews, J., Kastelle, T. & Hu, M. (2008). The evolving nature of Taiwan's national innovation system: The case of biotechnology innovation networks. *Research Policy*, 37 (3), 430-445.

Doloreux, D. (2002). What we should know about regional systems of innovation. *Technology in Society*, 24 (3), 243-263.

Dopfer, K. & Nelson, R.R. (2018). The Evolution of Evolutionary Economics. *Modern Evolutionary Economics*, 208-230.

Dopfer, K. (2001). *Evolutionary Economics: Program and Scope*. Springer Netherlands.

Dopfer, K. (2001). Evolutionary Economics:Framework for Analysis. *Evolutionary Economics: Program and Scope*, 1-44.

Dopfer, K., Foster, J. & Potts, J. (2004). Micro-meso-macro. *Journal of Evolutionary Economics*, 14 (3), 263-279.

Dosi, G. (1982). Technological paradigms and technological trajectories. *Research Policy*, 11 (3), 147-162.

Edquist, C. & Hommen, L. (1999). Systems of innovation: theory and policy for the demand side. *Technology in Society*, 21 (1), 63-79.

Edquist, C. (1997). *Systems of Innovation*. Routledge.

Edquist, C., Eriksson, M. & Sj gren, H. (2000). Collaboration in Product Innovation in the East Gothia Regional System of Innovation. *Enterprise and Innovation Management Studies*, 1 (1), 37-56.

Elsner, W. (2014). *The Microeconomics Of Complex Economies Evolutionary Institutional And Complexity Perspectives*. Elsevier Science Publishing Co Inc.

Elsner, W., Heinrich, T. & Schwardt, H. (2015). Themes of Complexity in the History of Economic Thought. *The Microeconomics of Complex Economies*, 307-362.

Foster, J. & Hölzl, W. (2004). *Applied evolutionary economics and complex systems*. Edward Elgar Pub.

Franco, M. & Mani, S. (2009). *Sectoral systems of innovation and production in developing countries*. Edward Elgar.

Frenken, K. (2006). Technological innovation and complexity theory. *Economics of Innovation and New Technology*, 15 (2), 137-155.

Friedman, D. (1998). Evolutionary economics goes mainstream: A review of the theory of learning in games. *Journal of Evolutionary Economics*, 8 (4), 423-432.

Geels, F.W. (2004). From sectoral systems of innovation to socio-technical systems. *Research Policy*, 33 (6-7), 897-920.

Grubler, A., Aguayo, F., Gallagher, K., Hekkert, M., Jiang, K., Mytelka, L., Neij, L., Nemet, G., Wilson, C., Andersen, P., Clarke, L., Anadon, L., Fuss, S., Jakob, M., Kammen, D., Kempener, R., Kimura, O., Kiss, B., O'Rourke, A., Schock, R., de Sousa, P. & Srivastava, L. (2012). Policies for the Energy Technology Innovation System (ETIS). *Global Energy Assessment (GEA)*, 1665-1744.

Hall, B.H. & Rosenberg, N. (2010). *Handbook of the economics of innovation*. Elsevier.

Herstatt, C., Tiwari, T., Ernst, D. & Buse, S. (2008). *India's National Innovation System: Key Elements and Corporate Perspectives*.

Hippel, E.v. (1988). *The sources of innovation*. Oxford University Press.

Hodgson, G.M. & Knudsen, T. (2008). In search of general evolutionary principles: Why Darwinism is too important to be left to the biologists. *Journal of Bioeconomics*, 10 (1), 51-69.

Hodgson, G.M. & Lamberg, J. (2018). The past and future of evolutionary economics: some reflections based on new bibliometric evidence. *Evolutionary and Institutional Economics Review*, 15 (1), 167-187.

Hodgson, G.M. (1994). *Economics and evolution*. Polity.

Hodgson, G.M. (1999). *Evolution and Institutions*. Edward Elgar Publishing.

Hodgson, G.M. (2007). Evolutionary and Institutional Economics as the New Mainstream?. *Evolutionary and Institutional Economics Review*, 4 (1), 7-25.

Hodgson, G.M. (2019). *Evolutionary Economics*. Cambridge University Press.

Intarakumnerd, P., Chairatana, P. & Tangchitpiboon, T. (2002). National innovation system in less successful developing countries: the case of Thailand. *Research Policy*, 31 (8-9), 1445-1457.

Japan Association for Evolutionary Economics. & Aruka, Y. (2001). *Evolutionary Controversies in Economics*. Springer.

Knudsen, T. (2002). Economic selection theory. *Journal of Evolutionary Economics*, 12 (4), 443-470.

Lall, S. & Urata, S. (2003). *Competitiveness, FDI and Technological Activity in East Asia*. Edward Elgar Publishing Limited.

Lewis, O. & Steinmo, S. (2012). , 44 (3), 314-339 .

Leydesdorff, L. & Strand, ?. (2013). The Swedish system of innovation: Regional synergies in a knowledge-based economy. *Journal of the American Society for Information Science and Technology*, 64 (9), 1890-1902.

Leydesdorff, L. (1995). *The Challenge of Scientometrics: The Development, Measurement, and Self-Organization of Scientific Communications*.

Leydesdorff, L. (2001). Scientometrics. *International Encyclopedia of the Social & Behavioral Sciences*, 13752-13755.

Lindley, R. (1997). *Smart Card Innovation*. Saim Pty Ltd.

MacDowall, J. (1984). The technology innovation system in Japan. *Journal of Product Innovation Management*, 1 (3), 165-172.

McMaster, R. & Watkins, C. (2012). Evolutionary Economics. *International Encyclopedia of Housing and Home*, 135-138.

Metcalfe, J.S. (1994). Evolutionary Economics and Technology Policy. *The Economic Journal*, 104 (425), 931.

Metcalfe, J.S. (1998). *Evolutionary economics and creative destruction*. Routledge.

Michael, K. (2003). *The technological trajectory OF the automatic identification industry: the application OF the systems OF innovation (SI) framework FOR the characterisation AND prediction OF the auto-ID industry*. Doctoral Thesis.

Michael, M.G. (2009). *Innovative automatic identification and location-based services*. Information Science Reference.

Motohashi, K. (2005). University–industry collaborations in Japan: The role of new technology-based firms in transforming the National Innovation System. *Research Policy*, 34 (5), 583-594.

Mowery, D.C. (1992). The U.S. national innovation system: Origins and prospects for change. *Research Policy*, 21 (2), 125-144.

Mueller, D. & Cantner, U. (2000). *Capitalism and Democracy in the 21st Century*. Physica-Verlag HD.

Murmann, J.P. & Frenken, K. (2006). Toward a systematic framework for research on dominant designs, technological innovations, and industrial change. *Research Policy*, 35 (7), 925-952.

Nelson, R. & Winter, S. (1982). *An Evolutionary Theory OF Economic Change*. Harvard University Press.

Nelson, R. & Winter, S. (2002). Evolutionary Theorizing IN Economics. *The Journal OF Economic Perspectives*, 16 (2), 23-46.

Nelson, R. (1981). Research on Productivity Growth and Productivity Differences: Dead Ends and New Departures. *Journal of Economic Literature*, 19 (3), 1029-1064.

Nelson, R. (2013). Demand, supply, and their interaction on markets, as seen from the perspective of evolutionary economic theory. *Journal of Evolutionary Economics*, 23 (1), 17-38.

Nelson, R.R. & Sampat, B.N. (2001). Making sense of institutions as a factor shaping economic performance. *Journal of Economic Behavior & Organization*, 44 (1), 31-54.

Nelson, R.R. (1982). *An evolutionary theory of economic change*. Harvard University Press.

Nelson, R.R. (1987). *Understanding technical change as an evolutionary process*. North-Holland.

Nelson, R.R. (1993). *National innovation systems*. Oxford University Press.

Nelson, R.R. (2008). Economic Development from the Perspective of Evolutionary Economic Theory. *Oxford Development Studies*, 36 (1), 9-21.

Niosi, J. (2000). *Canada's national system of innovation*. McGill-Queen's University Press.

Nooteboom, B. (1999). Innovation, learning and industrial organisation. *Cambridge Journal of Economics*, 23 (2), 127-150.

O'Neill, B. (2001). Cassandra/Cornucopian Debate. *International Encyclopedia of the Social & Behavioral Sciences*, 1525-1529.

Penrose, E. & Pitelis, C. (2009). *The Theory of the Growth of the Firm*. OUP Oxford.

Pitelis, C. (2012). Clusters, entrepreneurial ecosystem co-creation, and appropriability: a conceptual framework. *Industrial and Corporate Change*, 21 (6), 1359-1388.

Potts, J., Hartley, J., Banks, J., Burgess, J., Cobcroft, R., Cunningham, S. & Montgomery, L. (2008). Consumer Co- creation and Situated Creativity. *Industry & Innovation*, 15 (5), 459-474.

Raworth, K. (2018). *Doughnut Economics*. Penguin Random House UK.

Sahal, D. (1981). *Patterns of technological innovation*. Addison-Wesley Pub. Co., Advanced Book Program/World Science Division.

Saviotti, P.P. & Metcalfe, S. (2020). *Evolutionary Theories of Economic and Technological Change*. Taylor & Francis Group.

Saxenian, A. (1996). *Regional Advantage*. Harvard University Press.

Schlaile, M.P., Mueller, M., Schramm, M. & Pyka, A. (2018). Evolutionary Economics, Responsible Innovation and Demand: Making a Case for the Role of Consumers. *Philosophy of Management*, 17 (1), 7-39.

Schot, J. & Steinmueller, W.E. (2018). Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy*, 47 (9), 1554-1567.

Schumpeter, J.A. (1934). *Theory of Economic Development*. Harvard University Press.

Sharp, M. (1985). *Europe and the new technologies*. Pinter.

Shiozawa, Y. (2004). Evolutionary Economics in the 21st Century: A Manifesto. *Evolutionary and Institutional Economics Review*, 1 (1), 5-47.

Simon, H.A. (1955). A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics*, 69 (1), 99.

Solow, R.M. (1957). Technical Change and the Aggregate Production Function. *The Review of Economics and Statistics*, 39 (3), 312.

Sun, Y. (2002). China's National Innovation System in Transition. *Eurasian Geography and Economics*, 43 (6), 476-492.

Veblen, T. (1898). Why is Economics not an Evolutionary Science?. *The Quarterly Journal of Economics*, 12 (4), 373.

Vromen, J. (2012). Ontological Issues in Evolutionary Economics. *Philosophy of Economics*, 737-763.

Wieczorek, A.J., Negro, S.O., Harmsen, R., Heimeriks, G.J., Luo, L. & Hekkert, M.P. (2013). A review of the European offshore wind innovation system. *Renewable and Sustainable Energy Reviews*, 26, 294-306.

Wijnberg, N.M. (1994). National systems of innovation: Selection environments and selection processes. *Technology in Society*, 16 (3), 313-320.

Winter, S. (2014). The future of evolutionary economics: can we break out of the beachhead?. *Journal of Institutional Economics*, 10 (4), 613-644.

Witt, U. & Chai, A. (2018). *Understanding Economic Change*. Cambridge University Press.

Witt, U. (1987). *Individualistische Grundlagen der evolutorischen Ökonomik*. Mohr.

Witt, U. (1998). Imagination and leadership – The neglected dimension of an evolutionary theory of the firm. *Journal of Economic Behavior & Organization*, 35 (2), 161-177.

Witt, U. (2001). Learning to consume – A theory of wants and the growth of demand. *Journal of Evolutionary Economics*, 11 (1), 23-36.

Witt, U. (2008). What is specific about evolutionary economics?. *Journal of Evolutionary Economics*, 18 (5), 547-575.

Zhu, D. & Tann, J. (2005). A regional innovation system in a small-sized region: A clustering model in Zhongguancun Science Park. *Technology Analysis & Strategic Management*, 17 (3), 375-390.

de la Mothe, J. & Paquet, G. (2012). *Local and Regional Systems of Innovation*. Springer London, Limited.

van de Ven, A.H. & Poole, M.S. (1995). Explaining Development and Change in Organizations. *The Academy of Management Review*, 20 (3), 510.

Expectation Confirmation Theory

Expectation Confirmation Theory explains how individuals' post-purchase satisfaction and repurchase intentions depend on the pre-purchase expectations and subsequent experiences with products or services.

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Theory Factsheet

Proposed By: Oliver, 1980

Related Theories: Cognitive Dissonance Theory, Post acceptance model, Equity Theory

Discipline: Marketing

Unit of Analysis: Individual

**Level:** Micro-level

Type: Theory for Explaining

Operationalised: Qualitatively / Quantitatively

Introduction

The Expectation Confirmation Theory (ECT) originated from the research domains of consumer research and social psychology. The theory was first introduced in marketing to study consumer satisfaction and consumers' decision-making processes (Oliver, 1980). Since its inception, the marketing literature has consistently highlighted the critical role of consumer satisfaction, which further affects repurchases, consumer loyalty, and consumer retention (Rust & Zahorik, 1993; Churchill & Surprenant, 1982). The foundation for the concept of satisfaction was derived from applied psychology research related to life and employment satisfaction. For example, individuals set an initial standard of expectations, and any deviation from the initial reference point affects their satisfaction levels. Similarly, consumers have basic needs and certain expectations from products to fulfil their needs. When the product fails to meet consumers' expectations, this results in consumers' unfavourable attitudes (disconfirmation) and beliefs about the product (Yang, Lu & Chau, 2013). The disconfirmation concept is aligned with cognitive dissonance theory, which suggests that individuals experience a psychological conflict when their behaviour is not consistent with their beliefs and thoughts (Harmon-Jones & Mills, 2019). For example, users may believe that a certain technology is easy to use,

but find it complex during the actual usage. In such a case, users need to realign their attitudes toward that technology to resolve the discrepancy, leading to disconfirmation. If the behaviour and thoughts are aligned, consumers do not need to change attitude and hence no dissonance exists. Similarly, ECT offered insights into the cognitive post-purchase consequences of satisfaction and attitude. ECT utilised the Howard and Sheth (Haines, Howard & Sheth, 1970) model of consumer satisfaction to propose that disconfirmation stems from the comparison between anticipated satisfaction and received satisfaction. Contrary to the popular belief that a superior quality product results in higher consumer satisfaction, even a relatively inferior quality product can successfully meet consumers' expectations, leading to acceptable levels of consumer satisfaction (e.g., one-time use and throw-away products). Hence, the theory highlights how expectations prior to purchase and post-purchase experiences shape consumer satisfaction (Oliver, 1981). Another important objective of ECT was to offer guidance to marketers in retaining consumers, as the cost of acquiring new customers was substantially higher than retaining them (Anderson & Sullivan, 1993; Dabholkar, Shepherd & Thorpe, 2000). A conceptual model of the theory is given in FIG 1.

Figure 1: Expectancy Confirmation Theory
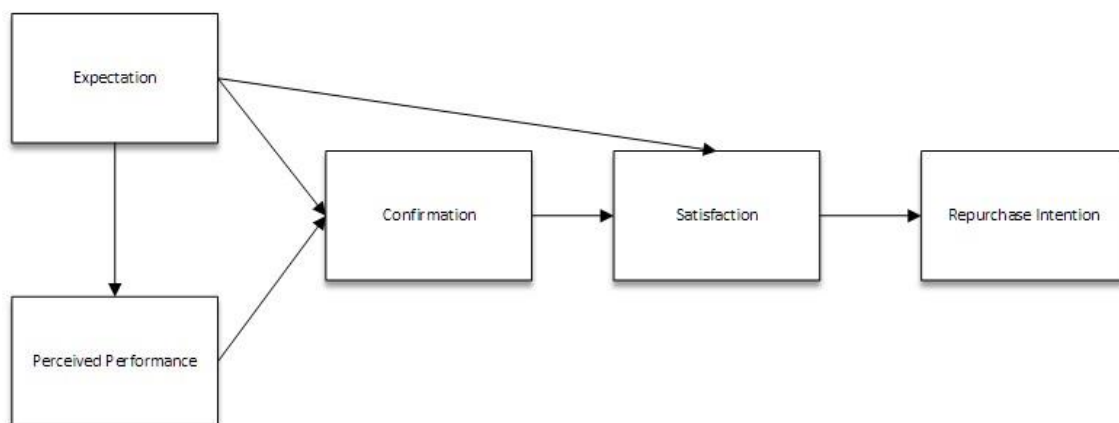
Theory

ECT demonstrates that consumer satisfaction is fuelled by belief/disbelief generated as an outcome of the evaluation of the performance against the expectation (Oliver, 1980). The conceptual underpinning of ECT theory can be explained in the following steps: formation of expectation, interaction and experience, confirmation or disconfirmation, and cognitive adjustment (Hossain & Quaddus, 2012) (FIG 2). These steps explain why consumers purchase again.

Figure 2: Consumer's evaluation of Expectation and Confirmation
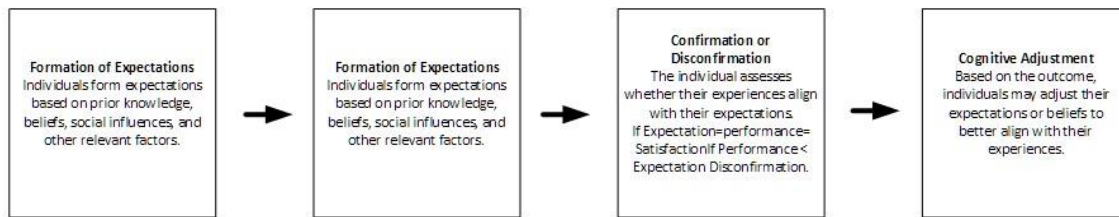
Formation of Expectations: Consumers form initial expectations about a specific product or service prior to purchase based on knowledge and prior experience. This knowledge is acquired through various mass media communication channels, peers, and influencers. Mass media acts as a critical source of product information and knowledge for consumers, who form expectations based on advertising, media reports, and other forms of media exposure. In addition, direct channels like personal selling, opinion leaders, peers, and influencers influence consumers' knowledge and expectations about the products. If consumers have access to accurate product information, they form realistic expectations. However, if the information is misleading, it leads to unrealistic expectations.

Interaction and Experience: Consumers purchase and use the product after carefully considering the information. Once the consumers use the product, they form perceptions about its performance.

Confirmation or Disconfirmation: Consumers assess the perceived performance of the product (or service) based on their initial expectations. There could be three possibilities that can lead to disconfirmation.
Perceived product performance > expectations = positive disconfirmation
Perceived product performance < expectation = negative disconfirmation
Perceived product performance = expectation = simple confirmation

Cognitive Adjustment: Based on the confirmation of their expectations, consumers form a level of satisfaction. Positive disconfirmation and simple confirmation strengthen consumers' attitudes toward the product, leading to a sense of satisfaction (Oliver & DeSarbo, 1988). In the case of negative disconfirmation, consumers develop an unfavourable attitude toward the product, generating dissatisfaction. Consumers satisfied with the performance of the products are more likely to repurchase products compared to dissatisfied consumers. In some specific cases, even dissatisfied consumers are forced to repurchase products, due to the absence of any other feasible alternative or high switching costs. Similarly, all satisfied consumers may not repurchase the same products, because of intrinsic factors such as variety-seeking behaviour, a need for uniqueness, or innovativeness (McAlister & Pessemier, 1982).

Theory Updates/Extensions

Expectation Disconfirmation Theory

Expectation disconfirmation theory (EDT) (Oliver, 1993) is an alternate version of ECT, which replaces confirmation with disconfirmation. Consumers compare the product performance with pre-purchase expectations in the post-purchase stage, creating disconfirmation perceptions. The combination of these perceptions and the deviation from the expected satisfaction levels affects consumers' satisfaction/dissatisfaction (Oliver, 2014). Oliver (2014) discussed two models of EDT. The first simplified expectation disconfirmation model consists of three main constructs: expectations, disconfirmation, and satisfaction. Higher initial expectations will lead to more instances where performance fails to meet the higher expectations. Hence, expectations are more likely to have a negative relationship with disconfirmation. Expectations and disconfirmation have a positive impact on satisfaction. The second model, the complete expectation disconfirmation one, includes performance as the fourth variable in the model. This model suggests that expectations have a positive effect on performance. In addition, if the product performance is high, it is more likely to exceed the initial expectations, leading to a positive disconfirmation. Hence, performance has a positive influence on disconfirmation and satisfaction. While comparing the two models, the simplified model is parsimonious, and the second complete model performs better in explaining the variations in satisfaction (Lankton & McKnight, 2012). The complete model also highlights the assimilation effects and asymmetric effects missing in the simplified model (Lankton & McKnight, 2012). Assimilation effects reflect how consumers balance their expectations and perceptions of product performance. For example, consumers may rely more on initial expectations than performance to form satisfaction, as it is difficult to evaluate the performance of complex technologies. Asymmetric effects indicate the distinct impact of positive and negative perceptions, where negative experiences (compared to positive experiences) have a relatively higher impact on satisfaction.

Expectation-Confirmation Model

In an information systems context, the user follows a similar decision journey leading to continuance/acceptance. The expectation-confirmation model (ECM) (Bhattacherjee, 2001) is one of the most well-known and extensively used models extended from ECT. ECM replaced the repurchase intention variable in ECT with information systems continuance intention to suit the research context. ECM defined confirmation as "*the congruence between expectation and actual performance*" (Bhattacherjee, 2001: p.359) and removed the performance construct of ECT because ECM assumes that the influence of perceived performance is already explained by confirmation. The model predominantly focused on the post-usage or post-acceptance variables to explain usage continuance. The effects of pre-acceptance variables are already manifested in the constructs of confirmation and satisfaction. In addition, the construct of perceived usefulness from the technology acceptance model (TAM) was introduced to reflect the post-acceptance expectations.

According to ECM, users' intention to continue IS usage depends on three factors: users' satisfaction with IS, the degree of users' confirmation of their expectations, and the post-usage perceived usefulness of IS. The perceived usefulness shows users' cognitive belief, and satisfaction reflects users' affect. Satisfaction has a stronger effect on IS continuance than perceived usefulness. The continuance is predominantly determined by users' satisfaction with initial use. Unpleasant

experiences and dissatisfaction arising from performance (e.g., quality of Internet speed or poor website design) negatively influence users' further use of such services or websites (Kang & Lee, 2010). Hence, satisfaction, an affective component of human behaviour, has a significant positive association with continuance. Initial expectations and confirmation (disconfirmation) of those expectations after the first use are two important antecedents to satisfaction. As noted earlier, expectations are at the baseline, which acts as an anchor for the further evaluation of the system. The confirmation is evaluated based on the gap between the actual performance and initial expectations. A positive confirmation suggests that users have reaped the expected benefits, whereas a negative confirmation suggests that the product or service has failed to meet users' expected levels of performance. Therefore, users' confirmation has a positive impact on their satisfaction with usage. The perceived performance (post-usage expectation) was operationalised as post-perceived usefulness in ECM. Research on IS continuance showed that the impact of perceived ease of use on attitude and behavioural intentions gradually declined from the pre-acceptance to post-acceptance stages. As users became familiar with IS, they became more concerned with the performance and benefits obtained from IS (Karahanna, Straub & Chervany, 1999). Hence, users' perceived usefulness of IS was expected to significantly predict their post-acceptance satisfaction. Also, when users can improve their performance and productivity with the help of IS, they are intrinsically motivated to use IS to seek potential rewards. Consequently, perceived usefulness has a positive influence on users' IS continuance. Finally, to understand the relationship between perceived usefulness and confirmation, the ECM took cues from the TAM model, where the cognitive beliefs (ease of use and perceived usefulness) in IS acceptance were related. However, the post-usage perceived usefulness was somehow mixed and confused with the much more popular pre-usage perceived usefulness featured in TAM. To avoid this confusion, in an extension of ECM (extended model of IS continuance), perceived usefulness was replaced by post-usage usefulness (Bhattacherjee, Perols & Sanford, 2008). This updated model also incorporated two additional variables: users' IT self-efficacy to reflect their confidence in their skills and abilities to perform the tasks, and facilitating conditions to enable users to access and use IS. In this model, the authors proposed that the association between perceived usefulness and satisfaction can be removed without any significant impact on the variance explained in satisfaction.

In another extension, ECM was combined with the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to investigate users' post-adoption behaviour toward mobile payment systems (Singh, 2020). The integrated model, with two additional variables of trust and perceived security, displayed a higher predictive power to explain users' continuance of mobile payments. Scholars have also integrated ECT with other theories, such as TAM and the Theory of Planned Behaviour (TPB), to measure user satisfaction and its impact on IS continuance. ECT and TAM were used to examine the usage and acceptance of online learning platforms to enhance educational technology acceptance and its utilisation among students (Tawafak et al., 2023). Similarly, ECT and TAM were integrated to predict blog continuance intentions, and the ECT model of IS continuance performed better than the TAM (Shiau & Chau, 2012). In another study, constructs from ECT and TPB were used to investigate the antecedents to users' continuance intention of using online shopping (Hsu et al., 2006). The findings indicated that users' prior experience and satisfaction with online shopping significantly positively impacted their continuance intentions of online shopping. The research findings from

integrated models suggest that ECM can be used in conjunction with other IS models like TAM and UTAUT to investigate users' post-adoption behaviour. In most cases, the integrated models with additional context-specific variables perform better, with improved predictive power.

Table 1: Variables as extensions of ECT

Variables	Relevant Studies
Trust	(Zhou et al., 2018; Yousaf, Mishra & Gupta, 2021; Shiau et al., 2020; Rahi et al., 2021; Kumar, Israel & Malik, 2018)
Quality	(Zhang et al., 2015; Roca, Chiu & Martínez, 2006)
Task fit	(Yuan et al., 2016; Sun, Fang & Zou, 2016; Osah & Kyobe, 2017)
Efficacy	(Yeh & Teng, 2012; Shiau et al., 2020; Mouakket, 2020)
Perceived Ease of Use	(Yuan et al., 2016; Weng et al., 2017)
Expectation	(Premkumar & Bhattacherjee, 2008;Piehler et al., 2016)
Subjective norms	(Yoon & Rolland, 2015; Sun et al., 2017)
Enjoyment	(Yoon & Rolland, 2015;Siepmann & Kowalczuk, 2021)
Attitude	(Weng et al., 2017;Venkatesh et al., 2011;Marikyan, Papagiannidis & Alamanos, 2020)
Social influence	(Yoon & Rolland, 2015; Venkatesh et al., 2011;Tam, Santos & Oliveira, 2020; Joo, Park & Shin, 2017)
Perceived risk	(Wang, Lin & Liu, 2021; Weng et al., 2017)
Performance	(Wang, Lin & Liu, 2021)

Innovativeness	(Wang et al., 2008)

Applications

ECT and its extensions have been widely used in multiple research contexts. ECT has been applied and used across the marketing, sociology, public policy, and IS domains.

ECT is widely used in its field of origin, namely in marketing, to examine multiple facets of consumer behaviour, such as purchase intentions, loyalty, and satisfaction (Anderson & Sullivan, 1993;Dabholkar, Shepherd & Thorpe, 2000;Oliver, 1981). ECT-based research offers valuable suggestions to marketers to fully comprehend and respond to customer preferences and requirements by providing information about the variables impacting post-purchase choices, eventually establishing long-term connections and achieving corporate growth. The theory has been applied in different research contexts, including the purchase of durable and non-durable items (Churchill & Surprenant, 1982), automobile repurchase (Oliver, 1993), restaurant service evaluations (Swan & Trawick, 1981), repurchase of camcorders (Spreng, MacKenzie & Olshavsky, 1996), photographic merchandise (Dabholkar, Shepherd & Thorpe, 2000), and professional business services (Patterson & Spreng, 1997). ECT has been used to determine how satisfaction with services may lead to consumer loyalty depending on users' self-determined motivation (Lin, Tsai & Chiu, 2009). It has also been used in the context of consumers' e-loyalty toward online book-selling websites and consumers' impulsive purchase behaviour (Tsao, 2013).

In sociology, ECT has been applied to various different cases. For instance, it has been used to explore police-citizen encounters in the USA. The research examined the impact of citizens' expectations of police performance and disconfirmation with actual services on their satisfaction levels (Reisig & Stroshine Chandek, 2001). The concept of disconfirmation with the prevailing expectations was utilised to explore gender-based inequalities (Wagner, Ford & Ford, 1986). ECT has been employed in the field of public policy to assess citizen satisfaction in relation to urban services, public administration, and federal services (Morgeson, 2013;Poister & Thomas, 2011;Van Ryzin, 2004;Pirog, 2013). The validity and generalisability of ECT have been confirmed via many other studies in similar contexts across different countries like China (Filtenborg, Gaardboe & Sigsgaard-Rasmussen, 2017) and England (James, 2009). An extensive amount of research exists in the public administration literature that examines the antecedents to citizen satisfaction. A recent meta-analysis integrated the findings of ECT-based research on citizens' satisfaction with public services to confirm that users are satisfied when the perceived performance meets or exceeds their expectations (Zhang et al., 2022). The analysis suggests that ECT offers useful insights and should be used to further investigate the determinants of citizen satisfaction.

In the domain of public policy, scholars have used ECT to study public satisfaction and loyalty to public transport. For a sustainable transport system, governments face complex challenges of building passenger loyalty to public transport similar to the concepts of consumer loyalty and repeat purchases. ECT is used to understand the multidimensional aspects of public transport usage from passengers' perspectives

(Fu, Zhang & Chan, 2018). The research findings have immensely helped governments draft public policies to improve public services to increase citizens' satisfaction with services. In social psychology, the expectancy-confirming philosophy is used to explore the influence of expectancy-based information processing and prejudicial attitudes on social stereotypes (Ford & Stangor, 1992). For example, some individuals associate stereotypes of violence and drug abuse with rap music artists due to specific promotion tactics used in poplar media. Policymakers in the banking industry have benefitted from the application of ECT to examine the importance of intrinsic motivations and its impact on users' satisfaction with services (Rahi & Abd. Ghani, 2019).

ECT, EDT, and ECM have been extensively used in IS adoption and continuance research. A vast amount of research has utilised ECT/ECM across multiple domains, such as m-health and fitness apps adoption, digital banking services, medical tourism, hospitality, smart wearables, e-learning platforms, e-commerce, online reviews, and ride-sharing services (Almaiah, Al-Khasawneh & Althunibat, 2020; Ashfaq et al., 2020; Ayanso, Herath & O'Brien, 2015; Chen, 2012; Si et al., 2022; Wu et al., 2022). Predominantly, ECM has been used to examine the usage and continuance intentions in a wide variety of IS products and services. The first few applications of ECM were to test users' IS continuance intentions with online banking services (Bhattacherjee, 2001) and changes in users' beliefs and attitudes toward computer-based training systems and system development (Bhattacherjee & Premkumar, 2004). Most of the research related to mobile and smartphone banking has strengthened the relevance of ECM in understanding consumers' intention to keep utilising mobile banking services (Chen, 2012; Susanto, Chang & Ha, 2016; Yuan et al., 2016). Similarly, ECT has been used to explain users' fintech continuance, considering the effects of users' self-efficacy (Shiau et al., 2020), as well as the continued usage of smart wearables (El-Gayar & Elnoshokaty, 2023). During the COVID-19 pandemic, ECT and ECM grew in prominence, evaluating users' continuance intentions and satisfaction toward e-learning systems (Almaiah, Al-Khasawneh & Althunibat, 2020; Mailizar, Almanthari & Maulina, 2021) and fitness apps (Yousaf, Mishra & Gupta, 2021). ECT has also found applicability in the domain of recent artificial intelligence (AI) technologies, for example, users' continuance and recommendations of AI-based smart voice assistants (Lee et al., 2021).

A significant amount of research has explored the determinants of user satisfaction with technology. In recent years, technology usage has become more personal in nature. It has reached users' homes, and with smartphones, it has become ubiquitous (Venkatesh & Brown, 2001). Users consistently use technology to fulfil their hedonic motives along with utilitarian motives. So, it is imperative to consider the specific contexts and instances of technology usage to predict users' continuance. User acceptance behaviour differs between utilitarian (productivity-oriented) and hedonic (pleasure-oriented) IS (van der Heijden, 2004). Hedonic IS is generally related to leisure activities, offering fun and entertainment, and it emphasises users spending more time with IS, rather than using IS as a means for improving productivity. Hence, perceived enjoyment, an intrinsic motivation, becomes more important than perceived usefulness for hedonic IS (van der Heijden, 2004). Numerous research findings suggest that perceived enjoyment is a critical predictor of user satisfaction and continuance in IS contexts, such as online services and social media apps (Kang & Lee, 2010), mobile internet (Jumaan, Hashim & Al-Ghazali, 2020), and mobile data service continuance (Kim, 2010). A positive confirmation has been shown to lead to higher levels of perceived enjoyment, leading to higher user

satisfaction (Kim, 2010). Similarly, when users enjoy blogging, they are more likely to continue using blog websites due to higher satisfaction (Shiau & Luo, 2013).

Table 2: Application of ECT in various fields

	Author	**Area of Study**
Marketing	(Churchill & Surprenant, 1982)	Durable and non-durable products
	(Swan & Trawick, 1981)	Restaurant service
	(Spreng, MacKenzie & Olshavsky, 1996)	Camcorder repurchase
	(Dabholkar, Shepherd & Thorpe, 2000)	Photographic products
	(Patterson & Spreng, 1997)	Business professional services
	(Oliver, 1993)	Automobile repurchase
Sociology	(Reisig & Stroshine Chandek, 2001)	Policy performance
Public Policy	(Van Ryzin, 2004)	Urban services
Social psychology	(Ford & Stangor, 1992)	Prejudicial attitudes and social stereotypes
Information systems	(Bhattacherjee, 2001)	Information systems continuance
	(Bhattacherjee, 2001)	E-commerce continuance decisions

Limitations

ECT originated in marketing literature, seeking to explain consumer satisfaction and post-purchase actions such as repurchase intentions and it was extended to IS research to examine users' satisfaction and post-acceptance continuance intentions. Scholars have discussed a few limitations of ECT and its extensions. ECT offers a parsimonious model to connect user satisfaction and repurchase/IS continuance intentions, which allows scholars to add additional context-relevant variables to increase the predictive power of their proposed model. One criticism of ECT is its inability to explain the situations of extremely low/high expectations and performance. ECT fails to explain why users remain dissatisfied even when the product performs higher than the consumer's initial expectations (Au, Ngai & Cheng, 2002; Premkumar & Bhattacherjee, 2008). Users may be constrained by organisational barriers to describe their actual expectations. For example, users may be concerned about how the top management or peers will think about them, if they do not conform to others' viewpoints. They may align their expectations due to conformity and not report actual expectations. It is also possible that users may

reduce their expectations after prolonged use of information systems, so that even if system performance remains high, users do not feel satisfied. Perceptions of reduction in the speed and performance of computers and phones are some examples where users may not feel that the system is performing at the levels when they started using it due to consistent usage. In a few cases, users may lack awareness of the technology features and benefits (no expectations), which makes them satisfied with low levels of system performance. The earlier versions of Windows had performance and stability issues, yet many people found them very useful as they did not have any set expectations of stability and consistent performance.

Scholars have also questioned the applicability of the expectation generation process outlined in ECT to the IS context. In ECT, expectations can be generated from sources such as mass media, advertising, and opinion leaders. A consumer can buy a product without having any specific expectations under the influence of marketing persuasion. However, it is very unlikely that a user (or organisation) will purchase an IS product without having predefined expectations. Hence, the traditional ECT suffers from the limitation of explaining the IS expectation formation process in the context of IS products. Some researchers have pointed out the distinction between consumers and customers, while applying the ECT to practice. They recommend using ECT, focusing on users in IS research who will use the product.

In addition, ECT assumes that expectation is a relatively constant construct only considering pre-consumption expectations, whereas expectation changes with time, knowledge gained, and experience (Bhattacherjee & Premkumar, 2004). ECT focuses on the confirmation of the consumer's belief/disbelief as a static construct. However, consumer satisfaction may be influenced by the magnitude of the belief/disbelief (Churchill & Surprenant, 1982). Thus, it should be considered a measurement step that calculates the discrepancy between expectation and performance (Hossain & Quaddus, 2012). Also, confirmation as a construct is not unidimensional, but it can be studied in two dimensions: subjective confirmation (the difference between expectations and perceived performance) and objective confirmation (the difference between expectations and objective performance). A few researchers have questioned the timing of the measurement of expectations, whether it should be before consumption (usage) or post-adoption. However, most of the ECM research has used post-adoption measurements for expectation. Furthermore, satisfaction can also be measured in different ways. A direct and simpler option is to measure it using a direct survey method. Other more complex ways include measurements based on consumer complaints, feedback, positive or negative word-of-mouth, online reviews and ratings, and measuring real repurchases.

ECT posits that users' repurchase or continuance decisions depend on their satisfaction with prior experience or usage of that product. An individual will indulge in a repetitive behaviour, if it offers desired levels of satisfaction. Satisfaction may be a prerequisite for continuance, but there are many other factors that determine post-purchase intentions. For example, the hedonic benefits and enjoyment derived from products can significantly affect repurchase (Kang, Hong & Lee, 2009). Similarly, habit formation, social influence, a need for uniqueness, materialism, the cost of purchase, and culture are other noteworthy constructs that substantially impact consumers' purchase decisions (Limayem, Hirt & Cheung, 2007).

Concepts

Expectation (Independent): Perceived belief probabilities attributed to consequences mainly based on prior experience and existing knowledge or through interactions with different members of the communication channels (Oliver, 1981)

Perceived Performance (Independent): Perceived performance is how the customers evaluate the product/service/technology in terms of quality and perceive its value after purchasing it (Churchill & Surprenant, 1982)

Confirmation (Independent/Dependent): Matching of user's expectation with the performance of product/service/technology (Bhattacherjee, 2001)

Satisfaction (Independent/Dependent): The feeling after confirmation of expectation from product/service/technology (Bhattacherjee, 2001)

Repurchase Intention (Independent/Dependent): Intention to buy product/service/technology again (Patterson & Spreng, 1997)

References

Almaiah, M.A., Al-Khasawneh, A. & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*, 25 (6), 5261-5280.

Anderson, E.W. & Sullivan, M.W. (1993). The Antecedents and Consequences of Customer Satisfaction for Firms. *Marketing Science*, 12 (2), 125-143.

Ashfaq, M., Yun, J., Yu, S. & Loureiro, S.M.C. (2020). I, Chatbot: Modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. *Telematics and Informatics*, 54, 101473.

Au, N., Ngai, E.W. & Cheng, T. (2002). A critical review of end-user information system satisfaction research and a new research framework. *Omega*, 30 (6), 451-478.

Ayanso, A., Herath, T.C. & O'Brien, N. (2015). Understanding continuance intentions of physicians with electronic medical records (EMR): An expectancy-confirmation perspective. *Decision Support Systems*, 77, 112-122.

Bhattacherjee, & Premkumar (2004). Understanding Changes in Belief and Attitude toward Information Technology Usage: A Theoretical Model and Longitudinal Test. *MIS Quarterly*, 28 (2), 229.

Bhattacherjee, A. (2001). An empirical analysis of the antecedents of electronic commerce service continuance. *Decision Support Systems*, 32 (2), 201-214.

Bhattacherjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly*, 25 (3), 351.

Bhattacherjee, A., Perols, J. & Sanford, C. (2008). Information Technology Continuance: A Theoretic Extension and Empirical Test. *Journal of Computer Information Systems*, 49 (1), 17-26.

Chen, S.C. (2012). To use or not to use: understanding the factors affecting continuance intention of mobile banking. *International Journal of Mobile Communications*, 10 (5), 490.

Churchill, G.A. & Surprenant, C. (1982). An Investigation into the Determinants of Customer Satisfaction. *Journal of Marketing Research*, 19 (4), 491.

Dabholkar, P.A., Shepherd, C. & Thorpe, D.I. (2000). A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a longitudinal study. *Journal of Retailing*, 76 (2), 139-173.

El-Gayar, O. & Elnoshokaty, A. (2023). Factors and Design Features Influencing the Continued Use of Wearable Devices. *Journal of Healthcare Informatics Research*, 7 (3), 359-385.

Filtenborg, A.F., Gaardboe, F. & Sigsgaard-Rasmussen, J. (2017). Experimental replication: an experimental test of the expectancy disconfirmation theory of citizen satisfaction. *Public Management Review*, 19 (9), 1235-1250.

Ford, T.E. & Stangor, C. (1992). The role of diagnosticity in stereotype formation: Perceiving group means and variances. *Journal of Personality and Social Psychology*, 63 (3), 356-367.

Fu, X., Zhang, J. & Chan, F.T. (2018). Determinants of loyalty to public transit: A model integrating Satisfaction-Loyalty Theory and Expectation-Confirmation Theory. *Transportation Research Part A: Policy and Practice*, 113, 476-490.

Haines, G.H., Howard, J.A. & Sheth, J.N. (1970). The Theory of Buyer Behavior. *Journal of the American Statistical Association*, 65 (331), 1406.

Harmon-Jones, E. & Mills, J. (2019). An introduction to cognitive dissonance theory and an overview of current perspectives on the theory. *Cognitive dissonance: Reexamining a pivotal theory in psychology (2nd ed.).*, 3-24.

Hossain, M.A. & Quaddus, M. (2012). Expectation–Confirmation Theory in Information System Research: A Review and Analysis. *Information Systems Theory*, 441-469.

Hsu, M., Yen, C., Chiu, C. & Chang, C. (2006). A longitudinal investigation of continued online shopping behavior: An extension of the theory of planned behavior. *International Journal of Human-Computer Studies*, 64 (9), 889-904.

James, O. (2009). Evaluating the Expectations Disconfirmation and Expectations Anchoring Approaches to Citizen Satisfaction with Local Public Services. *Journal of Public Administration Research and Theory*, 19 (1), 107-123.

Joo, Y.J., Park, S. & Shin, E.K. (2017). Students' expectation, satisfaction, and continuance intention to use digital textbooks. *Computers in Human Behavior*, 69, 83-90.

Jumaan, I.A., Hashim, N.H. & Al-Ghazali, B.M. (2020). The role of cognitive absorption in predicting mobile internet users' continuance intention: An extension of the expectation-confirmation model. *Technology in Society*, 63, 101355.

Kang, Y.S. & Lee, H. (2010). Understanding the role of an IT artifact in online service continuance: An extended perspective of user satisfaction. *Computers in Human Behavior*, 26 (3), 353-364.

Kang, Y.S., Hong, S. & Lee, H. (2009). Exploring continued online service usage behavior: The roles of self-image congruity and regret. *Computers in Human Behavior*, 25 (1), 111-122.

Karahanna, E., Straub, D.W. & Chervany, N.L. (1999). Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs. *MIS Quarterly*, 23 (2), 183.

Kim, B. (2010). An empirical investigation of mobile data service continuance: Incorporating the theory of planned behavior into the expectation–confirmation model. *Expert Systems with Applications*, 37 (10), 7033-7039.

Kumar, R.R., Israel, D. & Malik, G. (2018). Explaining customer's continuance intention to use mobile banking apps with an integrative perspective of ECT and Self-determination theory. *Pacific Asia Journal of the Association for Information Systems*, 10 (2), 79-112.

Lankton, N. & McKnight, H. (2012). Examining Two Expectation Disconfirmation Theory Models: Assimilation and Asymmetry Effects. *Journal of the Association for Information Systems*, 13 (2), 88-115.

Lee, K.Y., Sheehan, L., Lee, K. & Chang, Y. (2021). The continuation and recommendation intention of artificial intelligence-based voice assistant systems (AIVAS): the influence of personal traits. *Internet Research*, 31 (5), 1899-1939.

Limayem, Hirt, & Cheung (2007). How Habit Limits the Predictive Power of Intention: The Case of Information Systems Continuance. *MIS Quarterly*, 31 (4), 705.

Lin, C., Tsai, Y.H. & Chiu, C. (2009). Modeling Customer Loyalty from an Integrative Perspective of Self-Determination Theory and Expectation–Confirmation Theory. *Journal of Business and Psychology*, 24 (3), 315-326.

Mailizar, M., Almanthari, A. & Maulina, S. (2021). Examining Teachers' Behavioral Intention to Use E-learning in Teaching of Mathematics: An Extended TAM Model. *Contemporary Educational Technology*, 13 (2), ep298.

Marikyan, D., Papagiannidis, S. & Alamanos, E. (2020). *Cognitive Dissonance in Technology Adoption: A Study of Smart Home Users*.

McAlister, L. & Pessemier, E. (1982). Variety Seeking Behavior: An Interdisciplinary Review. *Journal of Consumer Research*, 9 (3), 311.

Morgeson, F.V. (2013). Expectations, Disconfirmation, and Citizen Satisfaction with the US Federal Government: Testing and Expanding the Model. *Journal of Public Administration Research and Theory*, 23 (2), 289-305.

Mouakket, S. (2020). Investigating the role of mobile payment quality characteristics in the United Arab Emirates: implications for emerging economies. *International Journal of Bank Marketing*, 38 (7), 1465-1490.

Oliver, R. (1981). Measurement and evaluation of satisfaction processes in retail settings. *Journal of Retailing*, 57 (3), 25–48.

Oliver, R.L. & DeSarbo, W.S. (1988). Response Determinants in Satisfaction Judgments. *Journal of Consumer Research*, 14 (4), 495.

Oliver, R.L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, 17 (4), 460.

Oliver, R.L. (1993). Cognitive, Affective, and Attribute Bases of the Satisfaction Response. *Journal of Consumer Research*, 20 (3), 418.

Oliver, R.L. (2014). *Satisfaction: A Behavioral Perspective on the Consumer*. Routledge.

Osah, O. & Kyobe, M. (2017). Predicting user continuance intention towards M-pesa in Kenya. *African Journal of Economic and Management Studies*, 8 (1), 36-50.

Patterson, P.G. & Spreng, R.A. (1997). Modelling the relationship between perceived value, satisfaction and repurchase intentions in a business- to-business, services context: an empirical examination. *International Journal of Service Industry Management*, 8 (5), 414-434.

Piehler, R., King, C., Burmann, C. & Xiong, L. (2016). The importance of employee brand understanding, brand identification, and brand commitment in realizing brand citizenship behaviour. *European Journal of Marketing*, 50 (9/10), 1575-1601.

Pirog, M. (2013). *Journal of Policy Analysis and Management*, 32 (3).

Poister, T.H. & Thomas, J.C. (2011). The Effect of Expectations and Expectancy Confirmation/Disconfirmation on Motorists' Satisfaction with State Highways. *Journal of Public Administration Research and Theory*, 21 (4), 601-617.

Premkumar, G. & Bhattacherjee, A. (2008). Explaining information technology usage: A test of competing models. *Omega*, 36 (1), 64-75.

Rahi, S. & Abd. Ghani, M. (2019). Integration of expectation confirmation theory and self-determination theory in internet banking continuance intention. *Journal of Science and Technology Policy Management*, 10 (3), 533-550.

Rahi, S., Othman Mansour, M.M., Alharafsheh, M. & Alghizzawi, M. (2021). The post-adoption behavior of internet banking users through the eyes of self-determination theory and expectation confirmation model. *Journal of Enterprise Information Management*, 34 (6), 1874-1892.

Reisig, M.D. & Stroshine Chandek, M. (2001). The effects of expectancy disconfirmation on outcome satisfaction in police- citizen encounters. *Policing: An International Journal of Police Strategies & Management*, 24 (1), 88-99.

Roca, J.C., Chiu, C. & Martínez, F.J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. *International Journal of Human-Computer Studies*, 64 (8), 683-696.

Rust, R.T. & Zahorik, A.J. (1993). Customer satisfaction, customer retention, and market share. *Journal of Retailing*, 69 (2), 193-215.

Shiau, W. & Chau, P.Y. (2012). Understanding blog continuance: a model comparison approach. *Industrial Management & Data Systems*, 112 (4), 663-682.

Shiau, W. & Luo, M.M. (2013). Continuance intention of blog users: the impact of perceived enjoyment, habit, user involvement and blogging time. *Behaviour & Information Technology*, 32 (6), 570-583.

Shiau, W., Yuan, Y., Pu, X., Ray, S. & Chen, C.C. (2020). Understanding fintech continuance: perspectives from self-efficacy and ECT-IS theories. *Industrial Management & Data Systems*, 120 (9), 1659-1689.

Si, H., Duan, X., Cheng, L. & Zhang, Z. (2022). Determinants of consumers' continuance intention to use dynamic ride-sharing services. *Transportation Research Part D: Transport and Environment*, 104, 103201.

Siepmann, C. & Kowalczuk, P. (2021). Understanding continued smartwatch usage: the role of emotional as well as health and fitness factors. *Electronic Markets*, 31 (4), 795-809.

Singh, S. (2020). An integrated model combining ECM and UTAUT to explain users' post-adoption behaviour towards mobile payment systems. *Australasian Journal of Information Systems*, 24.

Spreng, R.A., MacKenzie, S.B. & Olshavsky, R.W. (1996). A Reexamination of the Determinants of Consumer Satisfaction. *Journal of Marketing*, 60 (3), 15.

Sun, H., Fang, Y. & Zou, H. (2016). Choosing a Fit Technology: Understanding Mindfulness in Technology Adoption and Continuance. *Journal of the Association for Information Systems*, 17 (6), 377-412.

Sun, J., Sheng, D., Gu, D., Du, J.T. & Min, C. (2017). Understanding link sharing tools continuance behavior in social media. *Online Information Review*, 41 (1), 119-133.

Susanto, A., Chang, Y. & Ha, Y. (2016). Determinants of continuance intention to use the smartphone banking services. *Industrial Management & Data Systems*, 116 (3), 508-525.

Swan, J. & Trawick, I. (1981). Disconfirmation of expectations and satisfaction with a retail service. *Journal of Retailing*, 57 (3), 49–67.

Tam, C., Santos, D. & Oliveira, T. (2020). Exploring the influential factors of continuance intention to use mobile Apps: Extending the expectation confirmation model. *Information Systems Frontiers*, 22 (1), 243-257.

Tawafak, R.M., Al-Rahmi, W.M., Almogren, A.S., Al Adwan, M.N., Safori, A., Attar, R.W. & Habes, M. (2023). Analysis of E-Learning System Use Using Combined TAM and ECT Factors. *Sustainability*, 15 (14), 11100.

Tsao, W. (2013). Application of Expectation Confirmation Theory to Consumers' Impulsive Purchase Behavior for Products Promoted by Showgirls in Exhibits. *Journal of Promotion Management*, 19 (3), 283-298.

Van Ryzin, G.G. (2004). Expectations, performance, and citizen satisfaction with urban services. *Journal of Policy Analysis and Management*, 23 (3), 433-448.

Venkatesh, V. & Brown, S.A. (2001). A Longitudinal Investigation of Personal Computers in Homes: Adoption Determinants and Emerging Challenges. *MIS Quarterly*, 25 (1), 71.

Venkatesh, V., Thong, J.Y.L., Chan, F.K.Y., Hu, P.J. & Brown, S.A. (2011). Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context. *Information Systems Journal*, 21 (6), 527-555.

Wagner, D.G., Ford, R.S. & Ford, T.W. (1986). Can Gender Inequalities be Reduced?. *American Sociological Review*, 51 (1), 47.

Wang, W., Butler, J.E., Hsieh, J.P. & Hsu, S. (2008). Innovate with Complex Information Technologies: A Theoretical Model and Empirical Examination. *Journal of Computer Information Systems*, 49 (1), 27-36.

Wang, X., Lin, X. & Liu, Z. (2021). Understanding Consumers' Post-Adoption Behavior in Sharing Economy Services. *Journal of Computer Information Systems*, 61 (3), 275-284.

Weng, G.S., Zailani, S., Iranmanesh, M. & Hyun, S.S. (2017). Mobile taxi booking application service's continuance usage intention by users. *Transportation Research Part D: Transport and Environment*, 57, 207-216.

Wu, C., Zhou, Y., Wang, R., Huang, S. & Yuan, Q. (2022). Understanding the Mechanism Between IT Identity, IT Mindfulness and Mobile Health Technology Continuance Intention: An Extended Expectation Confirmation Model. *Technological Forecasting and Social Change*, 176, 121449.

Yang, S., Lu, Y. & Chau, P.Y. (2013). Why do consumers adopt online channel? An empirical investigation of two channel extension mechanisms. *Decision Support Systems*, 54 (2), 858-869.

Yeh, R.K. & Teng, J.T. (2012). Extended conceptualisation of perceived usefulness: empirical test in the context of information system use continuance. *Behaviour & Information Technology*, 31 (5), 525-540.

Yoon, C. & Rolland, E. (2015). Understanding Continuance Use in Social Networking Services. *Journal of Computer Information Systems*, 55 (2), 1-8.

Yousaf, A., Mishra, A. & Gupta, A. (2021). 'From technology adoption to consumption': Effect of pre-adoption expectations from fitness applications on usage satisfaction, continual usage, and health satisfaction. *Journal of Retailing and Consumer Services*, 62, 102655.

Yuan, S., Liu, Y., Yao, R. & Liu, J. (2016). An investigation of users' continuance intention towards mobile banking in China. *Information Development*, 32 (1), 20-34.

Zhang, H., Lu, Y., Gupta, S. & Gao, P. (2015). Understanding group-buying websites continuance. *Internet Research*, 25 (5), 767-793.

Zhang, J., Chen, W., Petrovsky, N. & Walker, R.M. (2022). The Expectancy-Disconfirmation Model and Citizen Satisfaction with Public Services: A Meta-analysis and an Agenda for Best Practice. *Public Administration Review*, 82 (1), 147-159.

Zhou, W., Tsiga, Z., Li, B., Zheng, S. & Jiang, S. (2018). What influence users' e-finance continuance intention? The moderating role of trust. *Industrial Management & Data Systems*, 118 (8), 1647-1670.

van der Heijden (2004). User Acceptance of Hedonic Information Systems. *MIS Quarterly*, 28 (4), 695.

Protection Motivation Theory

Protection Motivation Theory (PMT) is a theory explaining the impact of persuasive communication on protective behaviour with an emphasis on cognitive mechanisms mediating fear appeals and behaviour change.

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Theory Factsheet

Proposed By: Rogers, 1975

Parent Theory: Cost-benefit paradigm, expectancy-value theory

Related Theories: Drive-reduction Model, Theory of Reasoned Action, Health Belief Model, Subjective Expected Utility Theory, Self-efficacy Theory, Conceptualisation of Achievement Motivation, Decision Making Theory, Purposive Behaviourism, Fear Appeals Model

Discipline: Psychology

Unit of Analysis: Individual

Level: Micro-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

Protection Motivation Theory (PMT) was introduced by (Rogers, 1975) and further revised in 1983 (Rogers, 1983) to explain the impact of persuasive communication on behaviour, with an emphasis on cognitive mechanisms underpinning the rationale to follow or not to follow a recommended behaviour. The theory was originally conceptualised for the utilisation in the healthcare context (Conner & Norman, 2015). There were several practical and theoretical premises underpinning the development of the theory (Conner & Norman, 2015; Prentice-Dunn & Rogers, 1986). In terms of practical importance, PMT was one of the first theories focusing on the psychological conditions explaining the tendency of people to protect themselves. The theory attempted to distinguish the factors of health-compromising and health-promoting behaviours (Prentice-Dunn & Rogers, 1986; Floyd, Prentice-Dunn & Rogers, 2000). For example, despite the logic of avoiding threat and danger when recommended, individuals may still choose to engage in maladaptive behaviour. Protective behaviours, such as using seatbelts, regular physical examinations, a healthy lifestyle, refraining from mobile phone use while driving, avoiding driving

under the influence and using helmets while cycling could be taken to prevent injuries. However, people often do not adhere to preventive measures (Floyd, Prentice-Dunn & Rogers, 2000;Taylor, 2017;Rogers & Prentice-Dunn, 1997).

From the theoretical perspective, the introduction of PMT aimed to advance the literature explaining health-protective behaviours, which had largely relied upon the Theory of Reasoned Action, Subjective Expected Utility Theory and the Health Belief Model (Floyd, Prentice-Dunn & Rogers, 2000). The Theory of Reasoned Action postulates that behaviour is predicted by behavioural intention, which is formed as a result of pre-existing attitudes to behaviour and social norms surrounding the behaviour (Barrett, 1980). Subjective Expected Utility Theory, developed by (Savage, 1972), presents an individual's decision as a response to an economic proposition, whereby its attractiveness is based on the subjective evaluation of the personal utility of the behaviour and the probability of the utility being realised. The likelihood of the decision is higher when the perception of the utility functions of behaviour is stronger and the probability of the outcome is higher (Savage, 1972). The Health Belief Model suggests that health behaviour is influenced by four types of cognitions: perceived susceptibility (perception the risk of health threat), perceived severity (the strength of the threat), the perceived benefits and barriers (negative consequences) of the protective/recommended behaviour (Prentice-Dunn & Rogers, 1986;Rosenstock, 1974). All of the theories are rooted in a cost-benefit paradigm, which states that before adopting the recommended behaviour, individuals conduct a cost-benefit analysis. The motivation to follow an adaptive behaviour is fuelled by perceived threats and individuals' appeal for avoiding the negative consequences of not engaging in the behaviour (Weinstein, 1993).

While many core constructs across the Theory of Reasoned Action, the Health Belief Model, Subjective Expected Utility Theory and PMT are similar, the introduction of PMT aimed to address a few gaps in the literature on health protection motivation that had been limiting the understanding of and the relationships between the psychological and cognitive drivers of protective behaviour. First, the primary limitation of the Theory of Reasoned Action and Subjective Expected Utility Theory is that the models do not account for the factor associated with risky and non-risky behaviours, namely response efficacy (Floyd, Prentice-Dunn & Rogers, 2000). Second, although the Health Belief Model is considered sufficiently powerful when it comes to predicting behaviour due to its intuitive and straightforward organisation of cognitive factors, it does not fully address the complexity of the drivers of adaptive behaviour (Prentice-Dunn & Rogers, 1986). Specifically, the theory proposes a list of factors that motivate individuals. However, it does not explain whether the factors are part of threat or coping appraisals. In addition, the theory does not explain the relative importance of threat and coping appraisals when it comes to decision-making processes. For example, when it comes to smoking, the recommended behaviour is to quit it. However, to comply with the recommendation individuals should think that they are vulnerable to the threat and the threat is severe enough (e.g. as a result of smoking, they might get lung cancer). That means that individuals should score higher on threat appraisals than on coping appraisals. In addition, individuals should believe that they are able to quit smoking and can overcome the associated costs (e.g. nicotine withdrawal process) (Floyd, Prentice-Dunn & Rogers, 2000). Therefore, PMT went beyond stating that the perceptions of threat severity, vulnerability, response cost, response efficacy and self-efficacy drive behaviour change, but it captured the complexity of motivation by explaining the effects of two cognitive appraisal processes (coping appraisals and threat

appraisals). Specifically, based on PMT, individuals need to assess the threat appraisal dimension (perceive that they are vulnerable to the threat and it is severe enough) and coping appraisal (acknowledge the cost of carrying out the suggested action to comply with the recommended behaviour) separately (Floyd, Prentice-Dunn & Rogers, 2000;Rogers & Prentice-Dunn, 1997;Rogers, 1975). Third, prior research on fear-induced behaviour provided mixed findings about the motivational role of fear arousal and the likelihood of compliance with recommended behaviour (Janis, 1967;Sutton, 1982). Specifically, (Janis, 1967) argued that fear does not necessarily promote adaptive behaviour, as fear may also lead to a thorough assessment of the recommendation, potentially inhibiting motivation if fear arousal achieved a certain threshold. Further other empirical work, however, did not find sufficient support for the proposed effect of fear (Sutton, 1982). Hence, the development of PMT was required to provide conceptual clarity to the research on fear appeal and motivation, by identifying the key variables related to fear appeals and cognitive factors.
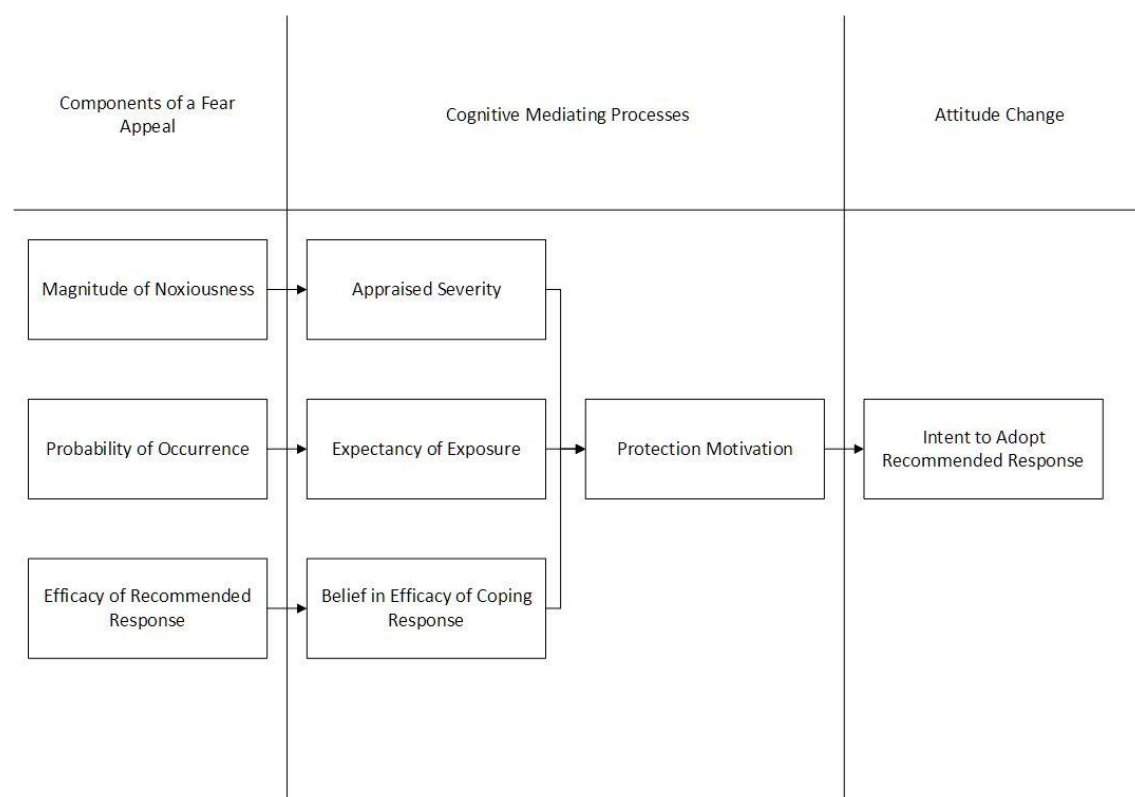
Theory

PMT is based on Expectancy-Value Theory (Rogers, 1975). Expectancy Value Theory postulates that expectancy and value are the two factors determining the likelihood of a person engaging in behaviour (Vroom, 1964). Expectancy concerns the probability that behaviour will result in the desired outcome, while value refers to the utility that an individual assigns to that outcome. It is believed that motivation is the result of the multiplicative impact of value and expectancy. That means that strong motivation is possible when people score high on both constructs. If either of the factors is equal to zero, motivation falls to zero too (Vroom, 1964). While PMT does not incorporate expectancy and value factors in the model, the theory postulates that people behave in a certain manner due to the expectancy of the consequences of their actions, which have a certain value (Floyd, Prentice-Dunn & Rogers, 2000;Prentice-Dunn & Rogers, 1986;Rogers, 1975).

Protection Motivation Theory considers the motivation to adopt the recommended behaviour as an attitudinal state (attitude change) predicted by cognitive processes mediating the effect of fear appeals (Rogers, 1975) (Figure 1). In line with expectancy-value theories (Atkinson, 1964;Edwards, 1954;Rogers, 1975) broke down fear appeals into three crucial stimuli, namely magnitude of the noxiousness of an event, the probability of event occurrence, and efficacy of recommended response reducing the stimuli of the noxious event. For example, studies in health psychology examine fear stimuli, such as the strength and the probability of cardiac attacks, and the efficacy of a healthy diet and lifestyle in reducing the likelihood of cardiac diseases (Plotnikoff & Higginbotham, 1998). Fear appeals could present communication about one and the combination of two or three of the mentioned components that may trigger cognitive processes. These cognitive processes represent appraisals of the communicated information about the noxiousness of a negative event, its probability of occurrence and efficacy of response. The cognitive processes reflect the appraisal of the severity of a threatening event, the expectancy of exposure to the threat and the efficacy of a coping response (Rogers, 1975). Appraisal of the severity of the threat concerns the evaluation of the degree to which the event can cause harm and damage. Expectancy of exposure refers to the assessment of the extent to which a person is susceptible to the threatening event, while the efficacy of a coping response is a belief that the

adaptive behaviour would be effective in mitigating the threat (Floyd, Prentice-Dunn & Rogers, 2000). Each appraisal process corresponds and is roughly proportional to the fear appeal component, e.g. the strength of threat severity appraisal is similar to the strength of the magnitude of the noxious event (Rogers, 1975). For the cognitive processes to lead to protective behaviour, their effect should be multiplicative, meaning that all beliefs should be sufficiently salient to lead to adaptive behaviour – i.e. belief that the threat is serious and individuals are vulnerable to it, as well as the belief that the suggested action is feasible to carry out and will be effective against the imminent threat (Rogers, 1975). This assumption is in line with the principle of Expectancy Value Theory (Vroom, 1964), which means that a zero score on any of the cognitive processes would reduce motivation to zero.

Figure 1: Protection Motivation Theory

By developing the theory of protection motivation, (Rogers, 1975) aimed to follow the tradition of prior psychological theories adopting the expectancy-value paradigm to explain attitudinal structures, behaviour and persuasive communication. At the same time, the proposed theory enabled Rogers to link small-scale theories into a higher-order model of the relationship between environmental stimuli inducing fear, cognitive processes, and motivation. That helped reach a more comprehensive explanation of the psychological foundation of protection motivation (Rogers, 1975). In addition, the development of the theory was the first attempt to address conflicting findings in the literature about the impact of fear appeals on attitude change and consequent behaviour (Janis, 1967;Sutton, 1982). Those inconsistencies were rooted in the hesitancy of prior studies to

conceptualise and differentiate the components of fear appeal (Floyd, Prentice-Dunn & Rogers, 2000;Rogers, 1975). PMT, in contrast, brought together the crucial factors of fear appeal, associated with cognitive variables mediating the impact of emotion on behaviour/attitude change (Rogers, 1975). A comprehensive yet intuitive framework explaining complex cognitive processes underpinning protective motivation has led to the adoption of the theory beyond the original health context. The wide application of PMT across different domains (Floyd, Prentice-Dunn & Rogers, 2000; Ritland & Rodriguez, 2014; Marikyan et al., 2022) and a meta-analysis of studies employing PMT demonstrate that the theory is robust in terms of explaining the behaviour of individuals facing threats (Floyd, Prentice-Dunn & Rogers, 2000).

Theory Updates/Extensions

Revised PMT

The cognitive mediating processes postulated by the original PMT model were shown to be an effective source to stimulate protection motivation (Rogers & Prentice-Dunn, 1997). However, further inquiries into the factors contributing to attitude/behaviour change following the encounter with the imminent threat led to the revision of the theory by (Rogers, 1983). The updated conceptual framework included self-efficacy (i.e. an individual's belief as to whether they are capable of complying with the recommended behaviour), the perception of the rewards of counter-protective behaviour and the perception of the costs of protective behaviour, which made the theory more comprehensive (Figure 2) (Rogers, 1983;Maddux & Rogers, 1983). The incorporation of rewards and costs reflected the strong focus on the rationality of decision-making. The reason behind the inclusion of self-efficacy is that the construct had been found to be strongly associated with behaviour change (Bandura et al., 1980; Condiotte & Lichtenstein, 1981; Beck & Ajzen, 1991). Self-efficacy originated from the Self-efficacy Theory, which postulates that individuals are likely to change behaviour when their self-belief or efficacy is strong (Maddux & Rogers, 1983; Bandura, 1977).

Figure 2: Cognitive Mediating Process of Protection Motivation Theory
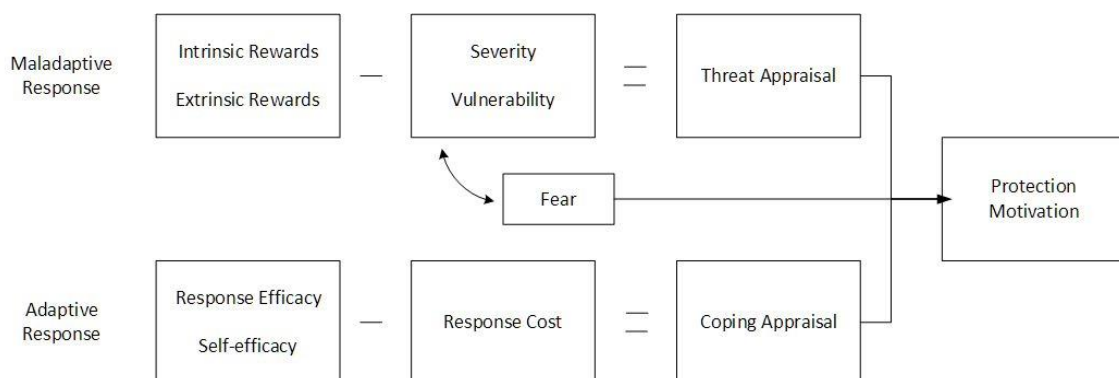
As a result of the operationalisation of the theory, the PMT full nomology is comprised of seven variables, which schematically could be grouped into emotion, coping

appraisal and threat appraisal factors (Figure3) (Boss et al., 2015;Floyd, Prentice-Dunn & Rogers, 2000;Rogers & Prentice-Dunn, 1997). Response efficacy, self-efficacy and response cost are coping appraisal constructs. They concern the evaluation of the coping resources available to the individual facing a threat. Threat severity, threat vulnerability and maladaptive rewards relate to threat appraisal factors. Fear mediates the paths between threat severity, threat vulnerability and protection motivation (Floyd, Prentice-Dunn & Rogers, 2000; Rogers & Prentice-Dunn, 1997). However, PMT core nomology (a simplified version of PMT) found wide application in the literature across many scientific domains, which includes five factors and excludes maladaptive rewards and fear (Figure 4) (Boss et al., 2015). According to this nomology, adaptive behaviour is the outcome of the positive function of response-efficacy, self-efficacy, threat vulnerability and threat severity, and the negative function of response cost (Rogers, 1983). The operationalisation of the model has led to its wide adoption for two reasons. On the one hand, the inclusion of self-efficacy improved the predictive power of the model, as the construct was confirmed to be the strongest predictor of behavioural intention (Maddux & Rogers, 1983). On the other hand, the theory has become methodologically simpler. In contrast to the original model, which suggested that the cognitive factors impact motivation in a multiplicative fashion (Rogers, 1975), the revised version enables researchers to test the effect of each variable (Rogers, 1983;Conner & Norman, 2015).

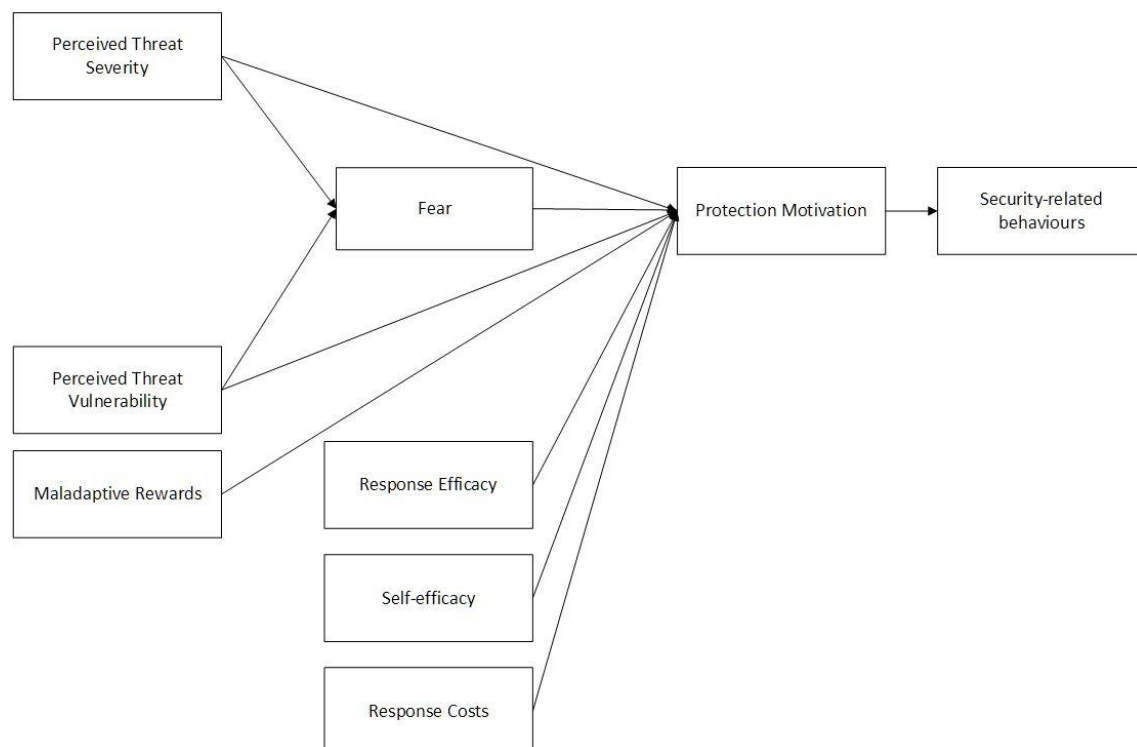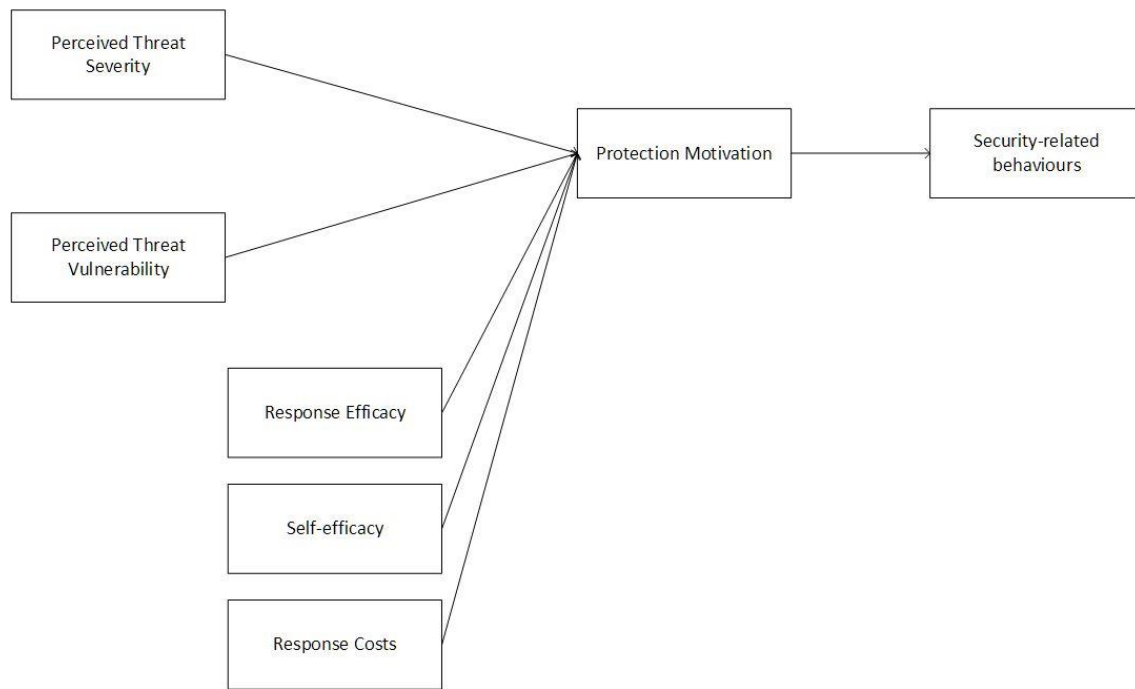**Figure 3: Full Nomology of Protection Motivation Theory**

Figure 4: Core Nomology of Protection Motivation Theory

Augmented Protection Motivation Theory

Augmented Protection Motivation Theory was developed in order to focus on behaviour that does not reflect the rules of rational decision-making (Oakley et al., 2020) (Figure 5). People might demonstrate irrational behaviour in the face of threat. For instance, knowing the likelihood of flooding threat, individuals might not take actions to avoid being flooded or minimise the negative consequences (e.g. designing floodproof houses) (Oakley et al., 2020). In an attempt to expand the theory beyond the boundaries of rationality, the authors added a third cognitive dimension (in addition to coping and threat appraisals) about ownership appraisal. Ownership appraisal refers to the acceptance of responsibility for carrying out protective behaviour. The authors argued that the evaluation of threat severity and vulnerability triggers the assessment of the degree to which the responsibility for adaptive behaviour needs to be laid on oneself. This cognitive phase can also be affected by individuals' emotions and social norms. The ownership appraisal process, in turn, leads to the evaluation of coping resources (Oakley et al., 2020). Given the novelty of Augmented Protection Motivation Theory, the applicability of the theory in different context is yet to be validated.

Figure 5: Augmented Protection Motivation Theory
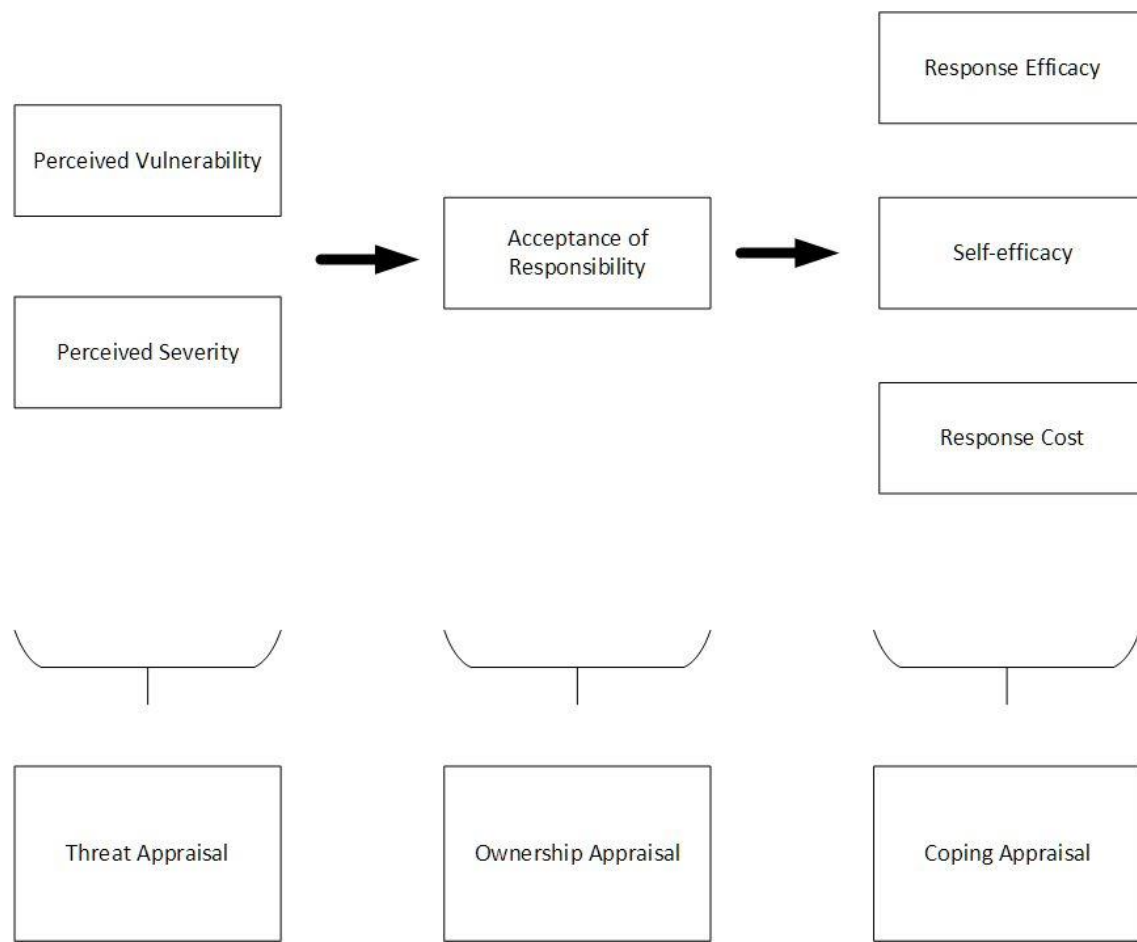
Applications

Due to the robustness of PMT, it has been used in different disciplines, such as psychology / health psychology (Plotnikoff & Higginbotham, 1998; Wurtele & Maddux, 1987), sport science (Plotnikoff & Trinh, 2010), tourism (Wang et al., 2019), environmental science (Cismaru et al., 2011; Chen, 2020; McCaughey et al., 2017) and marketing (inc. advertisements and consumer behaviour) (Pechmann et al., 2003; Tunner, Day & Crask, 1989;Papagiannidis et al., 2022). To a great degree, such applications demonstrated the predictive strength of the threat appraisal and coping appraisal variables. For example, a meta-analytic study of research on health behaviour confirmed that over the decades, the theory was a powerful theoretical model explaining protection motivation (Milne, Sheeran & Orbell, 2000). PMT was used to understand conditions that motivate cardiac patients to keep up with a healthy diet and exercise regularly (Plotnikoff & Higginbotham, 1998). It was found that perceived vulnerability and self-efficacy were the strongest determinants of a behaviour shift towards a healthy lifestyle (Plotnikoff & Higginbotham, 1998). In tourism, the protection motivation model was employed to investigate tourists' self-protective behaviour while travelling. It was found that both coping and threat appraisals increase individuals' motivation to take precautionary measures to prevent health risks (Wang et al., 2019). In the environment-related context, the core cognitive constructs of the theory were significant when it came to intention to embark on climate-change mitigation behaviour (Chen, 2020). However, following

evidence of the research on the front of pro-environmental behaviour, the protection motivation framework was extended with the moral obligation factor (Chen, 2020). Moral obligation refers to the perception of the degree to which a performed behaviour is morally acceptable (Conner & Armitage, 1998). As the name of the construct suggests, moral obligations touch upon the ethical aspect of actions, which is crucial when it comes to environmental preservation (Chen, 2020). Perceived moral obligation defines the feeling of responsibility over one's own action when facing an ethical choice (Beck & Ajzen, 1991). The empirical testing of the theory showed that moral obligation has a positive relationship with the intention to engage in adaptive behaviour. Moreover, the model explained 73.84% of the variance in the dependent variable, which is higher than the exploratory power of the original PMT model (Chen, 2020). As far as the marketing context was concerned, the manipulation of the core constructs with fear appeals helped find that the type of communication, gender and other potential variables may account for the variance in the effect sizes of protection motivation determinants (Tunner, Day & Crask, 1989).

The advancement of technology and widespread digitalisation made the information communication technologies ubiquitous in personal and business life (Venkatesh & Bala, 2008; Marikyan, Papagiannidis & Alamanos, 2019; Marikyan, Papagiannidis & Alamanos, 2021; Marikyan et al., 2022; Papagiannidis & Marikyan, 2020; Tajudeen et al., 2022). That triggered the wide employment of the protection motivation theory in the information systems management field over the last two decades. Considering the debates about the threats that technology could pose for users (e.g. pretexting, phishing, targeted malware, cyberattacks) and organisations (Verkijika, 2018; Ifinedo, 2012; Thompson, McGill & Wang, 2017), the theory was useful in understanding the factors that make individuals avoid technology-related threats (Ifinedo, 2012; Crossler, 2010). The protective and preventive measures could include compliance with information system policies in organisational settings (Ifinedo, 2012) and the use of secure passwords, regular back up of data and installation of software in private settings (Crossler, 2010; Chenoweth, Minch & Gattiker, 2009). However, the significance of the PMT constructs was not consistent across different security applications (Ifinedo, 2012; Chenoweth, Minch & Gattiker, 2009; Marikyan et al., 2022). When examining the adoption of anti-spyware software, all constructs but self-efficacy were found to predict behavioural intention (Chenoweth, Minch & Gattiker, 2009). When studying individuals' intention to back up data, only self-efficacy and response efficacy had direct impacts (Crossler, 2010). Similarly, when it came to secure online behaviour, perceived threat severity and perceived threat vulnerability did not have any correlations with a behavioural intention (Tsai et al., 2016). The perceived threat severity factor was not significant when exploring the intention to adopt blockchain technology either (Marikyan et al., 2022). The plausible interpretation of those inconsistent findings could be the variability of individuals' perceptions of threatening events and their consequences depending on the context (Ifinedo, 2012; Marikyan et al., 2022).

In an attempt to increase the explanatory power of the model when it came to information system utilisation, scholars came up with two updates of PMT (Verkijika, 2018; Lee, 2011). The first contextualisation incorporates regret as an emotional state that mediates threat appraisal and security behaviour (Verkijika, 2018). Regret was deemed necessary in relation to technology use, which is characterised by salient privacy concerns. In cases of privacy compliance, anticipated regret was confirmed to be a significant predictor (Sommestad, Karlzén & Hallberg, 2015). Path

analysis showed that anticipated regret had a direct impact on security intention and behaviour. The model expanded the understanding of security compliance by establishing the role of emotions in strengthening motivation. While prior research employing the five-factor PMT model found that cognitive processes account for 11% of the variance in intentions (Thompson, McGill & Wang, 2017), the addition of anticipated regret improved the variance in the outcome variable up to 33% (Verkijika, 2018). The second modification of the theory incorporates moral obligation, social influence and control variables (Lee, 2011). The theory adaptation in relation to security-compliant behaviour was motivated by three research objectives. First, the study aimed to extend PMT by conceptualising a direct impact of coping appraisals on the recommended behaviour. That objective was justified by prior studies using well-established theories (e.g. the Theory of Planned Behaviour, Technology Acceptance Model) and confirming the direct impact of perceptions on behaviour (Beck & Ajzen, 1991; Venkatesh et al., 2003). Second, by incorporating control variables (e.g. teaching load, academic rank, class size), the author aimed to demonstrate the variance in the motivation depending on context-specific factors. Third, testing the direct effect of moral obligation and social influence on security intentions made it possible to understand the predictive power of the judgement about the responsibility over security behaviour and the social pressure of peers, which had largely been ignored in the IS literature. The extended PMT model explained over 60% of the variance in adaptive behaviour (adoption of anti-plagiarism software). The results demonstrated that out of all coping appraisal factors, only response efficacy affects adoption. Intention is predicted by moral obligations, but not social influence. Also, the model shows the importance of contextual factors. For instance, it was found that the higher the rank of staff, the less likely they are to adopt anti-plagiarism software. Also, it was reported that women are less inclined to adopt anti-plagiarism software (Lee, 2011). Stemming from the novel findings of the significant role of control variables, this contextualisation of PMT brought a number of useful practical implications.

Limitations

Although PMT is a rigorous framework to understand individuals' intention to comply with adaptive behaviour, it has been noted by the author of the theory and other researchers that it does not provide an exhaustive list of all environmental factors, cognitive processes and moderators that might shape motivation (Rogers, 1975;Weinstein, 1993). The limitations of the theory were partly addressed in the revision of the framework in 1983 by Rogers, Cacioppo and Petty, whereby cognitive and individual variables, namely response cost and self-efficacy, were added to the model. The addition of those factors was a significant move toward expanding the exploratory power of the theory as evidenced by its wide testing in diverse disciplines (Boss et al., 2015;Verkijika, 2018; Lee, 2011). Later, PMT was also extended to account for psychological pre-conditions differentiating individuals' responses to adaptive behaviour by adding anticipated regret as a predictor of motivation (Verkijika, 2018).

A few other critiques have largely been unresolved. In particular, from the decision-making perspective, PMT follows the logic of rational behaviour, which is inherent to the cost-benefit paradigm (Wu, 2020). The predictive power of the theory holds true when in the face of imminent threats, respondents have the ability to assess threats and coping mechanisms rationally (Sturges & Rogers, 1996). However, individuals are

not always rational in their decision-making. They might not match threat and coping appraisals when deciding to comply with or ignore recommendations about protective behaviour (Floyd, Prentice-Dunn & Rogers, 2000). The principle of the rationality of choice limits the applicability of the theory to situations and some subject groups, such as children, who might not have the ability to conduct a rigorous cost-benefit analysis of choices (Sturges & Rogers, 1996).

PMT assumes that the cognitive processes are invariant across people with different personality traits and characteristics. For example, threat vulnerability is a subjective assessment, as people may attach different meanings to it depending on their own threat sensitivity threshold (Floyd, Prentice-Dunn & Rogers, 2000). In addition, dispositional factors (i.e. to what degree the person is situationally or psychologically predisposed to mitigating the threat), such as anxiety and defensive style, were found to impact the appraisal of fear appeals, although they were not incorporated into the model (Rogers, 1975). The importance of individual socio-demographic characteristics in explaining variance in motivation was confirmed when testing the moderating role of gender and age. The effects of threat appraisal factors were stronger for women and elderly people, while the effects of coping factors were stronger for men and younger people (Guo et al., 2015). Despite a few attempts to extend PMT with individual factors (Guo et al., 2015; Lee, 2011), the role of personality and psychological characteristics has stayed mostly unexplained.

There have been concerns about the meaning and the operationalisation of the response cost variable. The critique refers to the wider stream of health-protective behaviours and PMT in particular. Specifically, it is not clear whether the cost of carrying out adaptive behaviour (response cost) should be disintegrated from the expected loss of rewards (intrinsic and extrinsic) (Weinstein, 1993). Such a debate arose due to the theoretical ambiguity of whether response cost relates to the loss associated with switching behaviour or whether it refers to the potential loss (e.g. financial investment, mental effort) associated with carrying out the recommended behaviour.

In addition, it has been argued that PMT fails to explain individuals' intention to comply with suggested behaviour in specific cases. It was concluded that the theory should be extended by context-specific factors (Verkijika, 2018; Ifinedo, 2012; Thompson, McGill & Wang, 2017), especially against the backdrop of the findings that the inclusion of more than one factor in the model increases its explanatory power up to 70% (Verkijika, 2018). To respond to this critique, a few modifications have been applied to the model. For example, to understand pro-environmental behaviour, PMT was extended with the moral obligation construct, which enabled researchers to widen the application of the theory to behaviours beyond health protection (Chen, 2020). To explore the inhibitors of behaviour change, (Pechmann et al., 2003) tested and confirmed the role of social disapproval risks in predicting motivation. Although time preference was tested in prior research as a predictor of behaviour in emergency situations, such as flooding (Botzen et al., 2019), scholars have not yet investigated other temporal factors that might affect the perception of the persuasiveness of the advice of protective behaviour. Those factors include the duration of the fear stimulus and the time period between the exposure to information and the actual threatening event (Rogers, 1975).

Concepts

Response Efficacy (Independent): The belief that the adaptive response will work, that taking the protective action will be effective in protecting the self or others. (Floyd, Prentice-Dunn & Rogers, 2000)

Self-efficacy (Independent): The perceived ability of the person to actually carry out the adaptive response. (Floyd, Prentice-Dunn & Rogers, 2000)

Response Cost (Independent): The costs (e.g. monetary, personal, time, effort) associated with taking the adaptive coping response (Floyd, Prentice-Dunn & Rogers, 2000)

Fear (Independent): A negatively valenced emotion representing a response that arises from recognizing danger. This response may include any combination of apprehension, fright, arousal, concern, worry, discomfort, or a general negative mood, and it manifests itself emotionally, cognitively, and physically (Boss et al., 2015)

Perceived Threat Severity (Independent): How serious the individual believes that the threat would be to him- or herself (Milne, Sheeran & Orbell, 2000)

Perceived Threat Vulnerability (Independent): How personally susceptible an individual feels to the communicated threat (Milne, Sheeran & Orbell, 2000)

Maladaptive Rewards (Independent): The general rewards (intrinsic and extrinsic) of not protecting oneself, contrary to the fear appeal. (Boss et al., 2015)

Adaptive Behaviour (Dependent): A purposeful choice of a danger-control response in response to a fear appeal and choosing a behaviour that protects against the danger raised in the fear appeal (Boss et al., 2015)

References

Atkinson, J. (1964). *An introduction to motivation*. Van Nostrand.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84 (2), 191-215.

Bandura, A., Adams, N.E., Hardy, A.B. & Howells, G.N. (1980). Tests of the generality of self-efficacy theory. *Cognitive Therapy and Research*, 4 (1), 39-66.

Barrett, C.D. (1980). *Understanding Attitudes and Predicting Social Behavior*. Prentice Hall.

Beck, L. & Ajzen, I. (1991). Predicting dishonest actions using the theory of planned behavior. *Journal of Research in Personality*, 25 (3), 285-301.

Boss, S., Galletta, D., Lowry, P., Moody, G. & Polak, P. (2015). What do systems users have to fear? Using fear appeals to engender threats and fear that motivate protective security behaviors. *MIS Quarterly*, 39 (4), 837-864.

Botzen, W.J.W., Kunreuther, H., Czajkowski, J. & Moel, H. (2019). Adoption of Individual Flood Damage Mitigation Measures in New York City: An Extension of Protection Motivation Theory. *Risk Analysis*, 39 (10), 2143-2159.

Chen, M. (2020). Moral extension of the protection motivation theory model to predict climate change mitigation behavioral intentions in Taiwan. *Environmental Science and Pollution Research*, 27 (12), 13714-13725.

Chenoweth, T., Minch, R. & Gattiker, T. (2009). *Application of Protection Motivation Theory to Adoption of Protective Technologies*.

Cismaru, M., Cismaru, R., Ono, T. & Nelson, K. (2011). "Act on Climate Change": An Application of Protection Motivation Theory. *Social Marketing Quarterly*, 17 (3), 62-84.

Condiotte, M.M. & Lichtenstein, E. (1981). Self-efficacy and relapse in smoking cessation programs. *Journal of Consulting and Clinical Psychology*, 49 (5), 648-658.

Conner, M. & Armitage, C.J. (1998). Extending the Theory of Planned Behavior: A Review and Avenues for Further Research. *Journal of Applied Social Psychology*, 28 (15), 1429-1464.

Conner, M. & Norman, P. (2015). *Predicting and Changing Health Behaviour*. McGraw-Hill Education.

Crossler, R.E. (2010). *Protection Motivation Theory: Understanding Determinants to Backing Up Personal Data*.

Edwards, W. (1954). The theory of decision making. *Psychological Bulletin*, 51 (4), 380-417.

Floyd, D.L., Prentice-Dunn, S. & Rogers, R.W. (2000). A Meta-Analysis of Research on Protection Motivation Theory. *Journal of Applied Social Psychology*, 30 (2), 407-429.

Guo, X., Han, X., Zhang, X., Dang, Y. & Chen, C. (2015). Investigating m-Health Acceptance from a Protection Motivation Theory Perspective: Gender and Age Differences. *Telemedicine and e-Health*, 21 (8), 661-669.

Ifinedo, P. (2012). Understanding information systems security policy compliance: An integration of the theory of planned behavior and the protection motivation theory. *Computers and Security*, 31 (1), 83–95.

Janis, I.L. (1967). Effects of Fear Arousal on Attitude Change: Recent Developments in Theory and Experimental Research. *Advances in Experimental Social Psychology*, 166-224.

Lee, Y. (2011). Understanding anti-plagiarism software adoption: An extended protection motivation theory perspective. *Decision Support Systems*, 50 (2), 361-369.

Maddux, J.E. & Rogers, R.W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology*, 19 (5), 469-479.

Marikyan, D., Papagiannidis, S. & Alamanos, E. (2019). A systematic review of the smart home literature: A user perspective. *Technological Forecasting and Social Change*, 138, 139-154.

Marikyan, D., Papagiannidis, S. & Alamanos, E. (2021). "Smart Home Sweet Smart Home". *International Journal of E-Business Research*, 17 (2), 1-23.

Marikyan, D., Papagiannidis, S., Rana, O.F. & Ranjan, R. (2022). Blockchain adoption: A study of cognitive factors underpinning decision making. *Computers in Human Behavior*, 131, 107207.

Marikyan, D., Papagiannidis, S., Rana, O.F., Ranjan, R. & Morgan, G. (2022). "Alexa, let's talk about my productivity": The impact of digital assistants on work productivity. *Journal of Business Research*, 142, 572-584.

McCaughey, J.W., Mundir, I., Daly, P., Mahdi, S. & Patt, A. (2017). Trust and distrust of tsunami vertical evacuation buildings: Extending protection motivation theory to examine choices under social influence. *International Journal of Disaster Risk Reduction*, 24, 462-473.

Milne, S., Sheeran, P. & Orbell, S. (2000). Prediction and Intervention in Health-Related Behavior: A Meta-Analytic Review of Protection Motivation Theory. *Journal of Applied Social Psychology*, 30 (1), 106-143.

Oakley, M., Mohun Himmelweit, S., Leinster, P. & Casado, M. (2020). Protection Motivation Theory: A Proposed Theoretical Extension and Moving beyond Rationality—The Case of Flooding. *Water*, 12 (7), 1848.

Papagiannidis, S. & Marikyan, D. (2020). Smart offices: A productivity and well-being perspective. *International Journal of Information Management*, 51, 102027.

Papagiannidis, S., Alamanos, E., Bourlakis, M. & Dennis, C. (2022). *The Pandemic Consumer Response: A Stockpiling Perspective and Shopping Channel Preferences*.

Pechmann, C., Zhao, G., Goldberg, M.E. & Reibling, E.T. (2003). What to Convey in Antismoking Advertisements for Adolescents: The use of Protection Motivation Theory to Identify Effective Message Themes. *Journal of Marketing*, 67 (2), 1-18.

Plotnikoff, R.C. & Higginbotham, N. (1998). Protection motivation theory and the prediction of exercise and low-fat diet behaviours among Australian cardiac patients. *Psychology & Health*, 13 (3), 411-429.

Plotnikoff, R.C. & Trinh, L. (2010). Protection Motivation Theory. *Exercise and Sport Sciences Reviews*, 38 (2), 91-98.

Prentice-Dunn, S. & Rogers, R.W. (1986). Protection Motivation Theory and preventive health: beyond the Health Belief Model. *Health Education Research*, 1 (3), 153-161.

Ritland, R. & Rodriguez, L. (2014). The Influence of Antiobesity Media Content on Intention to Eat Healthily and Exercise: A Test of the Ordered Protection Motivation Theory. *Journal of Obesity*, 2014, 1-10.

Rogers, R. (1975). A protection motivation theory of fear appeals and attitude change1. *Journal of Psychology*, 91 (1), 93-114.

Rogers, R. (1983). *Cognitive and Physiological Processes in Fear Appeals and Attitude Change: A Revised Theory of Protection Motivation. 153-177*. In: Cacioppo, J. and Petty, R., Eds., Social Psychophysiology, Guilford Press, New York.

Rogers, R.W. & Prentice-Dunn, S. (1997). *Protection motivation theory*. In D. S. Gochman (Ed.), Handbook of health behavior research 1: Personal and social determinants. Plenum Press.

Rosenstock, I.M. (1974). Historical Origins of the Health Belief Model. *Health Education Monographs*, 2 (4), 328-335.

Savage, L.J. (1972). *The foundations of statistics*. Dover Publications.

Sommestad, T., Karlzén, H. & Hallberg, J. (2015). The sufficiency of the theory of planned behavior for explaining information security policy compliance. *Information & Computer Security*, 23 (2), 200-217.

Sturges, J.W. & Rogers, R.W. (1996). Preventive health psychology from a developmental perspective: An extension of protection motivation theory. *Health Psychology*, 15 (3), 158-166.

Sutton, S.R. (1982). *Fear-Arousing Communications: A Critical Examination of Theory and Research*. In: Eiser, J. R. (ed.) Social Psychology and Behavioral Medicine, New York: John Wiley & Sons.

Tajudeen, F.P., Nadarajah, D., Jaafar, N.I. & Sulaiman, A. (2022). The impact of digitalisation vision and information technology on organisations' innovation. *European Journal of Innovation Management*, 25 (2), 607-629.

Taylor, S.E. (2017). *Health Psychology*. McGraw-Hill Education.

Thompson, N., McGill, T.J. & Wang, X. (2017). "Security begins at home": Determinants of home computer and mobile device security behavior. *Computers & Security*, 70, 376-391.

Tsai, H.S., Jiang, M., Alhabash, S., LaRose, R., Rifon, N.J. & Cotten, S.R. (2016). Understanding online safety behaviors: A protection motivation theory perspective. *Computers & Security*, 59, 138-150.

Tunner, J.F., Day, E. & Crask, M.R. (1989). Protection motivation theory. *Journal of Business Research*, 19 (4), 267-276.

Venkatesh, Morris, Davis, & Davis (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27 (3), 425.

Venkatesh, V. & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39 (2), 273-315.

Verkijika, S.F. (2018). Understanding smartphone security behaviors: An extension of the protection motivation theory with anticipated regret. *Computers & Security*, 77, 860-870.

Vroom, V.H. (1964). *Work and motivation*. Wiley.

Wang, J., Liu-Lastres, B., Ritchie, B.W. & Mills, D.J. (2019). Travellers' self-protections against health risks: An application of the full Protection Motivation Theory. *Annals of Tourism Research*, 78, 102743.

Weinstein, N.D. (1993). Testing four competing theories of health-protective behavior. *Health Psychology*, 12 (4), 324–333.

Wu, D. (2020). Empirical study of knowledge withholding in cyberspace: Integrating protection motivation theory and theory of reasoned behavior. *Computers in Human Behavior*, 105, 106229.

Wurtele, S.K. & Maddux, J.E. (1987). Relative contributions of protection motivation theory components in predicting exercise intentions and behavior. *Health Psychology*, 6 (5), 453-466.

Resource-Based Theory

The resource-based theory (RBT) is an influential approach in strategic management. It has been widely applied as a managerial framework to determine vital resources for a firm to achieve a sustained competitive advantage. The theory provides an essential framework to explain and predict the fundamentals of a company's performance and competitive advantage.

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Theory Factsheet

Proposed By: Barney, 1991

Parent Theory: Theory of the Growth of the Firm

Related Theories: Resource – Advantage Theory, Agency Theory, Transaction Cost Theory, Behavioural theory, Network Theory, Relationship Marketing Theory, Stakeholder Theory, Knowledge-Based View

Discipline: Strategic management

Unit of Analysis: Organisation

Level: Meso-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

Resource-Based Theory (RBT) was first put forward by Penrose (2009), who proposed a model on the effective management of firms' resources, diversification strategy, and productive opportunities. Penrose's publication was the first to propose conceptualising a firm as a coordinated bundle of resources to address and tackle how it can achieve its goals and strategic behaviour (Penrose, 2009;Penrose, 2009). RBT began to take shape in the 1980s.The antecedent of RBT was the Theory of the Growth of the Firm. Later, during the 1990s, Jay Barney's work was critical to the emergence of RBT and became the dominant paradigm in strategic management and strategic planning.

RBT provides a framework to highlight and predict the fundamentals of organisation performance and competitive advantage. The focus of RBT on the firm's performance based on meso perspectives was a reaction to the earlier managerial interest in the industry structure, a more macro perspective. RBT addresses an internally-driven approach by focusing on internal organisation resources, as opposed to externally driven approaches to understanding the accomplishment or failure of leveraging organisational activities (Kozlenkova, Samaha & Palmatier, 2014). It aims to elaborate on imperfectly imitable firm resources that could potentially become the source of sustained competitive advantage (Barney, 1991).

Some confusion persists concerning the label for the theory, whether to appropriately use the term resource-based theory (RBT) or resource-based view (RBV). Some research papers refer to the theory as RBT based on the evidence that the view has evolved into a theory, but some others refer to RBV. However, reflecting on the research community's perspective, several research assessments support the RBT's credentials (Kozlenkova, Samaha & Palmatier, 2014;Crook et al., 2008).

Theory

There are two underlying assumptions of the RBT related to the explanation of how firm-based resources generate sustained competitive advantage and why some organisations may continually outperform others by gaining higher competitiveness (Helfat & Peteraf, 2003). First, the bundles of resources owned by firms are different from each other (Helfat & Peteraf, 2003). One of the cornerstones of RBT is the heterogeneity of resources and capabilities in a population of firms, which differentiate the competitive advantage of each firm. The heterogeneity of resources assumes that a firm possesses unique resources in a specific situation can potentially be more skilled to perform particular activities and create competitive advantage. Second, the complexities of trading resources across firms may create persistence in differences in resources (the assumption of resource immobility).

Theory assumptions of RBT begin with the assumption that organisational characteristics are not merely modified. The organisation needs to correct its orientation if it is to succeed and achieve sustainable competitive advantage. The dominant paradigm in determining a company's profits potential, such as the view of Porter (1989), suggests that a firm's internal factors, such as resources and capabilities, determine a firm's profit. The seminal work about strategic resources by Barney (1991) became the fundamental contribution to RBT, guiding the transformation perspective of the resource-based view into a developed theory as RBT. However, the traditional RBT does not elaborate on why and how some firms gain a competitive advantage in circumstances of unpredictable and rapid change (Adner & Helfat, 2003). The development of a broader RBT perspective suggests that firms can achieve competitive advantage not only

by utilising critical assets, but also by building new potential capabilities via learning, skill acquisition and the accumulation of tangible and intangible assets over time. The resource-based logic suggests that if valuable resources (i.e. resources that are costly and difficult to imitate) are possessed by few firms, those firms that are able to control these resources potentially to generate sustained competitive advantage (Barney, 1991). Hence, firms can achieve an advantage by continually recombining or reconfiguring diverse types of resources and by creating new applications to meet market demand (Adner & Helfat, 2003).

In RBT, resources refer to assets, business processes, capabilities, the firm's attributes, knowledge, information, etc. controlled by a company to comprehend and implement strategies aiming to enhance efficiency and effectiveness (Barney, 1991). The source of firm resources can vary, coming from both within and outside the organisation. Internal resources are, for example, R&D capabilities, logistics, brand management, and low-cost processes (Kozlenkova, Samaha & Palmatier, 2014); while external resources are for instance: the role of suppliers (Lewis et al., 2010), customer demand, technology change (Li & Calantone, 1998).

Company resources can be grouped into three categories, namely physical capital resources, human capital resources and organisational capital resources (Barney, 1991). Physical capital resources refer to company equipment, plant, its access to raw materials, geographical location and they include the physical technology utilised by a company. Human capital resources encompass experience, intelligence, training, judgment, relationships, and insights from employees, such as managers and workers in a company. Finally, organisational capital resources refer to a company's formal structure, the company's formal and informal system, which comprises planning, managing, and coordinating systems. Organisational resources also relate to informal relations amongst divisions within a company and the relationships between a company and its business environments.

Categorisation of company resources on RBT can also build upon two groups of tangible and intangible assets (Barney, 1991; Molloy et al., 2011). Tangible resources refer to all the assets, which include economic gains and visible business contributions, such as products and commodities. (Lyons & Brennan, 2019). Intangible resources comprise all the assets possessed by a company related to the access to capabilities and knowledge as well as organisational, strategic, and social benefits (Keränen & Jalkala, 2013). Tangible and intangible resources have different features in terms of deterioration of use, the ability for simultaneous utilisation and immateriality that are only obtained by intangible resources. Intangibles resource do not deteriorate with use, they can be used simultaneously by multiple managers, and are difficult to exchange (e.g. business process know-how, employee skills) (Molloy et al., 2011). On the other hand, tangible resource can deteriorate with use, may or may not have the ability to be used

simultaneously by different managers, and can be exchanged (e.g. material goods, commodities) (Molloy et al., 2011).

The second central construct of RBT, namely capabilities, represents a subset of the company's non-transferable company-specific resources that aim to improve the productivity of obtaining other resources (Makadok, 2001). Capabilities can manifest themselves in various forms and generally consist of tangible or intangible processes and information that help a company to create efficiency and improve its productivity (Kozlenkova, Samaha & Palmatier, 2014). However, a new concept of dynamic capabilities was introduced by Teece et al. (1997), which can "continuously create, extend, upgrade, protect, and keep relevant the enterprise's unique asset base" in a changing environment (Acedo, Barroso & Galan, 2006). Dynamic capabilities have enriched RBT research more recently by analysing the changes in the capabilities of addressing the rapid shifts in the organisation's environments (internal and external). The conceptualisation of capabilities has been extended with the introduction of dynamic capabilities, which refers to resources that can be managed not only when it comes to modifying other resources, but also for value creation (Kozlenkova, Samaha & Palmatier, 2014;Peteraf & Barney, 2003). Such resources represent, for example, alliance capabilities, big data deployment, and product development practices. Alliance capabilities appear to be a crucial part in the firm's strategies by co-operating and combining resources in the most effective and efficient manner (Nickerson & Zenger, 2004). Product development practices could also be an example of dynamic capabilities by creating capabilities to specialise and practise routines to increase company performance (Adner & Helfat, 2003).

Figure 1: The framework of Resource-based Theory to generate a sustainable competitive advantage

Based on Fig.1, the framework of RBT includes four conditions to assess whether a resource has the potential to become and generate a sustainable competitive advantage. The four conditions are (1) value, (2) being rare, (3) immobility and (4) sustainability (Barney, 1991). The four terms, known as the VRIS framework, are the characteristics that a firm must have as the strategic planning reference and hold the prospect of sustained competitive

advantage. First, the resource must be valuable, which refers to a condition that exploits the opportunities and/or threats in a firm's environment. For example, a company may have a secret formula to produce a specific product that only this company has. Second, the resource must be rare, in the sense that it is rare or unique among the firm's current and potential competition. For instance, a company may have the capability of a worldwide distribution network. Third, the resource must be imperfectly imitable: the valuable and scarce resources owned by a firm cannot be easily obtained by other firms who do not possess these resources. An example of an imperfectly imitable condition is a globally recognised product or company brand, which has no equivalent capability or resource that could be used by others. The fourth and final condition is that the resources cannot be strategically duplicated or substituted, that they are neither rare nor valuable or imperfectly imitable by other firms. An example of the non-substitutable condition is the portfolio of popular trademarks that are legally protected, making it a non-sustainable resource. The four conditions of RBT suggest that poor organisational policies, processes, and procedures may weaken a resource's potential competitive advantage (Barney, 2007). Hence, the organisation can act as the adjustment factor to prevent or support a firm from entirely realising the advantages of the firm's embodied resources in its evaluability, rareness, and costliness or complexity to imitate (Barney, 2007).

In development, the RBT framework presented in the VRIS model (valuable – rareness – inimitable – substitutability) was later replaced by the VRIO model (valuable – rareness – inimitability – organisation) (Barney, 1991;Barney, 2007). The VRIO model proposes the new criteria of the organisational embeddedness of a resource. This criterion proposes that the importance of an organisation is organised in such a way as to exploit the resource. It replaces the resource criterion concerning substitutability is the VRIS model. The needs of the organised organisation criterion suggest that the organisation should focus on the proper management (e.g., organisation policies, organised procedures) to manage the valuable, rare, and imperfectly imitable resources and obtain their full competitive potential (Barney, 2007;Amit & Schoemaker, 1993). The new criterion of 'organisation' also means that a firm's processes and structure play a critical role in determining the other three resource criteria of value, rarity, and imperfect imitability that aim to enhance organisational performance (Kozlenkova, Samaha & Palmatier, 2014). Thus, the organisation operation functions as the adjustment factor in deciding a firm's ability to enable or prevent realising the benefits embodied in its valuable, rare, and costly to imitate resources (Barney, 2007). The VRIO model's introduction has acknowledged that the organisation needs to leverage resources effectively instead of being only possessed by the organisation (Kozlenkova, Samaha & Palmatier, 2014).

Figure 2: The RBT framework using the VRIO model for sustained competitive advantage

Is a resource or capability . . .					
Valuable?	Rare?	Costly to imitate?	Exploited by organisation?	Competitive implications	Economic performance
No	—	—	No	Competitive disadvantage	Below normal
Yes	No	—		Competitive parity	Normal
Yes	Yes	No		Temporary competitive advantage	Above normal
Yes	Yes	Yes	Yes	Sustained competitive advantage	Above normal

The RBT framework presented in Figure 2 provides the relationship between the organisation resource heterogeneity and immobility and the four critical parameters for resource-based analysis (VRIO) to achieve sustained competitive advantage (Barney, 2007). This revised version of the RBT framework bringing in the critical criteria of VRIO can help understand the return potential associated with exploring any organisation's capabilities and resources.

Figure 3 describes the implications of how these four critical resource criteria may affect a firm's competitive advantage and economic performance. Based on this figure, we can analyse how an organisation's operation adjusts to these factors in the VRIO model (Barney, 2007). This framework facilitates understanding whether a specific organisation resource is a source for sustained competitive advantage. It helps answer the kinds of questions that need to be addressed, whether a particular resource is valuable? Rare? Imperfectly imitable? And, is the organisation organised to exploit this resource?

Figure 3: The VRIO framework
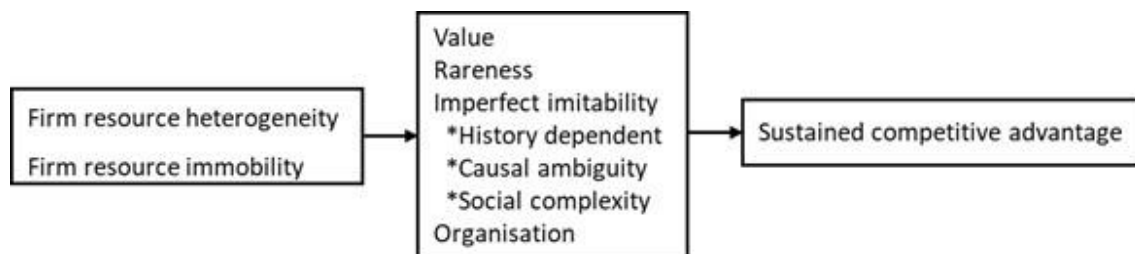
Applications

Beyond being used in strategic management, RBT has been adopted and applied in other business management areas, both in a qualitative and quantitative manner. To date, the application of RBT has been extended to various business studies such as marketing (Barney, 2014;Kozlenkova, Samaha & Palmatier, 2014), operational management (Hitt, Xu & Carnes, 2016;Lewis et al., 2010) economics (McWilliams & Siegel, 2011;Ahmed, Kristal & Pagell, 2014), supply chain management (Zimmermann & Foerstl, 2014;Ahmed, Kristal & Pagell, 2014), information systems (Seddon, 2014;Setia & Patel, 2013), and entrepreneurship (Molloy et al., 2011). Numerous studies have set out to examine the link between RBT and its implementation for various business purposes, for example, firm performance - big data analytics, firm dynamic capabilities, purchase and supply management practices, marketing capabilities, innovation - R&D, and strategic IS.

The application of RBT in various disciplines apart from its popularity amongst strategic management literature that emphasises its resource-base has supplied the footing for the RBT framework or an extension. The theory has been used to study business resource and capability strategy by adjusting recent business environment developments such as technology and innovation. Using big data analytics to see firm performance (Akter et al., 2016) or to use it for innovation in marketing (Wright et al., 2019) are examples of the influence of RBT in business and management studies. The study by Akter et al. (2016) showed that big data analytics could be aligned with the business strategy to enhance firm performance by using the RBT model, such as based on the entanglement perspective of socio-culturalism. The firm capabilities in technology, management, and talent capability may serve as the analytics capability business strategy alignment to investigate the firm performance by using big data analytics capability under the RBT model. In marketing subjects, the exploration of firm capability through the role of big data technology for innovation as the components of RBT are employed to explore market leadership by evaluating the resources needed by the organisation for big data application (Wright et al., 2019). From a marketing perspective, firm innovation capabilities require four sources of resources concerning equipment availability, expertise and skills, and innovation capability to exploit big data investment. The firm capability in innovation involves an appropriate system or IT expertise to operate big data adoption. The potential of innovation through the firm capability in big data technology may be positioned as an investment for sustained competitive advantage. The adoption of the RBT model has been used to support the study on marketing innovation through diverse market-based resources, such as technology and innovation, to sensing the changes in the business environment and responding to them (Kozlenkova, Samaha & Palmatier, 2014).

Moreover, RBT applications related to innovation have also been studied concerning the performance of corporate R&D alliances, such as investigating the relationships between corporate motivation and the

performance of R&D alliances (Lai & Chang, 2010). The R&D activity has been considered to be one of the primary ways to engage in innovation, and companies need to explore and obtain resources to facilitate innovation within the organisation. From the perspective of RBT, R&D activities can energise not only a firm's capacity development for innovation but are also essential to assist a firm in using its limited capabilities and resources and dealing with the turbulent and competitive environment (Barney, 1991).

Furthermore, the RBT model is also used to explain the firm's dynamic capabilities based on the concept of the capability lifecycle (Helfat & Peteraf, 2003). Dynamic capabilities occur in RBT as the firm's ability to integrate, develop, and reconfigure internal and external competences to respond to rapidly changing environments (Teece, Pisano & Shuen, 1997). The concept of the firm capability lifecycle emphasises understanding a firm's resources as product developments paths. The extension of a firm's capabilities into dynamic capabilities articulates the general direction and pattern in the evolution of organisational capabilities over time. The dynamic RBT may identify the firm's capability lifecycle based on the three initial processes of founding, development, and maturity – followed by six additional steps of capability transformation as follows: retirement, retrenchment, renewal, replication, redeployment, and recombination. The extension of understanding dynamic capabilities as the source of competitiveness in the RBT framework may complete the joint evolution of the critical elements of the dynamic RBT. The theory development in RBT also reveals how the theory has improved from the classic RBT to the extended RBT (ERBT). The application of this, such as a study on operation and supply chain management suggested by (Lewis et al., 2010), is based on two different approaches of classic RBT and ERBT to develop and combine long-term advantage. The classic RBT focuses on the internal organisation resources that are classified as scarce, imperfectly mobile, imperfectly imitable, and imperfectly substitutable, whereas the ERBT concentrates on firm resources and capabilities as the interplay between internal organisation and the external environment. For example, the creation of competitive advantage may have more to do with the relationships with suppliers compared to the existence of inimitable manufacturing production resources possessed by the organisation. To accelerate the cycle development process possible through inter-firm resources associated with ERBT, and gain long-run sustainable advantage requiring synchronisation and integration of both bounded (internal) and relational (external) resources.

The development of RBT also provides an alternative explanation for the sources of a company's competitive advantage that complements strategy as the positioning perspective by exploring the key scarce resources, such as the benefits of ICT use in the organisation. Study of organisational performance concerning IT subjects (e.g. IT-supported business processes, enterprise systems, knowledge-management systems, mobile devices) has led many information systems (IS) researchers to use RBT as the underpinning

theory (Seddon, 2014). An example of RBT in strategic IS proposed by Seddon (2014) and presents the critical concepts of RBT from the IS literature about the implications of strategic IS research of the RBT of the firm. Investigating strategic IS based on the RBT perspective may contribute to the knowledge of the RBT conditions (VRIS – valuable, rare, imperfectly imitable, non-substitutable) related to the ICT-related resources in a different context of applications (Seddon, 2014). Verification of the RBT conditions of resources may be applied as the theoretical foundation hypothesising associations between ICT-related resources and competitive advantage. In this specific area of IS, the approach of RBT may reveal the importance of ICT resources to support organisational value since IT management of a firm is very much concerned with the firm's ability to develop new capabilities.

Limitations

RBT has attracted criticisms on four key fronts. First, the traditional RBT is limited when it comes to explaining why and how some organisations gain a competitive advantage in an unpredictable and rapidly changing business environment (Kleinschmidt, de Brentani & Salomo, 2007). Second, the value creation idea that has been proposed based on this theory regarding valuable resources is tautological and static (Kozlenkova, Samaha & Palmatier, 2014; Priem & Butler, 2001), which means the theory is self-verifying and is not empirically testable (Barney, 2001), which may possibly relate to some poor quality RBT research (Kozlenkova, Samaha & Palmatier, 2014). The theory has also been criticised for being static and for failing to tackle the effect of organisational activities on resource effectiveness over time (Kozlenkova, Samaha & Palmatier, 2014). However, this criticism has been addressed by later theory refinements, such as by decoupling the direct relationship between VRI resources (valuable-rare-imperfectly imitable) and outcomes by defining organisational processes applied to exploit resources (Peteraf & Barney, 2003;Barney, 2007). Third, as the concept primarily refers to the work by Barney (1991), the support for the resource condition of being rare may be redundant, as any resource that meets the requirement of value, non-substitutability and inimitability is rare (Priem & Butler, 2001). Finally, RBT tends to ignore exogenous resources and assumes that only endogenous factors are essential to driving competitive advantage, although exogenous factors may otherwise offer potential as advantageous capabilities (Lewis et al., 2010). Despite the limitation of RBT, the rapid development of RBT and the innovation to the theory through adjustment, clarification and modification continue to improve its applicability and scope (Kozlenkova, Samaha & Palmatier, 2014).

Concepts

Firm Resource Heterogeneity (Independent): The heterogenous assets, capabilities, organisational processes, company attributes, knowledge, information, etc. controlled by a firm that facilitate the conception and implementation of strategies that potentially increase efficiency and effectiveness. (Barney, 1991)

Firm Resource Immobility (Independent): The ease by which a firm can acquire strategically relevant resources (e.g. capabilities, organisational processes, company attributes, knowledge, information, etc.) controlled by another firm to enter the industry and implement a similar strategy. (Barney, 1991)

Value (Independent/Dependent): The valuable resources possessed by a firm that enable the conception or implementation of a strategy that improves efficiency and effectiveness to generate sustainable competitive advantage. (Barney, 1991)

Rareness (Independent/Dependent): A firm's valuable resources that are undeniably unique among a set of competing and potentially competing ones for firms that can generate a sustainable competitive advantage. (Barney, 1991)

Imperfect Imitability (Independent/Dependent): The condition of a firm possessing a bundle of relevant valuable and rare resources that other firms cannot acquire. (Barney, 1991)

Substitutability (Independent/Dependent): A condition whereby a firm's resource must neither be strategically valuable, rare, nor imitable to be a source of sustainable competitive advantage. (Barney, 1991)

Sustained Competitive Advantage (Dependent): A competitive advantage possessed by a firm that remains present despite the endeavours of other firms to copy it. (Barney, 1991)

Organisational Capability (Independent): The ability of an organisation to perform a planned set of tasks by employing resources to achieve a specific outcome. (Helfat & Peteraf, 2003)

Organisational Dynamic Capability (Independent): The ability of an organisation to develop, integrate or reconfigure operational capabilities. (Helfat & Peteraf, 2003)

Capability Lifecycle (Independent): A general pattern and set of possible paths that characterise the evolution of the capabilities of an organisation. There are three main stages of organisation capability lifecycle, namely, (a) the founding stage; (b) the development stage; and (c) the maturity stage. (Helfat & Peteraf, 2003)

Npd Organisational Resources (Independent): Experiences and established approaches underlying international new product development that include global innovation culture, the attitude of top management involvement, resource commitment and NPD process formality. (Kleinschmidt, de Brentani & Salomo, 2007)

Global Innovation Culture (Independent): An organisational resource related to the ability to recognise and leverage specific resources, skills and ideas within the firm that incorporate globalisation but that are often geographically distributed. (Kleinschmidt, de Brentani & Salomo, 2007)

Management Involvment In Global Npd (Independent): The value of senior managers playing a visible role to incorporate essential knowledge and capabilities such as know-how, familiarity and understanding of a tacit nature based on a lesson from prior experience in firm-specific projects, leadership experiences and team interactions . (Kleinschmidt, de Brentani & Salomo, 2007)

Resource Commitment (Independent): The commitment of sufficient resources is an essential attitude by senior management that can also be conceptualised as intangible resources that are of value but imitable. It developed over time based on the organisation experiences and emphasis on international markets. (Kleinschmidt, de Brentani & Salomo, 2007)

Npd Process Formality (Independent): The formal, stage-like system to provide a template for routine activities and reviews to be employed throughout the stages of the NPD process. (Kleinschmidt, de Brentani & Salomo, 2007)

Global Npd Process Capabilities/routines (Independent/Dependent): Organisation characteristics related to key global NPD process capabilities relevant to identifying and exploiting new product opportunities for the international market, consisting of global knowledge integration, new product development homework activities and launch preparation. (Kleinschmidt, de Brentani & Salomo, 2007)

Global Knowledge Integration (Independent/Dependent): The capability by which firms access and integrate functionally and globally dispersed information about markets throughout the NPD activities that respond to customers worldview . (Kleinschmidt, de Brentani & Salomo, 2007)

Homework Activities (Independent/Dependent): The routine for conducting an early assessment of new product ideas, creating project definitions and evaluation of product potential in the global markets . (Kleinschmidt, de Brentani & Salomo, 2007)

Launceh Preparation (Independent/Dependent): A capability that encompasses detailed planning for the commercialisation of new products on an international scale. (Kleinschmidt, de Brentani & Salomo, 2007)

Global Npd Programme Performance (Dependent): A firm's potential to outperform its rivals as measured by superior financial performance and to establish an advanced strategic position. (Kleinschmidt, de Brentani & Salomo, 2007)

Financial Performance (Dependent): The new product development program accomplishment that encompasses profitability, sales and cost performance. (Kleinschmidt, de Brentani & Salomo, 2007)

Windows of Opportunities (Dependent): The extent to which global new product development programs open new product, market and technological arenas. (Kleinschmidt, de Brentani & Salomo, 2007)

Markeing Capbility Interdependency (Independent): The application of a firm's capabilities and resources for the development and implementation of its marketing strategy and information management. (Vorhies & Morgan, 2005)

Pricing (Independent): The ability to obtain the optimal revenue from the customers. (Vorhies & Morgan, 2005)

Product Development (Independent): The processes by which firms manage and create products and service offerings. (Vorhies & Morgan, 2005)

Channel Management (Independent): The firm's ability to develop and manage channels of distribution that can efficiently and effectively deliver value to end-consumers. (Vorhies & Morgan, 2005)

Marketing Communication (Independent): The firm's ability to maintain customer value perceptions. (Vorhies & Morgan, 2005)

Selling (Independent): The processes by which the firm develops customer orders. (Vorhies & Morgan, 2005)

Market Information Management (Independent): The processes by which firms understand about their markets and utilise market knowledge. (Vorhies & Morgan, 2005)

Marketing Planning (Independent): The firm's ability to formulate marketing strategies that optimise the match between the firm's resources and its marketplace. (Vorhies & Morgan, 2005)

Marketing Implementation (Independent): The processes by which a proposed marketing strategy is converted into realised resource deployments. (Vorhies & Morgan, 2005)

Firm Performance (Dependent): The business capabilities achieved by a firm signifying customer satisfaction, profitability and market effectiveness. (Vorhies & Morgan, 2005)

Customer Satisfaction (Dependent): The assessment from the firm's employees towards business performance related to their customer satisfaction over the past year and expectation for the following year. (Vorhies & Morgan, 2005)

Market Effectiveness (Dependent): The degree to which the firm's market-based goals have been accomplished. (Vorhies & Morgan, 2005)

Profitability (Dependent): The assessment from the firm's employees towards business performance related to the current profitability score and anticipated financial performance for the following year. (Vorhies & Morgan, 2005)

References

Acedo, F.J., Barroso, C. & Galan, J.L. (2006). The resource-based theory: dissemination and main trends. *Strategic Management Journal*, 27 (7), 621-636.

Adner, R. & Helfat, C.E. (2003). Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, 24 (10), 1011-1025.

Ahmed, M.U., Kristal, M.M. & Pagell, M. (2014). Impact of operational and marketing capabilities on firm performance: Evidence from economic growth and downturns. *International Journal of Production Economics*, 154, 59-71.

Akter, S., Wamba, S.F., Gunasekaran, A., Dubey, R. & Childe, S.J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment?. *International Journal of Production Economics*, 182, 113-131.

Amit, R. & Schoemaker, P.J.H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14 (1), 33-46.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17 (1), 99-120.

Barney, J.B. (2001). Is the Resource-Based "View" a Useful Perspective for Strategic Management Research? Yes. *The Academy of Management Review*, 26 (1), 41.

Barney, J.B. (2007). *Resource-based theory*. Oxford University Press.

Barney, J.B. (2014). How marketing scholars might help address issues in resource-based theory. *Journal of the Academy of Marketing Science*, 42 (1), 24-26.

Crook, T.R., Ketchen, D.J., Combs, J.G. & Todd, S.Y. (2008). Strategic resources and performance: a meta-analysis. *Strategic Management Journal*, 29 (11), 1141-1154.

Helfat, C.E. & Peteraf, M.A. (2003). The dynamic resource-based view: capability lifecycles. *Strategic Management Journal*, 24 (10), 997-1010.

Hitt, M.A., Xu, K. & Carnes, C.M. (2016). Resource based theory in operations management research. *Journal of Operations Management*, 41 (1), 77-94.

Keränen, J. & Jalkala, A. (2013). Towards a framework of customer value assessment in B2B markets: An exploratory study. *Industrial Marketing Management*, 42 (8), 1307-1317.

Kleinschmidt, E.J., de Brentani, U. & Salomo, S. (2007). Performance of Global New Product Development Programs: A Resource-Based View. *Journal of Product Innovation Management*, 24 (5), 419-441.

Kozlenkova, I.V., Samaha, S.A. & Palmatier, R.W. (2014). Resource-based theory in marketing. *Journal of the Academy of Marketing Science*, 42 (1), 1-21.

Lai, W. & Chang, P. (2010). Corporate motivation and performance in R&D alliances. *Journal of Business Research*, 63 (5), 490-496.

Lewis, M., Brandon- Jones, A., Slack, N. & Howard, M. (2010). Competing through operations and supply. *International Journal of Operations & Production Management*, 30 (10), 1032-1058.

Li, T. & Calantone, R.J. (1998). The Impact of Market Knowledge Competence on New Product Advantage: Conceptualization and Empirical Examination. *Journal of Marketing*, 62 (4), 13.

Lyons, P. & Brennan, L. (2019). Assessing Value From Business-to-Business Services Relationships: Temporality, Tangibility, Temperament, and Trade-Offs. *Journal of Service Research*, 22 (1), 27-43.

Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal*, 22 (5), 387-401.

McWilliams, A. & Siegel, D.S. (2011). Creating and Capturing Value. *Journal of Management*, 37 (5), 1480-1495.

Molloy, J.C., Chadwick, C., Ployhart, R.E. & Golden, S.J. (2011). Making Intangibles "Tangible" in Tests of Resource-Based Theory. *Journal of Management*, 37 (5), 1496-1518.

Nickerson, J.A. & Zenger, T.R. (2004). A Knowledge-Based Theory of the Firm—The Problem-Solving Perspective. *Organization Science*, 15 (6), 617-632.

Penrose, E.T. (2009). *The theory of the growth of the firm*. Oxford University Press.

Penrose, E.T. (2009). *The theory of the growth of the firm*. Oxford University Press.

Peteraf, M.A. & Barney, J.B. (2003). Unraveling the resource-based tangle. *Managerial and Decision Economics*, 24 (4), 309-323.

Porter, M.E. (1989). How Competitive Forces Shape Strategy. *Readings in Strategic Management*, 133-143.

Priem, R.L. & Butler, J.E. (2001). Is the Resource-Based "View" a Useful Perspective for Strategic Management Research?. *The Academy of Management Review*, 26 (1), 22.

Seddon, P.B. (2014). Implications for strategic IS research of the resource-based theory of the firm: A reflection. *The Journal of Strategic Information Systems*, 23 (4), 257-269.

Setia, P. & Patel, P.C. (2013). How information systems help create OM capabilities: Consequents and antecedents of operational absorptive capacity. *Journal of Operations Management*, 31 (6), 409-431.

Teece, D.J., Pisano, G. & Shuen, A. (1997). Dynamic capabilities and strategic management. *Knowledge and Strategy*, 18 (7), 509–533.

Wright, L.T., Robin, R., Stone, M. & Aravopoulou, D.E. (2019). Adoption of Big Data Technology for Innovation in B2B Marketing. *Journal of Business-to-Business Marketing*, 26 (3-4), 281-293.

Zimmermann, F. & Foerstl, K. (2014). A Meta-Analysis of the "Purchasing and Supply Management Practice-Performance Link". *Journal of Supply Chain Management*, 50 (3), 37-54.

Self-Presentation Theory

Self-presentation is an influential theory in sociology, aiming to explain how individuals develop, shape, and maintain their impressions in society.

By Varqa Shamsi Bahar (Business School, Newcastle University)

Theory Factsheet

Proposed By: Goffman, 1959

Related Theories: Impression management, Social Identity Theory, Symbolic Interactionism

Discipline: Psychology

Unit of Analysis: Individual, teams

Level: Micro-level

Type: Theory for Explaining

Operationalised: Qualitatively / Quantitatively

Introduction

Self-presentation theory explains how individuals use verbal and non-verbal cues to project a particular image in society (Goffman, 1959). The theory draws on dramaturgy metaphors, such as backstage and frontstage, as a lens to explore human behaviour in everyday life (Goffman, 1959). Using dramaturgy as an analytical tool dates back to Nicholas Evreinov's (1927) research on theatrical instincts, as well as Kenneth Burke's (1969) work evaluating and scrutinising dramatic action (Shulman, 2016). Continuing this discourse, Erving Goffman (1959) offered a rich vein of theoretical concepts in sociology by drawing on theatre metaphors. While sociology research at that time focused on broader societal forces and structures, self-presentation theory emphasised individual behaviours and offered a lens to evaluate how performers interact with others to achieve personal goals (Goffman, 1959). Key to self-presentation theory is the notion of impression management and the routines that individuals play to manage an audience's perception. As a result, self-presentation is crucial in developing one's social identity. Thus, the theory paved the way for a better understanding of identity development through the performance acts of individuals in society.

Theory

Drawing on Goffman's (1959) theorisation, self-presentation is defined as individuals' actions to control, shape, and modify the impressions other people have of them in

a particular setting. In other words, individuals' "*performance is socialised, moulded, and modified to fit into the understanding and expectations of the society in which it is presented*" (Goffman, 1959:p44). Hence, self-presentation holds a strategic value to individuals as impressions influence how others assess, treat, and reward them (Leary & Kowalski, 1990). For instance, in a workplace setting, impressions may shape personal success and career progression (Gardner & Martinko, 1988).

Self-presentation theory draws on the traditions of symbolic interactionism (Blumer, 1986). Goffman suggests six key principles of the theory (Goffman, 1959; Shulman, 2016). First, individuals are performers who express their self to society. In practice, individuals highlight a persona and project a particular image to others. Such a projection is a means to show their identity and who they are to the society. Second, individuals want to put forward a credible image. They do so by being truthful and authentic in the way they present themselves. They showcase their expertise in a particular domain. Third, individuals take special care to avoid presenting themselves "*out of character*". They strive to ensure that their performance or communication aligns with their role and identity in society. Fourth, if a performance is inadequate and not up to the mark, individuals address or repair it by engaging in restorative actions. Such actions ensure that their desired image is not tarnished. Fifth, self-presentation occurs in social places, known as regions of performance. Such regions in everyday life include the workplace, social gatherings, and social media. As such, they are "*platforms*" for self-presentation. Sixth, individuals work in teams and manage the impression of the collective to achieve common goals. In other words, a performance may not always occur alone, but can take place in concert with other individuals.

Individuals enact self-presentation because they are motivated to maximise rewards and minimise punishment (Leary & Kowalski, 1990;Schlenker, 1980). More specifically, motivations include the desire to (i) enhance self-esteem, (ii) develop a self-identity, and (iii) generate social and material benefits (Leary & Kowalski, 1990). In practice, people may strive to project an image that will result in praise and compliments, positively shaping one's self-esteem (Leary & Kowalski, 1990). In contrast, individuals may avoid presenting an image that draws criticism and a lack of self-worth (Cohen, 1959). More specifically, a central motivation for self-presentation is to build an identity in society to foster a unique perception in the minds of others (Schlenker, 1980). Further, self-presentation is an adequate mechanism to foster rewards that can be social, including, trust, affection, and friendship. It can generate material benefits, such as financial gain (Leary & Kowalski, 1990).

Goffman (1959) uses the dramaturgical metaphor to explain the self-presentation theory and states that "*the theatre metaphor is the 'structure of the social encounter' that occurs in all social life*" (Adams & Sydie, 2002:p170). Drawing on dramaturgical metaphors, self-presentation comprises backstage and frontstage strategies akin to a theatre performance (Cho et al., 2018). These strategies are summarised in Table 1. Backstage relates to reflecting, practising, and taking adequate measures to prepare oneself (Goffman, 1959). Such practices occur in private and offer individuals a more comfortable atmosphere in which to prepare without the pressure from society, such as norms and expectations to behave in a certain way (Jeacle, 2014). The theory suggests the significance of rehearsal, which focuses on preparation work for the frontstage (Siegel, Tussyadiah & Scarles, 2023). For instance, individuals can practise and adjust their presentation at home before a formal client meeting.

Table 1: Self-presentation strategies

Self-presentation strategies	Key activities
Rehearsal	Preparing for self-presentation
Idealisation	Performing an ideal accredited impression
Mystification	Holding the observers in a state of awe
Self-promotion	Demonstrating credibility and expertise
Exemplification	Expressing righteousness and ethicality
Supplication	Showing vulnerability and helplessness
Ingratiation	Fostering likability and attractiveness
Identification	Linking to a particular community
Basking in reflected glory	Associating with a particular person
Downward comparison	Projecting a superior image at the cost of others
Upward comparison	Act of comparing oneself with someone better
Remaining silent	Not forming specific views
Apology	The practice of showing remorse due to a wrong action and promising morally righteous conduct in the future
Corrective action	Suggesting action plans to avoid the recurrence of wrongdoing

In contrast, frontstage comprises the "*setting*", which includes the layout and objects in a particular room that set the scene for expression and action (Goffman, 1959). The setting is a place that is usually stable and unmovable, but at times can be relocated such as a circus (Goffman, 1959). Another key aspect of the frontstage is the "*personal front*", which relates to personal characteristics such as sex, age, and facial expressions (Goffman, 1959). These characteristics are signals that are either fixed or vary over time (Goffman, 1959). Fixed characteristics are, for instance, one's ethnic background, whereas characteristics that change include gestures based on one's mood. The theory suggests that the personal front can be better understood through the lens of appearance and manner. The former relates to one's temporal

state such as work or leisure. The latter expresses the interaction role that one is likely to pursue in a given situation, like being professional and sincere (Goffman, 1959). Usually, there exists a coherence between the appearance and manner, although, at times, they may be misaligned (Goffman, 1959). For instance, a person of high status may behave in a way considered down to earth (Goffman, 1959).

Individuals can enact certain routines as part of their self-expression on the frontstage. At times, these routines can become institutionalised when an individual takes on specific roles in society (Goffman, 1959). The theory highlights the following routines: idealisation, mystification, self-promotion, exemplification, supplication, ingratiation, identification, basking in reflected glory, downward comparison, upward comparison, remaining silent, apology, and corrective action (Schütz, 1998).

Idealisation relates to individuals performing an ideal accredited impression in society (Goffman, 1959). Idealisation is common in social stratification research: individuals strive to go higher up the ladder in the social strata and adjust their self-presentations to reflect that ideal state and value system. In practice, individuals gain insight into the sign equipment required to showcase idealisation, and subsequently use it to project the accredited social class. Mystification is pursued by reducing contact and increasing social distance with the audience to create a sense of awe (Goffman, 1959). It is a means of limiting familiarity with others. For instance, mystification was used by Kings and Queens to foster an impression of power. The audience responded in a way that respected their mystic and sacred identity.

Self-promotion is pursued to create a credible image of oneself in the minds of others (Giacalone & Rosenfeld, 1986;Schau & Gilly, 2003). Such a form of persuasion is relevant in various circumstances, such as job interviews, influencer marketing, and presidential speeches. For instance, a candidate applying for a digital marketing role may share reflections on their expertise in search engine optimisation. An influencer focusing on health and fitness may share online videos of their exercise regimes. A presidential candidate may talk about their vast political experience to project their leadership qualities. Therefore, self-promotion focuses on projecting oneself as an expert and capable person in a particular domain (Bande et al., 2019). However, the theory suggests the issue of misrepresentation: behaviours that represent a false front (Goffman, 1959). Individuals may use credible vehicle signs for the wrong reasons, such as deception and fraud (Goffman, 1959).

Exemplification strategy focuses on creating an impression of oneself as virtuous and honourable (Bonner, Greenbaum & Quade, 2017; Gardner, 2003; Schütz, 1997). In other words, exemplification relates to creating an identity that rests on the notion of morality and ethics. For instance, Chief Executive Officers (CEOs) may publish posts on social media supporting charities, which projects a righteous image. Further, individuals regularly take a stand against harmful organisational behaviours, such as those engaging in child labour. While sharing their views on social media, those individuals exemplify a high moral ground and justify why organisations engaging in transgressions need to be held accountable. However, an exemplification strategy has its potential dangers. The society may question the motive behind such actions and consider it a means to cover up previous unethical deeds (Stone et al., 1997).

Supplication is based on showing oneself as vulnerable and frail to draw adequate support and help from others (Christopher et al., 2005; Korzynski, Haenlein &

Rautiainen, 2021)**.** The ingratiation strategy relates to creating a likable and attractive impression in a particular place offline, such as one's workplace, and online on social media (Bolino, Long & Turnley, 2016;Gross et al., 2021). For instance, an individual can project themselves to be professional and collegial in the workplace to foster goodwill and social approval.

The identification strategy puts emphasis on associating oneself with a particular community to create a specific image in society (Brewer & Gardner, 1996). For instance, some consumers may link themselves to the Harley-Davidson community to create a rebellious and adventurous image (Schembri, 2009). Tattoos, leather jackets, and riding on Harley motorcycles in packs reinforce their identification (Schembri, 2009). A strategy that slightly overlaps with identification work is "*basking in reflected glory*" (Cialdini et al., 1976). In this case, an individual associates themselves with another person who has a positive impression in society and thus leverages those associations (Schütz, 1998).

Downward comparison focuses on projecting oneself as superior and in a positive light to the detriment of others (Wills, 1981). One may witness downward comparison in politics as one presidential candidate expresses how their vision and proposed policies are superior compared to another candidate. Upward comparison, however, is the practice of comparing oneself with someone better to improve one's self-evaluations and perceptions (Collins, 1996).

Remaining silent may be a particular practice for individuals to be neutral and not face any criticism or backlash (Premeaux & Bedeian, 2003). Finally, particularly when one is responsible for an adverse event or has engaged in a wrong action, they may share an apology, defined as "*repenting and promising moral behaviour in the future*" (Hart, Tortoriello & Richardson, 2020:p2). They may suggest putting corrective measures in place so that it does not happen again in the future (Schütz, 1998).

Figure 1 offers a generic framework of self-presentation theory, comprising frontstage and backstage strategies that help attain specific outcomes (Goffman, 1959; Leary & Kowalski, 1990). The backstage and frontstage are inter-related. Backstage strategies often involve preparation, desk research, and due diligence to gain insight into a particular performance (Jacobs, 1992). As such, backstage is an unofficial channel for individuals to gain the necessary skills, attributes, and contextual understanding to perform certain routines (Tiilikainen et al., 2024). Subsequently, individuals enact frontstage strategies involving those practised routines and impressions in a social context (Schütz, 1997).

Figure 1: *Framework for self-presentation strategies*
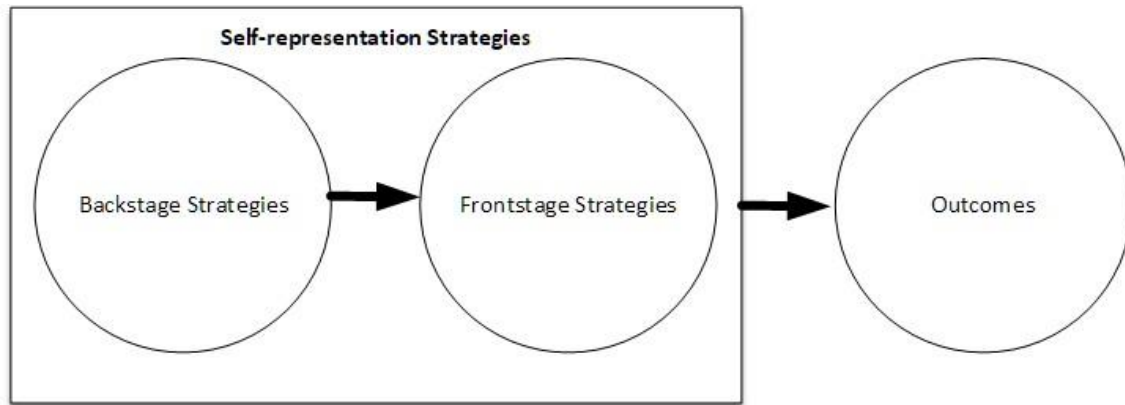
To ensure adequate self-presentation, the theory suggests various means by which impression management can be pursued in the right way and includes defensive and protective practices (Goffman, 1959) as well as maintaining the definition of the situation (Tiilikainen et al., 2024). Defensive practices pursued by performers are a means for individuals and teams to safeguard their own performance. It requires discipline, whereby individuals have "*presence of mind*". Disciplined individuals are resilient to unexpected circumstances and are sufficiently agile to ensure the performance attains its goal. In addition, individuals can enact circumspection by adequately preparing to offer a high-quality performance (Goffman, 1959). This involves taking time to design the performance and enacting foresight and prudence. Individuals may even show loyalty and devotion to other team members to ensure the overall impression does not fail (Goffman, 1959). When individuals reveal secrets or problems to outsiders, it damages the image of the team.

Protective practices, however, are pursued by audience members to help the performers manage their impressions (Goffman, 1959). They do so by not intruding on the back or frontstage. In practice, etiquette is maintained by not involving oneself in others' personal matters. Permission and consent are exercised to gain access. For instance, salespersons usually introduce themselves first and ask permission to discuss a product or service. However, the audience can exercise extra understanding and empathy when performance is not up to the mark for a person learning their trade (Goffman, 1959).

Finally, by maintaining a definition of the situation, individuals can develop an "*agreed upon, subjective understanding of what will happen in a given situation or setting, and who will play which roles in the action*" (Crossman, 2019). As a result, the concept defines the social order and gives symbolic meaning to human interactions that occur in everyday life (Tiilikainen et al., 2024). When the definition of the situation is not maintained or broken, the performance becomes ineffective and may even collapse (Tiilikainen et al., 2024).

Institutions shape how performers present themselves in everyday life. Goffman (1983:p1) used the terminology - interaction order – to explain the "*loose coupling between interaction practices and social structure*" and how "*the workings of the interaction order can easily be viewed as the consequence of systems of enabling conventions, in the sense of ground rules for a game, the provisions of a traffic code or the rules of syntax of a language*". As such, the interaction order offers rules and

norms that shape one's behaviour in society. At an extreme level, institutions can have high levels of dominance and control, which Goffman (1961) defines as total institutions, which are often applied in prisons, military organisations, and even hospitals. Total institutions exert control over individuals' daily routines, movements, and even identities (Goffman, 1961). The theoretical properties of total institutions include role dispossession i.e., "*the process through which new recruits are prevented from being who they were in the world they inhabited prior to entry*" (Shulman, 2016:p103). This involves trimming or programming, which relates to individuals being "*shaped and coded into an object that can be fed into the administrative machinery of the establishment, to be worked on smoothly by routine operations*" (Goffman, 1986:p16). Individuals in a total institution are forced to give up their identity kit i.e., personal belongings that give meaning to who they are in society (Shulman, 2016).

Theoretical developments

Since Goffman's original work, scholars have advanced the theoretical properties of self-presentation. Specifically, in sharp contrast to total institutions, Scott (2011:p3) suggested the notion of reinventive institutions, defined as "*a material, discursive or symbolic structure in which voluntary members actively seek to cultivate a new social identity, role or status. This is interpreted positively as a process of reinvention, self-improvement or transformation. It is achieved not only through formal instruction in an institutional rhetoric, but also through the mechanisms of performative regulation in the interaction context of an inmate culture*". Reinventive institutions are much more relevant in modern life, whereby individuals want to go through a transformation of their self and create a new identity (Scott, 2011). In other words, they want to let go of their previous self in pursuit of a reinvigorated new persona. Illustrative cases of reinventive institutions include spiritual communities and lifestyle groups (Shulman, 2016). Individuals are not forced to enter these communities; rather, they do so entirely voluntarily (Scott, 2010). These institutions are self-organising, i.e., the community members keep a check on each other to maintain the collective norms (Huber et al., 2020).

In contrast to Goffman's original theorisation of self-presentation in face-to-face, offline interactions, research work has extended the theory to evaluate online impression management (Bareket-Bojmel, Moran & Shahar, 2016; Ranzini & Hoek, 2017; Rui & Stefanone, 2013). In practice, individuals use technology features such as text, images or videos to signal and manage their online image. This contrasts with non-verbal signals, such as body language, which are often common in offline interactions. Online impression management can be managed more conveniently as individuals can develop, change, or edit informational cues in a way that suits their purpose (Sun, Fang & Zhang, 2021). However, individuals' digital footprint may remain over time online, and it can be viewed and accessed by others anytime (Hogan, 2010). This relates to the problem of "*stage breach*", where data about individuals' private lives are retrievable on search engines and social media platforms (Shulman, 2016). As such, the internet has caused the blurring of boundaries between back and frontstage, a phenomenon dubbed as "*collapsed contexts*" (Davis & Jurgenson, 2014), defined as "*a flattening of the spatial, temporal, and social boundaries that otherwise separate audiences on social networking sites*" (Duguay, 2016:p892). In response, individuals may use privacy filters or even delete

content posted in the past that may negatively influence their image in society (DeAndrea, Tong & Lim, 2018).

Due to the advent of social media, Hogan (2010) extended Goffman's theorisation by differentiating between "*performances*" and "*exhibitions*" that occur online. Performances, similar to Goffman's dramaturgy metaphor, occur in real-time, such as in chat rooms, online meetings, and live streams. In this case, the situation is synchronous, and performances are time-bound (Hogan, 2010). However, exhibitions do not occur in real time, and individuals use technology artifacts afforded by social media to curate content (Hogan, 2010). These include posting a status update, uploading a photo album, or sharing a pre-recorded, edited video. As a result, exhibitions occur in asynchronous situations.

Overall, self-presentation theory provides a dramaturgy analytical lens for researchers to evaluate human behaviour in face-to-face and online interactions that involve synchronous and/or asynchronous situations. It offers a range of back and frontstage strategies that individuals and teams enact to manage their impressions in society, also suggesting that the broader institutional environment shapes how they behave in everyday life. Table 2 summarises the key conceptual definitions of self-presentation theory.

Table 2: Key concepts and definitions

Concepts	Definitions
Performance	Actions or behaviours pursued by individuals that are in line with the definition of the situation
Performers	Actors, individuals, or collaborators who play a role in the performance
Frontstage	A metaphorical official stage or a social situation where individuals can present their self through strategies such as self-promotion and supplication
Backstage	A metaphorical unofficial stage where individuals can prepare, gain insight into the contextual situation and reflect on how to manage their self-image
Setting	The layout and objects in a particular social context that set the scene for a performance
Personal front	Personal attributes that showcase one's signals, which are either fixed or vary over time
Appearance	The temporal state of a performer, such as work or leisure
Manner	The interaction role that a performer is likely to enact in a particular social context

Defensive practices	Performers pursuing specific actions to safeguard their performance
Protective practices	Audience members pursuing certain actions to support the performers in their impression management pursuits
Definition of situation	Developing a common understanding of or consensus about particular situations in terms of the role individuals will play and the behavioural expectations in that social context
Interaction order	"*Loose coupling between interaction practices and social structure*" (Goffman, 1983:p1)
Total institutions	A "*place of residence and work where a large number of like-situated individuals cut off from the wider society for an appreciable period of time together lead an enclosed formally administered round of life*" (Goffman, 1968:p11)
Trimming or programming	Individuals being "*shaped and coded into an object that can be fed into the administrative machinery of the establishment, to be worked on smoothly by routine operations*" (Goffman, 1986:p16)
Identity kit	Personal belongings and artifacts that give meaning to one's identity
Reinventive institutions	"*A material, discursive or symbolic structure in which voluntary members actively seek to cultivate a new social identity, role or status*" (Scott, 2011:p3)
Collapsed contexts	"*A flattening of the spatial, temporal, and social boundaries that otherwise separate audiences on social networking sites*" *(Duguay, 2016:p892)*
Exhibitions	"*A site (typically online) where people submit reproducible artifacts*" (Hogan, 2010:p381)

Applications

Self-presentation theory is primarily anchored in sociology. However, other disciplines, such as management, marketing, and information systems, have extended the application of the theory in their respective contexts, such as work, social media, and branding. As such, the sociology discipline sheds light on the theoretical aspects of self-presentation, including its strategies, motivations, and application of the theory in everyday life (Goffman, 1959;Lewis & Neighbors, 2005;Schütz, 1998; Vohs, Baumeister & Ciarocco, 2005). Based on the theory,

management scholars have investigated the application of self-presentation at work at two levels: individual and organisational (Bolino et al., 2008; Bolino & Turnley, 1999; Cook et al., 2024; Windscheid et al., 2018). At an individual level, self-presentation theory has been extensively applied to evaluate job interviews and performance appraisals (Kim et al., 2023; Moon et al., 2024). The theory is highly appropriate when determining individuals' success or failure in securing work in organisations, as well as their job performance and career success (Gioaba & Krings, 2017; Bolino et al., 2008). For instance, leaders and managers who engage in appropriate self-presentation are more likely to generate "*buy-in*" and support from colleagues about their suggestions and action plans (Gardner & Martinko, 1988). Research has even investigated how employees manage their impressions when interacting with colleagues on social media (Sun, Fang & Zhang, 2021; Ollier-Malaterre, Rothbard & Berg, 2013). This is crucial yet challenging because employees simultaneously have to manage their work and personal identities on social media (Ollier-Malaterre, Rothbard & Berg, 2013). In addition, research looked into how entrepreneurs managed their impression after the failure of their business (Kibler et al., 2021; Shepherd & Haynie, 2011). They do so to retain their credibility for future entrepreneurial ventures (Kibler et al., 2021).

At an organisational level, empirical work has examined organisational impression management (Benthaus, Risius & Beck, 2016; Carter, 2006; Schniederjans, Cao & Schniederjans, 2013). This is defined as "*any action that is intentionally designed and carried out to influence an audience's perceptions of the organisation*" (Bolino et al., 2008:p1095). Studies have explored how organizational impression management strategies focus on assertive strategies to create a positive public image, such as sharing recent achievements (Mohamed, Gardner & Paolillo, 1999). In contrast, reactive strategies are used to manage crisis situations that tarnish the reputation of an organisation (Jin, Li & Hoskisson, 2022; Rim & Ferguson, 2020). Studies have also investigated how impression management of particular individuals (such as CEOs) shapes organisational image and performance (Cowen & Montgomery, 2020; Im, Kim & Miao, 2021). In contrast, research examined how organisational factors (e.g., culture) shape employee conduct in the workplace in a way that aligns with the values and norms expected in the organisation (Ashford et al., 1998).

In contemporary marketing, the metaphor of dramaturgy, which is central to impression management, has been used in retail and service research to investigate how to enhance customer experience (Bitner, 1992). In practice, the front and backstage have been effectively used to offer guidelines and implications to improve retail and service environments (Grove, Fisk & John, 2000). The marketing field even provides insight into how brands play a role in self-presentation (Ferraro, Kirmani & Matherly, 2013; Lee, Ko & Megehee, 2015). In particular, consumers often use and purchase brands that relate to a specific self-concept they strive to build and maintain (Jiménez-Barreto et al., 2022; Clark, Slama & Wolfe, 1999). In other words, brands offer consumers identity artifacts or props to express themselves. For instance, research by Jiménez-Barreto et al. (2022) finds that consumers find cool brands (original, iconic, and popular brands) valuable to construct their cool identity. This phenomenon is pertinent to luxury brands, which enable consumers to project a classy, high-status image in society (Kim & Oh, 2022). However, such consumer practices may backfire. Other people (or observers) may have negative perceptions of consumers using brands in a conspicuous or attention-seeking way (Ferraro, Kirmani & Matherly, 2013) and perceive them as having dark personalities, including narcissism, machiavellianism, and psychopathy (Razmus, Czarna &

Fortuna, 2023). Observers even perceive consumers who use luxury brands to have lower levels of warmth (Cannon & Rucker, 2019). Managing impressions in marketing applies to buyer-seller relationships (Fisk & Grove, 1996). For example, sales professionals are often required to project an expert image. Impression management is also core to business-to-business marketing management, for instance, to remain resilient in crises (Alo et al., 2023; Lan & Sheng, 2023).

Information systems researchers have effectively investigated how technology can be used in the self-presentation process (Kim, Chan & Kankanhalli, 2012;Ma & Agarwal, 2007; Shi, Lai & Chen, 2023). The theoretical integration of self-presentation and technology is particularly relevant due to the advent of the internet, social media, metaverse, and artificial intelligence. For instance, Ma and Agarwal (2007) examined how technology artifacts afforded by virtual communities, such as avatars, nicknames, digital photographs and personal pages, enable users to enact self-presentation to create their identity. They find that when people have perceived verified identities, defined as "*perceived confirmation from other community members of a focal person's belief about (their) identities*" (p. 46), it encourages the person to share knowledge with others in the virtual community. It even increases their satisfaction level with the community. Another study study found that the desire for online self-presentation, defined as the "*extent to which an individual wants to present his or her preferred image in a virtual community of interest,*" encourages individuals to purchase digital items, such as avatars and image files (Kim, Chan & Kankanhalli, 2012:p1235). These digital items are artifacts for self-expression and communication (Kim, Chan & Kankanhalli, 2012). The authors argue that the desire for online self-presentation in virtual communities is influenced by three factors: self-efficacy, norms, and involvement. They suggest that individuals who believe in their own capability to adequately develop a desired perception of themselves in the virtual community are more likely to engage in self-presentation work. Also, if the virtual community norms (rules and expectations) are conducive to self-presentation, the desire for self-presentation is stimulated. Further, if individuals are involved with the virtual community, i.e., they can relate to the community members, feel a strong affinity with them, and invest time and resources in the community, then it increases one's desire for self-presentation. Chen and Chen (2020) suggest that the perceived value of those digital items encourages users to make a purchase. Yet in another study, Oh, Goh and Phan (2023) offer interesting insights and show that social media users are more inclined to share positive news to their network as part of their image-building process, as opposed to negative or controversial news. The reason is that sharing positive news reinforces one's positive self-identity. In fact, such sharing behaviours are particularly relevant for users with a broader social network as they have a higher disposition to maintain a positive self-image (Oh, Goh & Phan, 2023).

Self-presentation theory has been applied to effectively explore human deception (DeAndrea et al., 2012; Toma, Hancock & Ellison, 2008). Individuals may apply impression management strategies to falsely show themselves favourably to achieve their desired goals (Petrescu, Ajjan & Harrison, 2023). Research shows that individuals whose motivation to produce a positive impression in a group is low are likely to present themselves in an authentic way (Wooten & Reed, 2000). Similarly, if individuals are highly motivated to create a favourable image, they are not likely to use deception in a group unless they possess the self-efficacy to engage in deceptive work (Wooten & Reed, 2000). Meanwhile, those with low self-efficacy will probably pursue evasive self-presentation practices, such as stalling or repressing

information (Wooten & Reed, 2000). Self-efficacy in the context of impression management means the extent to which an individual can control and manage their impression. It is subject to the requirements or demands of self-presentation in a particular social context, and the capabilities one possesses to achieve those demands (Schlenker & Leary, 1982). Figure 2 offers a framework that highlights deceptive self-presentation work in groups.

Figure 2: Behavioural consequences of self-presentational concerns among focus group participants. Source Wooten & Reed (2000)
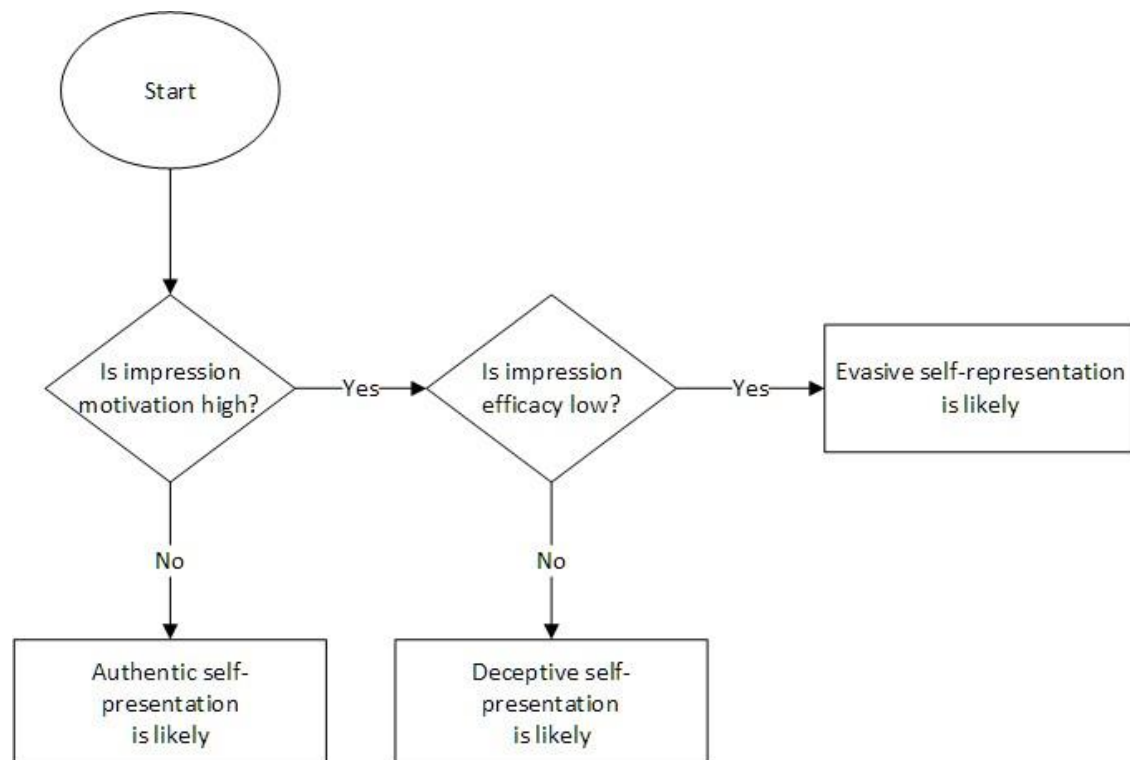
Importantly, with the advancements in digital technologies, such as artificial intelligence and deepfakes, individuals can develop content that may look real even though it is not (Mustak et al., 2023; Vasist & Krishnan, 2023). As a result, it has become extremely challenging to differentiate between authentic and fabricated content. This is further exacerbated as individuals can use digital tools, such as video filters, to project a misleading identity (Herring et al., 2024).

Limitations

Sociologists suggest that self-presentation theory, rooted in symbolic interactionism, focuses on micro-level interpretations of signs and meanings but offers a limited understanding of the broader societal factors and powers that influence individuals' lives (Shulman, 2016). Moreover, management studies criticise the analytical ability of a theatre metaphor to explore impression management within organisations (Shulman, 2016). While self-presentation theory may be a useful framework, the

extent to which a theatre's characteristics relate to an organisation has been questioned (Shulman, 2016). This limitation is acknowledged by Goffman, who states in his book that "*the perspective employed in this report is that of the theatrical performance; the principles derived are dramaturgical ones ... In using this model I will attempt not to make light of its obvious inadequacies. The stage presents things that are make-believe; presumably life presents things that are real.*" (Goffman, 1959). Ongoing management research is attending to this limitation by investigating how employees manage their impression towards their co-workers and supervisors in organisations (Huang, Paterson & Wang, 2024).

Along the same lines, scholars have questioned the validity of a "*performance*" in self-presentation and whether such rituals are relevant in today's society (Williams, 1986). The theory focuses on face-to-face interactions to manage impressions (Williams, 1986). Blumer (1972) suggests that the theory "*stems from the narrowly constructed area of human group life ....limited the area of face-to-face association with a corresponding exclusion of the vast sum of human activity falling outside such association.*" However, ongoing scholarly work is addressing this limitation by evaluating self-presentation in online environments, such as social media (Klostermann et al., 2023; Seidman, 2013). Self-presentation theory focuses heavily on the individual, and its applications to teams have received comparatively limited attention and extension (Blumer, 1972). As a result, recent research has looked into impression management on teamwork and team satisfaction (Schiller et al., 2024).

Scholars suggest that although Goffman's conceptualisation of the interaction order offers a unique yet descriptive theoretical property, it provides limited knowledge of how the interaction order evolves over time and the explanatory variables that could suggest how and why the change occurred (Colomy & Brown, 1996). Importantly, Goffman's conceptualisation of total institutions has received criticism in terms of its theoretical scope and generalisability, as not all organisations, such as mental hospitals, exert extreme control (Lemert, 1981). The total institution does not consider differences in "*organisational goal, professional ideology, staff personality*" (Weinstein, 1982:p269). Thus, research has looked into the application of impression management under different institutional environments, uncertainties in the business environment, and organisational motives (Ahmed, Elsayed & Xu, 2024; Busenbark, Lange & Certo, 2017).

Concepts

Rehearsal (Independent): The preparation work for the frontstage (Siegel, Tussyadiah & Scarles, 2023)

Self-promotion (Independent): The creation of a credible image of oneself in the minds of others (Giacalone & Rosenfeld, 1986)

Exemplification (Independent): The creation of an impression of oneself as virtuous and honourable (Gardner, 2003)

Supplication (Independent): The action of showing oneself as vulnerable and frail to draw adequate support and help from others (Christopher et al., 2005)

Ingratiation (Independent): The practice of creating a likable and attractive impression in a particular place (Bolino, Long & Turnley, 2016)

Identification (Independent): The action of associating oneself with a particular community to create a specific image in society (Brewer & Gardner, 1996)

Basking In Reflected Glory (Independent): The action of associating oneself with another person who has a positive impression in society to leverage those associations (Schütz, 1998)

Downward Comparison (Independent): The action of projecting oneself as superior and in a positive light to the detriment of others (Wills, 1981)

Upward Comparison (Independent): The action of comparing oneself with someone superior (Collins, 1996)

Remaining Silent (Independent): The practice for individuals to be neutral and not face any criticism or backlash by not engaging in the conversation (Schütz, 1998)

Apology (Independent): The practice of showing remorse due to a wrong action and promising morally righteous conduct in the future. (Hart, Tortoriello & Richardson, 2020)

Self-esteem (Dependent): The belief of having self-worth (Leary & Kowalski, 1990)

Self-identity (Dependent): The practice of creating a unique perception of oneself in public (Leary & Kowalski, 1990)

Social And Material Benefits (Dependent): Social rewards relate to non-financial aspects of life such as trust, affection, and friendship. Material rewards include financial gains. (Leary & Kowalski, 1990)

Backstage Strategy (Independent): The practice of reflecting, practising, and taking adequate measures to prepare oneself (Goffman, 1959)

Frontstage Strategy (Independent): The presentation of self in public or in society (Goffman, 1959)

Idealisation (Independent): Performing an ideal accredited impression (Goffman, 1959)

Mystification (Independent): Holding the observers in a state of awe (Goffman, 1959)

References

Adams, B.N. & Sydie, R.A. (2002). *Contemporary Sociological Theory*. Pine Forge Press.

Ahmed, Y., Elsayed, M. & Xu, B. (2024). *Bankruptcy in the UK: Do Managers Talk the Talk Before Walking the Walk?*.

Alo, O., Ali, I., Zahoor, N., Arslan, A. & Golgeci, I. (2023). Impression management and leadership in failing or failed business-to-business firms during and post-COVID-19: Empirical insights from Africa. *Industrial Marketing Management*, 113, 1-13.

Ashford, S.J., Rothbard, N.P., Piderit, S.K. & Dutton, J.E. (1998). Out on a Limb: The Role of Context and Impression Management in Selling Gender-Equity Issues. *Administrative Science Quarterly*, 43 (1), 23.

Bande, B., Jaramillo, F., Fernández-Ferrín, P. & Varela, J.A. (2019). Salesperson coping with work-family conflict: The joint effects of ingratiation and self-promotion. *Journal of Business Research*, 95, 143-155.

Bareket-Bojmel, L., Moran, S. & Shahar, G. (2016). Strategic self-presentation on Facebook: Personal motives and audience response to online behavior. *Computers in Human Behavior*, 55, 788-795.

Benthaus, J., Risius, M. & Beck, R. (2016). Social media management strategies for organizational impression management and their effect on public perception. *The Journal of Strategic Information Systems*, 25 (2), 127-139.

Bitner, M.J. (1992). Servicescapes: The Impact of Physical Surroundings on Customers and Employees. *Journal of Marketing*, 56 (2), 57.

Blumer, H. (1986). *Symbolic Interactionism*. University of California Press.

Blumer, H.G. (1972). Action vs interaction: Review of relations in Public by Erving Goffman 1971. *Society*, 9, 50–53.

Bolino, M., Long, D. & Turnley, W. (2016). Impression Management in Organizations: Critical Questions, Answers, and Areas for Future Research. *Annual Review of Organizational Psychology and Organizational Behavior*, 3 (1), 377-406.

Bolino, M.C. & Turnley, W.H. (1999). Measuring Impression Management in Organizations: A Scale Development Based on the Jones and Pittman Taxonomy. *Organizational Research Methods*, 2 (2), 187-206.

Bolino, M.C., Kacmar, K.M., Turnley, W.H. & Gilstrap, J.B. (2008). A Multi-Level Review of Impression Management Motives and Behaviors. *Journal of Management*, 34 (6), 1080-1109.

Bonner, J.M., Greenbaum, R.L. & Quade, M.J. (2017). Employee unethical behavior to shame as an indicator of self-image threat and exemplification as a form of self-image protection: The exacerbating role of supervisor bottom-line mentality. *Journal of Applied Psychology*, 102 (8), 1203-1221.

Brewer, M.B. & Gardner, W. (1996). Who is this "We"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, 71 (1), 83-93.

Burke, K.D. (1969). *A grammar of motives*. Univ. of California Press.

Busenbark, J.R., Lange, D. & Certo, S.T. (2017). Foreshadowing as Impression Management: Illuminating the Path for Security Analysts. *Strategic Management Journal*, 38 (12), 2486-2507.

Cannon, C. & Rucker, D.D. (2019). The Dark Side of Luxury: Social Costs of Luxury Consumption. *Personality and Social Psychology Bulletin*, 45 (5), 767-779.

Carter, S.M. (2006). The Interaction of Top Management Group, Stakeholder, and Situational Factors on Certain Corporate Reputation Management Activities*. *Journal of Management Studies*, 43 (5), 1145-1176.

Chen, H. & Chen, H. (2020). Understanding the relationship between online self-image expression and purchase intention in SNS games: A moderated mediation investigation. *Computers in Human Behavior*, 112, 106477.

Cho, C.H., Laine, M., Roberts, R.W. & Rodrigue, M. (2018). The Frontstage and Backstage of Corporate Sustainability Reporting: Evidence from the Arctic National Wildlife Refuge Bill. *Journal of Business Ethics*, 152 (3), 865-886.

Christopher, A.N., Morgan, R.D., Marek, P., Keller, M. & Drummond, K. (2005). Materialism and self-presentational styles. *Personality and Individual Differences*, 38 (1), 137-149.

Cialdini, R.B., Borden, R.J., Thorne, A., Walker, M.R., Freeman, S. & Sloan, L.R. (1976). Basking in reflected glory: Three (football) field studies. *Journal of Personality and Social Psychology*, 34 (3), 366-375.

Clark, T., Slama, M. & Wolfe, R. (1999). Consumption as Self-Presentation: A Socioanalytic Interpretation of Mrs. Cage. *Journal of Marketing*, 63 (4), 135-138.

Cohen, A.R. (1959). *Situational structure, self-esteem, and threat-oriented reactions to power.* .

Collins, R.L. (1996). For better or worse: The impact of upward social comparison on self-evaluations. *Psychological Bulletin*, 119 (1), 51-69.

Colomy, P. & Brown, J.D. (1996). Goffman and Interactional Citizenship. *Sociological Perspectives*, 39 (3), 371-381.

Cook, C., Callahan, J.L., Pollet, T.V. & Elliott, C. (2024). Gender(ed) performances: Women's impression management in stand-up comedy. *Human Relations*, 77 (4), 533-559.

Cowen, A.P. & Montgomery, N.V. (2020). To be or not to be sorry? How CEO gender impacts the effectiveness of organizational apologies. *Journal of Applied Psychology*, 105 (2), 196-208.

Crossman, A. (2019). *Assessing a situation, in terms of sociology.* .

Davis, J.L. & Jurgenson, N. (2014). Context collapse: theorizing context collusions and collisions. *Information, Communication & Society*, 17 (4), 476-485.

DeAndrea, D.C., Tom Tong, S., Liang, Y.J., Levine, T.R. & Walther, J.B. (2012). When Do People Misrepresent Themselves to Others? The Effects of Social Desirability, Ground Truth, and Accountability on Deceptive Self-Presentations. *Journal of Communication*, 62 (3), 400-417.

DeAndrea, D.C., Tong, S.T. & Lim, Y. (2018). What causes more mistrust: profile owners deleting user-generated content or website contributors masking their identities?. *Information, Communication & Society*, 21 (8), 1068-1080.

Duguay, S. (2016). "He has a way gayer Facebook than I do": Investigating sexual identity disclosure and context collapse on a social networking site. *New Media & Society*, 18 (6), 891-907.

Evreinov, N. (1927). *The theater in life*. NY: Brentanos.

Ferraro, R., Kirmani, A. & Matherly, T. (2013). Look at Me! Look at Me! Conspicuous Brand Usage, Self-Brand Connection, and Dilution. *Journal of Marketing Research*, 50 (4), 477-488.

Fisk, R.P. & Grove, S.J. (1996). Applications of impression management and the drama metaphor in marketing: an introduction. *European Journal of Marketing*, 30 (9), 6-12.

Gardner, W.L. & Martinko, M.J. (1988). Impression Management in Organizations. *Journal of Management*, 14 (2), 321-338.

Gardner, W.L. (2003). Perceptions Of Leader Charisma, Effectiveness, And Integrity. *Management Communication Quarterly*, 16 (4), 502-527.

Giacalone, R.A. & Rosenfeld, P. (1986). Self-Presentation and Self-Promotion in an Organizational Setting. *The Journal of Social Psychology*, 126 (3), 321-326.

Gioaba, I. & Krings, F. (2017). Impression Management in the Job Interview: An Effective Way of Mitigating Discrimination against Older Applicants?. *Frontiers in Psychology*, 8.

Goffman, E. (1959). *The presentation of self in everyday life*. Doubleday.

Goffman, E. (1961). *Asylums*. Walter de Gruyter, Inc.

Goffman, E. (1968). *Asylums*. Penguin.

Goffman, E. (1983). The Interaction Order: American Sociological Association, 1982 Presidential Address. *American Sociological Review*, 48 (1), 1.

Goffman, E. (1986). *Stigma Notes on the Management of Spoiled Identity*. Prentice Hall.

Gross, C., Debus, M.E., Liu, Y., Wang, M. & Kleinmann, M. (2021). I am nice and capable! How and when newcomers' self-presentation to their supervisors affects socialization outcomes. *Journal of Applied Psychology*, 106 (7), 1067-1079.

Grove, S.J., Fisk, R.P. & John, J.D. (2000). *Services as theater: Guidelines and implications.*. Thousand Oaks, CA: Sage.

Hart, W., Tortoriello, G.K. & Richardson, K. (2020). Profiling personality-disorder traits on self-presentation tactic use. *Personality and Individual Differences*, 156, 109793.

Herring, S.C., Dedema, M., Rodríguez, E. & Yang, L. (2024). *Strategic use of video face filter types: Influence of audience, gender, and culture*.

Hogan, B. (2010). The Presentation of Self in the Age of Social Media: Distinguishing Performances and Exhibitions Online. *Bulletin of Science, Technology & Society*, 30 (6), 377-386.

Huang, L., Paterson, T.A. & Wang, S. (2024). Identity-Consistent Self-Image Maintenance Following Leader Abuse: Integrating Self-Presentation and Self-Concept Orientation Perspectives. *Journal of Management*, 50 (4), 1361-1392.

Huber, M.A., Metze, R.N., Stam, M., Regenmortel, T.V. & Abma, T.A. (2020). Self-managed programmes in homeless care as (reinvented) institutions. *International Journal of Qualitative Studies on Health and Well-being*, 15 (1), 1719002.

Im, J., Kim, H. & Miao, L. (2021). CEO letters: Hospitality corporate narratives during the COVID-19 pandemic. *International Journal of Hospitality Management*, 92, 102701.

Jacobs, B.A. (1992). UNDERCOVER DECEPTION. *Journal of Contemporary Ethnography*, 21 (2), 200-225.

Jeacle, I. (2014). "And the BAFTA goes to […]": the assurance role of the auditor in the film awards ceremony. *Accounting, Auditing & Accountability Journal*, 27 (5), 778-808.

Jiménez-Barreto, J., Correia Loureiro, S.M., Rubio, N. & Romero, J. (2022). Service brand coolness in the construction of brand loyalty: A self-presentation theory approach. *Journal of Retailing and Consumer Services*, 65, 102876.

Jin, J., Li, H. & Hoskisson, R. (2022). The Use of Strategic Noise in Reactive Impression Management: How Do Market Reactions Matter?. *Academy of Management Journal*, 65 (4), 1303-1326.

Kibler, E., Mandl, C., Farny, S. & Salmivaara, V. (2021). Post-failure impression management: A typology of entrepreneurs' public narratives after business closure. *Human Relations*, 74 (2), 286-318.

Kim, H., Chan, H.C. & Kankanhalli, A. (2012). What Motivates People to Purchase Digital Items on Virtual Community Websites? The Desire for Online Self-Presentation. *Information Systems Research*, 23 (4), 1232-1245.

Kim, T., David, E.M., Chen, T. & Liang, Y. (2023). Authenticity or Self-Enhancement? Effects of Self-Presentation and Authentic Leadership on Trust and Performance. *Journal of Management*, 49 (3), 944-973.

Kim, Y. & Oh, K.W. (2022). The effect of materialism and impression management purchase motivation on purchase intention for luxury athleisure products: the moderating effect of sustainability. *Journal of Product & Brand Management*, 31 (8), 1222-1234.

Klostermann, J., Meißner, M., Max, A. & Decker, R. (2023). Presentation of celebrities' private life through visual social media. *Journal of Business Research*, 156, 113524.

Korzynski, P., Haenlein, M. & Rautiainen, M. (2021). Impression management techniques in crowdfunding: An analysis of Kickstarter videos using artificial intelligence. *European Management Journal*, 39 (5), 675-684.

Lan, H. & Sheng, J. (2023). In anticipation of a downturn: The role of impression management in buffering against failure. *Industrial Marketing Management*, 115, 355-367.

Leary, M.R. & Kowalski, R.M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin*, 107 (1), 34-47.

Lee, J., Ko, E. & Megehee, C.M. (2015). Social benefits of brand logos in presentation of self in cross and same gender influence contexts. *Journal of Business Research*, 68 (6), 1341-1349.

Lemert, E.M. (1981). Issues in the study of deviance. *The Sociological Quarterly*, 22 (2), 285–305.

Lewis, M.A. & Neighbors, C. (2005). Self-Determination and the Use of Self-Presentation Strategies. *The Journal of Social Psychology*, 145 (4), 469-490.

Ma, M. & Agarwal, R. (2007). Through a Glass Darkly: Information Technology Design, Identity Verification, and Knowledge Contribution in Online Communities. *Information Systems Research*, 18 (1), 42-67.

Mohamed, A.A., Gardner, W.L. & Paolillo, J.G.P. (1999). A taxonomy of organizational impression management tactics . *Journal of Competitiveness Studies*, 7 (1), 108-130.

Moon, B., Daljeet, K.N., Bourdage, J.S. & Roulin, N. (2024). Impression Management Profiles in Job Interviews: Relations with Applicant Individual Differences and Interview Outcomes. *Journal of Business and Psychology*, 39 (4), 849-870.

Mustak, M., Salminen, J., Mäntymäki, M., Rahman, A. & Dwivedi, Y.K. (2023). Deepfakes: Deceptions, mitigations, and opportunities. *Journal of Business Research*, 154, 113368.

Oh, H., Goh, K. & Phan, T.Q. (2023). Are You What You Tweet? The Impact of Sentiment on Digital News Consumption and Social Media Sharing. *Information Systems Research*, 34 (1), 111-136.

Ollier-Malaterre, A., Rothbard, N.P. & Berg, J.M. (2013). When Worlds Collide in Cyberspace: How Boundary Work in Online Social Networks Impacts Professional Relationships. *Academy of Management Review*, 38 (4), 645-669.

Petrescu, M., Ajjan, H. & Harrison, D.L. (2023). Man vs machine – Detecting deception in online reviews. *Journal of Business Research*, 154, 113346.

Premeaux, S.F. & Bedeian, A.G. (2003). Breaking the Silence: The Moderating Effects of Self- Monitoring in Predicting Speaking Up in the Workplace*. *Journal of Management Studies*, 40 (6), 1537-1562.

Ranzini, G. & Hoek, E. (2017). To you who (I think) are listening: Imaginary audience and impression management on Facebook. *Computers in Human Behavior*, 75, 228-235.

Razmus, W., Czarna, A.Z. & Fortuna, P. (2023). Luxury consumption and the dark triad of personality. *Journal of Business Research*, 169, 114246.

Rim, H. & Ferguson, M.A.T. (2020). Proactive Versus Reactive CSR in a Crisis: An Impression Management Perspective. *International Journal of Business Communication*, 57 (4), 545-568.

Rui, J. & Stefanone, M.A. (2013). Strategic self-presentation online: A cross-cultural study. *Computers in Human Behavior*, 29 (1), 110-118.

Schau, J.H. & Gilly, M.C. (2003). We Are What We Post? Self-Presentation in Personal Web Space. *Journal of Consumer Research*, 30 (3), 385-404.

Schembri, S. (2009). Reframing brand experience: The experiential meaning of Harley–Davidson. *Journal of Business Research*, 62 (12), 1299-1310.

Schiller, S., Nah, F.F., Luse, A. & Siau, K. (2024). Men are from Mars and women are from Venus: dyadic collaboration in the metaverse. *Internet Research*, 34 (1), 149-173.

Schlenker, B.R. & Leary, M.R. (1982). Social anxiety and self-presentation: A conceptualization model. *Psychological Bulletin*, 92 (3), 641-669.

Schlenker, B.R. (1980). *Impression management*. Brooks/Cole Pub. Co.

Schniederjans, D., Cao, E.S. & Schniederjans, M. (2013). Enhancing financial performance with social media: An impression management perspective. *Decision Support Systems*, 55 (4), 911-918.

Schütz, A. (1997). Self- Presentational Tactics of Talk- Show Guests: A Comparison of Politicians, Experts, and Entertainers[1]. *Journal of Applied Social Psychology*, 27 (21), 1941-1952.

Schütz, A. (1998). Assertive, Offensive, Protective, and Defensive Styles of Self-Presentation: A Taxonomy. *The Journal of Psychology*, 132 (6), 611-628.

Scott, S. (2010). Revisiting the Total Institution: Performative Regulation in the Reinventive Institution. *Sociology*, 44 (2), 213-231.

Scott, S. (2011). *Total Institutions and Reinvented Identities*. Palgrave Macmillan.

Seidman, G. (2013). Self-presentation and belonging on Facebook: How personality influences social media use and motivations. *Personality and Individual Differences*, 54 (3), 402-407.

Shepherd, D.A. & Haynie, J.M. (2011). Venture failure, stigma, and impression management: A self- verification, self- determination view. *Strategic Entrepreneurship Journal*, 5 (2), 178-197.

Shi, J., Lai, K.K. & Chen, G. (2023). Examining retweeting behavior on social networking sites from the perspective of self-presentation. *PLOS ONE*, 18 (5), e0286135.

Shulman, D. (2016). *The Presentation of Self in Contemporary Social Life*. SAGE Publications, Inc.

Siegel, L.A., Tussyadiah, I. & Scarles, C. (2023). Cyber-physical traveler performances and Instagram travel photography as ideal impression management. *Current Issues in Tourism*, 26 (14), 2332-2356.

Stone, J., Wiegand, A.W., Cooper, J. & Aronson, E. (1997). When exemplification fails: Hypocrisy and the motive for self-integrity. *Journal of Personality and Social Psychology*, 72 (1), 54-65.

Sun, Y., Fang, S. & Zhang, Z.(. (2021). Impression management strategies on enterprise social media platforms: An affordance perspective. *International Journal of Information Management*, 60, 102359.

Tiilikainen, S., Tuunainen, V., Sarker, S. & Arminen, I. (2024). Toward a Process-Based, Interpretive Understanding of How Collaborative Groups Deal With ICT Interruptions. *MIS Quarterly*, 48 (1), 167-218.

Toma, C.L., Hancock, J.T. & Ellison, N.B. (2008). Separating Fact From Fiction: An Examination of Deceptive Self-Presentation in Online Dating Profiles. *Personality and Social Psychology Bulletin*, 34 (8), 1023-1036.

Vasist, P.N. & Krishnan, S. (2023). Engaging with deepfakes: a meta-synthesis from the perspective of social shaping of technology theory. *Internet Research*, 33 (5), 1670-1726.

Vohs, K.D., Baumeister, R.F. & Ciarocco, N.J. (2005). Self-Regulation and Self-Presentation: Regulatory Resource Depletion Impairs Impression Management and Effortful Self-Presentation Depletes Regulatory Resources. *Journal of Personality and Social Psychology*, 88 (4), 632-657.

Weinstein, R.M. (1982). Goffman's asylums and the social situation of mental patients. *Orthomolecular Psychiatry*, 11 (4), 267–274.

Williams, S.J. (1986). Appraising Goffman. *The British Journal of Sociology*, 37 (3), 348.

Wills, T.A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, 90 (2), 245-271.

Windscheid, L., Bowes-Sperry, L., Jonsen, K. & Morner, M. (2018). Managing Organizational Gender Diversity Images: A Content Analysis of German Corporate Websites. *Journal of Business Ethics*, 152 (4), 997-1013.

Wooten, D.B. & Reed, A. (2000). A Conceptual Overview of the Self-Presentational Concerns and Response Tendencies of Focus Group Participants. *Journal of Consumer Psychology*, 9 (3), 141-153.

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Social Capital Theory

Social capital refers to the structure and quality of social relationships and constitutes a positive product of social interactions that can be a source of benefits for individuals, social groups and the society as a whole.

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Theory Factsheet

Proposed By: Bourdieu, 1986

Related Theories: Human Capital

Discipline: Sociology

Unit of Analysis: Individual, social groups, regional/national

Level: Micro-level/Meso-level/Macro-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

The concept of social capital (SC) has evolved over three periods. The first period was at the beginning of the last century reaching up to 1980. The second period took place in the 80s and 90s, when Pierre Bourdieu (1986), James Coleman (1988), and Robert Putnam (1995) developed the construct and were established as its main theorists. Finally, from the 90s onwards, several scholars have developed a strong interest in the construct, aiming to delimit the content of the term, to investigate its role in various scientific fields (e.g., economics, psychology, health, education), and to measure it.

The first person who used the term "*social capital*" was the pedagogue Lyda Judson Hanifan (1916), who described it as the elements of everyday life such as goodwill, friendliness, mutual sympathy, and the breadth of social contacts. In 1961, the economist Jane Jacobs (1992) defined social capital as the existence and function of social networks in the big cities of the USA and claimed that it is the real wealth of these cities regarding their economic development. In the 70s, the economist Greg Loury (1977) used the term in his study of social inequalities across various ethno-racial groups, defining it as the networks of family and social relations that can promote the knowledge and abilities of a person. According to Loury, individuals'

social connections determine their access to education, work, and other social goods.

However, it was only during the 80s and 90s that social capital theory was grounded. The first to introduce SC in a systematic manner was the sociologist Pierre Bourdieu (1986), who approached it as individuals' access to a collective resource. Bourdieu distinguished between four forms of capital: the economic (which refers to property rights), the cultural (e.g., various assets, such as university degrees), the symbolic (which reflects the social prestige of individuals) and the social (which refers to the resources derived from social connections). Economic capital is the basis. All the other types of capital stem from this through a series of complex and non-automated transformative processes, and, under certain conditions, may be converted to economic capital (Bourdieu, 1986). For example, through social connections (i.e., social capital) individuals can have better access to financial resources (e.g., investment capital). Similarly, James Coleman (1988), who was primarily interested in the sociology of education, distinguished between physical (e.g., tangible aspects such as a machine), human (e.g., social skills and knowledge) and social (e.g., social relationships) capital, and he highlighted the role of social capital for the creation of human capital (e.g., family and community support may create development opportunities for young people). Finally, while Bourdieu and Coleman adopted an individualist approach to SC, Robert Putnam (1995) proposed the collective approach that defines it as a public good. According to Putnam (1995), SC concerns the amount of trust and civic participation which is available in a community, a city, or a state and may facilitate interpersonal cooperation, from which all community members may benefit irrespective of their unique investment in social networks.

From the 90s onwards, social capital theory gained momentum. Several scholars from different scientific fields, such as economics (SCHIFF, 1992;Ostrom, 2000), sociology (Carpiano, 2006;Portes, 1998), psychology (Lin, 2002), and educational studies (Israel, Beaulieu & Hartless, 2001), attempted to conceptualise and understand the construct. At the same time, international organisations (OECD, 2001;World Bank, 1998) provided a framework regarding the definition and the dimensions of SC. Despite these developments, Bourdieu (1986) and Putnam (1995) are still considered to be the main theorists of the concept.

Theory

Social capital refers to the structure and quality of social relationships, from which individuals, social groups and the society may benefit (Sarracino & Mikucka, 2017). Although the literature on social capital has grown significantly, there is no consensus regarding its conceptualisation and operationalisation (Fine, 2001;Storberg, 2002). However, most scholars agree that social capital is a multidimensional resource that is generated through interpersonal interactions, and it includes both network ties and shared values, such as trust and reciprocity, that may facilitate cooperation and collective action (Agampodi et al., 2015;Lin, 2002;Tsounis et al., 2023).

The main theoretical approaches to social capital as a resource are the individualist and the collective. According to Bourdieu (1986), who is the main theorist of the individualist approach, SC reflects the material advantages gained by individuals

who participate in various social networks, as long as they adhere to certain rules of social behaviour that apply within these networks (Carpiano, 2006). These networks constitute a collective resource that all participants have access to, and where their commitment and intentional action is required. Individual actors may create these networks and participate in compliance with the formal or unspoken rules of these networks in order to gain benefits. Thus, these networks are developed because of the deliberate effort aimed at maximising a benefit (Bourdieu, 1986). The amount of SC to which individuals have access depends on the size of the network connections that they can effectively mobilise, and on the amount of SC possessed by the individuals and groups of their social environment (Bourdieu, 1986). Hence, emphasis is placed both on the extent and the content of social relationships. When it comes to the measurement of the construct, Bourdieu (1986) argued that it is better to be assessed at the individual level. That is, although Bourdieu recognised social networks and their function as a collective resource, he suggested that it is relevant to assess the amount of SC each individual has access to because the results of the participation in the same social networks may be different for different individuals (Bourdieu, 1986). Under this prism, the most important thing regarding the function and the benefits that derive from SC is not its mere existence, but the extent to which an individual has access to and makes use of the available SC. In addition, in order for SC to happen, individuals need to be able (i.e., have the necessary resources such as energy and time) and willing to engage in activities (e.g., networking, collaboration) that promote SC.

Robert Putnam (1995), who proposed the collective approach, conceptualised social capital as a set of characteristics of a community or social group (e.g., community networks, civic engagement, the cultivation of a strong civic identity), as well as the development of trust and reciprocity between the members of the community or the group (Putnam, 1995). This means that community members can cope with the demands of an adverse situation by using the available resources that exist in their network (Kritsotakis & Gamarnikow, 2004;Putnam, 1995).The positive effects of SC may be boosted when these characteristics are activated, while they may be weakened when these characteristics are not used. For Putnam (1995), SC is a collective characteristic of social structures and as such it must be conceptualised and measured as an ecological resource characterising communities, groups or organisations (Putnam, 1995). Thus, SC is elevated from a feature of individuals to a feature of communities, becoming a collective trait that functions at the aggregate level. According to the collective view, the benefits of SC as a resource go beyond each individual, since collective SC impacts positively the communities where people live in, the organisations where they work, and the society as a whole. For example, social capital may increase a firm's productivity and innovation (Hasan et al., 2020), contribute to community resilience (Liu et al., 2022), and to a countries' financial development (Elkhuizen et al., 2018), even if its usefulness is not the same for all individuals in these groups. The main characteristics of both the individualist and collective approach are depicted in Figure 1.

Figure 1: Theoretical Approaches to Social Capital as a Resource

	Individualist Approach	Collective Approach
Main Theorist	Pierre Bourdieu	Robert Putnam
Starting Point	Financial Capital	Human Capital
Type of Resource/Type of access	Collective/Individual	Collective/Collective
Effects	Personal Growth	Community Growth
Level of Analysis	Micro-level	Meso-/Macro-level

Based on its main characteristics and functions, SC has been distinguished into: (i) bonding, bridging and linking (Ferlander, 2007;Harpham, 2002;DiClemente, 2002;Woolcock & Narayan, 2000), and (ii) structural, cognitive and relational (Krishna, 2001;Uphoff & Wijayaratna, 2000). The first distinction refers to the proximity of linkages between different actors and the direction of social action, while the second refers to the specific dimensions of SC. Bonding SC refers to close/strong ties between individuals within a homogeneous group (e.g., family, close friends) that strengthen the common identities and functions as a resource shared among members. Bridging SC refers to more distant network connections amongst people of heterogeneous or different groups (e.g., neighbours, members of different social groups) (Harpham, 2002;DiClemente, 2002;Putnam, 2000). Finally, linking SC refers to vertical ties between people in different formal power hierarchies (e.g., governmental organisations (DiClemente, 2002;Szreter & Woolcock, 2004;Woolcock & Narayan, 2000)). In the case of bonding SC, the social action has an inward direction (i.e., within group), while in the case of both bridging and linking the social action is directed outward. The second distinction refers to the dimensions of social capital. Structural refers to externally observed social constructions such as closer network ties (e.g., with family members, friends and colleagues), as well as less proximal ties (e.g., strangers that could be approached trough organisational and financial collaborations), that may both facilitate access to resources. Cognitive SC refers to intangible aspects like shared values attitudes and beliefs (e.g., trust and reciprocity) (Harpham, 2002;Uphoff & Wijayaratna, 2000). Finally, relational SC -which was initially proposed by Nahapiet and Ghoshal (1998) - refers to the nature and quality of social relationships. However, this dimension is not widely used since it largely overlaps with cognitive and structural SC (Murayama, Fujiwara & Kawachi, 2012). The distinctions between the main forms of social capital are presented in Figure 2.

Figure 2: Basic Forms of Social Capital - Distinction based on the proximity of linkages and the direction of the social action & Distinction based on the content (i.e., dimensions of social capital)
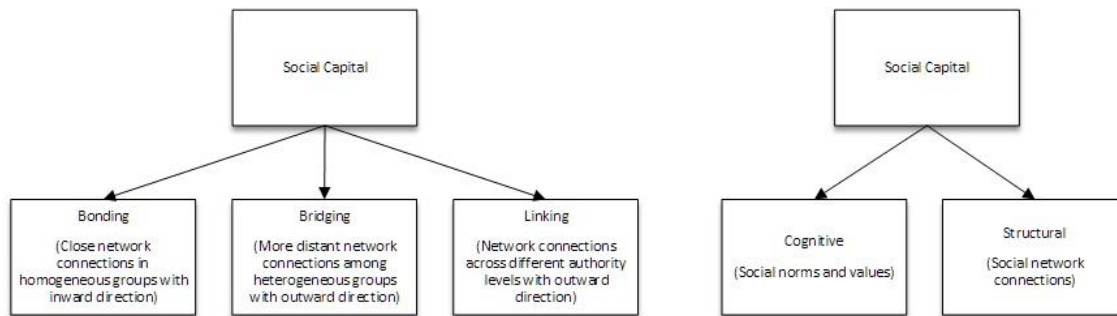
Several other, less common, distinctions which are found in the literature are presented in Table 1. These distinctions are not widely used, because they are either not supported by a strong theoretical framework or they largely overlap with the most dominant distinctions. For instance, the positive vs. negative distinction (Graeff & Svendsen, 2013) integrates the characteristics of SC with its outcomes (e.g., negative SC is related to the reproduction of inequalities). In a similar vein, the distinction between instrumental vs. principled (Heffron, 2001) is based only on the motives for social participation, which again mixes up the dimensions with the antecedents of SC. The horizontal vs. vertical (Dolfsma & Dannreuther, 2003), as well as formal vs. informal (Dhesi, 2000), distinctions broadly overlap with some aspects of the predominant bonding/bridging/linking distinction, without capturing both the closeness of social ties and the direction of social action, in a comprehensive way (as in the case of bonding/bridging/linking differentiation). Finally, other forms such as open vs. closed (Van Deth, 2003), or approaches that distinguish SC according to the strength of social ties, i.e. weak vs strong ties (Granovetter, 1985), have not been empirically supported, or they have been incorporated in as a part of the predominant distinctions, as described above.

Table 1: Less Common Distinctions of Social Capital

Social Capital	Description	
Positive vs.	Reciprocal social relationships with positive social impact.	(Graeff & Svendsen, 2013)
Negative	Social relationships (e.g., a criminal organisation) resulting in negative social effects.	
Instrumental vs.	Social interactions and relationships that facilitate individual prosperity.	(Heffron, 2001)

Principled	Social interactions based on principles and ethical values	
Horizontal vs.	Ties among individuals within the same groups.	(Dolfsma & Dannreuther, 2003)
Vertical	Ties among individuals across different hierarchical levels	
Formal vs.	Norms, procedures and relationships that concern formal participation in civic organisations.	(Dhesi, 2000)
Informal	Social relationships with family members, friends, or colleagues, where institutional consolidation of networks is not required.	
Open vs.	Civically engaged and based on open membership.	(Van Deth, 2003)
Closed	Protective and exercising closed membership, aiming at individual benefits.	

Despite the lack of consensus regarding what social capital is, the extant literature seems to agree about its role as a resource that captures both social norms (i.e., cognitive) and network connections (i.e., structural). The most important social norms that are identified in the literature are trust and reciprocity (Tsounis et al., 2023). Trust refers to the "*actor' s belief that, at worst, others will not knowingly or willingly do him harm, and at best, that they will act in his interests*" (Newton, 2001:p202). Trust enhances collective behaviour and productive cooperation, reduces transactional costs, strengthens the ability of individuals, groups, and organisations to work together for common purposes, and helps maintain peaceful and stable social relations (Fukuyama, 2002;Newton, 2001). Reciprocity constitutes a dynamic social condition where people, give, receive, and return emotional and functional support (Mauss, Guyer & Maurer, 2011). Thus, reciprocity is a way to establish mutual social relationships, since giving implies a rigorous commitment to reciprocate (Torche & Valenzuela, 2011). The exchange of mutual support motivates individuals to further re-invest in certain positive social relationships (Xu, Li & Zhang, 2021). Finally, beyond social norms, SC concerns strong social networks, which constitute its structural aspect. Social networks encompass horizontal and vertical connections between individuals, social groups, and organisations that provide access to further resources, which, in turn, can be invested for gaining benefits (Lin, 2002).

Next to these core dimensions (i.e., trust, reciprocity and network connections), several other dimensions of SC have been proposed in the literature but are considered problematic for several reasons. For example, social participation, which refers to active citizenship behaviours (De Silva et al., 2006;Harpham, 2002;Putnam, 1995), broadly overlaps with network interactions that capture connectedness or structural SC. Similarly, helpfulness, solidarity or social responsibility overlap with trust and reciprocity. Social cohesion, which refers to the sense of security and coherence within the community (Onyx & Bullen, 2000), is more a result rather than a dimension of SC. Justice and tolerance of diversity are close yet distinct construcks from SC, while other dimensions, such as democratic orientations, cannot be broadly applied to define the construct (Van Deth, 2003).

The conceptualisation of SC is intertwined with the way it is measured. In line with theory, social capital can be assessed at different levels of analysis, namely, the micro-, the meso-, and the macro-level (Villalonga-Olives & Kawachi, 2015). Assessing SC at the micro-level of analysis is in line with the individualist tradition, according to which it refers to one's personal connections, the strength of these connections, and the resources available to these connections. In this context, SC is assessed with scales that evaluate individuals' access to the SC of the social structures in which they are embedded, e.g., the organisation in which they work (Flap & Völker, 2001), or the community where they live (Chen et al., 2009). Meso- and macro-level approaches are based on the ecological tradition, according to which SC is a collectively produced and owned resource, from which the whole community may benefit (Putnam, 2000). To this end, at the meso-level, SC is measured as a collective resource of an organisation or a workplace (Tsounis et al., 2023), the family (Carrillo-Álvarez et al., 2019), or the local community (Harpham, 2002), while at the macro-level, SC is assessed with regional or national surveys that evaluate trust, social participation and social interactions. Commonly, SC is assessed with macro-indices such as the number of social organisations (formal or informal) in a country, the average number of participants in these organisations, participation in elections or indicators of community volunteerism, which are perceived as reflections of the social interaction and community involvement (Adam, 2008;Sarracino & Mikucka, 2017).

Applications

Given its relevance for economic, social, and political life, social capital has attracted significant attention in several scientific fields. Its usefulness as an individual and/or a collective resource has been widely recognised, since there is significant empirical evidence supporting its added value in explaining health promotion (Ehsan et al., 2019), economic development and sustainability (Sarracino & Mikucka, 2017;McShane et al., 2016), political participation (KRISHNA, 2002) and social life at work (Tsounis et al., 2023), in the family (Alvarez, Kawachi & Romani, 2017) and at school (Israel & Beaulieu, 2004). In what follows, the applications of SC theory for understanding organisations, health, as well as school and family contexts, are presented.

Social capital has been found to have beneficial effects for employees and organisations. Several studies that have examined workplace SC (WSC) as **an individual asset** (e.g., the quality of relationships of employees with their colleagues or within the organisation) indicated that it relates positively with job satisfaction

(Flap & Völker, 2001;Requena, 2003), organisational commitment (Watson & Papamarcos, 2002) and work engagement (Strömgren et al., 2016), and negatively with job stress (Boyas & Wind, 2010). However, in organisational studies, WSC is primarily defined and measured as an ecological resource of an organisation from which all members can benefit (Eguchi et al., 2017;Kouvonen et al., 2006;Meng, Clausen & Borg, 2018;Ommen et al., 2009;Pejtersen et al., 2010;Tsounis et al., 2023), even those with weaker social connections (Putnam, 2000). As an **ecological characteristic,** WSC may be perceived as a job resource at the organisational level of analysis that may motivate employees to fulfill their goals but also protect from the adverse effects of job stressors (Bakker & Demerouti, 2017). Indeed, previous studies supported the positive relationship between WSC and work engagement (Fujita et al., 2016;Meng, Clausen & Borg, 2018), as well as between WSC and job performance (Ghorbanzadeh et al., 2023;Huang & Liu, 2017). WSC may facilitate goal achievement in several ways. For example, WSC allows better knowledge sharing due to trustfulness and lower transactional costs (Prusak & Cohen, 2001), while it may also contribute to intellectual capital creation and renewal (Nahapiet & Ghoshal, 1998), which is an important determinant of individual and organisational performance. Next to the motivational role of WSC several studies have provided evidence for its buffering effect on the relationship between workload (OSHIO, INOUE & TSUTSUMI, 2014) or emotional demands and perceived stress (Pihl-Thingvad et al., 2021). The link between social capital and organisational growth due to the above functions has been supported in several studies that provide evidence for its positive role in knowledge transfer and innovation adoption (Maurer, Bartsch & Ebers, 2011;Michalakopoulou et al., 2023), as well as sales growth as a rate of organisational performance (Subramony et al., 2018).

Several scholars have also highlighted the role of social capital for career and employability research. In an attempt to maximise opportunities for future employment, individuals try not only to strengthen their human capital by acquiring new skills, but they also try to expand their social capital through participation in formal and informal networks (Smith, 2010). SC as a resource may enhance individuals' potential to reach competitive labour markets by gaining access to information regarding job openings, while social connections may trigger future career opportunities (Smith, 2010;Tomlinson, 2017;Tomlinson & Anderson, 2021). In a similar vein, SC is important for employees' career transitions, since it is fundamental for building one's career capital i.e., "*the overall set of non-financial resources a person is able to bring to his or her work*" (Arthur, DeFillippi & Jones, 2001:p101). Beyond "*knowing self*" and "*knowing how*", which represent human and cultural capital, respectively, "*knowing whom*" (i.e., social capital) is important for both internal and external role transitions (Brown, Hooley & Wond, 2020;Mello, Suutari & Dickmann, 2023).

A considerable number of studies have also tested the role of social capital as a social determinant of health (Ehsan et al., 2019). Higher SC reflects better access to (potential or actual) material, informational and affective resources that are embedded in social networks (Carpiano & Hystad, 2011) and may facilitate health promotion and prevention, but also deal with health problems. In line with the individualist approach (Bourdieu, 1986), this may mean that individuals may have access to sources of emotional and instrumental social support (e.g., informal support and care) in case of illness. In addition, SC reflects a broader range of social participation, which may create a sense of belonging to the community and may reduce the stress which is associated with uncertainty and social isolation (Ehsan et

al., 2019). Moreover, individuals' social participation may enhance the development of their social skills, which, in turn, may improve access to material resources and information regarding health care facilities (Woolcock & Narayan, 2000). Similarly, SC, as a collective resource, may benefit the health of a whole community. According to Putnam (Putnam, 2000), communities with high levels of SC may positively affect all community members through two paths: first, through the development and broadening of informal settings and forms of support and, second, through the development of political action that demands governmental initiatives for the improvement of health-care settings (Kawachi & Berkman, 2014). The findings of systematic reviews and meta-analyses regarding the effects of SC on health can be summarised as follows: (i) the cognitive aspects of SC are more clearly associated with better physical and mental health (Ehsan & De Silva, 2015;De Silva, 2005;Gilbert et al., 2013), (ii) its beneficial effects are more systematic for certain health indicators, such as mortality levels, but contradictory for some others, such as obesity (Kim, Subramanian & Kawachi, 2008;Moore, 2010;Nyqvist et al., 2014), (iii) higher SC implies better health outcomes for almost all age groups (Almedom, 2005;Vyncke et al., 2013), (iv) the positive association between SC and health has been confirmed in both cross-sectional (Ehsan et al., 2019) and longitudinal studies (Choi et al., 2014;Murayama, Fujiwara & Kawachi, 2012), (v) SC may buffer the negative consequences of low socio-economic status on health (Uphoff et al., 2013), and (vi) its favourable effects are more systematic when it is captured as an individual resource (Islam et al., 2006). However, it is important to note that empirical findings are not always comparable due to the lack of agreement regarding the definition and measurement of the construct (Pitkin Derose & Varda, 2009).

Also, literature provides evidence for the applications of social capital in several other contexts such as in schools (Israel, Beaulieu & Hartless, 2001) and the family (Alvarez, Kawachi & Romani, 2017). The study of school SC is based on Coleman's approach (1988), who focused on several functions of SC, such as information, obligations, and social norms, which are transmitted through social ties within schools, promoting children's flourishing. The main indicators of SC in the relevant studies include student-teacher relationships, students' participation in extracurricular activities and contacts between school and parents (Israel & Beaulieu, 2004). Empirical evidence showed that SC is positively related to students' academic achievements (Dufur, Parcel & Troutman, 2013) and well-being and negatively to victimisation (Gottfredson & DiPietro, 2011). Several studies have also examined the effects of the SC of the family on family members (Alvarez, Kawachi & Romani, 2017). It is argued that family SC is a relevant family resource, since family constitutes a primitive social context which provides instrumental and emotional support that is important for life span development (Alvarez, Kawachi & Romani, 2017). Empirical evidence showed that family SC relates positively to family members' well-being, and better health-outcomes (Rothon, Goodwin & Stansfeld, 2012;Wu et al., 2010).

Limitations

A major point of critique of SC theory concerns the lack of consensus regarding the definition of the construct, which raises doubts about its validity. For instance, some approaches to SC are quite restrictive as they capture only some dimensions e.g., social networks (Lin, 2002), but neglect others e.g., reciprocity (Pejtersen et al., 2010),

while other approaches integrate dimensions that are similar but not in the heart of the concept (e.g., justice (Pejtersen et al., 2010), tolerance in diversity (Onyx & Bullen, 2000)). Narrayan and Pritchett have pointed out that SC is a "*concept that means many things to many people*" (Narayan & Pritchett, 1999:p871), while Fine highlights how "*almost any form of personal and social interaction has the capacity to be understood as social capital*" (Fine, 2001:p21). According to Adler and Known (2002), the excessive use of SC as an umbrella construct may damage its theoretical and empirical evidence.

The lack of agreement regarding its definition further limits the valid measurement of the construct. First, there are limitations regarding the core dimensions of social capital, which results in scales that are either too restrictive and capture only a part of the concept like cognitive SC (Glendinning & West, 2007;Ommen et al., 2009), structural (Litwin & Stoeckel, 2014) or bonding SC (Eguchi et al., 2017), or are too extensive and include dimensions that do not lie in the core of SC e.g., justice (Pejtersen et al., 2010). Second, many existing scales assess certain dimensions at the individual level and others at the collective level. This is a limitation because the conceptualisation varies according to the level of interest each time, and, hence, results are not comparable across levels. For example, the "*Social Capital Questionnaire for Adolescent Students*" (SCQ-AS;Paiva et al., 2014) assesses trust at the individual level (i.e., "*I trust my friends at school*") while other aspects related with social support are measured only at the ecological level (i.e., "*The teachers at my school are sympathetic and give us support*"). Similarly, the Social Capital Scale of Onyx and Bullen (2000) captures some aspects at the ecological level (i.e., "*Do you agree that most people can be trusted?*" - trust) and other aspects at the individual level (i.e., "*Have you visited a neighbour in the past week?*" – neighbourhood connections). Such inconsistencies also exist in organisational studies, with some scholars examining aspects of SC at both the individual and the organisational level e.g., "*I have much / some / little / almost no / no trust in management*" and "*In my company/organisation people who work together trust each other because that is the best and easiest way to get the work done*" (Requena, 2003). Third, SC is assessed with adapted scales that were designed to assess different constructs for other purposes (Fine, 2010). Finally, next to these limitations, there are also some challenges regarding the measurement of the outcomes of social capital. For example, although several studies support the positive link between social capital and economic growth (Graeff & Svendsen, 2013;van Staveren & Knorringa, 2007), it is very difficult to link with accuracy specific aspects of SC with specific material gains or economic indices. All in all, these issues refrain from comparing data that derive from different definitions and operationalisations, and make it challenging to fully understand the role of SC for organisational, societal, and economic outcomes.

Another important point of criticism is that social capital is conceptualised as a "*by definition*" positive construct, although it may lead to controversial effects. Several scholars have elaborated on the "*dark side*" of social capital (Adler & Kwon, 2002;Pillai et al., 2017), while empirical evidence has revealed such unfavourable effects (Carrera, Sohail & Carmona, 2017;Martins et al., 2017;Sakuraya et al., 2017). Portes (1998:p15) highlights four main unfavourable consequences of SC: "*exclusion of outsiders, excess claims on group members, restriction on individual freedoms, and downward levelling norms*". For example, empirical evidence suggests that SC may negatively affect organisational functioning. Research findings suggest that trust may weaken the positive relationship between task conflict and innovation,

since it can lead to less monitoring (De Clercq, Thongpapanl & Dimov, 2009). Moreover, strong ties and relationships may negatively affect knowledge acquisition due to over-embeddedness (Presutti, Boari & Fratocchi, 2007;Strindlund, Abrandt Dahlgren & Ståhl, 2022;Yli- Renko, Autio & Sapienza, 2001). Similarly, the intense internal cohesion of a group may enhance convergent thinking, which results in overlooking divergent information (Singh, Tan & Mookerjee, 2011). Zhang et al. (2016) showed that creativity may lead to higher social isolation even under conditions of high SC, indicating that social networking may have controversial effects for more creative employees. Interpersonal networks may produce mutual identification among members, limiting diverse views and the acquisition of new information. Thus, social identification may lead to group polarisation (Janis, 1972;Woolcock, 1998). In turn, due to this polarisation, less powerful members may feel pressure to accept the viewpoints of the more prototypical members of the organisation (Walker, 1985). Under these conditions, high levels of SC may lead to homogenisation, resulting in network closure effects. Thus, a danger posed by higher levels of SC is highlighting confirmation bias, since the presence of dense networks may inhibit the generation of alternative perspectives. Finally, research evidence shows that different forms of SC may lead to differential effects. For example, high trust and reciprocity within closer network connections, such as friends and family (i.e., bonding SC), may lead to emotional or instrumental support, while at the same time they may weaken the social ties with the broader community i.e., bridging SC (Takahashi & Magalong, 2008). These aspects of social capital downplay the idealistic approach towards the concept but contribute to a more realistic understanding of its effects.

Concepts

Cognitive Social Capital (Independent/Moderator): The intangible aspects of social capital that refer to social norms and values such as trust and reciprocity. (Harpham, 2002)

Structural Social Capital (Independent/Moderator): The network ties that provide access to other resources. (Nahapiet & Ghoshal, 1998)

Bonding Social Capital (Independent/Moderator): The form of social capital that refers to strong ties between people within homogeneous groups with inward direction. (Putnam, 2000)

Bridging Social Capital (Independent/Moderator): The form of social capital that refers to weak ties or more distant and open network connections among individuals across diverse social cleavages with outward direction. (Putnam, 2000)

Trust (Independent/Moderator): Individuals' expectation that others will not willingly harm them and that they will act in an honest manner. (Newton, 2001)

Reciprocity (Independent/Moderator): The offer and raising of mutual support which is based on the expectation that the provided help will be returned, if needed. (Torche & Valenzuela, 2011)

Individual Social Capital (Independent/Moderator): A person's closer (i.e., bonding) and community (i.e., bridging) network connections that are trustworthy, reciprocal, and resourceful. (Chen et al., 2009)

Family Social Capital (Independent/Moderator): The amount of structural social capital (i.e., network ties and social interactions), and cognitive social capital (i.e., family cohesion and sense of belonging) that is available within the family and through connections outside the family. (Carrillo-Álvarez et al., 2019)

Workplace Social Capital (Independent/Moderator): A workplace resource that refers to employees' perceptions regarding trust, reciprocity and network interactions that exist among peers as well as among individuals across different levels of the hierarchy within an organisation or across organisations. (Tsounis et al., 2023)

References

Adam, F. (2008). Mapping social capital across Europe: findings, trends and methodological shortcomings of cross-national surveys. *Social Science Information*, 47 (2), 159-186.

Adler, P.S. & Kwon, S. (2002). Social Capital: Prospects for a New Concept. *Academy of Management Review*, 27 (1), 17-40.

Agampodi, T.C., Agampodi, S.B., Glozier, N. & Siribaddana, S. (2015). Measurement of social capital in relation to health in low and middle income countries (LMIC): A systematic review. *Social Science & Medicine*, 128, 95-104.

Almedom, A.M. (2005). Social capital and mental health: An interdisciplinary review of primary evidence. *Social Science & Medicine*, 61 (5), 943-964.

Alvarez, E.C., Kawachi, I. & Romani, J.R. (2017). Family social capital and health – a systematic review and redirection. *Sociology of Health & Illness*, 39 (1), 5-29.

Arthur, M.B., DeFillippi, R.J. & Jones, C. (2001). Project-Based Learning as the Interplay of Career and Company Non-Financial Capital. *Management Learning*, 32 (1), 99-117.

Bakker, A.B. & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22 (3), 273-285.

Bourdieu, P. (1986). *The forms of capital. In J.G. Richardson (Ed.), Handbook of theory and research for the sociology of education*. Greenwood Press.

Boyas, J. & Wind, L.H. (2010). Employment-based social capital, job stress, and employee burnout: A public child welfare employee structural model. *Children and Youth Services Review*, 32 (3), 380-388.

Brown, C., Hooley, T. & Wond, T. (2020). Building career capital: developing business leaders' career mobility. *Career Development International*, 25 (5), 445-459.

Carpiano, R.M. & Hystad, P.W. (2011). "Sense of community belonging" in health surveys: What social capital is it measuring?. *Health & Place*, 17 (2), 606-617.

Carpiano, R.M. (2006). Toward a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help?. *Social Science & Medicine*, 62 (1), 165-175.

Carrera, N., Sohail, T. & Carmona, S. (2017). Audit committees' social capital and financial reporting quality. *Accounting and Business Research*, 47 (6), 633-672.

Carrillo-Álvarez, E., Villalonga-Olives, E., Riera-Romaní, J. & Kawachi, I. (2019). Development and validation of a questionnaire to measure family social capital. *SSM - Population Health*, 8, 100453.

Chen, X., Stanton, B., Gong, J., Fang, X. & Li, X. (2009). Personal Social Capital Scale: an instrument for health and behavioral research. *Health Education Research*, 24 (2), 306-317.

Choi, M., Mesa-Frias, M., Nüesch, E., Hargreaves, J., Prieto-Merino, D., Bowling, A., Smith, G.D., Ebrahim, S., Dale, C.E. & Casas, J.P. (2014). Social capital, mortality, cardiovascular events and cancer: a systematic review of prospective studies. *International Journal of Epidemiology*, 43 (6), 1895-1920.

Coleman, J.S. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology*, 94, S95-S120.

De Clercq, D., Thongpapanl, N. & Dimov, D. (2009). When good conflict gets better and bad conflict becomes worse: the role of social capital in the conflict–innovation relationship. *Journal of the Academy of Marketing Science*, 37 (3), 283-297.

De Silva, M.J. (2005). Social capital and mental illness: a systematic review. *Journal of Epidemiology & Community Health*, 59 (8), 619-627.

De Silva, M.J., Harpham, T., Tuan, T., Bartolini, R., Penny, M.E. & Huttly, S.R. (2006). Psychometric and cognitive validation of a social capital

measurement tool in Peru and Vietnam. *Social Science & Medicine*, 62 (4), 941-953.

Dhesi, A.S. (2000). Social capital and community development. *Community Development Journal*, 35 (3), 199-214.

DiClemente, R.J. (2002). *Emerging Theories in Health Promotion Practice and Research*. John Wiley & Sons, Ltd.

Dolfsma, W. & Dannreuther, C. (2003). Subjects and Boundaries: Contesting Social Capital-Based Policies. *Journal of Economic Issues*, 37 (2), 405-413.

Dufur, M.J., Parcel, T.L. & Troutman, K.P. (2013). Does capital at home matter more than capital at school? Social capital effects on academic achievement. *Research in Social Stratification and Mobility*, 31, 1-21.

Eguchi, H., Tsutsumi, A., Inoue, A. & Odagiri, Y. (2017). Psychometric assessment of a scale to measure bonding workplace social capital. *PLOS ONE*, 12 (6), e0179461.

Ehsan, A., Klaas, H.S., Bastianen, A. & Spini, D. (2019). Social capital and health: A systematic review of systematic reviews. *SSM - Population Health*, 8, 100425.

Ehsan, A.M. & De Silva, M.J. (2015). Social capital and common mental disorder: a systematic review. *Journal of Epidemiology and Community Health*, 69 (10), 1021-1028.

Elkhuizen, L., Hermes, N., Jacobs, J. & Meesters, A. (2018). Financial development, financial liberalization and social capital. *Applied Economics*, 50 (11), 1268-1288.

Ferlander, S. (2007). The Importance of Different Forms of Social Capital for Health. *Acta Sociologica*, 50 (2), 115-128.

Fine, B. (2001). *Social capital versus social theory*. Routledge.

Fine, B. (2010). *Theories of social capital*. Pluto Press.

Flap, H. & Völker, B. (2001). Goal specific social capital and job satisfaction. *Social Networks*, 23 (4), 297-320.

Fujita, S., Kawakami, N., Ando, E., Inoue, A., Tsuno, K., Kurioka, S. & Kawachi, I. (2016). The association of workplace social capital with work engagement of employees in health care settings: A multilevel cross-sectional analysis. *Journal of Occupational and Environmental Medicine*, 58 (3), 265-271.

Fukuyama, F. (2002). Social capital and development. *SAIS Review (1989-2003)*, 22 (1), 23-37.

Ghorbanzadeh, D., Khoruzhy, V.I., Safonova, I.V. & Morozov, I.V. (2023). Relationships between social media usage, social capital and job performance: the case of hotel employees in Iran. *Information Development*, 39 (1), 6-18.

Gilbert, K.L., Quinn, S.C., Goodman, R.M., Butler, J. & Wallace, J. (2013). A meta-analysis of social capital and health: A case for needed research. *Journal of Health Psychology*, 18 (11), 1385-1399.

Glendinning, A. & West, P. (2007). Young people's mental health in context: Comparing life in the city and small communities in Siberia. *Social Science & Medicine*, 65 (6), 1180-1191.

Gottfredson, D.C. & DiPietro, S.M. (2011). School Size, Social Capital, and Student Victimization. *Sociology of Education*, 84 (1), 69-89.

Graeff, P. & Svendsen, G.T. (2013). Trust and corruption: The influence of positive and negative social capital on the economic development in the European Union. *Quality & Quantity*, 47 (5), 2829-2846.

Granovetter, M. (1985). Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 91 (3), 481-510.

Hanifan, L. (1916). The Rural School Community Center. *The ANNALS of the American Academy of Political and Social Science*, 67 (1), 130-138.

Harpham, T. (2002). Measuring social capital within health surveys: key issues. *Health Policy and Planning*, 17 (1), 106-111.

Hasan, I., (Stan) Hoi, C., Wu, Q. & Zhang, H. (2020). Is social capital associated with corporate innovation? Evidence from publicly listed firms in the U.S. *Journal of Corporate Finance*, 62, 101623.

Heffron, J.M. (2001). Beyond community and society: The externalities of social capital building. *Social Capital as a Policy Resource*, 251-268.

Huang, L.V. & Liu, P.L. (2017). Ties that work: Investigating the relationships among coworker connections, work-related Facebook utility, online social capital, and employee outcomes. *Computers in Human Behavior*, 72, 512-524.

Islam, M.K., Merlo, J., Kawachi, I., Lindström, M. & Gerdtham, U. (2006). Social capital and health: Does egalitarianism matter? A literature review. *International Journal for Equity in Health*, 5 (1).

Israel, G.D. & Beaulieu, L.J. (2004). Investing in Communities: Social Capital's Role in Keeping Youth in School. *Community Development Society. Journal*, 34 (2), 35-57.

Israel, G.D., Beaulieu, L.J. & Hartless, G. (2001). The Influence of Family and Community Social Capital on Educational Achievement*. *Rural Sociology*, 66 (1), 43-68.

Jacobs, J. & Albers, G. (1992). *The Death and Life of Great American Cities*. Vintage Books.

Janis, I.L. (1972). *Victims of groupthink*. Houghton, Mifflin.

KRISHNA, A. (2002). Enhancing Political Participation in Democracies. *Comparative Political Studies*, 35 (4), 437-460.

Kawachi, I. & Berkman, L.F. (2014). Social Capital, Social Cohesion, and Health. *Social Epidemiology*, 290-319.

Kim, D., Subramanian, S. & Kawachi, I. (2008). Social Capital and Physical Health. *Social Capital and Health*, 139-190.

Kouvonen, A., Kivimäki, M., Vahtera, J., Oksanen, T., Elovainio, M., Cox, T., Virtanen, M., Pentti, J., Cox, S.J. & Wilkinson, R.G. (2006). Psychometric evaluation of a short measure of social capital at work. *BMC Public Health*, 6 (1).

Krishna, A. (2001). Moving from the Stock of Social Capital to the Flow of Benefits: The Role of Agency. *World Development*, 29 (6), 925-943.

Kritsotakis, G. & Gamarnikow, E. (2004). What is social capital and how does it relate to health?. *International Journal of Nursing Studies*, 41 (1), 43-50.

Lin, N. (2002). *Social Capital*. Cambridge University Press.

Litwin, H. & Stoeckel, K.J. (2014). Confidant Network Types and Well-Being Among Older Europeans. *The Gerontologist*, 54 (5), 762-772.

Liu, Y., Cao, L., Yang, D. & Anderson, B.C. (2022). How social capital influences community resilience management development. *Environmental Science & Policy*, 136, 642-651.

Martins, J.G., de Paiva, H.N., Paiva, P.C.P., Ferreira, R.C., Pordeus, I.A., Zarzar, P.M. & Kawachi, I. (2017). New evidence about the "dark side" of social cohesion in promoting binge drinking among adolescents. *PLOS ONE*, 12 (6), e0178652.

Maurer, I., Bartsch, V. & Ebers, M. (2011). The Value of Intra-organizational Social Capital: How it Fosters Knowledge Transfer, Innovation Performance, and Growth. *Organization Studies*, 32 (2), 157-185.

Mauss, M., Guyer, J.I. & Maurer, B. (2011). *The Gift*. Martino Fine Books.

McShane, C.J., Turnour, J., Thompson, M., Dale, A., Prideaux, B. & Atkinson, M. (2016). Connections: the contribution of social capital to regional development. *Rural Society*, 25 (2), 154-169.

Mello, R., Suutari, V. & Dickmann, M. (2023). Career success of expatriates: the impacts of career capital, expatriate type, career type and career stage. *Career Development International*, 28 (4), 406-425.

Meng, A., Clausen, T. & Borg, V. (2018). The association between team- level social capital and individual- level work engagement: Differences between subtypes of social capital and the impact of intra- team agreement. *Scandinavian Journal of Psychology*, 59 (2), 198-205.

Michalakopoulou, K., Bamford, D., Reid, I. & Nikitas, A. (2023). Barriers and opportunities to innovation for legal service firms: a thematic analysis-based contextualization. *Production Planning & Control*, 34 (7), 604-622.

Moore, S. (2010). Social Networks, Social Capital and Obesity. *Obesity Prevention*, 673-685.

Murayama, H., Fujiwara, Y. & Kawachi, I. (2012). Social Capital and Health: A Review of Prospective Multilevel Studies. *Journal of Epidemiology*, 22 (3), 179-187.

Nahapiet, J. & Ghoshal, S. (1998). Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review*, 23 (2), 242-266.

Narayan, D. & Pritchett, L. (1999). Cents and Sociability: Household Income and Social Capital in Rural Tanzania. *Economic Development and Cultural Change*, 47 (4), 871-897.

Newton, K. (2001). Trust, Social Capital, Civil Society, and Democracy. *International Political Science Review*, 22 (2), 201-214.

Nyqvist, F., Pape, B., Pellfolk, T., Forsman, A.K. & Wahlbeck, K. (2014). Structural and Cognitive Aspects of Social Capital and All-Cause Mortality: A Meta-Analysis of Cohort Studies. *Social Indicators Research*, 116 (2), 545-566.

OECD (2001). *The Well-being of Nations*. OECD.

OSHIO, T., INOUE, A. & TSUTSUMI, A. (2014). The Mediating and Moderating Effects of Workplace Social Capital on the Associations between Adverse Work Characteristics and Psychological Distress among Japanese Workers. *Industrial Health*, 52 (4), 313-323.

Ommen, O., Driller, E., Köhler, T., Kowalski, C., Ernstmann, N., Neumann, M., Steffen, P. & Pfaff, H. (2009). The Relationship between Social Capital in Hospitals and Physician Job Satisfaction. *BMC Health Services Research*, 9 (1).

Onyx, J. & Bullen, P. (2000). Measuring Social Capital in Five Communities. *The Journal of Applied Behavioral Science*, 36 (1), 23-42.

Ostrom, E. (2000). *Social capital: A fad or a fundamental concept*. World Bank.

Paiva, P.C.P., Paiva, H.N.d., Oliveira Filho, P.M.d., Lamounier, J.A., Ferreira, E.F.e., Ferreira, R.C., Kawachi, I. & Zarzar, P.M. (2014). Development and Validation of a Social Capital Questionnaire for Adolescent Students (SCQ-AS). *PLoS ONE*, 9 (8), e103785.

Pejtersen, J.H., Kristensen, T.S., Borg, V. & Bjorner, J.B. (2010). The second version of the Copenhagen Psychosocial Questionnaire. *Scandinavian Journal of Public Health*, 38 (3_suppl), 8-24.

Pihl-Thingvad, J., Andersen, L.P.S., Pihl-Thingvad, S., Elklit, A., Brandt, L.P.A. & Andersen, L.L. (2021). Can high workplace social capital buffer the negative effect of high workload on patient-initiated violence? Prospective cohort study. *International Journal of Nursing Studies*, 120, 103971.

Pillai, K.G., Hodgkinson, G.P., Kalyanaram, G. & Nair, S.R. (2017). The Negative Effects of Social Capital in Organizations: A Review and Extension. *International Journal of Management Reviews*, 19 (1), 97-124.

Pitkin Derose, K. & Varda, D.M. (2009). Social Capital and Health Care Access. *Medical Care Research and Review*, 66 (3), 272-306.

Portes, A. (1998). Social Capital: Its Origins and Applications in Modern Sociology. *Annual Review of Sociology*, 24 (1), 1-24.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24 (1), 1-24.

Presutti, M., Boari, C. & Fratocchi, L. (2007). Knowledge acquisition and the foreign development of high-tech start-ups: A social capital approach. *International Business Review*, 16 (1), 23-46.

Prusak, L. & Cohen, D. (2001). How to invest in social capital. *Harvard Business Review*, 79 (6), 86-97.

Putnam, R. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, 6 (1), 65-78.

Putnam, R.D. (2000). Bowling Alone: America's Declining Social Capital. *Culture and Politics*, 223-234.

Requena, F. (2003). Social capital, satisfaction and quality of life in the workplace. *Social Indicators Research*, 61 (3), 331-360.

Rothon, C., Goodwin, L. & Stansfeld, S. (2012). Family social support, community "social capital" and adolescents' mental health and educational outcomes: a longitudinal study in England. *Social Psychiatry and Psychiatric Epidemiology*, 47 (5), 697-709.

SCHIFF, M. (1992). Social Capital, Labor Mobility, and Welfare. *Rationality and Society*, 4 (2), 157-175.

Sakuraya, A., Imamura, K., Inoue, A., Tsutsumi, A., Shimazu, A., Takahashi, M., Totsuzaki, T. & Kawakami, N. (2017). Workplace social capital and the onset of major depressive episode among workers in Japan: a 3-year prospective cohort study. *Journal of Epidemiology and Community Health*, 71 (6), 606-612.

Sarracino, F. & Mikucka, M. (2017). Social Capital in Europe from 1990 to 2012: Trends and Convergence. *Social Indicators Research*, 131 (1), 407-432.

Singh, Tan, & Mookerjee (2011). Network Effects: The Influence of Structural Capital on Open Source Project Success. *MIS Quarterly*, 35 (4), 813.

Smith, V. (2010). Review article: Enhancing employability: Human, cultural, and social capital in an era of turbulent unpredictability. *Human Relations*, 63 (2), 279-300.

Storberg, J. (2002). The Evolution of Capital Theory: A Critique of a Theory of Social Capital and Implications for HRD. *Human Resource Development Review*, 1 (4), 468-499.

Strindlund, L., Abrandt Dahlgren, M. & Ståhl, C. (2022). When cooperation turns ugly: exploring the dark side of social capital. *Qualitative Research in Organizations and Management: An International Journal*, 17 (5), 1-18.

Strömgren, M., Eriksson, A., Bergman, D. & Dellve, L. (2016). Social capital among healthcare professionals: A prospective study of its importance for job satisfaction, work engagement and engagement in clinical improvements. *International Journal of Nursing Studies*, 53, 116-125.

Subramony, M., Segers, J., Chadwick, C. & Shyamsunder, A. (2018). Leadership development practice bundles and organizational performance: The mediating role of human capital and social capital. *Journal of Business Research*, 83, 120-129.

Szreter, S. & Woolcock, M. (2004). Health by association? Social capital, social theory, and the political economy of public health. *International Journal of Epidemiology*, 33 (4), 650-667.

Takahashi, L.M. & Magalong, M.G. (2008). Disruptive social capital: (Un)Healthy socio-spatial interactions among Filipino men living with HIV/AIDS. *Health & Place*, 14 (2), 182-197.

Tomlinson, M. & Anderson, V. (2021). Employers and graduates: the mediating role of signals and capitals. *Journal of Higher Education Policy and Management*, 43 (4), 384-399.

Tomlinson, M. (2017). Forms of graduate capital and their relationship to graduate employability. *Education + Training*, 59 (4), 338-352.

Torche, F. & Valenzuela, E. (2011). Trust and reciprocity: A theoretical distinction of the sources of social capital. *European Journal of Social Theory*, 14 (2), 181-198.

Tsounis, A., Xanthopoulou, D., Demerouti, E., Kafetsios, K. & Tsaousis, I. (2023). Workplace Social Capital: Redefining and Measuring the Construct. *Social Indicators Research*, 165 (2), 555-583.

Uphoff, E.P., Pickett, K.E., Cabieses, B., Small, N. & Wright, J. (2013). A systematic review of the relationships between social capital and socioeconomic inequalities in health: a contribution to understanding the psychosocial pathway of health inequalities. *International Journal for Equity in Health*, 12 (1), 54.

Uphoff, N. & Wijayaratna, C. (2000). Demonstrated Benefits from Social Capital: The Productivity of Farmer Organizations in Gal Oya, Sri Lanka. *World Development*, 28 (11), 1875-1890.

Van Deth, J.W. (2003). Measuring social capital: Orthodoxies and continuing controversies. *International Journal of Social Research Methodology*, 6 (1), 79-92.

Villalonga-Olives, E. & Kawachi, I. (2015). The measurement of social capital. *Gaceta Sanitaria*, 29 (1), 62-64.

Vyncke, V., De Clercq, B., Stevens, V., Costongs, C., Barbareschi, G., Jónsson, S.H., Curvo, S.D., Kebza, V., Currie, C. & Maes, L. (2013). Does neighbourhood social capital aid in levelling the social gradient in the health and well-being of children and adolescents? A literature review. *BMC Public Health*, 13 (1).

Walker, G. (1985). Network Position and Cognition in a Computer Software Firm. *Administrative Science Quarterly*, 30 (1), 103.

Wallace, P.A. & LaMond, A.M. (1977). *Women, minorities, and employment discrimination*. Lexington Books.

Watson, G.W. & Papamarcos, S.D. (2002). *Journal of Business and Psychology*, 16 (4), 537-552.

Woolcock, M. & Narayan, D. (2000). Social Capital: Implications for Development Theory, Research, and Policy. *The World Bank Research Observer*, 15 (2), 225-249.

Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27 (2), 151-208.

World Bank (1998). *The initiative on defining, monitoring and measuring social capital: overview and program description*.

Wu, Q., Xie, B., Chou, C., Palmer, P.H., Gallaher, P.E. & Anderson Johnson, C. (2010). Understanding the Effect of Social Capital on the Depression of Urban Chinese Adolescents: An Integrative Framework. *American Journal of Community Psychology*, 45 (1-2), 1-16.

Xu, S., Li, W. & Zhang, W. (2021). The Dynamics of Social Capital: Examining the Reciprocity between Network Features and Social Support. *Journal of Computer-Mediated Communication*, 26 (6), 362-383.

Yli- Renko, H., Autio, E. & Sapienza, H.J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology- based firms. *Strategic Management Journal*, 22 (6-7), 587-613.

Zhang, G., Chan, A., Zhong, J. & Yu, X. (2016). Creativity and social alienation: the costs of being creative. *The International Journal of Human Resource Management*, 27 (12), 1252-1276.

van Staveren, I. & Knorringa, P. (2007). Unpacking social capital in Economic Development: How social relations matter. *Review of Social Economy*, 65 (1), 107-135.

Social Exchange Theory

Social exchange theory explains the social behaviour in dyadic and collective relations by applying a principle of a cost–benefit analysis of relations.

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Theory Factsheet

Proposed By: Homans, 1961

Related Theories: Social Comparison Theory, Social Capital Theory, An Affective Theory of Social Exchange, Rational Choice Theory

Discipline: Sociology

Unit of Analysis: Social Groups, Dyadic relations

Level: Meso-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

Social Exchange Theory (SET) emerged at the end of the 1950s and has since developed into a large body of research on social behaviour. The theory has been widely used to explain both utilitarian and sociological views on relations within social networks (Blau, 2017; DeLamater & Ward, 2013; 1987; Homans, 1961). The emergence and the development of the theory were largely attributed to the works of John Thibaut, George Homans, Peter Blau and Harold Kelley. They were interested in the psychology of small groups, aiming to understand interpersonal relationships in communities and dyadic relationships (Emerson, 1976). Specifically, Homans used a reductionist approach to explain the relationships between people through reinforcement mechanisms, whereby the behaviour of social actors is reinforced by reward and inhibited by punishments (Delamater, 2006). The idea that the reinforcement mechanism underpins social relations stemmed from the research on operant conditioning (e.g. the works of Burrhus Frederic Skinner). That stream of research viewed behaviour as a result of a learning process through the positive and negative consequences that such behaviour entails. (Homans, 1961). Blau built the theory by offering a technical-economic perspective on the analysis of the properties of social systems (Blau, 2017). While he shared similar views on rewards and punishments, Blau's research approach derived from the principles of utilitarianism. He considered the rationale for behaviour resulted from anticipation,

rather than the perception of actual gains (DeLamater & Ward, 2013). Thibaut and Kelley applied theoretical concepts to human decision making in social groups and developed matrices to predict the outcomes of relations. The matrices represent different outcomes of exchange defined by the different proportions of costs and rewards that people receive/incur in interpersonal relations. An individual's decision to continue or participate in exchange depends on the degree to which it brings better rewards (e.g. social power, profit) or higher economies in costs compared to other competing relations (Thibaut & Kelley, 2017). Although the approaches of the theory construction and analysis diverged among the four scholars, they shared the idea that behaviour in social groups is a form of exchange. The differences in the perspectives on the analysis of social relationships have defined the evolution of the social exchange research and the significant role that it played in the literature.

The emergence of SET brought together the sociological, economic and psychological perspectives, advancing research on human behaviour. This approach aimed to resolve debates in the literature about using economic approaches in anthropological research (Knight, 1940; Malinowski, 2013). Due to the heavy reliance on a rational interpretation of human decision making in the market context, the applicability of economic theories to normatively regulated behaviour had been questioned. Therefore, the development of the social exchange research enabled the application of a quasi-economic type of analysis to social systems. Also, the interdependence concept introduced by the SET aimed to contribute to sociological theories. Prior anthropological research viewed people as independent from the actions of other actors and focused on the cognitive processes involved in deriving the meaning of things motivating behaviour (Blumer, 1986). Such an approach provided limited insight into the motives and outcomes produced during interaction. In contrast, Social Exchange Theory articulated the utilitarian function of social relations and their contingency on other actors. It paved the way towards understanding the rational mechanisms underpinning decision making and the perception of the outcomes of social exchange (Heath, 1976).

Theory

Social Exchange Theory explains four main constituents of the social behaviour of individuals. First, the framework defines reinforcement tools – i.e. the rewards/benefits and resources of exchange - underpinning individuals' motivation to engage in social interaction. A reward is an outcome of relations having a positive connotation, while a resource is an attribute giving a person a capability to enable the reward, stimulating people to embark on exchange relations (Emerson, 1976). Resources can represent love, status, money, information, services and goods (Foa & Foa, 1980). The associated rewards for exchanged resources can be allocated along a two-dimensional matrix. The first dimension is particularism, which indicates that the worth of exchanged resources depends on the source. For instance, a monetary resource is evaluated as low at the particularism scale, as regardless of the source the value of the money is the same. In contrast, love has a high particularism score, as the value of this resource is strongly associated with the provider. The second dimension of resources refers to concreteness, which is the degree of the resource's tangibility. The resources which have low concrete value could be regarded as symbolic and have more value for receiving parties (Cropanzano & Mitchell, 2005). Overall, resources enable two types of rewards: socioemotional and economic benefits. The socioemotional benefits result from

situations when acquired resources increase self-esteem and tackle social needs, while the economic benefits address financial needs (Shore et al., 2006). However, there is no consistency in the findings of prior research as to whether both types of benefits are equally important for the parties in relations (Chen, 1995; Cropanzano & Mitchell, 2005).

The second constituent refers to the mechanisms of exchange. The theory postulates that resources are exchanged based on the subjective cost-reward analysis (Blau, 2017; Cropanzano & Mitchell, 2005). Such an analysis is contingent on two main conditions defining the decision of the person to perform exchange relations. These conditions are: a) the degree to which a similar performance has been rewarded to a person or other people in the past and b) the degree to which the result of the exchange is valuable to a person (Blau, 2017; Homans, 1961). This is generally attributed to Homans's views that the more often individuals receive a reward for an action, the more likely they will engage in future actions under similar conditions (Homans, 1961). Cost and benefit factors in the social exchange are different from the economic exchange, as the conditions and obligations are not clearly specified (Blau, 2017). Therefore, the evaluation of the fairness of the costs invested in relations and the rewards resulting from them is subjective. The perception is dependent on individual norms of fairness and as a result it should be interpreted from the user's perspective (Homans, 1961; Blau, 2017). To understand a user's perception, it is important to understand differences among people, in terms of exchange orientation, the differences in the comparison of costs and rewards over time and the difference of contexts (Varey, 2015).

Third, social exchange relations are stimulated by social structures and social capital factors (Blau, 2017; Cropanzano & Mitchell, 2005; Samuel, 1994). The dependence on social structures reflects the contingency of the outcome of interactions on the initial relationship between the parties (Blau, 2017; Cropanzano & Mitchell, 2005). Social capital represents different forms of social entities, including norms, rules, information channels, expectations and obligations. These entities are embedded in the structures of social organisations. Social capital can not only facilitate, but also restrict the development of social relations and their outcomes (Nahapiet & Ghoshal, 1998; Wasko & Faraj, 2005; Samuel, 1994). The outcomes may include power and equity distribution within social networks. Thus, the structural relation between the actors of the sharing economy platform reflects the number of valued resources that the actors control and the balance of resource distribution against other actors (Samuel, 1994). For example, it was found that organisational social capital, reflecting the collective commitment and self-sacrifice of the leadership, contributes to cooperative behaviour and undermines opportunistic behaviours (Mostafa & Bottomley, 2020). Social capital was examined not only as a factor facilitating the cooperation between people, but as a reward of relations. It was found that interpersonal interactions are driven by the expected maximisation of social benefits, such as enhanced social ties and networks (Wang & Liu, 2019).

The fourth mechanism underpinning social exchange is reciprocity, which creates obligations between the parties (Molm, 1997; Cropanzano & Mitchell, 2005; Emerson, 1976). The explanaiton of the role of reciprocity in social exhcnage and interdependence between social actors stems from research on experimental econoemics and evolutionary psychology, postulating that humans are evolutionarily predisposed to behave in such a way as to ensure reciprocation (DeLamater & Ward, 2013; Thibaut & Kelley, 2017; Hoffman, McCabe & Smith, 1998). People have

developed mental matrices on the balance of rewards-costs in relations that underpin decision making (Hoffman, McCabe & Smith, 1998). On the one hand, reciprocity represents the norm defining beliefs about the outcome of exchange and motivating behaviour. People embark on relations with an expectation that the favour (i.e. contributions to relations) will be returned, though without the requirement to do it immediately. The lack of a specific time-frame of the return of favour makes social exchange long-term oriented (Molm, 1997). This expectation can be rooted in cultural norms or individual moral orientation revolving around the beliefs that the parties will reach a fair agreement, in which unfair treatment by a party will be punished, while fair treatment will be rewarded (Cropanzano & Mitchell, 2005). On the other hand, the rule of reciprocity acts as a regulating mechanism, ensuring mutually rewarding relationships based on actors' interdependence (Blau, 2017; Cropanzano & Mitchell, 2005). Interdependence is manifested as mutual and complementary arrangements, motivating the other party to pay back for the resource provided (J., 1969; Molm, 2003). Although exchange based on negotiated rules (as in economic transactions) is more straightforward, social exchange based on the reciprocity rule results in the more long term and reliable relations through the development of trust, loyalty and mutual commitment (Cropanzano & Mitchell, 2005; Molm, Peterson & Takahashi, 1999).

Given the above, the process of social exchange can be presented as a two-step behavioural model (Figure 1). The social exchange is initiated from the positive or negative treatment of the target of exchange (Cropanzano et al., 2017). A positive action is rewarding for the target and can represent the provision of support, high-quality service or goods (Riggle, Edmondson & Hansen, 2009; Cropanzano, 2003). A negative action can represent the sacrifices that the target bears, such as abuse, selfishness or bullying (Tepper et al., 2009; Rayner & Keashly, 2005). In response to such actions, the target actor reciprocates with good or bad behaviour to achieve equity, whereby good behaviour is reciprocated with a good deed, and negative behaviour causes a negative response. A series of positive exchanges favouring both parties tends to translate into long-term cooperation and commitment (Cropanzano et al., 2017).

Figure 1: A Model of Social Exchange
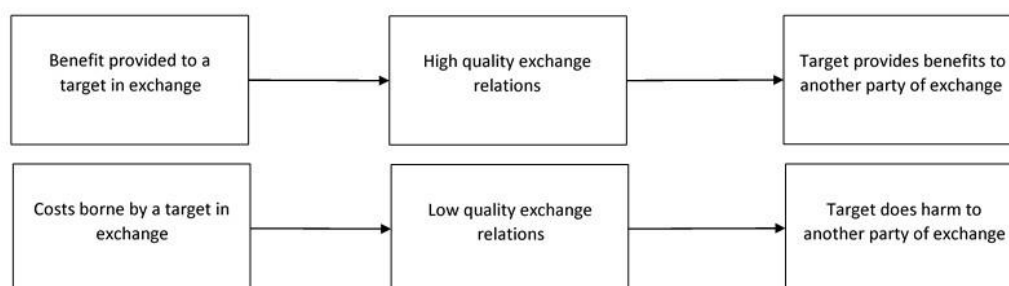

Extension

Affective Theory of Social Exchange

Due to the economic principle of cost-benefit analysis in social exchange, SET views motives, perceptions and outcomes of social behaviour as rational and actors of exchange as emotionless. While the theory claims that social relations are sustained due to rational choices and reinforcement mechanisms, it does not consider the mediating role of emotions that are intertwined in those mechanisms (Lawler, 2001). Emotions are positive and negative states with neurological and cognitive properties. Although Homans (1961), Blau (1964) and Thibaut and Kelley (1959) admitted the role of emotions in certain aspects of behaviour evaluation (e.g. sentiment, intrinsic perception and the comparison level), they did not theorise about these aspects (Blau, 2017; Homans, 1961; Thibaut & Kelley, 2017).

To bridge the gap in the literature, Lawler (2001) developed the Affective Theory of Social Exchange (Lawler, 2001). The theory draws on a review of the literature on emotions and their implications for the contexts, processes and outcomes of exchange (Izard, 1991; Izard, 1991). The review enabled Lawler (2001) to distinguish global and specific emotions from sentiments. Emotions refer to an internal state that can be attached to an ambiguous source (global emotions) or attached to a specific event or object (specific emotions). Sentiments refer to an enduring affective state in relation to the social context or object(s). Global emotions potentially transition to specific emotions and sentiments. The goal of the theory was to understand the conditions in which social exchange leads social actors towards attaching global negative and positive emotions (i.e. feeling good and feeling bad) to social objects and develop enduring negative and positive feelings to them (Lawler, 2001).

Building on the prior research on commitment in social relations (Lawler & Thye, 1999; Lawler, 2001), five theoretical assumptions were developed (Fig 2). The fundamental argument of these assumptions is that positive emotions produced as a result of exchange create solidarity effects, manifested through expanding collaborations, non-obligated exchange of benefits, loyalty and forgiving behaviour (Lawler & Yoon, 1996; Lawler & Thye, 1999; Lawler, 2001). A social exchange was assumed to produce positive and negative global emotions depending on the outcomes of the exchange (assumption 1). These emotions serve as a distinctive type of rewards and punishments (assumption 2). An exchange can motivate actors to carry out or refrain from the exchange, as a way to reproduce positive emotions (e.g. pride in self and gratitude toward the other) and prevent negative ones (e.g. shame in self, anger towards the other) (assumption 3) (Lawler, 2001).

Figure 2: Interrelation of assumptions
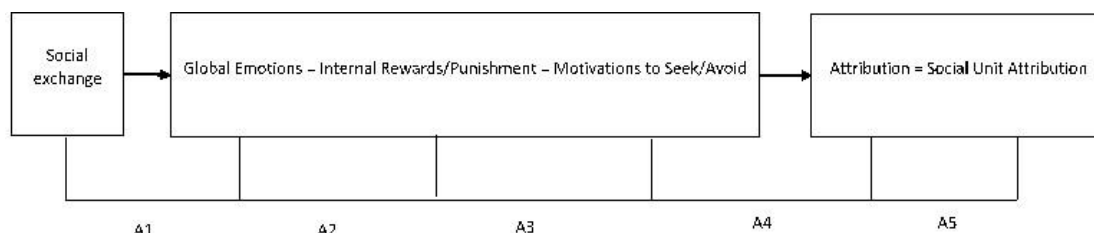
Affective states motivate actors to invest cognitive effort in understanding the sources of emotions (assumption 4) (Lawler, 2001). Global emotions can trigger an attribution process. Attribution is the process of associating emotions with more specific, object-focused emotions (Sorrentino & Higgins, 1986). Objects include task, self, other, relationships and social groups. Tasks are embedded in exchange structures, which can be productive, negotiated, reciprocal and generalised. Task properties, defined as the degree to which actors' contributions to tasks are separable from the contributions of other people and the degree to which actors share responsibility for the task, refer to the type of exchange structure. Productive exchange pursues the generation of a joint good. Negotiated exchange is carried out under predefined terms and conditions. Reciprocal exchange implies reciprocation without a strict timeframe and conditions. Generalised exchange means that reciprocation is carried out indirectly to a member of the group, other than the one who initially provided resources (Molm, 1994; Howard & Ekeh, 1976). The varying degree of shared responsibility and task separability across the types of exchange structures determine the strength of pleasant and unpleasant feelings. Feelings trigger the emotional attribution of the task success and failure to the self and/or other people involved in the exchange, thus inducing associated object-specific emotions (e.g. pride in oneself, gratitude to others) (Lawler, 2001).

The fifth assumption states that the explanation of the source of global emotions by actors is carried out with reference to social objects, such as people, social relations, events or social networks. That means that emotional attribution results in either affective attachment (association of emotions) or detachment (disassociation of emotions) from objects. Affective attachment occurs in conditions when social objects represent controllable and stable causes of positive emotions. Negative emotions caused by social objects representing stable and uncontrollable causes result in effective detachment (Lawler, 2001). In the context of education, a stable controllable cause can be a personal skill and capability, while a stable uncontrollable cause can be represented by the difficulty of the tasks provided by a teacher (Kelley & Michela, 1980). The theoretical assumptions of the Affective Theory of Social Exchange provide a detailed account of the conditions under which particular types of emotions are manifested and their role in regulating the evaluation process of social exchange outcomes. The theory does not dispute the rational premises of social exchange, but rather complements Social Exchange Theory with the theorisation of the non-rational aspect of behaviou which is inherent to humans. The theory explains the ways through which rational choices are interrelated with affective states, thus providing implications for the development of solidarity and sustained relations.

Applications

Social exchange theory is a very broad framework, fitting many micro and macro-sociological theories. The rather generic conceptualisation of relations within communities enables the theory to explain almost any reasonable finding about the pattern of behaviour (Cropanzano et al., 2017). The focus on the ubiquitous principle of reciprocity persistent in social relations makes the theory the pillar of social behaviourism (DeLamater & Ward, 2013). It has become the unitary framework explaining social power (Molm, Peterson & Takahashi, 1999), networks (Tsai & Cheng, 2012), justice (Ambrose & Schminke, 2003), psychological contracts (Rousseau, 1995) and other social phenomena. The principles of the theory have driven a large body

of research attempting to describe and explain different aspects of individuals' behaviour, manifested in various disciplinary contexts.

The research on individuals' behaviour takes three directions. First, the theory was used to explore the cost-benefit evaluation that predefines individuals' decisions to participate in social activities (Kankanhalli, Tan & Wei, 2005; Kanwal et al., 2020). The focus on costs and benefits was conducive to contexts where relations take place (Kankanhalli, Tan & Wei, 2005; Kanwal et al., 2020). For example, in a study exploring the response of the community to infrastructural development, perceived negative impact and perceived benefits of interventions were examined in relation to satisfaction with and support for those interventions. The results of the study showed that the outcome of behaviour can be predicted by a negative correlation with perceived negative impact and a positive correlation with perceived benefits (Kanwal et al., 2020). Another piece of research focused on the role of actual and potential costs against the extrinsic and intrinsic benefits of sharing activities in organisations. The sharing practice was proved to be the result of the compromise between the input of effort to perform the practice, the obligation to reciprocate, organisational rewards (e.g. salary increase, incentives, job security), altruistic benefit (helping others) and perceived confidence about the positive outcome of the practice (Kankanhalli, Tan & Wei, 2005). Also, researchers weighted the costs and benefits of practices to evaluate the expected reciprocity of relations (Kankanhalli, Tan & Wei, 2005; Kanwal et al., 2020). They have also tested the reciprocity norm as a belief in fair exchange (Davlembayeva, Papagiannidis & Alamanos, 2020). A great deal of empirical evidence has provided support for the principle of the theory that the expectation of reciprocity drives individuals' engagement in relations (Molm, 1997; Cropanzano & Mitchell, 2005). A belief in reciprocal relations is associated with satisfaction, motivating continuous behaviour (Shiau & Luo, 2012). It is the strongest social factor predicting users' intention to participate in the sharing economy (Davlembayeva, Papagiannidis & Alamanos, 2020) and the antecedent of helping behaviour in organisations (Thomas & Rose, 2010).

The second body of research focused on the outcomes of reciprocal and non-reciprocal exchange. Reciprocal relations result in commitment, satisfaction and other manifestations of a positive behaviour (Griffin & Hepburn, 2005). Researchers concluded that reciprocity has a mediating effect on commitment through trust (Coyle-Shapiro et al., 2002), as well as a direct effect on commitment demonstrated through emotional attachment (Griffin & Hepburn, 2005). When it comes to non-reciprocal relations, scholars have argued that perceived negative inequity (the perception that an individual received fewer rewards compared to costs) and positive inequity (the perception that the rewards are greater than the costs) leads to stress (Walster, Berscheid & Walster, 1973; Adams, 1963) and induces emotions like guilt and anger (Sherf & Venkataramani, 2015). The relations producing output that is discrepant from input trigger behaviours that aim to compensate or take revenge for the lack of reciprocation (Biron & De Reuver, 2013; Rosette & Zhou Koval, 2018). Pro-active behavioural measures to restore inequity include physical compensation for inequity (increase rewards to another party), self-deprivation (decrease reward to oneself to equate with the reward of another party) and retaliation against the party of relations causing inequity (Walster, Berscheid & Walster, 1973; Folkman & Lazarus, 1988). Cognitive processes such as self-affirmation, denial of responsibility and the devaluation of the input of the other party of relations refer to the emotion-focused measures of inequity restoration (Walster, Berscheid & Walster, 1973; Davies et al., 2018). Self-affirmation is the persuasion of oneself that relationships are

equitable. Devaluation of the input of the other party and denial of responsibility concern the refusal to accept the blame for the inequitable treatment of another party by psychologically distorting his/her inputs and outcomes, decreasing or increasing them as required (Walster, Berscheid & Walster, 1973).

The third stream of research used the SET framework to study social capital factors in the formation of dyadic and collective relations (Davlembayeva, Papagiannidis & Alamanos, 2020; Koopman et al., 2015). Factors such as trust, social norms, altruism or egoistic motives affect the evaluation of the outcome of relations (Reiche, 2012; Davlembayeva, Papagiannidis & Alamanos, 2020; Koopman et al., 2015). For example, there is evidence that trust and ties are the predictors of continuous knowledge sharing (Reiche, 2012). Social capital produced through the ingratiation towards superior group members positively contributes to the quality of exchange relations (Koopman et al., 2015). In the context of the sharing economy, individuals' participation in sharing platforms is conditioned by the positive effect of egoistic belief, reciprocity norm and social value (Davlembayeva, Papagiannidis & Alamanos, 2020). Although the findings have not been consistent in terms of the significance of specific social capital factors, the overall proposition of Social Exchange Theory about the facilitating and inhibiting role of social capital has largely been confirmed across studies.

As far as the context is concerned, a large amount of evidence exists about the employment of Social Exchange Theory to investigate the behaviour of people in the organisational context (Long, Li & Ning, 2015; Slack, Corlett & Morris, 2015). The theory explained the volition of employees towards engagement with corporate social responsibility activities (Slack, Corlett & Morris, 2015) and the motivation to engage in extra-role performance as a payback for the positive environment created in the organisation (Long, Li & Ning, 2015). The Social Exchange Framework is an influential tool in explaining relationship models functioning on the basis of information systems (Shiau & Luo, 2012; Baxter & Braithwaite, 2008). In the information systems management discipline, the theory was used to explore the effect of different constructs related to costs and rewards on the exchange practices in online communities (Geiger, Horbel & Germelmann, 2018; Kankanhalli, Tan & Wei, 2005) and technology utilisation and acceptance (Gefen & Keil, 1998). For example, it was helpful in identifying the risks and benefits of using online-based knowledge management systems, which has contributed to the utilisation of the system for sharing knowledge among system members (Kankanhalli, Tan & Wei, 2005). The theory, combined with Maslow's hierarchy of needs, has been used as an overarching theoretical model to explain the determinants of knowledge sharing on websites. The empirical testing of the model showed that perceived benefits trigger general and specific knowledge sharing behaviour, while the associated costs (e.g. cognitive and execution costs) inhibit that behavioural intention (Yan et al., 2016). The application of the theory to studying the rationale for engagement in online social networking websites suggests that the opportunity to strengthen social ties and control privacy are considered against the privacy risks entailed by using social media tools (Wang & Liu, 2019). In the area of medicine, the theory has guided studies exploring the utilisation of mobile health-based interventions designed to propose medication adherence among patients. The findings of those studies showed that negative and positive reinforcement (i.e. cost and rewards) encourage or discourage the use of the system (Chatterjee, 2019). Also, research on entrepreneurship confirmed that the cost-reward evaluation is the mechanism underpinning entrepreneurs' decision making. Specifically, investment decisions are

determined by the beliefs that project costs should not exceed the promised benefits (Zhao et al., 2017).

Limitations

The principles that ensure the wide application of Social Exchange Theory have come to face criticism (Cropanzano & Mitchell, 2005; Coyle-Shapiro et al., 2002). It has been argued that the core ideas of the theory are not adequately articulated and integrated, which creates problems when using them as an overarching framework in research. The major limitation concerns the non-exhaustive and overlapping list of constructs, which limit the explanatory capability of the theory and undermine its predictive power. The tendency to use an incomplete set of constructs leads towards a partial explanation of individuals' behaviour. The vagueness of the theoretical principles results in a number of interpretations of their conceptual boundaries, which, in turn, creates a divergence in the interpretation of research findings (Cropanzano & Mitchell, 2005). While the lack of precisely defined constructs makes the theory widely used across disciplines, it challenges the inference from conclusions and makes it difficult to replicate the findings (Cropanzano & Mitchell, 2005).

The second issue concerns a lack of accuracy and consistency in terminology. The original works by Blau (Blau, 2017) referred to social and economic exchanges as transactions and not relationships, like the mainstream literature (Organ, 1988). Despite attempts to clarify the difference between relationship and exchange, there is still a need to define whether an exchange is a type of relationship, a transaction that leads to a relationship or vice versa (Cropanzano & Mitchell, 2005). For instance, a prior relationship between parties can have an effect on the exchange, and the exchange can contribute to the development of continued relationships. This debate has not been resolved to date, as scholars use the terms (transaction, relations) interchangeably (Mora Cortez & Johnston, 2020; Davlembayeva, Papagiannidis & Alamanos, 2020; Davlembayeva, Papagiannidis & Alamanos, 2021).

The third issue concerns the lack of consistency and definition of the rules of exchange across studies. Although the major principle of the theory is the rule of reciprocity, scholars adopt a number of other principles (e.g. negotiated rule, rationality, altruism, group gain, status consistency and competition) to explain behaviour (Gouldner, 1960; Cropanzano & Mitchell, 2005). Different rules of exchange create a heterogeneity of perspectives on individuals' behaviour and put forward inconsistent findings (Cropanzano & Mitchell, 2005). Therefore, there is a need to have a clear and single definition for each rule of exchange to reduce the ambiguity associated with the theory's principles.

The fourth limitation concerns the operationalisation and the taxonomy of concepts. Although a vast number of empirical studies have measured the underpinnings and the outcomes of interpersonal relations (Davlembayeva, Papagiannidis & Alamanos, 2020; Long, Li & Ning, 2015; Koopman et al., 2015), the literature still represents a behaviour or social actors in too simplistic a way. Specifically, researchers differentiated the concept of positive and negative actions without a critical understanding of how the valence of action is defined (Cropanzano et al., 2017). As a result, the need to utilise broad standards for evaluating the deviance of

behaviour that can be useful in determining the valence of social exchange constructs was questioned (Bennett et al., 2005). Another issue is the simplicity of presenting the structure of reciprocity. Reciprocity constructs fall into opposite categories – negative and positive. The logic behind this categorisation is that the absence of a positive event (e.g. supportive behaviour) equates to a negative event (e.g. abusive behaviour). However, this representation is unidimensional. It does not take into account the activity dimension, which can be used to differentiate actively exhibited positive/negative behaviour from withheld positive/negative behaviour (Cropanzano et al., 2017). Despite the conceptual difference between the types of behaviour, such a categorisation has not yet been empirically tested.

Concepts

Cost (Independent): The alternative activities or opportunities foregone by the actors involved. (Homans, 1961)

Social Exchange (Dependent): The exchange of activity, tangible or intangible, and more or less rewarding or costly, between at least two persons. (Homans, 1961)

Reciprocity (Independent/Dependent): The giving of benefits to another in return for benefits received, is one of the defining features of social exchange and, more broadly, of social life. (Molm, 2010)

Norm of Reciprocity (Independent): The norm of reciprocity defines certain actions and obligations as repayments for benefits received. (Gouldner, 1960)

Equity (Dependent): The balance between a person's inputs and outcomes on the job. (Adams, 1963)

Reward (Independent): The sources of positive reinforcement. (Blau, 2017)

References

Adams, J.S. (1963). Towards an understanding of inequity. *The Journal of Abnormal and Social Psychology*, 67 (5), 422-436.

Ambrose, M.L. & Schminke, M. (2003). Organization structure as a moderator of the relationship between procedural justice, interactional justice, perceived organizational support, and supervisory trust. *Journal of Applied Psychology*, 88 (2), 295-305.

Baxter, L.A. & Braithwaite, D.O. (2008). *Engaging Theories in Interpersonal Communication*. Sage Publications, Inc.

Bennett, R.J., Aquino, K., Reed, A. & Thau, S. (2005). The Normative Nature of Employee Deviance and the Impact of Moral Identity. *Counterproductive work behavior: Investigations of actors and targets.*, 107-125.

Biron, M. & De Reuver, R. (2013). Restoring balance? Status inconsistency, absenteeism, and HRM practices. *European Journal of Work and Organizational Psychology*, 22 (6), 683-696.

Blau, P. (2017). *Exchange and Power in Social Life*. Routledge.

Blumer, H. (1986). *Symbolic Interactionism*. University of California Press.

Chatterjee, D.S. (2019). Explaining customer ratings and recommendations by combining qualitative and quantitative user generated contents. *Decision Support Systems*, 119, 14-22.

Chen, C.C. (1995). New Trends in Rewards Allocation Preferences: A Sino-U.S. Comparison. *Academy of Management Journal*, 38 (2), 408-428.

Coyle-Shapiro, J.A., Morrow, P.C., Richardson, R. & Dunn, S.R. (2002). Using profit sharing to enhance employee attitudes: A longitudinal examination of the effects on trust and commitment. *Human Resource Management*, 41 (4), 423-439.

Cropanzano, R. & Mitchell, M.S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal of Management*, 31 (6), 874-900.

Cropanzano, R. (2003). The Structure of Affect: Reconsidering the Relationship Between Negative and Positive Affectivity. *Journal of Management*, 29 (6), 831-857.

Cropanzano, R., Anthony, E.L., Daniels, S.R. & Hall, A.V. (2017). Social Exchange Theory: A Critical Review with Theoretical Remedies. *Academy of Management Annals*, 11 (1), 479-516.

Davies, S.G., McGregor, J., Pringle, J. & Giddings, L. (2018). Rationalizing pay inequity: women engineers, pervasive patriarchy and the neoliberal chimera. *Journal of Gender Studies*, 27 (6), 623-636.

Davlembayeva, D., Papagiannidis, S. & Alamanos, E. (2020). Sharing economy: Studying the social and psychological factors and the outcomes of social exchange. *Technological Forecasting and Social Change*, 158, 120143.

Davlembayeva, D., Papagiannidis, S. & Alamanos, E. (2021). Sharing economy platforms: An equity theory perspective on reciprocity and commitment. *Journal of Business Research*, 127, 151-166.

DeLamater, J. & Ward, A. (2013). *Handbook of Social Psychology*.

Delamater, J. (2006). *Handbook of Social Psychology (Handbooks of Sociology and Social Research)*. Springer.

Emerson, R.M. (1976). Social Exchange Theory. *Annual Review of Sociology*, 2 (1), 335-362.

Foa, E.B. & Foa, U.G. (1980). Resource Theory. *Social Exchange*, 77-94.

Folkman, S. & Lazarus, R.S. (1988). Coping as a mediator of emotion. *Journal of Personality and Social Psychology*, 54 (3), 466-475.

Gefen, D. & Keil, M. (1998). The impact of developer responsiveness on perceptions of usefulness and ease of use. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 29 (2), 35-49.

Geiger, A., Horbel, C. & Germelmann, C.C. (2018). "Give and take": how notions of sharing and context determine free peer-to-peer accommodation decisions. *Journal of Travel & Tourism Marketing*, 35 (1), 5-15.

Gouldner, A.W. (1960). The Norm of Reciprocity: A Preliminary Statement. *American Sociological Review*, 25 (2), 161.

Griffin, M.L. & Hepburn, J.R. (2005). Side-bets and reciprocity as determinants of organizational commitment among correctional officers. *Journal of Criminal Justice*, 33 (6), 611-625.

Heath, A.F. (1976). *Rational choice & social exchange*. Cambridge University Press.

Hoffman, E., McCabe, K. & Smith, V. (1998). BEHAVIORAL FOUNDATIONS OF RECIPROCITY: EXPERIMENTAL ECONOMICS AND EVOLUTIONARY PSYCHOLOGY. *Economic Inquiry*, 36 (3), 335-352.

Homans, G.C. (1961). *Social behavior*.

Howard, L. & Ekeh, P.P. (1976). Social Exchange Theory: The Two Traditions. *Contemporary Sociology*, 5 (5), 665.

Izard, C.E. (1991). *The psychology of emotions*. Plenum Press.

J., G.K. (1969). *Psychology of Behaviour Exchange (Topics in Social Psychology)*. Longman Higher Education.

Kankanhalli, Tan, & Wei (2005). Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation. *MIS Quarterly*, 29 (1), 113.

Kanwal, S., Rasheed, M.I., Pitafi, A.H., Pitafi, A. & Ren, M. (2020). Road and transport infrastructure development and community support for tourism: The role of perceived benefits, and community satisfaction. *Tourism Management*, 77, 104014.

Kelley, H.H. & Michela, J.L. (1980). Attribution Theory and Research. *Annual Review of Psychology*, 31 (1), 457-501.

Knight, M.M. (1940). HERSKOVITS, MELVILLE J. The Economic Life of Primitive Peoples. *The ANNALS of the American Academy of Political and Social Science*, 210 (1), 184-185.

Koopman, J., Matta, F.K., Scott, B.A. & Conlon, D.E. (2015). Ingratiation and popularity as antecedents of justice: A social exchange and social capital perspective. *Organizational Behavior and Human Decision Processes*, 131, 132-148.

Lawler, E.J. & Thye, S.R. (1999). BRINGING EMOTIONS INTO SOCIAL EXCHANGE THEORY. *Annual Review of Sociology*, 25 (1), 217-244.

Lawler, E.J. & Yoon, J. (1996). Commitment in Exchange Relations: Test of a Theory of Relational Cohesion. *American Sociological Review*, 61 (1), 89.

Lawler, E.J. (2001). An Affect Theory of Social Exchange. *American Journal of Sociology*, 107 (2), 321-352.

Long, C., Li, Z. & Ning, Z. (2015). Exploring the nonlinear relationship between challenge stressors and employee voice: The effects of leader–member exchange and organisation-based self-esteem. *Personality and Individual Differences*, 83, 24-30.

Malinowski (2013). *Man and Culture*. Routledge.

Molm, L.D. (1994). Dependence and Risk: Transforming the Structure of Social Exchange. *Social Psychology Quarterly*, 57 (3), 163.

Molm, L.D. (1997). *Coercive power in social exchange*. Cambridge University Press.

Molm, L.D. (2003). Theoretical Comparisons of Forms of Exchange. *Sociological Theory*, 21 (1), 1-17.

Molm, L.D., Peterson, G. & Takahashi, N. (1999). Power in Negotiated and Reciprocal Exchange. *American Sociological Review*, 64 (6), 876.

Mora Cortez, R. & Johnston, W.J. (2020). The Coronavirus crisis in B2B settings: Crisis uniqueness and managerial implications based on social exchange theory. *Industrial Marketing Management*, 88, 125-135.

Mostafa, A.M.S. & Bottomley, P.A. (2020). Self-Sacrificial Leadership and Employee Behaviours: An Examination of the Role of Organizational Social Capital. *Journal of Business Ethics*, 161 (3), 641-652.

Nahapiet, J. & Ghoshal, S. (1998). Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review*, 23 (2), 242-266.

Organ, D.W. (1988). *Organizational citizenship behavior*. Lexington Books.

Rayner, C. & Keashly, L. (2005). Bullying at Work: A Perspective From Britain and North America. *Counterproductive work behavior: Investigations of actors and targets.*, 271-296.

Reiche, B.S. (2012). Knowledge Benefits of Social Capital upon Repatriation: A Longitudinal Study of International Assignees. *Journal of Management Studies*, 49 (6), 1052-1077.

Riggle, R.J., Edmondson, D.R. & Hansen, J.D. (2009). A meta-analysis of the relationship between perceived organizational support and job outcomes: 20 years of research. *Journal of Business Research*, 62 (10), 1027-1030.

Rosette, A.S. & Zhou Koval, C. (2018). Framing advantageous inequity with a focus on others: A catalyst for equity restoration. *Journal of Experimental Social Psychology*, 76, 283-289.

Rousseau, D.M. (1995). *Psychological contracts in organizations*. SAGE Publications.

Samuel, C.J. (1994). *Foundations of social theory*. Belknap Press of Harvard University Press.

Sherf, E.N. & Venkataramani, V. (2015). Friend or foe? The impact of relational ties with comparison others on outcome fairness and satisfaction judgments. *Organizational Behavior and Human Decision Processes*, 128, 1-14.

Shiau, W. & Luo, M.M. (2012). Factors affecting online group buying intention and satisfaction: A social exchange theory perspective. *Computers in Human Behavior*, 28 (6), 2431-2444.

Shore, L.M., Tetrick, L.E., Lynch, P. & Barksdale, K. (2006). Social and Economic Exchange: Construct Development and Validation. *Journal of Applied Social Psychology*, 36 (4), 837-867.

Slack, R.E., Corlett, S. & Morris, R. (2015). Exploring Employee Engagement with (Corporate) Social Responsibility: A Social Exchange Perspective on Organisational Participation. *Journal of Business Ethics*, 127 (3), 537-548.

Sorrentino, R.M. & Higgins, E.T. (1986). *Handbook of motivation and cognition*. Guilford Press.

Tepper, B.J., Carr, J.C., Breaux, D.M., Geider, S., Hu, C. & Hua, W. (2009). Abusive supervision, intentions to quit, and employees' workplace deviance:

A power/dependence analysis. *Organizational Behavior and Human Decision Processes*, 109 (2), 156-167.

Thibaut, J.W. & Kelley, H.H. (2017). *The Social Psychology of Groups*. Routledge.

Thomas, C. & Rose, J. (2010). The Relationship between Reciprocity and the Emotional and Behavioural Responses of Staff. *Journal of Applied Research in Intellectual Disabilities*, 23 (2), 167-178.

Tsai, M. & Cheng, N. (2012). Understanding knowledge sharing between IT professionals – an integration of social cognitive and social exchange theory. *Behaviour & Information Technology*, 31 (11), 1069-1080.

Varey, R.J. (2015). Social Exchange (Theory). *Wiley Encyclopedia of Management*, 1-3.

Walster, E., Berscheid, E. & Walster, G.W. (1973). New directions in equity research. *Journal of Personality and Social Psychology*, 25 (2), 151-176.

Wang, X. & Liu, Z. (2019). Online engagement in social media: A cross-cultural comparison. *Computers in Human Behavior*, 97, 137-150.

Wasko, & Faraj (2005). Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice. *MIS Quarterly*, 29 (1), 35.

Yan, Z., Wang, T., Chen, Y. & Zhang, H. (2016). Knowledge sharing in online health communities: A social exchange theory perspective. *Information & Management*, 53 (5), 643-653.

Zhao, Q., Chen, C., Wang, J. & Chen, P. (2017). Determinants of backers' funding intention in crowdfunding: Social exchange theory and regulatory focus. *Telematics and Informatics*, 34 (1), 370-384.

Social Influence Theory

Social Influence Theory explains the impact of social influence on individuals through three processes of influence acceptance, namely compliance, identification and internalisation, and considers the conditions necessary for these processes to occur.

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Theory Factsheet

Proposed By: Kelman, 1953

Related Theories: Cognitive Dissonance Theory, Elaboration likelihood model of persuasion, Model of interpersonal influence characteristics

Discipline: Psychology

Unit of Analysis: Individual

Level: Micro-level

Type: Theory for Explaining

Operationalised: Qualitatively / Quantitatively

Introduction

Social Influence Theory (SIT) was originally formulated by Herbert Kelman (1953) in the early 1950s as the framework explaining the conditions under which social influence induces attitude or behaviour change. The theory was developed against the backdrop of significant social and political upheavals, exemplified by civil rights movements and anti-war protests. The socio-political climate change brought to the fore the contradictory phenomena in which people could conform to social norms and rules whether or not they believed in their legitimacy (Kelman, 1953). However, prior research on social influence was inadequate to explain the underlying processes of collective persuasion and the translation of social compliance into attitude and behaviour change. Although evidence existed about the predictors of conformity (Kelman, 1953; Sherif, 1935), the intricate nature of attitude changes stimulated by a particulate type of communication lacked a theoretical explanation. Dissatisfied with the ability of the preceding theories to explain contradictory responses to social pressures and social norms, in Social Influence Theory, Kelman (1953;1958;1974) analysed different types of influence situations and associated responses.

Social Influence Theory was inspired by the intellectual foundations of three streams of research laying the basis for analysing different motivational grounds for attitude change (Kelman, 1974). These streams included the literature on conformity and social dynamics (Asch, 1961; Sherif, 1935), cognitive dissonance/consistency research (Festinger, 1954; Festinger, 1962) and the functional theories of attitude (Katz, 1960; Smith, Bruner & White, 1956). Kelman built upon research on conformity and social dynamics (Asch, 1961; Luchins, 1945; Sherif, 1935) that had investigated the personal conditions that make people conform or resist pressures in social groups, such as political propaganda and general public opinion. The guiding principles borrowed from those observations that informed the development of SIT were that: (1) attitude is a societal product, regulated by social conventions, values, norms, and rules, as well as the reflection of personal predisposition, (2) social influence has a differential impact on people's acceptance of the influence, and (3) the acceptance of the influence depends on power, the characteristics of an influencing persona/group, and the message that they communicate (Asch, 1961; Festinger, 1954; Sherif, 1935). Cognitive dissonance/consistency research provided a point of reference to suggest that attitude and behaviour change happens against the backdrop of discrepancies between the existing attitudes and new cognitions (Kelman, 1979). In a pursuit to downplay these discrepancies, individuals would either resist or make a change in the existing system of beliefs and values (Festinger, 1954). The observations on the consistency of cognitions helped formulate the two opposing forces necessary for influence acceptance. These forces include new information communicated by an influencing agent, manifested as the exertion of influence, and an inherent inclination of people towards stability, which counterforces the permeation of the new information in the existing system of beliefs and values (Kelman, 1979). Finally, Kelman drew on the functionalists' views of Katz (1960) and Smith et al. (1956), which stated that attitude has a functional significance for "*the goals we are pursuing, the values we are hoping to maximise, the coping processes in which we are engaged*" (Kelman, 1979:128). The functionalist approach emphasises that an individual changes attitudes not only to reduce the discrepancy between existing beliefs and the induced behaviour, but also because the individual is motivated to engage in that behaviour (Kelman, 1974). This is because the induced behaviour has implications for self-evaluation (e.g., self-image, self-esteem) and the ability to maintain social relations. As such, the motivational power of the induced behaviour depends on the degree to which the individual is oriented towards self-development, growth, new learning and self-utilisation (Kelman, 1979).

To go beyond a mere understanding of the motivation for attitude and behaviour change, Kelman's Social Influence Theory aimed to expand knowledge on several fronts. First, it aimed to shed light on the structure of social situations to explain the generic processes that are required for the induction of behaviour. Second, the theory aimed to distinguish between the different modes of influence acceptance by drawing on the differences in situational premises in which influence is attempted. As such, through Social Influence Theory, Kelman sought to explain the qualitative distinctions of different modes of individuals' responses to a social influence and the relative importance of those modes for long-term behaviour change (Kelman, 1979).

Theory

Social Influence Theory postulates that there are three modes of social influence acceptance, namely compliance, identification, and internalisation (Kelman, 1958). Kelman (1974) defined social influence as a behaviour change within the social settings induced by one person or a group of people. Compliance, identification, and internalisation represent the responses to social influences that can be best viewed as the outcomes of the dynamic processes of interaction with an influencing agent(s) in an informational and motivational context (Kelman, 1979). To understand the difference between compliance, identification, and internalisation, Kelman (1974) proposed a structure of generic social influence situations from the perspective of the person towards whom the influence is elicited (hereafter referred to as an individual or a person), as illustrated in Figure 1. The left-hand side of the model demonstrates the three steps of the evaluation of the stimulus elements: the definition of the situation, the presentation of the agent and the specification of the response. These are required for an influence to have an effect on its recipient. Exposure, positive orientation and induced behaviour represent responses to the stimulus elements, leading to influence acceptance. The right-hand side of the model depicts the psychological prerequisites for positive responses to stimulus elements, namely the perception of the conditions for goal achievement and an expected goal of induced behaviour. The interrelation between the stimulus assessment stages, associated psychological processes and the consequent responses to the stimulus are illustrated by arrows. "O" refers to an influencing person or a group of people (hereafter referred to as an influencing agent) that individuals interact with to derive the meaning about an agent, specify a response to influence exposure and assess the conditions for induced behaviour (Kelman, 1974).

Figure 1: The structure of social influence situations (Kelman, 1974)

Definition of situation refers to the state that follows after an influencing agent provides information in a deliberate or unintentional attempt to induce behaviour

(Kelman, 1974). Deliberate induction of behaviour takes the form of direct commands, such as threats, requirements, orders or persuasion. Unintentional induction can be an indirect expression of expectations, thoughts and norms (Kelman, 1979). Induced behaviour is discrepant to some extent from the behaviour and attitudes of the individual upon whom influence is exerted, which typically entails some degree of the individual's resistance to change. This is because people are inherently inclined to cognitive stability, which reduces personal receptivity to new information. If receptivity to new information is weak, the influence of the new information will probably be neutralised by the recipient (Pelinka & Suedfeld, 2017). Therefore, the chances are that the definition of situation will lead to individuals' willingness to expose themselves to the influence, depending on the degree to which the corresponding psychological prerequisite (an expected goal of induced behaviour) and the situational condition (importance of induced behaviour) are met. To minimise resistance to social influence, the information about induced behaviour should convince an individual that the adoption of induced behaviour, although challenging an existing system of beliefs and attitudes, is conducive to the achievement of an individual's goals (Kelman, 1974; Kelman, 1979). The definition of situation activates the willingness to expose oneself to the induced behaviour if its consequences are perceived as relevant for goal achievement. Consequently, the strength of motivation to respond to the influence depends on the degree of importance of the induced behaviour to one's own goals (Kelman, 1974). *Presentation of agent* is the stage when a person evaluates the characteristics of an influencing agent, which may be social status, expertise, prestige, values, available resources and other attributes (Kelman, 1953; Kelman, 1974). The relationship between this stage of stimulus evaluation with the corresponding psychological prerequisite means that the influencing agent is evaluated in terms of how powerful the agent is in creating the required conditions for goal achievement. By deriving meaning from the attributes and communication of influencing agents, individuals can assess the relevance of the behaviour of the influencing agents to the achievement of personal goals (DeShields, Kara & Kaynak, 1996; Kelman, 1958; Kelman, 1974). The awareness of the characteristics of the influencer that are salient for a person reduces the psychological distance and resistance to the elicited information (Kelman, 1979). Characteristics that resonate with the individual signal favourable conditions for goal achievement, ensure a positive orientation toward the influencing agent and enhance predisposition towards the adoption of the induced behaviour. Hence, the factor amplifying the likelihood that agent evaluation will translate into positive orientation towards the agent is the strength of their perceived power (Kelman, 1974). *Specification of response* is the process preceding the adoption of behaviour, whereby an individual forms an understanding of a precise course of action for the behaviour to be implemented (Kelman, 1974). The induction of behaviour is conditioned by its prepotency. Prepotency is the extent to which induced behaviour is considered the most clearly relevant that has been activated in the influence situation. In other words, the stronger and the more relevant the induced behaviour compared to other available alternatives, the more chances are that behaviour will be induced (Kelman, 1953; Kelman, 1974).

The difference in the importance of induced behaviour, the power sources of an influencing agent, and the manner in which the induced behaviour has become prepotent contribute to the variance in behavioural responses to the social influence (Pelinka & Suedfeld, 2017; O'Keefe, 2016). The resulting changes in

behaviour may be overt or covert in the form of new attitudes and beliefs (Kelman, 1979). Overt and covert behaviour change (i.e. influence acceptance) is manifested through either of the three routes, i.e. *compliance* with the influence, *identification* with an influencing agent or *internalisation* of the induced behaviour. The induction of the behaviour through the compliance, identification and internalisation routes is associated with different emotions and individuals' expectations of the embeddedness of induced behaviour in the social system (Table 1). Specifically, compliance is the acceptance of influence for individuals to receive rewards and avoid punishments for non-compliant behaviour (Kelman, 1958; Pelinka & Suedfeld, 2017). Compliance is a response to external demands motivated by concerns about the social ramifications of that behaviour (Pelinka & Suedfeld, 2017). Examples of such behaviour include abiding by laws and the prescriptions of a doctor. Such behaviour helps reduce the discrepancy in rules and norms cultivated and imposed by the external social environment, and, consequently, eliminates the feelings of social fear and embarrassment that noncompliance may cause (Kelman, 1974). The induced behaviour is likely to be performed under the surveillance of the influencing agent (Pelinka & Suedfeld, 2017). In the patient-doctor dynamics, compliance is higher when doctors have close interaction with patients and the latter tend to seek doctors' approval (Davis, 1971). Similarly, the enforcement of laws is merely possible due to the existence of formal institutions controlling compliance with laws in different spheres of life (Jackson et al., 2012). Therefore, compliance is likely to occur if an influencing agent has the means of control. The agent would exert power and authority in relation to the recipients of communication, while the latter would have restricted behavioural choices to act otherwise (Bagozzi & Lee, 2002; Cialdini & Goldstein, 2004).

Identification is a social influence with the purpose of achieving self-definite goals (Kelman, 1958; Pelinka & Suedfeld, 2017). Like compliance, the adoption of behaviour following identification does not manifest individuals' personal values, but it is intrinsically satisfying (Cialdini & Goldstein, 2004; Kelman, 1958; Pelinka & Suedfeld, 2017). The induction of behaviour through identification is based on the expectation that the behaviour helps fulfil particular social roles. It is important for people because it can promote one's own position in society. The induced behaviour becomes dominant when demands in social roles are clearly delineated (Kelman, 1958; Pelinka & Suedfeld, 2017). The social roles become apparent if individuals affiliate themselves with a particular social category (Kelman, 1974). For example, individuals can be nudged into the consumption of sustainable products and voting for a democratic political party in the United States of America under the expectation that identification with green consumerism and social equality would help sustain membership in respective social and political groups (Bagozzi & Lee, 2002). Identification is more likely to take place, if the relationship to an influencing agent is salient, while the source inducing the behaviour should be attractive enough to foster the desire to affiliate with it (Kelman, 1958; Pelinka & Suedfeld, 2017). Therefore, refusal to identify oneself with a social category with a dominating narrative in society can create feelings of guilt and shame (Kelman, 1974).

Influence internalisation is an act of adopting behaviour because it is construed as being congruent with personal values and views, such as deeply entrenched beliefs and attitudes about social conduct, norms and idealised images (Kelman, 1958; Pelinka & Suedfeld, 2017; O'Keefe, 2016). Such beliefs, values and attitudes usually work as self-guiding principles nurtured early on in people's lives under the influence of the social environment the person grew up in (Bagozzi & Lee, 2002). The denial of

social influence internalisation that goes against deeply rooted values could lead to emotional reactions, such as regret and self-disappointment (Kelman, 1974). For the behaviour to be perceived as congruent, it has to be relevant and easily relatable to personal goals (Kelman, 1979; Pelinka & Suedfeld, 2017). The perception of behavioural congruency and intrinsic value for the individual is facilitated when an influencing agent is perceived as credible (Kelman, 1958). The internalisation of behaviour aligned with the intrinsic needs of a person is expected to result in the restructuring of the existing value system and means-end framework for goal achievement (Kelman, 1958).

The three cognitive modes of influence acceptance can result in different behavioural responses (Bagozzi & Lee, 2002). Out of the three acceptance processes, internalisation can be considered to be the strongest predictor of long-term commitment, as it does not depend on a social and situational context (Kelman, 2006). In the case of internalisation, individuals' behaviour is consistent with norms and beliefs, which are already internalised and deep-rooted in the existing system of values. As the influence is not dissonant with existing cognitions, the induced behaviour will more likely prevail in any social context and under any circumstances (Kelman, 1958). For example, individuals are willing to engage in pro-environmental behaviour in the long term if pro-environmental values had been deeply entrenched in the individual before influence elicitation took place. In contrast, the commitment to behaviour accepted through identification depends on the context, where the induced behaviour is relevant for maintaining desirable social identity and reciprocal social relationships (Stryker & Serpe, 1982). For example, commitment to organisations based on an employee's corporate identification will carry on until the employee changes the workplace. The effect of compliance is short-term, as the behaviour is constrained to the context where surveillance is possible and other behavioural alternatives are limited (Kelman, 1958). In other words, the induction of behaviour is compelled by the need to create a favourable short-term impression in specific social conditions (Friedlander & Schwartz, 1985). For example, to provide services, police and healthcare workers require people to enact certain behaviours, which may not be sustained once the service or treatment is complete.

Table 1: Distinctions between the three modes of influence acceptance (Based on Kelman, 1958 and Kelman, 1974)

	Compliance	**Identification**	**Internalisation**
Embeddedness of induced behaviour in the external social/internal system	External demands	Expectations of social roles	Personal system of values

Associated emotions	Social fear, embarrassment	Guilt and shame	Regret and self-disappointment
The importance of induced behaviour	Concerns with social implications	Social anchorage	Concerns with value congruence
The power of an influencing agent	Means control	Attractiveness	Credibility
The manner in which the induced behaviour has become prepotent	Restricted behaviour choice	Defined role requirements	Restructuring of the means-end framework
Conditions under which induced behaviour is performed	Surveillance	Salience	Relevance to values

The development of Social Influence Theory marked a turning point in social influence research, addressing a gap in prior studies, which predominantly focused on instances of conformity (Asch, 1961; Sherif, 1935). SIT advanced the literature in two ways. Firstly, it offered a nuanced and qualitative analysis of social influence situations. It made it possible to delineate between individuals' responses to persuasion, ranging from superficial conformity to genuine changes in beliefs, in both dual relationships and group dynamics. Secondly, SIT complemented the functionalist approach to attitude (Katz, 1960; Smith, Bruner & White, 1956). In addition to interpreting induced behaviour in functional terms, the theory also provided classifications of the different meanings of situations in which influences occur and the implications of these situations for attitude and behaviour change (Kelman, 1979).

Theory Extension

A model of interpersonal influence characteristics

SIT has inspired numerous studies in social psychology, with scholars building upon and developing new frameworks. One of the notable modifications of SIT is the development of a new Model of Interpersonal Influence Characteristics, by Levy et al. (Levy, Collins & Nail, 1998). Levy et al. (Levy, Collins & Nail, 1998) reconceptualised the social influence literature produced in 1950, largely dominated by the research

of Kelman (1953; 1958; 1974) and newer social influence taxonomies (Raven, 1992). The new conceptual taxonomy was aimed at addressing the challenge in the existing theories on social influence, namely vagueness in the concepts within the sphere of social influence, and the challenge of differentiating social influence from other topics in social psychology.

The model of Levy et al. (1998) was different from traditional approaches in that it did not attempt to offer a mutually exclusive and discrete categorisation of social influence instances for predictive purposes. Instead, it offered a parsimonious model for analysing interpersonal influence cases. The model consists of four fundamental elements: (1) the level of cognitive processing, (2) the intentionality of the influence, (3) social status, and (4) the direction of change. The level of cognitive processing refers to the degree of an individual's awareness of being exposed to the influence of another person, which is represented as the conscious-unconscious dichotomy (Levy, Collins & Nail, 1998). This dichotomy corresponds to the views of other cognitive psychologists, suggesting that people tend to process information in an automatic or deliberate manner (Petty & Cacioppo, 1986). Automatic and deliberate cognitive processes contrast in the degree to which they are controlled by an individual and the level of attentional resources they require (Wyer & Srull, 1994; Levy, Collins & Nail, 1998). For example, conscious cognitive processing is prompted by an individual's awareness of the attempt to induce behaviour. The influencee puts mental effort into considering whether a behavioural or attitudinal response should align with or oppose the induced behaviour. Responses could be the decision to abide by enforced legal regulation or rebel against the imposition of rules by legitimate authorities. Unconscious cognitive processing occurs outside of the influencee's awareness and control. It happens without cognitive guidance and results in such responses as intuitive alignment to commonly accepted social norms, instinctive social responses (e.g. equity and reciprocity), and spontaneous reactions in the form of attraction or repulsion (Levy, Collins & Nail, 1998).

The intentionality of the influence refers to whether an influencing agent has the intention to exert power on an individual. It is considered only in cases of the conscious processing of influences (Levy, Collins & Nail, 1998). The notion of unintentionality can be traced back to Social Influence Theory, emphasising that identification can result from an unintentional attempt to provoke actions (e.g. self-categorisation to achieve a desired social status) (Kelman, 1958). The degree of intentionality takes the form of a three-level category: intentional, unintentional and irrelevant influences. Intentional influence is the one which is exerted deliberately (e.g. rules of conduct) and inflicts either compliant or non-compliant responses (Levy, Collins & Nail, 1998). Unintentional influence stipulates imitation or anti-imitation, manifested as the increased or decreased similarity in behavioural, cognitive or affective characteristics between individuals and influencers. Examples of imitation could be acting in line with group norms and the adoption of the traits and characteristics of the influencer. Consequently, the instances of anti-imitation could be acting in opposition to social norms and the imitation of traits and characteristics of the opposite social group (Levy, Collins & Nail, 1998; Levy & Nail, 1993). The irrelevant category encompasses the concepts that are theoretically irrelevant, where the intentionality of the influence is impossible to trace. Under such circumstances, the acceptance of influence can hinge upon individuals' personal experience, observations or exposure to persuasive or impactful communication (Levy, Collins & Nail, 1998).

Social status refers to the relative difference of an individual from an influencing agent (lower vs peer, vs higher vs irrelevant), which can correspond to different forms of social influence acceptance (Levy, Collins & Nail, 1998). Specifically, a higher social status of an influencing agent bestows upon them the power to make individuals obedient or, conversely, can trigger rebellious reactions against influencers (Levy, Collins & Nail, 1998). In the condition of influencers' lower social status, individuals can also succumb to social pressure if they have responsibility over the influencers. Such a form of compliance is referred to as power-of-the-powerless (Raven, 1993). Negative power dynamics for influencees can also provide them with the grounds to oppose the influence—an act referred to as counter power-of-the-powerless (Levy, Collins & Nail, 1998). Intentional influence from peers is postulated to result in either direct conformity or non-conformity with social expectations and norms. Similarly, an unintentional influence attempt from peers is poised to result in either imitation or anti-imitation of the behaviour and attitudes of a social group (Levy, Collins & Nail, 1998).

The direction of change takes the form of positive, negative and irrelevant responses. The inclusion of the direction of change characteristic in the framework was rooted in the proposition that sometimes influence can be counter-effective and raise an opposite reaction (Levy, Collins & Nail, 1998). Table 2 summarises and defines all types of responses to social influence. The relationships between the four fundamental interpersonal influence characteristics making up the decision tree are presented in Figure 2.

**Table 2: Definitions of social influence concepts (Levy, Collins & Nail, 1998, pp. 730-733)**

Concept	Definition
Obedience	A form of compliance in which the influencee yields to perceived legitimate authority.
Rebellion	A form of anti-compliance in which the influencee acts in opposition to perceived legitimate authority.
Direct conformity	A form of compliance in which the influencee yields to perceived peer or group norms.
Direct anti-conformity	A form of anti-compliance in which the influencee acts in opposition to perceived peer or group norms.
Power-of-the-powerless	A form of compliance in which the influencer's lower social status gives him/her legitimate authority power over the influencee.

Counter power-of-the-powerless	A form of anti-compliance in which the influencee acts in opposition to the legitimate power of a lower social status influencer
Indirect conformity	A form of imitation in which an influencee acts in the direction of perceived peer or group norms. Compared to direct conformity, indirect conformity implies that social influence is unintentionally elicited.
Indirect anti-conformity	A form of anti-imitation in which an influencee acts in opposition of perceived peer or group norms. Compared to direct anti-conformity, indirect anti-conformity implies that social influence is unintentionally elicited.
Positive identification	A form of imitation in which an influencee adopts the traits, characteristics or mannerisms of another individual or group.
Disinhibitory contagion	A form of contagion in which the influencee (…) experiences a reduction of restraints as a consequence of observing the influencer perform the desired act. The influencee's behaviour may or may not be an exact imitation of the influencer's behaviour. The reduction of restraints means the reduction of the psychological avoidance of behaviour.
Negative identification	A form of anti-imitation in which an influencee adopts the traits, characteristics or mannerisms that are opposite to those of another individual or group.
Informational influence	Social influence that derives from the persuasive content of a communication wherein internalisation is in the direction of the influencer's communication. In this context, internalisation means that the influence is assimilated with internal beliefs and values, as initially intended by the communicator.
Counter informational / boomerang effect	Social influence that derives from the persuasive content of a communication, wherein internalisation is in a direction opposite to that of the influencer's communication. In other words, the influence results in the creation of internal beliefs and values that are opposite to what the communicator initially intended.

Reactance	An internal motive to protect or restore one's threatened sense of freedom.
Direct learning	The acquisition of a new response as a consequence of direct experience.
Vicarious learning	The acquisition of a new response as a consequence of observation.
Attraction	An influencee's positive affective evaluation of an influencer.
Echo contagion	A form of contagion in which an unconflicted influencee spontaneously imitates or reflects the affect or behaviour of the influencer.
Hysterical contagion	A form of contagion involving the spread of physical symptoms from the influencer to an influencee in the absence of an identifiable pathogen. 'Pathogen' refers to any physical or mental condition.
Repulsion	The influencee's negative affective evaluation of an influencer. In other words, repulsion represents an affective response to the evaluation of the influencer.
Social loafing	A situation in which individuals exert less effort toward achieving a common goal when performing in a group of co-actors than when performing alone.
Norm activation	The social triggering of an influencee's cognitive structures, such as memories, associations, beliefs, values, ideas, expectations, assumptions or general prior knowledge.
Social facilitation	A situation in which the presence of others, as spectators or as co-actors, enhances the emission of the influencee's dominant responses.
Instinct social responses	Inborn predisposition to respond to others (e.g. attachment, aggression, esteem needs).

Note: the concept appears in the order in which it is presented in Figure 2

Figure 2: Decision tree for interpersonal influence characteristics (Levy, Collins & Nail, 1998)
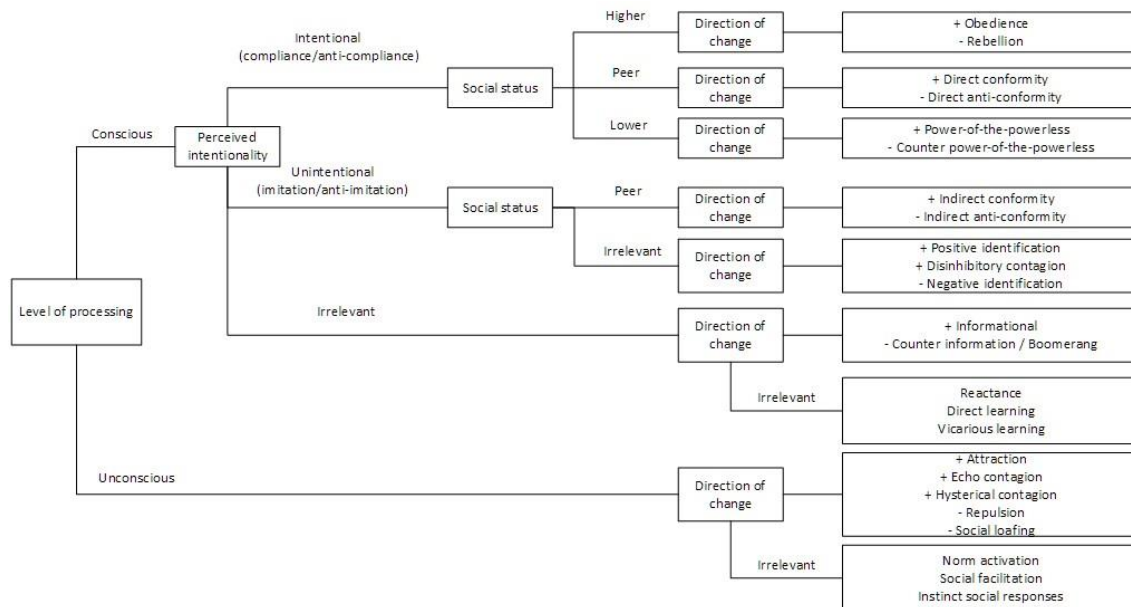
The decision tree of interpersonal influence characteristics served as a novel conceptualisation of Kelman's Social Influence Theory and other research in the broad domain of social influence (French, 1956; Raven, 1992). Consisting of only four types of characteristics, the framework represents a logical system for differentiating a higher number of interpersonal influence instances, compared to Social Influence Theory. Also, reformulating existing knowledge on social influence opened avenues for theoretical advances, especially around influence intentionality and unconscious processing, which had not been emphasised in prior theories. The decision tree by Levy et al. (Levy, Collins & Nail, 1998) presents distinct subcategories for unintentional influence (i.e. indirect conformity, anti-conformity, identification, disinhibitory contagion, and residual influence types) and unconscious influence processing (i.e. attraction, echo contagion, hysterical contagion, repulsion, social loafing and other influences theoretically irrelevant to the concept category). Consequently, the model not only addressed the knowledge gaps persistent in social influence research at that time, but paved the way for further empirical inquiry into the underexplored dimensions of social influence situations.

Applications

For decades, Social Influence Theory guided studies across various disciplines. Initially, its application was predominantly seen in organisational, medical, and socio-political studies. In the discipline of organisational management, the SIT was employed to discern behavioural patterns related to compliance, identification,

and the internalisation processes influencing employees' behavioural development. For example, researchers delved into the impact of authority on employee compliance (Freedman, 1981), negative behaviour development among co-workers due to group affiliations (Herold & Conlon, 1981) and the changes in internalised beliefs among demographically (dis)similar individuals (Eagly, Wood & Fishbaugh, 1981). In medical studies, the theory was utilised to explore the factors inherent to social environmental influencing health-destructive and health-protective behaviours, such as resistance to smoking (Covington, 1981) and adherence to treatments advocated by healthcare practitioners (Dembroski, Lasater & Ramirez, 1978; Rodin & Janis, 1979). In the socio-political context, the theory found application in explaining the implications of large-scale interventions for specific nations' economic and political submissiveness (vs dominance) (Richardson, 1976), civil movements and socio-cultural transformations (Ewens & Ehrlich, 1973; Moscovici & Mugny, 1985; Pool, Wood & Leck, 1998), political polarisation (Kelman, 1970; MOR, 2007; Watanabe et al., 2017) and other phenomena. Equally valuable was SIT's application in understanding social relations at the community level. For instance, researchers investigated the role of the social context in the development of cultural preferences among children (Bunton & Weissbach, 1974; Kochanska, Tjebkes & Fortnan, 1998) and the influence of values on the perception of policies of international financial institutions (Riggs, 1980). At the individual level, the theory was employed to examine various aspects of interpersonal relations, including but not limited to the perception of power and the legitimacy of actions (Bickman, 1974), stigmatisation and dynamics in interracial interactions (Page, 1997).

In the past two decades, along with the unfaded interest in the social influence phenomenon within organisational and larger social systems (Binyamin, 2020), the application of SIT has also expanded in the domains of marketing and information system management (Baker et al., 2014; Cheung et al., 2022; Huang, 2019). As research on user interaction around information systems has burgeoned, scholars have adapted Kelman's framework to investigate shifts in attitudes toward new technology. For example, SIT was integrated with the Elaboration Likelihood Model developed by Petty and Cacioppo (1986) to understand the effectiveness of influence in the process of information systems acceptance. Modifications in SIT also concerned the integration of context-specific factors associated with influence acceptance. Studies examined the impact of system characteristics (design quality, technology quality, information quality) on identification (Cheung et al., 2022). SIT was also used for examining post-adoption behaviour, whereby the effect of identification processes on continuous usage of IT services was tested alongside the effect of the expectation-confirmation mechanism (i.e. the assessment of the degree to which expectations are confirmed by actual performance) (Huang, 2019).

The adaptability of SIT to various scenarios of interpersonal interactions has led to implications for various sub-streams in marketing and public relations research. In the traditional marketing context, for instance, researchers have delved into consumption behaviour under the influence of communication from referent groups and the alignment of influence with personal goals and values (Yang, Tseng & Lee, 2021). In the business-to-business environment, the focus has extended to examining the impact of brand communications on the behaviour and performance of customer service representatives (Baker et al., 2014). Recently, with more companies venturing into sustainable production, there is a growing body of research utilising SIT

for understanding the underpinnings of pro-environmental behaviour. Studies have examined the influence of sustainability advocacy groups and personal norms on sustainable consumption choices (Confetto et al., 2023; Elgaaied-Gambier, Monnot & Reniou, 2018). The applications of Social Influence Theory have been instrumental in designing persuasive messages and campaigns that align with different company objectives, whether aiming for momentary compliance or the enduring internalisation of influence. In the digital marketing context, SIT has been used to explain user behaviour on social media platforms (Oliveira, Garcia & Vivacqua, 2021;Sánchez-Fernández & Jiménez-Castillo, 2021;Santiago, Magueta & Dias, 2020) and the attitudinal and behavioural implications of online influencer marketing (Fan & Chan, 2023; Tafesse & Wood, 2021). In particular, studies found that social media influencers' personality characteristics (e.g. closeness, interactivity, homophily and originality) drive imitation and the adoption of induced behaviour ((Chloe) Ki, Park & Kim, 2022; Li & Peng, 2021). Researchers have applied the theory loosely, however, primarily focusing on the characteristics of an influencing agent. This emphasis often occurs without due consideration to the relation of the examined characteristics to a particular route of influence acceptance.

Limitations

Social Influence Theory garnered critique around its lack of acknowledgement of contextual factors, its inability to differentiate the intentionality of influences and associated behavioural responses, and insufficient attention to the role of power dynamics in social influence situations and cognitive processes of persuasion (Latané, 1981; Levy, Collins & Nail, 1998; Lisha et al., 2017;Petty & Cacioppo, 1986;Wang et al., 2022). In particular, researchers emphasised the need to explore the contextual differences of situations affecting variance in social influence effects. To that end, some critics argued that Kelman's theory may not be adequate to address the role of situational factors in social influence processes (Dong et al., 2021). It was found that temporal-spatial factors (i.e. time difference and the crowdedness of the environment where influence is elicited) affect the evaluation of the characteristics of an influencing agent and the persuasiveness of communication consequently (Dong et al., 2021). Other scholars contended that the theory does not account for the variations in social influence processes across different cultures (Lisha et al., 2017; Wang et al., 2022). Evidence from cross-cultural research has suggested that social influence dynamics can be influenced by cultural norms and values (Wang et al., 2022). Therefore, cultural differences should be considered to eliminate flawed generalisations. Second, the notion of intentionality was implicit in Social Influence Theory, suggesting that identification did not require an influencing agent to deliberately exert power upon an individual to stimulate the induction of behaviour to secure membership in a particular social group (Kelman, 1953; Levy, Collins & Nail, 1998). The lack of explicit distinctions between intentional and unintentional influences limited the understanding of the types of potential behavioural responses that unintentional influences may entail (Levy, Collins & Nail, 1998). Drawing on this limitation of SIT, Levy et al. (Levy, Collins & Nail, 1998) developed the Model of Interpersonal Influence Characteristics and provided an explicit categorisation and scenarios under which unintentional influence can be exerted and the responses it entails. Third, it has also been highlighted that SIT did not pay necessary consideration to power dynamics in social influence situations. In that regard, the Social Impact Theory by Latané (1981) emphasises the role of power and its distribution. Social Impact Theory postulates

that the strength of the influencing group of people, the immediacy (proximity) of the agent to the individual and the number of people in the group determine how people respond to social influence. Finally, it has been argued that, in an attempt to cover the broader scope of responses to social influences, SIT provides an insufficient explanation of the cognitive processes underscoring communication persuasion (Petty & Cacioppo, 1986). To address that limitation, the Elaboration Likelihood Model developed by Petty and Cacioppo (1986) delves into the motivational and ability factors impacting information processing and persuasion.

Concepts

Compliance (Dependent): Compliance can be said to occur when an individual accepts influence because he hopes to achieve a favourable reaction from another person or group. (Kelman, 1958)

Identification (Dependent): Identification can be said to occur when an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or a group. (Kelman, 1958)

Internalisation (Dependent): Internalisation can be said to occur when an individual accepts influence because the content of the induced behaviour - the ideas and actions of which it is composed-is intrinsically rewarding. (Kelman, 1958)

References

(Chloe) Ki, C., Park, S. & Kim, Y. (2022). Investigating the mechanism through which consumers are "inspired by" social media influencers and "inspired to" adopt influencers' exemplars as social defaults. *Journal of Business Research*, 144, 264-277.

Asch, S.E. (1961). EFFECTS OF GROUP PRESSURE UPON THE MODIFICATION AND DISTORTION OF JUDGMENTS. *Documents of Gestalt Psychology*, 222-236.

Bagozzi, R.P. & Lee, K. (2002). Multiple Routes for Social Influence: The Role of Compliance, Internalization, and Social Identity. *Social Psychology Quarterly*, 65 (3), 226.

Baker, T.L., Rapp, A., Meyer, T. & Mullins, R. (2014). The role of brand communications on front line service employee beliefs, behaviors, and performance. *Journal of the Academy of Marketing Science*, 42 (6), 642-657.

Bickman, L. (1974). The Social Power of a Uniform[1]. *Journal of Applied Social Psychology*, 4 (1), 47-61.

Binyamin, G. (2020). Do leader expectations shape employee service performance? Enhancing self-expectations and internalization in employee role identity. *Journal of Management & Organization*, 26 (4), 536-554.

Bunton, P.L. & Weissbach, T.A. (1974). Attitudes toward Blackness of Black Preschool Children Attending Community-Controlled or Public Schools. *The Journal of Social Psychology*, 92 (1), 53-59.

Cheung, M.L., Leung, W.K., Aw, E.C. & Koay, K.Y. (2022). "I follow what you post!": The role of social media influencers' content characteristics in consumers' online brand-related activities (COBRAs). *Journal of Retailing and Consumer Services*, 66, 102940.

Cialdini, R.B. & Goldstein, N.J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology*, 55 (1), 591-621.

Confetto, M.G., Covucci, C., Addeo, F. & Normando, M. (2023). Sustainability advocacy antecedents: how social media content influences sustainable behaviours among Generation Z. *Journal of Consumer Marketing*, 40 (6), 758-774.

Covington, M.V. (1981). Strategies for Smoking Prevention and Resistance Among Young Adolescents. *The Journal of Early Adolescence*, 1 (4), 349-356.

Davis, M.S. (1971). Variation in Patients' Compliance with Doctors' Orders: Medical Practice and Doctor-Patient Interaction. *Psychiatry in Medicine*, 2 (1), 31-54.

DeShields, O.W., Kara, A. & Kaynak, E. (1996). Source effects in purchase decisions: The impact of physical attractiveness and accent of salesperson. *International Journal of Research in Marketing*, 13 (1), 89-101.

Dembroski, T.M., Lasater, T.M. & Ramirez, A. (1978). Communicator Similarity, Fear Arousing Communications, and Compliance with Health Care Recommendations[1]. *Journal of Applied Social Psychology*, 8 (3), 254-269.

Dong, L., Zhang, J., Huang, L. & Liu, Y. (2021). Social influence on endorsement in social Q&A community: Moderating effects of temporal and spatial factors. *International Journal of Information Management*, 61, 102396.

Eagly, A.H., Wood, W. & Fishbaugh, L. (1981). Sex differences in conformity: Surveillance by the group as a determinant of male nonconformity. *Journal of Personality and Social Psychology*, 40 (2), 384-394.

Elgaaied-Gambier, L., Monnot, E. & Reniou, F. (2018). Using descriptive norm appeals effectively to promote green behavior. *Journal of Business Research*, 82, 179-191.

Ewens, W.L. & Ehrlich, H.J. (1973). The Relative Influence of Reference Others with Regard to Civil Rights Activism. *Sociological Focus*, 6 (1), 1-13.

Fan, F. & Chan, K. (2023). From a Relational Approach: The Persuasiveness of Advertisements Endorsed by Celebrities and Online Influencers. *Journal of Promotion Management*, 29 (5), 735-757.

Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, 7 (2), 117-140.

Festinger, L. (1962). *A theory of cognitive dissonance*. Stanford University Press.

Freedman, S.C. (1981). Threats, Promises, and Coalitions: A Study of Compliance and Retaliation in a Simulated Organizational Setting[1]. *Journal of Applied Social Psychology*, 11 (2), 114-136.

French, J.R.P. (1956). A formal theory of social power. *Psychological Review*, 63 (3), 181-194.

Friedlander, M.L. & Schwartz, G.S. (1985). Toward a theory of strategic self-presentation in counseling and psychotherapy. *Journal of Counseling Psychology*, 32 (4), 483-501.

Herold, D.M. & Conlon, E.J. (1981). Work Factors as Potential Causal Agents of Alcohol Abuse. *Journal of Drug Issues*, 11 (3), 337-356.

Huang, Y. (2019). Examining students' continued use of desktop services: Perspectives from expectation-confirmation and social influence. *Computers in Human Behavior*, 96, 23-31.

Jackson, J., Bradford, B., Hough, M., Myhill, A., Quinton, P. & Tyler, T.R. (2012). Why do People Comply with the Law?: Legitimacy and the Influence of Legal Institutions. *British Journal of Criminology*, 52 (6), 1051-1071.

Katz, D. (1960). The Functional Approach to the Study of Attitudes. *Public Opinion Quarterly*, 24 (2, Special Issue: Attitude Change), 163.

Kelman, H. (1974). *Further Thoughts on the Processes of Compliance, Identification, and Internalization*.

Kelman, H. (1979). *The role of action in attitude change*. .

Kelman, H.C. (1953). Attitude Change as a Function of Response Restriction. *Human Relations*, 6 (3), 185-214.

Kelman, H.C. (1958). Compliance, identification, and internalization three processes of attitude change. *Journal of Conflict Resolution*, 2 (1), 51-60.

Kelman, H.C. (1970). A Social-Psychological Model of Political Legitimacy and Its Relevance to Black and White Student Protest Movements[†]. *Psychiatry*, 33 (2), 224-246.

Kelman, H.C. (2006). Interests, Relationships, Identities: Three Central Issues for Individuals and Groups in Negotiating Their Social Environment. *Annual Review of Psychology*, 57 (1), 1-26.

Kochanska, G., Tjebkes, J.L. & Fortnan, D.R. (1998). Children's Emerging Regulation of Conduct: Restraint, Compliance, and Internalization from Infancy to the Second Year. *Child Development*, 69 (5), 1378-1389.

Latané, B. (1981). The psychology of social impact. *American Psychologist*, 36 (4), 343-356.

Levy, D.A. & Nail, P.R. (1993). Contagion: a theoretical AND empirical review AND reconceptualization. *Genetic, social, and generalpsychology monographs*, 119 (2), 233-284.

Levy, D.A., Collins, B.E. & Nail, P.R. (1998). A new model of interpersonal influence characteristics. *Journal of social behavior and personality*, 13 (4), 715.

Li, Y. & Peng, Y. (2021). Influencer marketing: purchase intention and its antecedents. *Marketing Intelligence & Planning*, 39 (7), 960-978.

Lisha, C., Goh, C.F., Yifan, S. & Rasli, A. (2017). Integrating guanxi into technology acceptance: An empirical investigation of WeChat. *Telematics and Informatics*, 34 (7), 1125-1142.

Luchins, A.S. (1945). Social Influences on Perception of Complex Drawings. *The Journal of Social Psychology*, 21 (2), 257-273.

MOR, B.D. (2007). The rhetoric of public diplomacy and propaganda wars: A view from self- presentation theory. *European Journal of Political Research*, 46 (5), 661-683.

Moscovici, S. & Mugny, G. (1985). *Perspectives on minority influence*. Cambridge University Press.

O'Keefe, D.J. (2016). Persuasion and Social Influence. *The International Encyclopedia of Communication Theory and Philosophy*, 1-19.

Oliveira, C., Garcia, A.C.B. & Vivacqua, A.S. (2021). The cost structure of influencers' posts: the risk of losing followers. *Personal and Ubiquitous Computing*, 25 (2), 259-280.

Page, S. (1997). An Unobtrusive Measure of Racial Behavior in a University Cafeteria. *Journal of Applied Social Psychology*, 27 (24), 2172-2176.

Pelinka, A. & Suedfeld, P. (2017). *Attitude Change*. Taylor & Francis Group.

Petty, R.E. & Cacioppo, J.T. (1986). The Elaboration Likelihood Model of Persuasion. *Communication and Persuasion*, 1-24.

Pool, G.J., Wood, W. & Leck, K. (1998). The self-esteem motive in social influence: Agreement with valued majorities and disagreement with derogated minorities. *Journal of Personality and Social Psychology*, 75 (4), 967-975.

Raven, B.H. (1992). *A power/interaction model of interpersonal influence: French and Raven thirty years later. .*

Raven, B.H. (1993). The Bases of Power: Origins and Recent Developments. *Journal of Social Issues*, 49 (4), 227-251.

Richardson, N.R. (1976). Political Compliance and U.S. Trade Dominance. *American Political Science Review*, 70 (4), 1098-1109.

Riggs, R.E. (1980). The Bank, the IMF, and the WHO. *Journal of Conflict Resolution*, 24 (2), 329-357.

Rodin, J. & Janis, I.L. (1979). The Social Power of Health- Care Practitioners as Agents of Change. *Journal of Social Issues*, 35 (1), 60-81.

Santiago, J., Magueta, D. & Dias, C. (2020). *CONSUMER ATTITUDES TOWARDS FASHION INFLUENCERS ON INSTAGRAM: IMPACT OF PERCEPTIONS AND ONLINE TRUST ON PURCHASE INTENTION*.

Sherif, M. (1935). *A study of some social factors in perception*.

Smith, M.B., Bruner, J.S. & White, R.W. (1956). *Opinions and personality*.

Stryker, S. & Serpe, R.T. (1982). Commitment, Identity Salience, and Role Behavior: Theory and Research Example. *Personality, Roles, and Social Behavior*, 199-218.

Sánchez-Fernández, R. & Jiménez-Castillo, D. (2021). How social media influencers affect behavioural intentions towards recommended brands: the role of emotional attachment and information value. *Journal of Marketing Management*, 37 (11-12), 1123-1147.

Tafesse, W. & Wood, B.P. (2021). Followers' engagement with instagram influencers: The role of influencers' content and engagement strategy. *Journal of Retailing and Consumer Services*, 58, 102303.

Wang, Q., Chau, M., Peng, C. & Ngai, E.W.T. (2022). Using the Anchoring Effect and the Cultural Dimensions Theory to Study Customers' Online Rating Behaviors. *Information Systems Frontiers*, 24 (5), 1451-1463.

Watanabe, C., Naveed, K., Neittaanmäki, P. & Fox, B. (2017). Consolidated challenge to social demand for resilient platforms - Lessons from Uber's global expansion. *Technology in Society*, 48, 33-53.

Wyer, R.S. & Srull, T.K. (1994). *Handbook of Social Cognition: Volume 2*. Lawrence Erlbaum.

Yang, X., Tseng, Y. & Lee, B. (2021). Merging the Social Influence Theory and the Goal-Framing Theory to Understand Consumers' Green Purchasing Behavior: Does the Level of Sensitivity to Climate Change Really Matter?. *Frontiers in Psychology*, 12.

Socio-Technical Theory

Socio-technical theory is an organisational theory that conceptualises a given work or other system in view of its constituent social and technical subsystems, with the goal of achieving system success through joint optimisation.

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Theory Factsheet

Proposed By: Trist & Bamforth, 1951

Parent Theory: General Systems Theory, Open Systems Theory

Related Theories: Actor Network Theory, Soft Systems Theory, Work Systems Theory, Work Systems Method

Discipline: Management and business studies

Unit of Analysis: Individual, work system, organisation, industry, nation, society

Level: Meso-level

Type: Theory for Design and Action

Operationalised: Qualitatively / Quantitatively

Introduction

Socio-technical theory originated in the 1950s at the Tavistock Institute in London (Ropohl, 1999), led by Trist and Bamforth (1951) and Emery (1993), resulting from industry-based action research focusing on coal mining (Fox, 1990) and labour studies in Britain (Ropohl, 1999). Built on an open systems foundation (von Bertalanffy, 1950), the theory promised a "*new paradigm*" (Trist, 1981:p42) that defied the dominant technological imperative at the time, in favour of an approach that perceived people as more than extensions to machines (refer to Table 1 for an overview of the initial view of the new paradigm i.e., socio-technical theory). The proposed socio-technical paradigm also deviated from the notion that people were dispensable to a perspective where individuals were considered as a "*resource to be developed*", encouraging collaboration, commitment and a risk-taking environment, as opposed to competition, alienation and minimal levels of risk taking respectively (Trist, 1981:p42).

Table 1: Adopted from Trist et al. (1981)

Old Paradigm	New Paradigm
The technological imperative	Joint optimization
Man as an extension of the machine	Man as complementary to the machine
Man as an expendable spare part	Man as a resource to be developed
Maximum task breakdown, simple narrow skills	Optimum task grouping, multiple broad skills
External controls (supervisors, specialist staffs, procedures)	Internal controls (self-regulating subsystems)
Tall organisation chart, autocratic style	Flat organisation chart, participative style
Competition, gamesmanship	Collaboration, collegiality
Organisation's purposes only	Members' and society's purposes also
Alienation	Commitment
Low risk-taking	Innovation

According to Pasmore et al. (1982:p1182), the socio-technical approach is a *"method of viewing organisations which emphasises the interrelatedness of the functioning of the social and technological subsystems of the organisation and the relation of the organisation as a whole to the environment in which it operates. Put simply, the sociotechnical system perspective contends that organisations are made up of people that produce products or services using some technology, and that each affects the operation and appropriateness of the technology as well as the actions of the people who operate it."* Within this definition is the value-added notion, whereby the products and services produced are "*valued by customers (who are part of the organisation's external environment)*" (Griffith & Dougherty, 2001:p206).

Further simplified, Emery (1980) maintains that socio-technical research is about mutual benefits derived from the intersection of social and technical elements. This intersection emphasises a reciprocity between humans and machines, in which a process of dual shaping of the social and technical systems occurs (Ropohl, 1999:p59). As such, the socio-technical approach defines the social and technical dimensions, which are termed subsystems, that form a system of interest or broader system, known as a suprasystem. The theory stipulates that the success of the socio-technical system is a product of the interactions between these subsystems. Socio-technical theory emerged in response to dominant technocratic models that were technologically deterministic, ignoring human factors (Kling, 1980; Trist, 1981). These models were regarded as restrictive in their disregard for the social aspects within a system, particularly with respect to how the social subsystem interacts with the technical subsystem. As such the socio-technical approach was proposed to acknowledge the significance of society or the social aspects in the design, redesign and interventions affecting a system, whereby the aim of each subsystem

would be to "*meet its own objectives, by using its own means, but is also in an interdependent relation with other subsystems*" (Bauer & Herder, 2009:p601). Design activities were originally completed in the context of a primary work system or organisational unit as the main units of analysis (Trist, 1981). Alternate units of analysis were also recognised in early socio-technical studies, external to the primary work system or the organisational boundary, acknowledging the macrosocial as a significant unit of analysis (Trist, 1981).

Support for socio-technical theory was initially underwhelming and it was not till the 1980s that a shift from the dominant "*technocratic and bureaucratic mode*" became apparent (Trist, 1981). This transition was encouraged in seminal work concerning social analyses in the technology realm (Kling, 1980:p62), which maintained that deviance from the "*technical determinist*" orientation was necessary in researching technologies. Kling's landmark study described the importance of prospective and speculative analyses in addressing the implications of emerging technologies, in view of "*the capabilities, potential benefits, and potential harm of new technical developments*", concluding that meaningful analyses of implications must incorporate social and economic factors, thereby avoiding sole reliance on technical aspects (Kling, 1980:p62). These sentiments were reiterated by Trist (1981:p9), who claimed that "*(t)he technological imperative which was still dominant throughout the eighties could be disobeyed with positive economic as well as human results... the best match would be sought between the requirements of the social and technical systems.*" Bijker (1997:p273) concurred that integration is required, claiming that "*all stable ensembles are bound together as much by the technical as by the social*", and as such should be treated as a single unit consisting of "*intimate social and technical links*". Since its introduction, socio-technical theory has diverged into various application areas.

Theory

Open Systems Basis

Socio-technical theory is built on the foundations of general systems theory and open systems theory (von Bertalanffy, 1950). An open system, as opposed to a closed system, can be defined as one in which there is flow ("*import*" and "*export*") and or interaction between components and the environment, resulting in the modification or evolution of system components (von Bertalanffy, 1950). Consequently, socio-technical systems inherit key assumptions, concepts, and characteristics from these parent theories. These inherited elements include concepts relevant to responsiveness to environmental factors and the key notion of "*equifinality*" in the achievement of a steady state (Trist et al., 2016; Herbst, 1974). With respect to the environment, the open systems perspective acknowledges that a system's success and / or survival is affected by the way it interacts with its environment, and its evolution and responsiveness to any changing conditions. This implies that environmental factors will influence the way the system behaves (Mumford, 2003), and therefore, to resolve complex issues, the dynamics between psychological, economic, technical, cultural, and political aspects need to be understood (Mumford, 2003). The application of open systems thinking within the socio-technical framework promotes not only the dual consideration of the social and technical elements, but also an awareness of "*present and future environmental demands*" (Pasmore et al., 1982:p1186). As to equifinality, this is

expressed as a range of possible initial conditions for ensuring a steady state or equilibrium (Trist et al., 2016). Equifinality is an important notion when considering the operationalisation of the theory through (information) systems design, in that multiple designs could potentially achieve a steady socio-technical system state. A steady state refers to the ability of an open system to reach a time-dependent state of equilibrium, whereby the entire system and its components remain constant (von Bertalanffy, 1950).

Social and Technical Subsystems

The socio-technical approach distinguishes between various dimensions of a given system through the concept of a subsystem. Initial studies identified the dimensions of a socio-technical system as socio-psychological, referencing the people and denoting the human aspects; the technological, as referring to the artifacts or the things; and the economic, as representing the effectiveness of interactions between the human and technological resources (Trist et al., 2016). Current conceptualisations are concerned with three primary dimensions or subsystems: the social, technical, and environmental. In a general sense, the social subsystem refers to the human factors or elements present in a socio-technical system. In an organisational setting, the social subsystem comprises the individuals or people that constitute an organisation and the relationships, values, structure, work-related elements and associations that are delivered by organisational members (Trist & Bamforth, 1951; Emery, 1993; Jacobs, 1972; Bostrom & Heinen, 1977a; Pasmore et al., 1982). The technical subsystem refers to the physical and material flows within a transformation process, in addition to the tasks, control and maintenance functions, and when applied to the organisational setting, denotes the tools, techniques, skills, and devices that are required by workers to fulfil organisational objectives and tasks (Trist & Bamforth, 1951; Emery, 1993; Jacobs, 1972; Taylor, 1975; Bostrom & Heinen, 1977a; Pasmore et al., 1982). These subsystems collectively operate within a given environmental subsystem, which influences their function and the way in which they interact. The environmental subsystem is defined as the context, surroundings, and conditions within which the open socio-technical system operates and is situated, referring to both the internal and external environment (Emery & Marek, 1962; Cummings, 1978; Trist, 1981; Pasmore et al., 1982). According to the founders of the socio-technical school of thought, and in the context of the coal mining industry, the interactions between the social, technical and environmental systems are conveyed as follows: *"So close is the relationship between the various aspects that the social and the psychological can be understood only in terms of the detailed engineering facts and of the way the technological system as a whole behaves in the environment of the underground situation"*(Trist & Bamforth, 1951:p11).

Socio-technical perspectives of an organisation or work system are similarly comprised of distinct but interrelated social and technical subsystems, where a work system is a primary unit or department within an organisation that can be regarded and (re)designed as a socio-technical system consisting of interacting subsystems, within which subdimensions exist (Taylor, 1975; Bostrom & Heinen, 1977a; Bostrom & Heinen, 1977b; Trist, 1981). Within a work system, constructs such as structure, people, technology, and tasks exist and interact (Bostrom & Heinen, 1977a; Bostrom & Heinen, 1977b). This prevalent representation of a socio-technical system is centred on the assumption *"that the outputs of the work system are the result of joint interactions between these two (i.e., the social and technical) systems"*, and as such

integration is necessary during the design or redesign process (Bostrom & Heinen, 1977a:p17). Other representations of socio-technical subsystems focus on defining the characteristics of the distinct social and technical subsystems in view of origins, control and situatedness among other aspects (Table 2), noting that the social and technical aspects *"point in different directions"*, and that the *"the strength of sociotechnical systems results (from) the integration of these two kinds of different phenomena"* (Fischer & Herrmann, 2011:p4).

Table 2: Adopted from Fischer and Herrmann (2011)

	Technical systems	**Social systems**
Origins	Are a product of human activity; can be designed from outside.	Are the result of evolution, cannot be designed but only *influenced* from outside.
Control	Are designed to be controllable with respect to prespecified performance parameters.	Always have the potential to challenge control.
Situatedness	Low: preprogrammed learning and interaction with the environment.	High: includes the potential of improvisation and nonanticipatable adaptation of behaviour patterns.
Changes	Are either preprogrammed (so that they can be simulated by another technical system) or a result of intervention from outside (so that a new version is established).	Evolutionary: gradual accumulation of small, incremental changes, which can lead to emergent changes (which, however are not anticipatable). There is no social system that can simulate the changes of another social system.
Contingency	Are designed to avoid contingency; the more mature a version is, the less its reactions appear as contingent.	The potential for change and evolution is based on contingency.
Criteria	Correctness, reliability, unexpected, unsolicited events are interpreted as malfunction.	Personal interest, motivation; in the case of unsolicited events, intentional malpractice may be the case.
Modeling	Can be modeled by describing how input is processed and leads to a certain output.	Models can only approximate the real behaviour and have continuously to be adapted.

Modus of development	Is produced or programmed from outside.	Develops by evolution that is triggered by communicative interaction.

Principles of Socio-technical Theory

There are two main principles of socio-technical theory, the first relating to the nature of interactions between the social and technical components in defining the degree of success of a system, and the second concerning the *"goodness of fit"* between the social and technical factors of an organisation (Trist, 1981:p10), which results in an optimum state for the suprasystem. This fit was formally termed joint optimisation, which fundamentally refers to equal consideration of the technical and human elements throughout the socio-technical design or redesign process (Emery, 1993; Emery, 1980; Trist, 1981), and entails achieving a "*best match... between the requirements of the social and technical systems*" (Trist, 1981:p9). Although varying interpretations of this principle exist (Mumford, 2003), joint optimisation references a process of reaching an optimum state in the interest of the overall system, rather than privileging or optimising one subsystem, as described by Trist et al. (2016:p7): "*Inherent in the socio-technical approach is the notion that the attainment of optimum conditions in any one dimension does not necessarily result in a set of conditions optimum for the system as a whole. If the structures of the various dimensions are not consistent, interference will occur, leading to a state of disequilibrium, so that achievement of the overall goal will to some degree be endangered and in the limit made impossible. The optimisation of the whole tends to require a less than optimum state for each separate dimension.*"

The definition of optimisation was later enhanced to encompass sensitivity to environmental pressures in the pursuit of optimisation within an organisational setting (Pasmore et al., 1982:p1182). This is due largely to the open systems foundation (von Bertalanffy, 1950), whereby organisations are required to be flexible to accommodate variations in their environments, additionally implying that, in order to avoid "*organisational obsolescence*", joint optimisation should not be considered a static endeavour (Pasmore et al., 1982:p1189). Hence, socio-technical design for joint optimisation is very much an iterative and frequently evolving process. Another key point in this regard is that optimisation should be a mutual, rather than an independent, activity within the socio-technical system, to encourage the most favourable outcome for the given system, as explained by Trist (1981:p24): "*The technical and social systems are independent of each other in the sense that the former follows the laws of the natural sciences while the latter follows the laws of the human sciences and is a purposeful system. Yet they are correlative in that one requires the other for the transformation of an input into an output, which comprises the functional task of a work system. Their relationship represents a coupling of dissimilars which can only be jointly optimised. Attempts to optimise for either the technical or social system alone will result in the suboptimisation of the socio-technical whole.*"

Socio-Technical Design

The principles of the theory, specifically the principle of joint optimisation, are operationalised through a process of socio-technical design, redesign, or some

other form of socio-technical intervention, depending on the unit of analysis in each project. Socio-technical design signifies the design or redesign of (information) systems achieved through stakeholder participation and incorporating interaction between people and (new) technologies (Herbst, 1974). Pasmore et al. (1982) note that socio-technical interventions should not assume technology as a constant where society would be expected to conform to technical demands. Instead, design and or redesign activities should determine the suitable configurations, options and interplay between the human and technical components that would allow for a steady, optimal state to be defined and achieved. Socio-technical studies in the mid-70s identify important requirements in this regard. For instance, Herbst (1974), using relevant concepts such as Wiener's (1980) cybernetics, Shannon and Weaver's (1963) communication theory and von Bertalanffy's (1950) open systems theory, explores the role of control mechanisms within an open environment and the function of control mechanisms in maintaining a "*steady state*". The open environment is also referred to by Herbst (1974:p21) as the "*variable environment*", necessitating a distinct approach to socio-technical systems design, where the role of learning within the organisation, the integration of a "*non-disciplinary*" approach, and the value of documenting a design sequence originating with the social system are documented (Herbst, 1974:p30). With respect to the social system, Herbst (1974) claims that when the social organisation needs have been mapped, it is possible to somewhat reverse engineer and work towards a conceptualisation of the required and supporting technological conditions. Other approaches to socio-technical design have been proposed, all of which guide a collaborative approach to problem solving and to achieving joint optimisation. That is, "*prolonged, patient and intense collaboration*" has long been regarded as key to socio-technical design (Trist et al., 2016:pxiii).

In operationalising socio-technical theory, various principles-based and other design models/approaches have been introduced. Regarding principles, Cherns (1976) presented nine socio-technical design principles, to serve as a design checklist. The nine principles are compatibility, minimal critical specification, the socio-technical criterion, organism versus mechanism, boundary location, information flow, support congruence, design and human values and incompletion. Collectively, the principles are not specifically aimed at the socio-technical designer, but rather at individuals within an organisation affected by a redesign, in addition to a specialist in the area. These principles were later revised (Cherns, 1987), to include compatibility, minimal critical specification, variance control, information flow, power and authority, the multifunctional principle, support congruence, transitional organisation, and incompletion of the Forth Bridge principle. While the original checklist (Cherns, 1976) included design and human values within the eighth principle, the revised list omits values as these are considered to support all the principles (Cherns, 1987) and as such cannot be represented as a distinct principle.

Socio-technical design, on the other hand, is defined by influential scholar Enid Mumford (2003:p262) as providing "*a new worldview of what constitutes quality of working life and humanism at work. It facilitates organisational innovation by recommending the removal of many elite groups and substituting flatter hierarchies, multiskilling and group decision-taking. It wants to replace tight controls, bureaucracy and stress with an organisation and technology that enhances human freedom, democracy and creativity.*" Mumford's prominent design approach ETHICS stands for Effective Technical and Human Implementation of Computer-based Systems, and is a model and philosophy that endorses user involvement and

participation as key features throughout the socio-technical design process (Mumford, 1983; Mumford, 1993). A 15-step process was initially defined (Mumford, 1983). However, simplified versions of ETHICS are also available, such as the four-stage process later defined by Mumford (1993:pp 260-262), with the stages as follows: Mission and key task description - expressing what the department is trying to accomplish and the tasks required; Diagnosis of needs - defining effectiveness and job satisfaction (knowledge, psychological, efficiency and effectiveness, and job design) requirements, identifying challenges prohibiting the mission from being accomplished, and establishing future change needs; Information requirements - determining essential (highly desirable) and useful information and solidifying objectives for the new system; and Departmental and job redesign - employing socio-technical design principles to consider how redesign can take place in a manner that is sensitive to social and technological aspects.

An updated, six-stage version is also available in Mumford (2000:p132), with the stages as follows:

 Diagnosis of needs - defining reasons and motivations for changing the current system, describing system boundaries, identifying core objectives/ purpose/ information needs/ tasks, gauging job satisfaction levels and efficiency, and determining the nature of future change; Setting of objectives - establishing unambiguous objectives pertaining to efficiency, job satisfaction and future change that are desired in the new system; Identifying solutions - recognising design alternatives, including socio-technical solutions, and partaking in discussion; Choice and deployment of solution - selecting and implementing a solution; Follow-up evaluation - evaluating the deployed solution; and Reporting - documenting theoretical and practical lessons.

Irrespective of variations amongst the various representations of ETHICS, the underlying premise is that "*ETHICS is intended to provide users who are not technologists with the means to control or influence systems analysis and design. The approach does this by involving them in the design processes and providing tools and techniques that assist an analysis of their needs and problems*" (Schuler, 1993:p259).

Other socio-technical design models and methodologies also exist. In the context of smart card innovation in Australia, for example, Lindley (1997:p168) proposes a socio-technical design process entailing phases such as systems exploration, systems analysis, initial design by joint optimisation, redesign and implementation, and evolution and redesign as an iterative process. Another model, suggested as a meta-design framework by Fischer and Herrmann (2011), focuses on meta-design at the meta, intermediate, and basic levels, allowing for the continuous adaptation and evolution of socio-technical systems within an environment, facilitated through participatory design processes. Davis et al. (2014) propose a hexagonal framework in which socio-technical systems are represented in view of six interrelated components; namely, goals, people, processes/procedures, culture, technology, and buildings/infrastructure that exist within an external environment. Furthermore, approaches that incorporate values into the design process have been proposed, such as value-sensitive design (Friedman, 1996; Himma & Tavani, 2008), privacy by design (Cavoukian, 2012), and democracy by design (Pitt, Dryzek & Ober, 2020), among others. More recently, numerous integrated co-design approaches have

also emerged in the literature. For example, in the biomedical engineering field, a socio-technical, ethically aligned co-design methodology has been detailed, embedded within an existing engineering design process (Robertson et al., 2019). Additional design approaches that embody socio-technical notions are identified and reviewed by Baxter and Somerville (2011) and include soft systems methodology, human-centred design, contextual design, cognitive systems engineering and more.

Theory Updates/Extensions

Socio-technical theory has evolved from the traditional notions and principles defined above, primarily in response to altering organisational and technological environments and contexts, but with the basic philosophy remaining consistent (Davis et al., 2014). During the latter part of the 1980s and the early 1990s, socio-technical theory received considerably less attention due to the introduction of alternative approaches, namely, lean and business processes re-engineering (Baxter & Sommerville, 2011). Irrespective of its relative popularity, the transition in thought and application of socio-technical theory has reflected the introduction of technologies and corresponding industry applications within specific time periods. Davies et al. (2014:p4) succinctly document the shift in focus in socio-technical research, as follows: "*The emphasis has shifted from an early focus on heavy industry… to a gradual broadening of enquiry to advanced manufacturing technologies…through to office-based work and services (and to) the design of large scale IT projects.*" For further information, refer to Trist (1981) for an overview of the historical context, and developments at the work system, whole of organisation and macrosocial levels from the 1950s to the 1970s. Mumford (1983) also provides a detailed account of theory updates, and later an account of the evolution of socio-technical concepts including international work in the socio-technical space (Mumford, 2006), while Davis et al. (2014) have more recently offered an overview of the shift in focus in socio-technical thinking.

The evolution of socio-technical theory can also be reviewed in terms of the focus on socio-technical designs and interventions. For instance, over time socio-technical research has involved the integration of numerous perspectives, deviating from the original organisational focus. In the Information Systems and ICT fields, for example, Morris (2009) states that socio-technical systems literature can be grouped based on several dominant perspectives including, but not limited to, the social sciences, organisational sciences, engineering, and complex systems viewpoints. Each perspective determines the manner in which socio-technical research can be conducted. As such, Morris (2009) examines socio-technical systems scholarship based on these four perspectives, presenting the important considerations within each perspective. Additionally, Geels has focused on the dynamics of socio-technical systems in terms of transitions, transformations and reproduction in the context of sustainability using a multi-level perspective (MLP) (Geels, 2005; McKelvey, 2006;Geels, 2010;Verbong & Geels, 2010). Another emerging area is socio-technical design for public interest technology (PIT). This stream of socio-technical research offers a transdisciplinary perspective, operationalising socio-technical principles within an ecosystem setting and presenting a framework that documents technology design considerations (such as stages, context, environment, design activities), including the technology application environment, the explicit

recognition of values through to situating various approaches that lead to the design of PIT (Abbas, Pitt & Michael, 2021).

Applications

Socio-technical theory has been applied in a range of disciplines, notably information systems (complex systems), organisational studies / business / management and engineering (Morris, 2009), among others, employing diverse qualitative and quantitative approaches and socio-technical design methodologies. Furthermore, socio-technical theory has been applied in multiple contexts and levels (Griffith & Dougherty, 2001; Geels, 2005), ranging from micro to macro. That is, it could be applied to work systems within an organisation, to the entire organisation, through to "*macrosocial systems*" functioning at the societal level, such as sectors of industry (Trist, 1981:p11). The approach is not restricted to organisations but also accommodates other "*socio-technical phenomena*" (Trist, 1981:p11), although the focus of socio-technical theory has traditionally been at the work system, organisational or departmental level and on achieving economic, work-related and other outcomes. For early empirical applications, refer to Pasmore et al. (1982:p1181). While the application of the socio-technical approach to the design of work systems has been widely documented (Trist & Bamforth, 1951; Cherns, 1976; Cherns, 1987; Clegg, 2000; Alter, 2006; Alter, 2008; Alter, 2013; Eason & Waterson, 2013), studies also point to the need for extensions to the approach (Davis et al., 2014).

Recent studies and applications of the socio-technical approach have reviewed contemporary socio-technical frameworks to account for technological developments (Bednar & Welch, 2020), and to systematically explore socio-technical dimensions such as technology, task, actor and structure in order to identify research gaps in new application areas such as platforms and the platform economy (Kapoor et al., 2021). The transition of socio-technical theory from one discipline to the next has resulted in variable application of the original theory. For instance, in some disciplines it has been used to describe complex systems in general, while in other disciplines, socio-technical theory has been applied and operationalised in a range of empirical studies. Refer to the special issue by Griffith and Gougherty (2001) for an overview of the role, application and categories of research in engineering and technology management. A selection of texts is also provided below.

Table 3: Selection of texts

Area	Reference
Theoretical contribution/evolution	Appelbaum (1997) Geels (2004) Pasmore (1995) Sony & Naik (2020)
Design-related	Adman & Warren (2000) Becker (2007)

	Doorn (2013)
	Hirschheim & Klein (1994)
	Jones, Artikis & Pitt (2013)
	Patnayakuni & Ruppel (2010)
	Pitt & Diaconescu (2016)
	Whitworth & De moor (2003)
Application in practice	Bourazeri & Pitt (2014)
	Chai & Kim, 2012 (2012)
	Herrmann et al. (2004)
	Kling & Courtright (2003)
	Molina (1990)
	Ryan, Harrison & Schkade (2002)
	Sawyer, Allen & Lee (2003)

Limitations

From a theoretical and philosophical perspective, the socio-technical approach was promising in its deviation from technological determinism and its emphasis on joint optimisation of the social and technical subsystems. Ideally the socio-technical approach leads to mutually beneficial outcomes. However, according to critics, the theory initially failed to live up to its potential. For instance, Kelly (1978), in an analysis of applicability, maintains that there are inherent flaws within socio-technical theory, one of which is related to the joint optimisation notion. The author questions whether earlier and founding socio-technical studies did in fact achieve jointly optimised socio-technical systems, claiming that activities privileged the social system (Kelly, 1978:p1084). This resulted in the technical system being somewhat overlooked, as it had "*not been altered in any of these cases as part of a sociotechnical intervention*" (Kelly, 1978:p1086). Pasmore et al. (1982:p1181) reiterated these concerns in an article that reviewed early socio-technical studies from both theoretical and practical (experimental) perspectives. The authors analyse the evolution of the theory and over 130 related experiments, concluding that only a minimal number of experiments entailed the redesigning of technology. Rather, the focus in most of the studies was on "*rearranging the social system around an existing technology in order to approximate joint optimisation*" (Pasmore et al., 1982:p1185). It was explained that optimisation was not a product of finding a suitable match between the social and technical subsystems but rather with independently adapting the social subsystem to support technology (Pasmore et al., 1982:p1195). Technology was thus considered as a constant, and, as such, Pasmore et al. (1982:p1200) believed that greater interest in technological development was required within socio-technical studies. Related to this point, Coiera (2007:S99) cautions against an overly critical approach to technology, to avoid an "*anti-technology*" perspective, which in turn will result in limited application of core socio-technical principles.

With respect to socio-technical design, further weaknesses have been exposed using a critical information systems lens (see Stahl (2007) for an overview). Mumford (2003) has also reported on the implementation, power and participation-related limitations of socio-technical design and the ETHICS approach more specifically. While stakeholder participation and consultation are regarded as critical to socio-

technical design success and the achievement of joint optimisation, participation can also have an undesirable effect in cases where consensus cannot be achieved (refer to Fok et al. (1987) for further information regarding this point), resulting in an inability to reconcile competing and divergent stakeholder interests and an intensification of the gap between stakeholders and their varying interests. Furthermore, limitations of Bostrom and Heinen's seminal work (1977a; 1977b) have been documented, with early studies maintaining that certain claims, such as the requirement to alter designers' perspectives of an organisation (this was regarded the primary reason for MIS failures), were unsubstantiated (Langefors, 1978). Early critiques also propose the Infological approach as an alternative socio-technical framing to address these issues of perspective, advocating instead for user empowerment through inclusion in design initiatives in addition to the need for new types of analysts or designers to support socio-technical design (Bostrom & Heinen, 1977a). More recently, there has also been a call for contemporary socio-technical analysis given the progress in technologies, namely from the perspective of ecological, financial, and socio-technical sustainability (Bednar & Welch, 2020). Other studies, such as that of Davis et al. (2014:p2), have also expressed the need for further extensions to the socio-technical approach, noting that scholars "*engaged in socio-technical thinking need to extend their conceptualisations of 'systems', apply the core ideas to new domains reaching beyond the traditional focus on new technologies, and, at the same time, become involved in predictive work*".

Concepts

Work System (Concept): A primary unit or department within an organisation that can be regarded and (re)designed as a socio-technical system consisting of interacting subsystems, within which subdimensions exist. (Trist & Bamforth, 1951)

Social Subsystem (Concept): The individuals or people that constitute an organisation and the relationships, values, structure, work-related elements, and associations that are delivered by organisational members. More generally, the social subsystem refers to the human factors or elements present in a socio-technical system. (Trist & Bamforth, 1951)

Technical Subsystem (Concept): The tools, techniques, skills, and devices that are required by workers to fulfil organisational objectives and tasks. More generally, the technical subsystem refers to the physical and material flows within a transformation process, in addition to the tasks, control and maintenance functions. (Trist & Bamforth, 1951)

Environmental Subsystem (Concept): The context, surroundings, and conditions within which the open socio-technical system operates and is situated, referring to both the internal and external environment. (Emery & Marek, 1962)

Open System (Concept): A system where there is flow ("import" and "export") and or interaction between components and the environment,

resulting in the modification or evolution of the components. (von Bertalanffy, 1950)

Steady State (Concept): The ability of an open system to reach a time-dependent state of equilibrium, whereby the entire system and its components remain constant. (von Bertalanffy, 1950)

Equifinality (Concept): The range of possible initial conditions for ensuring a steady state within an open system, noting that when applied to socio-technical design, multiple design options may achieve a steady state. (Trist et al., 2016)

Joint optimisation (Concept): The degree of fit between the social and technical subsystems, resulting in an optimum state and benefits for the overall socio-technical system. (Emery, 1993)

References

Abbas, R., Pitt, J. & Michael, K. (2021). Socio-Technical Design for Public Interest Technology. *IEEE Transactions on Technology and Society*, 2 (2), 55-61.

Adman, P. & Warren, L. (2000). Participatory Sociotechnical Design of Organizations and Information Systems – an Adaptation of ETHICS Methodology. *Journal of Information Technology*, 15 (1), 39-51.

Alter, S. (2006). Work Systems and IT Artifacts - Does the Definition Matter?. *Communications of the Association for Information Systems*, 17.

Alter, S. (2008). Defining information systems as work systems: implications for the IS field. *European Journal of Information Systems*, 17 (5), 448-469.

Alter, S. (2013). Work System Theory: Overview of Core Concepts, Extensions, and Challenges for the Future. *Journal of the Association for Information Systems*, 14 (2), 72-121.

Appelbaum, S.H. (1997). Socio- technical systems theory: an intervention strategy for organizational development. *Management Decision*, 35 (6), 452-463.

Bauer, J.M. & Herder, P.M. (2009). Designing Socio-Technical Systems. *Philosophy of Technology and Engineering Sciences*, 601-630.

Baxter, G. & Sommerville, I. (2011). Socio-technical systems: From design methods to systems engineering. *Interacting with Computers*, 23 (1), 4-17.

Becker, J., Niehaves, B. & Janiesch, C. (2007). Socio-Technical Perspectives on Design Science in IS Research. *Advances in Information Systems Development*, 127-138.

Bednar, P.M. & Welch, C. (2020). Socio-Technical Perspectives on Smart Working: Creating Meaningful and Sustainable Systems. *Information Systems Frontiers*, 22 (2), 281-298.

Bijker, W.E. (1997). *Of Bicycles, Bakelites, and Bulbs*. The MIT Press.

Bostrom, R.P. & Heinen, J.S. (1977a). MIS Problems and Failures: A Socio-Technical Perspective. Part I: The Causes. *MIS Quarterly*, 1 (3), 17.

Bostrom, R.P. & Heinen, J.S. (1977b). MIS Problems and Failures: A Socio-Technical Perspective, Part II: The Application of Socio-Technical Theory. *MIS Quarterly*, 1 (4), 11.

Bourazeri, A. & Pitt, J. (2014). *A Game-Based Approach for Collective Action in Self-Organising Socio-technical Systems*.

Cavoukian, A. (2012). Privacy by Design [Leading Edge]. *IEEE Technology and Society Magazine*, 31 (4), 18-19.

Chai, S. & Kim, M. (2012). A socio-technical approach to knowledge contribution behavior: An empirical investigation of social networking sites users. *International Journal of Information Management*, 32 (2), 118-126.

Cherns, A. (1976). The Principles of Sociotechnical Design. *Human Relations*, 29 (8), 783-792.

Cherns, A. (1987). Principles of Sociotechnical Design Revisted. *Human Relations*, 40 (3), 153-161.

Clegg, C.W. (2000). Sociotechnical principles for system design. *Applied Ergonomics*, 31 (5), 463-477.

Coiera, E. (2007). Putting the technical back into socio-technical systems research. *International Journal of Medical Informatics*, 76, S98-S103.

Cummings, T.G. (1978). Self-Regulating Work Groups: A Socio-Technical Synthesis. *The Academy of Management Review*, 3 (3), 625.

Davis, M.C., Challenger, R., Jayewardene, D.N. & Clegg, C.W. (2014). Advancing socio-technical systems thinking: A call for bravery. *Applied Ergonomics*, 45 (2), 171-180.

Doorn, N. (2013). *Early engagement and new technologies* . Springer.

Eason, K. & Waterson, P. (2013). The implications of e-health system delivery strategies for integrated healthcare: Lessons from England. *International Journal of Medical Informatics*, 82 (5), e96-e106.

Emery, F. (1980). Designing Socio-Technical Systems for 'Greenfield' Sites. *Journal of Occupational Behaviour*, 1 (1), 19-27.

Emery, F. (1993). *Characteristics of Socio-Technical Systems In E. Trist, H. Murray & B. Trist (Ed.), The Social Engagement of Social Science, a Tavistock Anthology, Volume 2: A Tavistock Anthology-The Socio-Technical Perspective*. University of Pennsylvania Press.

Emery, F.E. & Marek, J. (1962). Some Socio-technical Aspects of Automation. *Human Relations*, 15 (1), 17-25.

Fischer, G. & Herrmann, T. (2011). Socio-Technical Systems. *International Journal of Sociotechnology and Knowledge Development*, 3 (1), 1-33.

Fok, L., Kumar, K. & Wood-Harper, T. (1987). *METHODOLOGIES FOR SOCIO-TECHNICAL-SYSTEMS (STS) DEVELOPMENT: A COMPARISON* . ICIS 1987 Proceedings.

Fox, W.M. (1990). An Interview with Eric Trist, Father of the Sociotechnical Systems Approach. *The Journal of Applied Behavioral Science*, 26 (2), 259-279.

Friedman, B. (1996). Value-sensitive design. *Interactions*, 3 (6), 16-23.

Geels, F. (2005). Processes and patterns in transitions and system innovations: Refining the co-evolutionary multi-level perspective. *Technological Forecasting and Social Change*, 72 (6), 681-696.

Geels, F.W. (2004). From sectoral systems of innovation to socio-technical systems. *Research Policy*, 33 (6-7), 897-920.

Geels, F.W. (2010). Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Research Policy*, 39 (4), 495-510.

Griffith, T.L. & Dougherty, D.J. (2001). Beyond socio-technical systems: introduction to the special issue. *Journal of Engineering and Technology Management*, 18 (3-4), 207-218.

Herbst, P.G. (1974). *Socio-technical design; strategies in multidisciplinary research*. Tavistock Publications [distributed in the USA by Harper & Row, Barnes & Noble Import Division.

Herrmann, T., Hoffmann, M., Kunau, G. & Loser, K. (2004). A modelling method for the development of groupware applications as socio-technical systems. *Behaviour & Information Technology*, 23 (2), 119-135.

Himma, K.E. & Tavani, H.T. (2008). *The Handbook of Information and Computer Ethics (Kingfisher Leisure Guide)*. Wiley-Interscience.

Hirschheim, R. & Klein, H.K. (1994). Realizing Emancipatory Principles in Information Systems Development: The Case for Ethics. *MIS Quarterly*, 18 (1), 83.

Jacobs, A. (1972). *Facilities planning and manufacturing systems design*. Doctoral Thesis.

Jones, A.J.I., Artikis, A. & Pitt, J. (2013). The design of intelligent socio-technical systems. *Artificial Intelligence Review*, 39 (1), 5-20.

Kapoor, K., Ziaee Bigdeli, A., Dwivedi, Y.K., Schroeder, A., Beltagui, A. & Baines, T. (2021). A socio-technical view of platform ecosystems: Systematic review and research agenda. *Journal of Business Research*, 128, 94-108.

Kelly, J.E. (1978). A Reappraisal of Sociotechnical Systems Theory. *Human Relations*, 31 (12), 1069-1099.

Kling, R. & Courtright, C. (2003). Group Behavior and Learning in Electronic Forums: A Sociotechnical Approach. *The Information Society*, 19 (3), 221-235.

Kling, R. (1980). Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research. *ACM Computing Surveys*, 12 (1), 61-110.

Langefors, B. (1978). Discussion of the Article by Bostrom and Heinen: MIS Problems and Failures: A Socio-Technical Perspective. Part I: The Causes . *MIS Quarterly*, 2 (2), 55-62.

Lindley, R. (1997). *Smart Card Innovation*. Saim Pty Ltd.

McKelvey, M.D. (2006). *Flexibility and stability in the innovating economy*. Oxford University Press.

Molina, A. (1990). Transputers and transputer-based parallel computers : Sociotechnical constituencies and the build-up of British-European capabilities in information technologies. *Research Policy*, 19 (4), 309-333.

Morris, A. (2009). *Socio-Technical Systems in ICT: A Comprehensive Survey*.

Mumford, E. (1983). *Designing human systems for new technology*. Manchester Business School.

Mumford, E. (1993). The ETHICS approach. *Communications of the ACM*, 36 (6), 82.

Mumford, E. (2000). A Socio-Technical Approach to Systems Design. *Requirements Engineering*, 5 (2), 125-133.

Mumford, E. (2003). *Redesigning Human Systems*. Irm Press.

Mumford, E. (2006). The story of socio-technical design: reflections on its successes, failures and potential. *Information Systems Journal*, 16 (4), 317-342.

Pasmore, W., Francis, C., Haldeman, J. & Shani, A. (1982). Sociotechnical Systems: A North American Reflection on Empirical Studies of the Seventies. *Human Relations*, 35 (12), 1179-1204.

Pasmore, W.A. (1995). Social Science Transformed: The Socio-Technical Perspective. *Human Relations*, 48 (1), 1-21.

Patnayakuni, R. & Ruppel, C.P. (2010). A socio-technical approach to improving the systems development process. *Information Systems Frontiers*, 12 (2), 219-234.

Pitt, J. & Diaconescu, A. (2016). *Interactive Self-Governance and Value-Sensitive Design for Self-Organising Socio-technical Systems*.

Pitt, J., Dryzek, J. & Ober, J. (2020). Algorithmic Reflexive Governance for Socio-Techno-Ecological Systems. *IEEE Technology and Society Magazine*, 39 (2), 52-59.

Porra, J. & Hirschheim, R. (2007). A Lifetime of Theory and Action on the Ethical Use of Computers: A Dialogue with Enid Mumford. *Journal of the Association for Information Systems*, 8 (9), 467-478.

Robertson, L.J., Abbas, R., Alici, G., Munoz, A. & Michael, K. (2019). Engineering-Based Design Methodology for Embedding Ethics in Autonomous Robots. *Proceedings of the IEEE*, 107 (3), 582-599.

Ropohl, G. (1999). Philosophy of Socio-Technical Systems. *Society for Philosophy and Technology Quarterly Electronic Journal*, 4 (3), 186-194.

Ryan, S.D., Harrison, D.A. & Schkade, L.L. (2002). Information-Technology Investment Decisions: When Do Costs and Benefits in the Social Subsystem Matter?. *Journal of Management Information Systems*, 19 (2), 85-127.

Sawyer, S., Allen, J.P. & Lee, H. (2003). Broadband and Mobile Opportunities: A Socio-Technical Perspective. *Journal of Information Technology*, 18 (2), 121-136.

Schuler, D. (1993). *Participatory design*. L. Erlbaum Associates.

Shannon, C.E. & Weaver, W. (1963). *The Mathematical Theory of Communication*. University of Illinois Press.

Sony, M. & Naik, S. (2020). Industry 4.0 integration with socio-technical systems theory: A systematic review and proposed theoretical model. *Technology in Society*, 61, 101248.

Taylor, J.C. (1975). The Human Side of Work: The Socio- Technical Approach to Work System Design. *Personnel Review*, 4 (3), 17-22.

Trist, E., Higgin, G., Murray, H. & Pollock, A. (2016). *Organizational Choice*. Taylor & Francis Group.

Trist, E.L. & Bamforth, K.W. (1951). Some Social and Psychological Consequences of the Longwall Method of Coal-Getting. *Human Relations*, 4 (1), 3-38.

Trist, E.L. (1981). *The evolution of socio-technical systems*. Ontario Quality of Working Life Centre.

Verbong, G. & Geels, F. (2010). Exploring sustainability transitions in the electricity sector with socio-technical pathways. *Technological Forecasting and Social Change*, 77 (8), 1214-1221.

Whitworth, B. & De moor, A. (2003). Legitimate by design: Towards trusted socio-technical systems. *Behaviour & Information Technology*, 22 (1), 31-51.

Wiener, N. (1980). *Cybernetics*. MIT Press.

von Bertalanffy, L. (1950). The Theory of Open Systems in Physics and Biology. *Science*, 111 (2872), 23-29.

Task–Technology Fit

The Task–Technology Fit model postulates that the match between task requirements and technology characteristics predicts the utilisation of the technology and individuals' performance.

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Introduction

The Task-Technology Fit Model was developed by (Goodhue & Thompson, 1995) to explain the utilisation of technology by examining the fit of technology to users' tasks/requirements. The purpose of the theory was to add to the body of knowledge on technology utilisation in the private and public contexts, which had limited explanation as to how the acceptance of technology contributes to individuals' performance. TTF was the first theory that aimed to explore the post-adoption aspect of technology utilisation, unlike other prior research, which had mainly focused on the antecedents of use and intention (Goodhue & Thompson, 1995). Specifically, by 1995, the literature on the IS management domain was characterised by two streams of research, namely focusing on technology utilisation and task-technology fit. The research on technology utilisation mostly examined the relationships between attitudes, beliefs, their associated factors and the use of information communication technologies (Goodhue & Thompson, 1995;Cheney, Mann & Amoroso, 1986;Doll & Torkzadeh, 1991; Lucas, 1975; Lucas, 1981; Robey, 1979; Thompson, Higgins & Howell, 1994;Swanson, 1987). This stream was represented

by theories such as the Theory of Reason Action (TRA), the Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM) (Fishbein & Ajzen, 1975;Davis, 1989; Bagozzi, 1982). For instance, TRA and TPB measure the likelihood of technology acceptance by investigating the effects of attitude toward behaviour, subjective norm and perceived behavioural control (Fishbein & Ajzen, 1975; Ajzen, 2011). TAM explains and predicts the use of technology and behavioural intention by examining the core constructs, which are perceived usefulness and perceived ease of use (Venkatesh et al., 2003). The research in that domain was complemented by research findings on the factors that relate to attitudes and beliefs, such as technology characteristics (e.g. quality) (Lucas, 1975; Olson & Ives, 1982) or situational factors (e.g. social influence) (Davis, 1989; Baroudi, Olson & Ives, 1986; Hartwick & Barki, 1994; Venkatesh & Davis, 2000). The acceptance of technology was mostly considered to be the manifestation of intention or use behaviour. The key factors of those studies are summarised in Figure 1.

Figure 1: Utilisation Focus Model
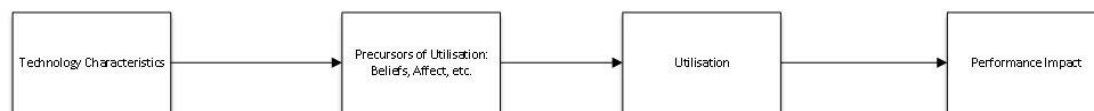
Although, in line with those theories, the individual's performance was not explicitly measured, the assumption of the research was that technology acceptance correlates with increased performance. However, there are two reasons that jeopardise the accuracy of the conclusions of the research about the impact on performance using those theories (i.e. TRA, TAM, TPB). First, the antecedents of technology acceptance are perceptual, which means that they reflect individuals' awareness of the event, which they can report. The major limitation of self-reported measures is that there is a risk of discrepancy between the individuals' perception and objective observation (de Guinea, Titah & Léger, 2014). Secondly, the acceptance of technology does not necessarily mean that users improve their performance (Goodhue & Thompson, 1995). Some evidence suggested that the adoption and the extensive use of technology (PCs) had a weak, non-significant or even negative effect on personal productivity and efficiency (Weill, 1992). In addition, the utilisation of technology had been largely examined in work settings, which are characterised by mandatory use. Therefore, the improvement of performance indicators may correlate not simply with extensive use, but rather with the ability of technology to address the needs and requirements of the user (i.e. task-technology fit) (Goodhue & Thompson, 1995).

The second stream of research reflected the focus on technology performance and task-technology fit. Figure 2 depicts the main variables and relationships explored in that research line. The literature was represented by experimental research studies confirming the difference in performance outcome depending on task requirements (Baroudi, Olson & Ives, 1986; Dickson, DeSanctis & McBride, 1986). Several other studies confirmed the correlation between the technology-fit factor and technology adoption, both in organisational and private settings (Cooper & Zmud, 1990; Tornatzky & Klein, 1982). Also, the research provided evidence that the mismatch

between technology characteristics and tasks hinders the decision-making process (Vessey, 1991). However, the reliability of the findings of prior studies was questionable, as they did not measure performance per se. For example, some studies used the utilisation construct as a proxy (Lucas, 1975; Lucas, 1981), although it was confirmed that utilisation does not have a strong power to predict performance (Goodhue & Thompson, 1995). Given the lack of common ground between the two streams of research, TTF theory was developed to bring together evidence from the two research lines. The objective of the theory was to test and confirm the assumption that the utilisation of information systems results in increased performance only on condition that technology functionality corresponds to users' task requirements (Goodhue & Thompson, 1995).

Figure 2: Fit Focus Model
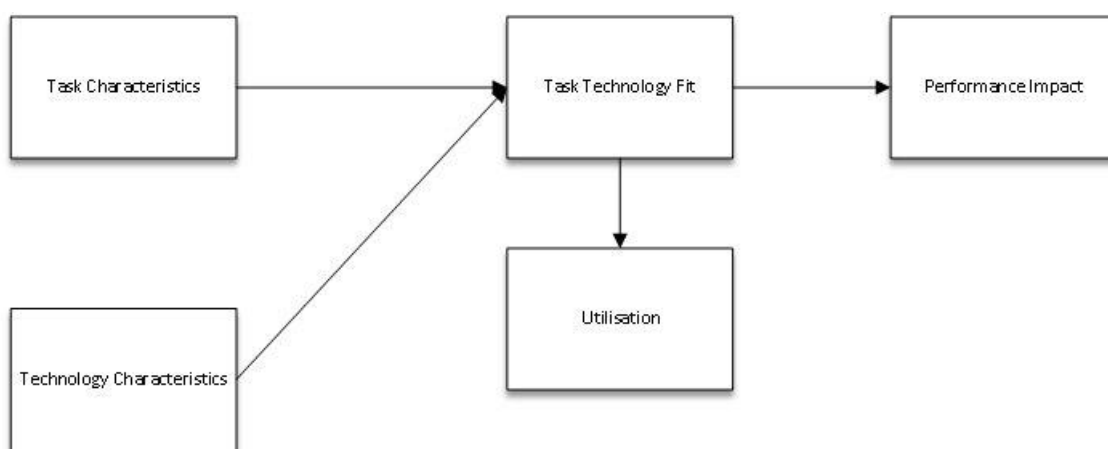
Theory

TTF has a conceptual version, named the Technology-to-Performance Chain (TPC) model. TPC ,which resulted from the merger of the two research streams, explains the relationships between the three main component of the chain, namely task-technology fit, utilisation and performance impact (Figure 3). Task-technology fit is the interdependence between an individual (a technology user), technology (data, hardware, software tools and the services they provide) and task (activity carried out by individuals to produce the required output) characteristics. The degree to which technology is capable of performing a user's tasks is contingent on the degree to which individual abilities, task requirement and technology functionalities match (Goodhue & Thompson, 1995). The utilisation component reflects the act of using the system evaluated by the frequency or diversity of use (Davis, 1989; Thompson, Higgins & Howell, 1994). The utilisation is determined by a number of attitudinal and belief factors, contributing to the use of technology both in mandatory and voluntary settings. These factors include, but are not limited to, social norms, attitude to behaviour and expected consequences (Bagozzi, 1982; Fishbein & Ajzen, 1975). The performance impact relates to what can be achieved by performing the portfolio of tasks. TPC is a complex conceptual model, which

makes it challenging for empirical testing. Therefore, core components and assumptions were used to develop a simplified and a measurable TTF model (Figure 4).

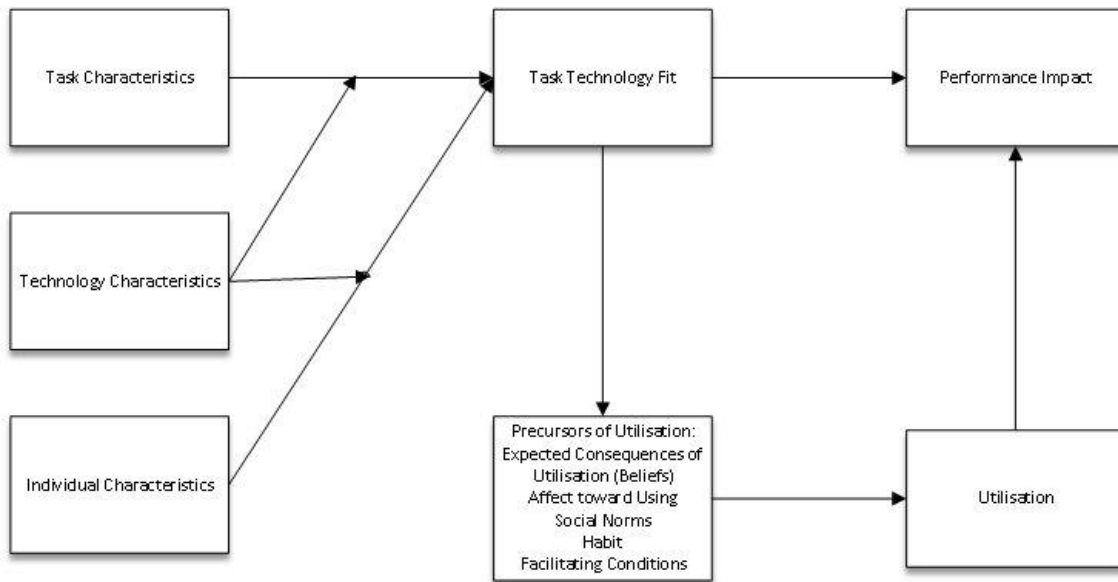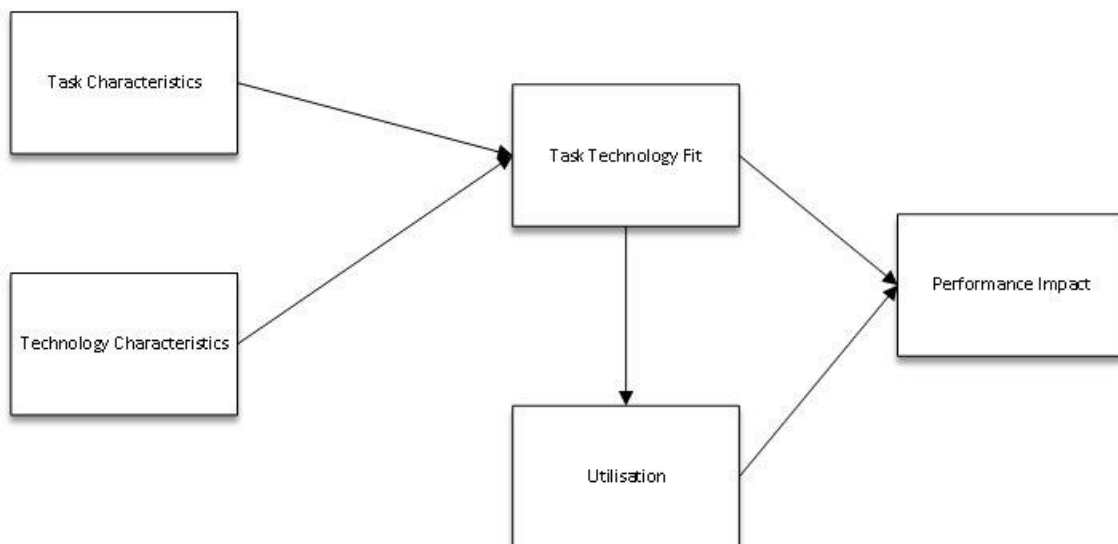### *Figure 3: Technology to Performance Chain*

Figure 4: Task Technology Fit

TTF includes five constructs that represent the model, namely, task characteristics, technology characteristics, task-technology fit, technology utilisation and performance impact. While task characteristics and technology characteristics

reflect the specific dimensions of the technology and its utilisation, the general task-technology fit factor captures individuals' perceptions of task-technology fit (Goodhue & Thompson, 1995; Goodhue, 1992). The TTF model also has three propositions. The first proposition states that the user's evaluation of task-technology fit is determined by both task characteristics and characteristics of the technology. The degree to which a system assists an individual in performing his or her portfolio of tasks is measured by users' rating of eight dimensions: quality, locatability, authorisation, compatibility, production timeliness, systems reliability, ease of use/training and relationship with users. Task characteristics are measured by task non-routineness, interdependence and job title. Those are the factors that might make a user rely more heavily on certain aspects of the information technology. Technology characteristics refer to technology-specific attributes or functions. The second proposition of the theory states that the utilisation of information systems by individuals is dependent on the perceived fit. The third proposition of the theory postulates that a positive evaluation of task-technology fit not only predicts utilisation, but positively influences perceived performance (the accomplishment of a portfolio of tasks by an individual) (Goodhue & Thompson, 1995).

The development of the conceptual model of technology-to-performance chain and the measurable TTF model contributed to the literature in a number of ways. First, TPC goes beyond the DeLone and McLean model by not only illustrating the effect of utilisation and user attitude on individuals' performance, but also by explaining how technology contributes to improved performance (DeLone & McLean, 1992). This became possible by incorporating the task-technology fit factor and explicitly examining the relationship between technology and task, utilisation and performance. Second, the TTF model offered a theoretical framework for considering a number of issues related to technology performance. The issues included, but were not limited to, measurements of the management of information systems success, exploring and understanding the importance of individuals' engagement with technology and its impact on performance, and the use of TTF will reveal the issues related to IS use (Goodhue & Thompson, 1995). Third, the TTF model sheds light on the role of technology fit and utilisation in performance, by demonstrating that 14 per cent of the variance in perceived performance is due to the role of TTF and only 4 per cent is due to the effect of utilisation (Goodhue & Thompson, 1995). Although the overall predictive strength of the model is not high, the TTF model attracted the attention of future research to the fit factor (Dishaw & Strong, 1998;Palvia & Chervany, 1995;Strong, 1997; Strong, Lee & Wang, 1997; Wu & Chen, 2017). Finally, by testing the dimensions of TTF, it is possible to gain insights as to what can be done to improve the user experience in terms of ease of use, concerns about the reliability of the system, etc(Goodhue & Thompson, 1995).

Theory Extensions

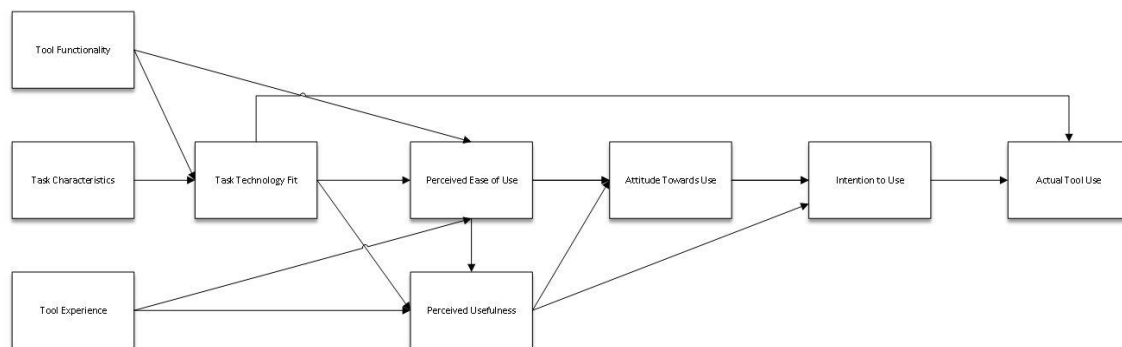### Task Technology Fit and Technology Acceptance Model

TTF was extended by Dishaw and Strong by integrating it with TAM (Dishaw & Strong, 1999) as illustrated in Figure 5. TAM postulates that the use of technology raises cognitive evaluation in the form of perceived ease of use and perceived usefulness, which, in turn, motivate behavioural intention and subsequent use behaviour (Davis, 1993; Davis, 1989). Perceived ease of use refers to the degree to which technology use is free from effort (Davis, 1989), while perceived performance refers to the

degree to which the user thinks that technology improves performance (Bandura, 1982). The rationale for the extension development was the combination of the two dominant theories on technology acceptance with the purpose of increasing TTF's predictive power (Dishaw & Strong, 1999). Although TTF had received wide application in research (Zigurs & Buckland, 1998; Maruping & Agarwal, 2004; Fjerrnestad & Hiltz, 1997), TTF alone was not very robust in predicting utilisation. The explanatory power of the model underperformed compared to other theories, such as TAM. TTF explained only 2 per cent of the variance in the utilisation and 14 per cent of the variance in performance, compared to 40 per cent of the variance in use explained by TAM (Goodhue & Thompson, 1995; Davis, 1989). On the one hand, both theories adopt the user perceptive on the use and evaluation of technology and explore outcomes, such as adoption, acceptance and performance. On the other hand, TTF and TAM provide complementary insights into the utilisation of technology. TAM focuses on the intention of use, while TTF focuses on the outcome of use. TAM is a competing theory providing a contrasting vantage point on technology utilisation.

In the extension, the relationships between variables within TAM and the TTF model were left unchanged. As in the original model, TAM represents the interaction between perceived usefulness and perceived ease of use, having an effect on attitude, intention and use behaviour (Davis, 1993; Davis, 1989). TTF represents the model examining actual tool use, affected by TTF and tool experience, the former, in turn, being affected by tool functionality and task requirements. To simplify measurement, the fit factor is employed as a unidimensional construct. Seven additional links were introduced to integrate TAM and TTF variables, supported by prior studies. Specifically, the model suggests that TTF influences individuals' perceptions (Dishaw & Strong, 1999). The support for the relationships is rooted in the definitions of perceived usefulness, perceived ease of use and TTF (Goodhue & Thompson, 1995; Goodhue, 1995). If an individual thinks that the given technology has a good fit with the task, the perception of usefulness and ease of use will rise. Also, the model introduces the correlation between tool experience, functionality and perceived ease of use. This means that elevated functionality of the technology is related to the idea that the technology is sophisticated and complex to use. Thus, there will be a negative effect of tool functionality on perceived ease of use. On the other hand, individuals with experience are more likely to perceive the technology as being easy to use. Lastly, the model has a theorised path between task characteristics and acceptance. The relationship is based on the assumption that the more complex the task is, the lower the individual's interest in a given technology (Dishaw & Strong, 1999).

TTF-TAM adds to the literature by providing a theory which explains technology acceptance based on attitude/behaviour mechanisms and by putting forward rational determinants of acceptance (e.g. factors such as fit and job performance) (Dishaw & Strong, 1999). Such a combination addresses the gap raised in research, arguing that individuals might not have a good attitude towards the technology, but accept it as it increases their performance (Letchumanan & Tarmizi, 2011; Goodhue & Thompson, 1995). The extension of the theory also addresses the limitation of TTF related to its low predictive power. The comparative empirical validation of TAM, TTF and combined TTF/TAM theories confirmed that the integrated model explains 51 per cent of the variance in the utilisation construct, compared to 36-41 per cent if two models are examined separately (Dishaw & Strong, 1999).

Figure 5: TTF-TAM

Task technology fit and Unified Theory of Acceptance and Use of Technology

The second update of the TTF model was by extending it with a Unified Theory of Acceptance and Use of Technology (Zhou, Lu & Wang, 2010) (Figure 6). UTAUT is the comprehensive framework on technology adoption, which postulates that the likelihood of adopting technology is dependent on the direct effect of four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions, as well as four moderators (Venkatesh et al., 2003). Performance expectancy and effort expectancy share a great deal of similarity with perceived usefulness and perceived ease of use from TAM, since they pertain to users' evaluation of technology use and outcome, based on expectations prior to actual use (Davis, 1989;Venkatesh et al., 2003). Social influence refers to the belief that other people think that the technology needs to be adopted, whereas facilitating conditions imply the beliefs about the availability of technical infrastructure that may support the use of the technology (Venkatesh et al., 2003).

The development of TTF-UTAUT was aimed at addressing several gaps in prior research. Firstly, mobile banking adoption was an under-researched topic, since it was primarily dominated by the focus on utilisation (Aldás- Manzano, Ruiz- Mafé & Sanz- Blas, 2009; Ha, Yoon & Choi, 2007; Chen, Yen & Chen, 2009; Hsu, Lu & Hsu, 2007). That means that the research mostly investigated the user perception of usefulness, compatibility and the relative advantage of technology, and overlooked the role of technology fit in adoption (Goodhue & Thompson, 1995;Goodhue, 1995). Also, the integration of TTF with UTAUT was motivated by the lack understanding of the conditions and user-perceived factors explaining the utilisation of technology. Although TTF-TAM (Dishaw & Strong, 1999) shed light on the role of perceived usefulness and perceived ease of use, the role of facilitating conditions and social influence was not examined. Facilitating conditions and social influence were found to be crucial in predicting adoption behaviour, as suggested by UTAUT (Venkatesh et al., 2003). UTAUT outperforms other technology acceptance theories (e.g. TAM) in terms of explaining technology adoption and includes a wide range of factors that effect individuals' intention to use and use behaviour (Venkatesh et al., 2003;Zhou, Lu & Wang, 2010).

The TTF-UTAUT model postulates that technology adoption is predicted by the perceived fit between tasks and technology. In line with the TTF model, the fit between technology and tasks is predicted by technology and task characteristics (Goodhue & Thompson, 1995). The positive relation between task technology fit and user adoption is drawn from the original theory. It states that irrespective of the attitude that individuals hold about technology, they are not likely to adopt it, if there is a mismatch between the technology's functionality and task requirements (Goodhue & Thompson, 1995; Goodhue, 1995). Secondly, in line with the UTAUT model, the user adoption of technology is predicted by the effort expectancy, performance expectancy, facilitating conditions and social influence (Venkatesh et al., 2003). Third, performance expectancy is influenced by perceived fit (Zhou, Lu & Wang, 2010). The correlation between TTF and performance expectancy is supported by prior studies confirming that TTF affects perceived usefulness (Dishaw & Strong, 1999). Perceived usefulness is similar to performance expectancy in that both variables measure the expected impact of technology use on performance (Venkatesh et al., 2003;Davis, 1989). The relationship implies that when technology functionality has the capability of completing the required tasks, individuals' performance expectation increases accordingly (Zhou, Lu & Wang, 2010). Fourth, effort expectancy is affected by technology characteristics. The link between task characteristics and effort expectancy suggests that technologies with higher functionality require less effort to use them (Zhou, Lu & Wang, 2010).

The examination of the model demonstrated high predictive strength, with UTAUT (45.7%) and TTF (43.3%) explaining less variance in technology adoption compared to a newly proposed extension (57.5%) (Zhou, Lu & Wang, 2010). Also, the predictive power is stronger compared to TTF-TAM by 6 per cent (Zhou, Lu & Wang, 2010; Dishaw & Strong, 1999). Follow-up studies demonstrated the validity of the model by confirming that its explained variance was higher than 50 per cent (Abbas et al., 2018). The extended version of the theory contributes to the literature by providing a behavioural model which can robustly predict adoption. In addition to the increased predictive strength, the model provides evidence about additional factors explaining adoption behaviour (Zhou, Lu & Wang, 2010).

Figure 6: TTF-UTAUT Model

Applications

Due to the complexity and multidimensionality of TTF, the validation of the hypothesised relationship and the role of construct dimensions did not bring consistent results across the studies. It was found that the factors representing task-technology fit exhibited different strength and significance when testing the utilisation of different technologies. When examining enterprise architecture management systems, only four fit dimensions were supported: locatability, systems reliability, production timelines and ease-of-use (Eybers et al., 2019). The examination of the use of knowledge management technology found that only output quality and compatibility determine the utilisation of the technology (Teo & Men, 2008). When investigating the adoption of enterprise system management tools, only four dimensions (locatability, systems reliability, production timelines and ease-of-use) were significant (Eybers et al., 2019). However, the study on the adoption of an electronic health-record system supported the role of each TTF dimension (Dwivedi, WadeScott & Schneberger, 2012). Given the inconsistent results of the empirical validation of the model, it became common practice to avoid complexities with operationalising the model, by adopting a fit-as-match approach. Such an

approach implies that TTF has become a first-order construct and users are simply asked whether the technology suits their tasks (Furneaux, 2012).

A multi-item first-order TTF construct has become widely adopted across studies, which contributed to the wide application of the theory in examining technology utilisation and adoption (Lin, 2012; Wu & Chen, 2017; Lin & Huang, 2008). For example, the adoption of a knowledge management system was examined by employing the TTF scale with eight items (Lin & Huang, 2008). A one-dimensional TTF scale was used to explore the direct and indirect effect of the construct on continuous intention to use (Lin, 2012;Wu & Chen, 2017). The use of the model in the e-learning context indicated that TTF is a vital component in exploring the improvement of students' grades following the adoption of the system (McGill & Klobas, 2009). The effect of variables in the model was also confirmed when exploring the use of e-books by teachers and technology effect on their performance. Although the variance in the use behaviour was minimal (7%), the model accounted for 50 per cent of the variance in performance, meaning that technology fit improves the quality of teaching, the quality of research, improves productivity and job performance (D'Ambra, Wilson & Akter, 2013). A strong predictive power of TTF-TAM was confirmed in studies focusing on the use of e-commerce tools and online courses, explaining 76 per cent of the variance in the intention to adopt e-commerce (Shih & Chen, 2013) and 95.7 per cent of the variance in continuance intention to use online courses (Wu & Chen, 2017). In addition, the effect of UTAUT and TTF factors were significant for the prediction of mobile banking usage (Abbas et al., 2018), whereas for internet banking adoption the effort expectancy was not important (Tarhini et al., 2016). Given the wide application of TTF and its extensions with one-dimensional constructs for a range of technologies, the findings on the predictive strength and the role of factors were mainly consistent, which demonstrates good external validity of the theory.

Although, the theory was originally developed for adoption by individuals, it was adapted in order to be applied to the group-level context by making group performance an outcome variable (Zigurs & Buckland, 1998). Group performance is defined as a multifaceted variable, which can be manifested as efficiency, process quality, output quality, consensus or satisfaction (Fjerrnestad & Hiltz, 1997; Delgado Piña, María Romero Martínez & Gómez Martínez, 2008). For example, the examination of group support systems (GSS) confirmed that the fit factor is a crucial construct in predicting the use of the system by a group of people (Zigurs & Buckland, 1998). TTF explained the use and effectiveness of information communication technologies in virtual teams. By understanding the degree to which technology satisfies the needs for different interpersonal interactions, the adoption of TTF made it possible to select the best technologies that will support group tasks (e.g. conflict management, motivation/confidence building and affect management) and increase group performance (Maruping & Agarwal, 2004).

TTF, TTF-TAM and TTF-UTAUT were tested in different geographical locations and cultural settings, providing partial confirmation of the model's validity. TTF theory was tested in the Chinese consulting industry and confirmed only partial validity of the model in determining utilisation and performance. Only the output quality and compatibility dimensions were significant for predicting utilisation (Teo & Men, 2008). The application of TTF-TAM to study the continuous intention to use mobile banking in China resulted in the theory explaining 53 per cent of the variance in the outcome variable. Specifically, the continuous intention to use was positively affected by

perceived usefulness and task-technology fit. Although the effect of perceived ease of use on CIU was not significant, it had a positive effect on perceived usefulness (Yuan et al., 2016). Similarly, the validation of TTF-TAM was successful when studying the adoption of visual analytics in Jordanian enterprises. It was found that task, technology, and user characteristics are the main antecedents of TTF. TTF positively contributes to perceived usefulness and ease of system use, which, in turn, predict intention to use visual analytics systems. The model explained around 60 per cent of the variance in behavioural intention (Daradkeh, 2019). However, the validation of the TTF model and its extensions in comparative studies demonstrated that the effects of the variables are different due to the diversity in cultures, values, beliefs and work attitudes. For example, the examination of the fit of technology to managerial tasks in Greece and the US showed that the two samples distinguish between different TTF dimensions. The findings enabled researchers to conclude that managers perform activities and interact with technology differently in the countries being investigated (Ferratt & Vlahos, 1998). The utilisation of the TTF-UTAUT model to examine mobile payment use intention in Korea and China showed that the model is more applicable to predicting consumer behaviour in China. TTF explained almost 81 per cent of the variance in the behavioural intention of Chinese consumers and confirmed that the effect of all but effort expectancy was significant. The only two predictors of the usage intention of Korean consumers were social influence and TTF, which cumulatively accounted for around 60 per cent of the variance in the outcome variable (Lin et al., 2019). The study examining the moderating effect of Hofstede's cross-cultural dimensions on TTF model sheds light on the reason for inconsistent findings across cultures. It was found that individualism and uncertainty avoidance moderate the effect of TTF constructs. The findings suggested that uncertainty avoidance decreases the effect of TTF on individual performance and the tendency to individualism decreases the effect of TTF on use behaviour (Tam & Oliveira, 2019). That means that the criteria that people use to evaluate technology fit to their requirements may depend on norms and should be considered when adapting the technology for various cultural contexts.

While most of the research undertaken used variance-based approaches to explore the relationship between the constructs (Eybers et al., 2019; Teo & Men, 2008; Shih & Chen, 2013), a few research papers employed fuzzy-set Qualitative Comparative Analysis (fsQCA) and crisp set Qualitative Comparative Analysis (csQCA) approaches (Mikalef & Torvatn, 2019; Weber et al., 2016). These are the methods based on Boolean algebra, which make it possible to determine the relationship between the configurations of conditions and outcomes. FsQCA and csQCA helped researchers to uncover unique combinations of task-technology fit factors leading to better individual and organisational performance and productivity (Mikalef & Torvatn, 2019).

The applications of the TTF model and its extensions are summarised in Table 1.

Table 1: Theory Applications

Reference	Application	TTF	TTF-TAM	TTF-UTAUT

Reference		TTF	TTF-TAM	TTF-UTAUT
(Eybers et al., 2019)	Architecture management systems	X		
(Teo & Men, 2008) (Lin & Huang, 2008)	Knowledge management technology	X		
(Dwivedi, WadeScott & Schneberger, 2012)	electronic health-record system	X		
(Lin, 2012) (Wu & Chen, 2017) (McGill & Klobas, 2009)	Web learning system	X		
(D'Ambra, Wilson & Akter, 2013)	E-books	X		
(Shih & Chen, 2013)	E-commerce		X	
(Abbas et al., 2018) (Tarhini et al., 2016)	Mobile and internet banking			X
(Marikyan, Papagiannidis & Alamanos, 2021)	Smart technology		X	

Reference	Geography	TTF	TTF-TAM	TTF-UTAUT
(Teo & Men, 2008)	China	X		
(Lin et al., 2019)	China			X
(Daradkeh, 2019) (Yuan et al., 2016)	China		X	
(Ferratt & Vlahos, 1998)	Greece	X		

| (Ferratt & Vlahos, 1998) | USA | X | | |
| (Lin et al., 2019) | Korea | | | X |

Reference	Methodology	TTF	TTF-TAM	TTF-UTAUT
(Eybers et al., 2019) Teo & Men, 2008	Variance-based approach	X		
(Shih & Chen, 2013)	Variance-based approach		X	
(Lin et al., 2019) (Abbas et al., 2018)	Variance-based approach			X
(Mikalef & Torvatn, 2019)	fsQCA	X		
(Weber et al., 2016)	csQCA	X		

Limitations

The TTF theory and its extensions have a number of limitations, among which are the complexity of the models, which makes it difficult to test empirically, weak predictive power, and the lack of focus on situational and personal factors. The most important shortcoming of the original TTF model is that due to multi-dimensional constructs, the applicability of the theory in different situations and scenarios is limited. Therefore, there are very few studies which tested all dimensions of task-tech technology fit (Eybers et al., 2019;Teo & Men, 2008; Dummy7). To make the model more universal, scholars predominantly use one-dimensional scales, which downgrades the comprehensiveness of the model in terms of explaining specific factors within the task-technology fit domain, facilitating or inhibiting the utilisation and users' performance.

TTF models have been criticised for a lack of focus on individuals' psychological and situational factors, such as the role of top management, trust (between team members and team leaders) and the responsibilities of team members (Agarwal, Sambamurthy & Stair, 2000). Individual differences can have an underlying impact on the final outcome of technology utilisation (Staples, Hulland & Higgins, 1999). For

example, following the argument that TTF-TAM needed to measure self-efficacy, Strong et al. (2006) tested the effect of the construct by integrating it with the model. Although the significance of computer self-efficacy was confirmed, the updated model did not find wide implications. Also, TTF-UTAUT was criticised for a lack of focus on factors which may shape the adoption behaviour of end-users. That limitation motivated the update of the model by integrating it with trust (Oliveira et al., 2014). Still, future research is required to explore other psychological variables or situational conditions that would improve the explanatory role of the theory.

The generalisability of the research findings using TTF was questioned when scholars found contingency in the situational and contextual factors (Table 2). The applications of the model in different geographical locations characterised by different cultures, social norms and values demonstrated that the factors of TTF, TTF-TAM and TTF-UTAUT perform differently (Yuan et al., 2016; Daradkeh, 2019; Lin et al., 2019). Individuals' personal beliefs, values and cultural differences in organisations can have an impact on the outcome, which have been ignored in those models. Only few studies (Tam & Oliveira, 2019; Ferratt & Vlahos, 1998) have examined the effect of cultural dimensions (individualism and uncertainty avoidance) on TTF. That signals the need for future research to incorporate the values and cultural differences of individuals when employing TTF. In addition, there is a need to explore whether factors such as organisational culture, social norms and environmental factors have an effect on TTF and subsequently on technology adoption and acceptance (Lee, Cheng & Cheng, 2007).

Table 2: Contingency factors

Source	Theory	Situation factors
(Yuan et al., 2016)	TTF	Culture
(Daradkeh, 2019)	TTF-TAM	Individual characteristics (innovativeness)
(Lin et al., 2019)	TTF-UTAUT	Culture
(Tam & Oliveira, 2019)	TTF	Culture
(Ferratt & Vlahos, 1998)	TTF	Culture and socio-technical system

(Lee, Cheng & Cheng, 2007)	TTF	Individual characteristics (cognitive factors, socio-demographic factors, experience)

Concepts

Task Characteristics (Task Equivocality, Task Interdependence)
(Independent): The factors that might move a user to rely more heavily on certain aspects of the information technology. (Goodhue & Thompson, 1995)

Task-Technology Fit (Independent/Dependent): The degree to which a technology assists an individual in performing his or her portfolio of tasks, more specifically. (Goodhue & Thompson, 1995)

Utilisation (Independent/Dependent): The behaviour of employing the technology in completing tasks. (Goodhue & Thompson, 1995)

Performance Impact (Dependent): The accomplishment of a portfolio of tasks by an individual. (Goodhue & Thompson, 1995)

References

Abbas, S.K., Hassan, H.A., Iftikhar, S. & Waris, A. (2018). Assimilation of TTF and UTAUT for Mobile Banking Usage. *International Journal of Advanced Engineering, Management and Science*, 4 (4), 305-308.

Agarwal, R., Sambamurthy, V. & Stair, R.M. (2000). Research Report: The Evolving Relationship Between General and Specific Computer Self-Efficacy—An Empirical Assessment. *Information Systems Research*, 11 (4), 418-430.

Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & Health*, 26 (9), 1113-1127.

Aldás- Manzano, J., Ruiz- Mafé, C. & Sanz- Blas, S. (2009). Exploring individual personality factors as drivers of M- shopping acceptance. *Industrial Management & Data Systems*, 109 (6), 739-757.

Bagozzi, R.P. (1982). A Field Investigation of Causal Relations among Cognitions, Affect, Intentions, and Behavior. *Journal of Marketing Research*, 19 (4), 562-584.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37 (2), 122-147.

Baroudi, J.J., Olson, M.H. & Ives, B. (1986). An empirical study of the impact of user involvement on system usage and information satisfaction. *Communications of the ACM*, 29 (3), 232-238.

Chen, J.V., Yen, D.C. & Chen, K. (2009). The acceptance and diffusion of the innovative smart phone use: A case study of a delivery service company in logistics. *Information & Management*, 46 (4), 241-248.

Cheney, P.H., Mann, R.I. & Amoroso, D.L. (1986). Organizational Factors Affecting the Success of End-User Computing. *Journal of Management Information Systems*, 3 (1), 65-80.

Cooper, R.B. & Zmud, R.W. (1990). Information Technology Implementation Research: A Technological Diffusion Approach. *Management Science*, 36 (2), 123-139.

D'Ambra, J., Wilson, C.S. & Akter, S. (2013). Application of the task-technology fit model to structure and evaluate the adoption of E-books by Academics. *Journal of the American Society for Information Science and Technology*, 64 (1), 48-64.

Daradkeh, M. (2019). Visual Analytics Adoption in Business Enterprises. *International Journal of Information Systems in the Service Sector*, 11 (1), 68-89.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13 (3), 319.

Davis, F.D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38 (3), 475-487.

DeLone, W.H. & McLean, E.R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research*, 3 (1), 60-95.

Delgado Piña, M.I., María Romero Martínez, A. & Gómez Martínez, L. (2008). Teams in organizations: a review on team effectiveness. *Team Performance Management: An International Journal*, 14 (1/2), 7-21.

Dickson, G.W., DeSanctis, G. & McBride, D.J. (1986). Understanding the effectiveness of computer graphics for decision support: a cumulative experimental approach. *Communications of the ACM*, 29 (1), 40-47.

Dishaw, M. & Strong, D. (1998). Assessing software maintenance tool utilization using task–technology fit and fitness-for-use models. *Journal of Software Maintenance: Research and Practice*, 10 (3), 151-179.

Dishaw, M.T. & Strong, D.M. (1999). Extending the technology acceptance model with task–technology fit constructs. *Information & Management*, 36 (1), 9-21.

Doll, W.J. & Torkzadeh, G. (1991). The Measurement of End-User Computing Satisfaction: Theoretical and Methodological Issues. *MIS Quarterly*, 15 (1), 5.

Dwivedi, Y., WadeScott, M. & Schneberger, L. (2012). *Information Systems Theory*.

Eybers, S., Gerber, A., Bork, D. & Karagiannis, D. (2019). Matching Technology with Enterprise Architecture and Enterprise Architecture Management Tasks Using Task Technology Fit. *Enterprise, Business-Process and Information Systems Modeling*, 245-260.

Ferratt, T.W. & Vlahos, G.E. (1998). An investigation of task-technology fit for managers in Greece and the US. *European Journal of Information Systems*, 7 (2), 123-136.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior*. Addison-Wesley Pub. Co.

Fjerrnestad, J. & Hiltz, S. (1997). *Experimental studies of group decision support systems: an assessment of variables studied and methodology*.

Furneaux, B. (2012). Task-Technology Fit Theory: A Survey and Synopsis of the Literature. *Information Systems Theory*, 87-106.

Goodhue, D. (1992). *User evaluations of MIS success: what are we really measuring?*.

Goodhue, D.L. & Thompson, R.L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, 19 (2), 213.

Goodhue, D.L. (1995). Understanding User Evaluations of Information Systems. *Management Science*, 41 (12), 1827-1844.

Ha, I., Yoon, Y. & Choi, M. (2007). Determinants of adoption of mobile games under mobile broadband wireless access environment. *Information & Management*, 44 (3), 276-286.

Hartwick, J. & Barki, H. (1994). Explaining the Role of User Participation in Information System Use. *Management Science*, 40 (4), 440-465.

Hsu, C., Lu, H. & Hsu, H. (2007). Adoption of the mobile Internet: An empirical study of multimedia message service (MMS). *Omega*, 35 (6), 715-726.

Lee, C., Cheng, H.K. & Cheng, H. (2007). An empirical study of mobile commerce in insurance industry: Task–technology fit and individual differences. *Decision Support Systems*, 43 (1), 95-110.

Letchumanan, M. & Tarmizi, R. (2011). Assessing the intention to use e- book among engineering undergraduates in Universiti Putra Malaysia, Malaysia. *Library Hi Tech*, 29 (3), 512-528.

Lin, T. & Huang, C. (2008). Understanding knowledge management system usage antecedents: An integration of social cognitive theory and task technology fit. *Information & Management*, 45 (6), 410-417.

Lin, W. (2012). Perceived fit and satisfaction on web learning performance: IS continuance intention and task-technology fit perspectives. *International Journal of Human-Computer Studies*, 70 (7), 498-507.

Lin, Wu, Lim, Han, & Chen (2019). Understanding the Sustainable Usage Intention of Mobile Payment Technology in Korea: Cross-Countries Comparison of Chinese and Korean Users. *Sustainability*, 11 (19), 5532.

Lucas, H.C. (1975). Performance and the Use of an Information System. *Management Science*, 21 (8), 908-919.

Lucas, H.C. (1981). *The analysis, design, and implementation of information systems*. McGraw-Hill.

Marikyan, D., Papagiannidis, S. & Alamanos, E. (2021). "Smart Home Sweet Smart Home". *International Journal of E-Business Research*, 17 (2), 1-23.

Maruping, L.M. & Agarwal, R. (2004). Managing team interpersonal processes through technology: A task-technology fit perspective. *Journal of Applied Psychology*, 89 (6), 975-990.

McGill, T.J. & Klobas, J.E. (2009). A task–technology fit view of learning management system impact. *Computers & Education*, 52 (2), 496-508.

Mikalef, P. & Torvatn, H.Y. (2019). A Configurational Approach to Task-Technology Fit in the Healthcare Sector. *Business Information Systems Workshops*, 169-180.

Oliveira, T., Faria, M., Thomas, M.A. & Popovič, A. (2014). Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM. *International Journal of Information Management*, 34 (5), 689-703.

Olson, M.H. & Ives, B. (1982). Chargeback Systems and User Involvement in Information Systems - An Empirical Investigation. *MIS Quarterly*, 6 (2), 47.

Palvia, S.C. & Chervany, N.L. (1995). An experimental investigation of factors influencing predicted success in DSS implementation. *Information & Management*, 29 (1), 43-53.

Robey, D. (1979). User Attitudes and Management Information System Use. *Academy of Management Journal*, 22 (3), 527-538.

Shih, Y. & Chen, C. (2013). The study of behavioral intention for mobile commerce: via integrated model of TAM and TTF. *Quality & Quantity*, 47 (2), 1009-1020.

Staples, D.S., Hulland, J.S. & Higgins, C.A. (1999). A Self-Efficacy Theory Explanation for the Management of Remote Workers in Virtual Organizations. *Organization Science*, 10 (6), 758-776.

Strong, D.M. (1997). IT process designs for improving information quality and reducing exception handling: A simulation experiment. *Information & Management*, 31 (5), 251-263.

Strong, D.M., Dishaw, M.T. & Bandy, D.B. (2006). Extending task technology fit with computer self-efficacy. *ACM SIGMIS Database*, 37 (2-3), 96.

Strong, D.M., Lee, Y.W. & Wang, R.Y. (1997). Data quality in context. *Communications of the ACM*, 40 (5), 103-110.

Swanson, E.B. (1987). INFORMATION CHANNEL DISPOSITION AND USE. *Decision Sciences*, 18 (1), 131-145.

Tam, C. & Oliveira, T. (2019). Does culture influence m-banking use and individual performance?. *Information & Management*, 56 (3), 356-363.

Tarhini, A., El-Masri, M., Ali, M. & Serrano, A. (2016). Extending the UTAUT model to understand the customers' acceptance and use of internet banking in Lebanon. *Information Technology & People*, 29 (4), 830-849.

Teo, T.S.H. & Men, B. (2008). Knowledge portals in Chinese consulting firms: a task–technology fit perspective. *European Journal of Information Systems*, 17 (6), 557-574.

Thompson, R.L., Higgins, C.A. & Howell, J.M. (1994). Influence of Experience on Personal Computer Utilization: Testing a Conceptual Model. *Journal of Management Information Systems*, 11 (1), 167-187.

Tornatzky, L.G. & Klein, K.J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, EM-29 (1), 28-45.

Venkatesh, Morris, Davis, & Davis (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27 (3), 425.

Venkatesh, V. & Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46 (2), 186-204.

Vessey, I. (1991). Cognitive Fit: A Theory-Based Analysis of the Graphs Versus Tables Literature. *Decision Sciences*, 22 (2), 219-240.

Weber, M., Weeger, A., Gewald, C. & Haase, U. (2016). *The Effect of 'Device' in Task-Technology Fit: A Study of German Hospitals*.

Weill, P. (1992). The Relationship Between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector. *Information Systems Research*, 3 (4), 307-333.

Wu, B. & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. *Computers in Human Behavior*, 67, 221-232.

Yuan, S., Liu, Y., Yao, R. & Liu, J. (2016). An investigation of users' continuance intention towards mobile banking in China. *Information Development*, 32 (1), 20-34.

Zhou, T., Lu, Y. & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. *Computers in Human Behavior*, 26 (4), 760-767.

Zigurs, I. & Buckland, B.K. (1998). A Theory of Task/Technology Fit and Group Support Systems Effectiveness. *MIS Quarterly*, 22 (3), 313.

de Guinea, A.O., Titah, R. & Léger, P. (2014). Explicit and Implicit Antecedents of Users' Behavioral Beliefs in Information Systems: A Neuropsychological Investigation. *Journal of Management Information Systems*, 30 (4), 179-210.

Technology Acceptance Model

The technology acceptance model (TAM) explains the acceptance of information systems by individuals. TAM postulates that the acceptance of technology is predicted by the users' behavioural intention, which is, in turn, determined by the perception of technology usefulness in performing the task and perceived ease of its use.

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Theory Factsheet

Proposed By: Davis, 1989

Parent Theory: Theory of Reasoned Action

Related Theories: Information Diffusion, IS Success Model, Theory of Planned Behaviour, Task Technology Fit

Discipline: Information systems management

Unit of Analysis: Individual

Level: Micro-level

Type: Theory for Explaining and Predicting

Operationalised: Quantitatively

Introduction

The acceptance and the use of information technologies can bring immediate and long-term benefits at organisational and individual levels, such as improved performance, financial and time efficiency and convenience (Foley Curley, 1984; Sharda, Barr & McDonnell, 1988). The potential of technology to deliver benefits has long motivated IS management research to examine the willingness of individuals to accept innovative technology (Davis, 1989). The research on the adoption of technology became of primary importance in the 1980s, which coincided with the growth of the use of personal computers. However, a major stumbling stone at the development of the research on the adoption of personal computing was the lack of empirical insight into users' responses to the information system performance. Before the development of TAM, various technological and organisational perspectives had aimed to advance IS-related research (e.g. (Benbasat, Dexter & Todd, 1986; Robey & Farrow, 1982; Franz & Robey, 1986)). Research had emphasised

the importance of factors such as users' involvement in the design and implementation of information systems (Robey & Farrow, 1982; Franz & Robey, 1986). A second stream of research had been underpinned by the practitioners' focus on the development of information systems, especially when it came to evaluating and refining system design and characteristics (Gould & Lewis, 1985; Good et al., 1986). Those studies had widely used subjective performance perception scales but neglected the validation of the quality of those measures. As a result, the correlation of those subjective measures with actual use had not been sufficiently significant to confirm their internal and external validity (De Sanctis, 1983; Ginzberg, 1981; Schewe, 1976; Srinivasan, 1985). Hence, there was a need to develop reliable measures to investigate attitudinal factors mediating the relationship between IS characteristics and system use. The Theory of Reasoned Action (TRA), developed by Ajzen and Fishbein (Ajzen, 2011) was used to predict the attitudinal underpinnings of behaviours across a wide range of areas. However, the generic nature of TRA stimulated a great deal of discussion on the theoretical limitations of the application of the model in the IS field (Davis, Bagozzi & Warshaw, 1989; Bagozzi, 1981). The model did not measure variables specific to technology use. Hence, researchers had to identify the factors salient to the utilisation of technology and information systems. To address the limitations related to the lack of a theoretical model and scales to measure the acceptance of technology, Davis (Davis, 1989) developed the technology acceptance model (TAM) based on TRA. The model's underpinning logic was that in the context of technology utilisation, behavioural intention was not shaped by a generic attitude toward behavioural intention, but specific beliefs related to technology use. The goal of TAM was to become the framework for examining a wide range of behaviours of technology users while maintaining a parsimonious approach (Davis, 1989).

Theory

The primary objective of TAM was to shed light on the processes underpinning the acceptance of technology, in order to predict the behaviour of and provide a theoretical explanation for the successful implementation of technology. The practical objective of TAM was to inform practitioners about measures that they might take prior to the implementation of systems. To fulfil the objectives of the theory, several steps were carried out (Davis, 1989; Davis, 1993). Davis embarked on the development of the model of technology acceptance by framing the processes mediating the relationship between IS characteristics (external factors) and actual system use. The model was based on the Theory of Reasoned Action, which provided a psychological perspective on human behaviour and was missing in the IS literature at that time (Davis, 1989; Davis, 1993).

The second step was to identify and define variables and validate measures that would highly correlate with system use. Based on prior empirical literature on human behaviour and the management of information systems, multi-item scales for perceived ease of use and perceived usefulness were developed, pre-tested, and validated in several studies. It was hypothesised that the two constructs were fundamental determinants of user acceptance, due to evidence in previous research (e.g. (Johnson & Payne, 1985; Payne, 1982; Robey, 1979). The research suggested that an individual's decision to perform a behaviour is the result of the analysis of the benefit that they expect to receive from the behaviour compared to the effort/costs they put in to perform the behaviour (Johnson & Payne, 1985; Payne,

1982). This means that the use of the information system is determined by an evaluation of the trade-off between the perceived usefulness of the system and the perceived difficulty of using it (Davis, 1989). Perceived usefulness was defined as the individual's perception of the extent to which the use of a given technology improves performance. The conceptualisation of this construct stemmed from Bandura's concept of outcome judgement, which refers to an individual's expectation of a positive outcome triggering behaviour (Bandura, 1982). Perceived usefulness was operationalised based on evidence confirming the effect of system performance expectancy on system usage (Robey, 1979). Perceived ease of use was defined as the degree to which a person believes that using a particular system is free of effort (Davis, 1989). This construct derived from the self-efficacy concept, which refers to a situation-specific belief about how well someone can execute actions for the prospective task (Davis, 1989; Bandura, 1982). It was suggested that self-efficacy had a predictive role in decision-making about technology use (Hill, Smith & Mann, 1987). Also, perceived ease of use shared a similarity with the complexity factor theorised in the innovation diffusion literature as a barrier to innovation adoption. It was defined as the degree to which individuals find the innovation difficult to understand and use (Mahajan, 2010). The validity and reliability of the constructs were assessed by testing the contingency of the self-reported usage of IS on the two proposed factors in the organisational context. The developed scales showed excellent psychometric properties. The model was further validated, by confirming significant relationships between perceived usefulness, perceived ease of use, intention and use behaviour (Davis, 1989).

According to TAM, technology acceptance is a three-stage process, whereby external factors (system design features) trigger cognitive responses (perceived ease of use and perceived usefulness), which, in turn, form an affective response (attitude toward using technology/intention), influencing use behaviour (Davis, 1989; Davis, 1993). TAM represents the behaviour, as the outcome predicted by perceived ease of use, perceived usefulness and behavioural intention (Figure 1). Perceived ease of use and perceived usefulness capture the expectations of positive behavioural outcomes and the belief that behaviour will not be labour-consuming (Davis, 1989). According to a follow-up study, behavioural intention can be substituted by the attitude toward behaviour (Davis, 1993), which is an affective evaluation of the potential consequences of the behaviour (Ajzen, 2011). The higher the affective response, the higher is the likelihood that the behaviour will take place. The effect of perceived usefulness on actual use can be direct, which underscores the importance of the variable in predicting behaviour. Although perceived ease of use does not affect use behaviour directly, it underpins the effect of perceived usefulness (Davis, 1993). The model implies that if an application is expected to be easy to use, the more likely it is that it will be considered useful for the user and the more likely it is that this will stimulate the acceptance of the technology (Davis, 1989; Davis, 1993).

The development of the model and measures for technology acceptance have made significant theoretical contributions and have had a great practical value. The application of the model for testing IS usability has made it possible to evaluate the motivation of users to adopt a range of technologies (Hwang, 2005; Gefen, Karahanna & Straub, 2003; Araújo & Casais, 2020), which had not been done before due to a lack of validated subjective measures. The development of constructs which had a strong and significant correlation with use behaviour made it possible

to understand the cognitive and affective factors mediating the effect of system characteristics on technology acceptance (Davis, 1989).

Figure 1: Technology Acceptance Model
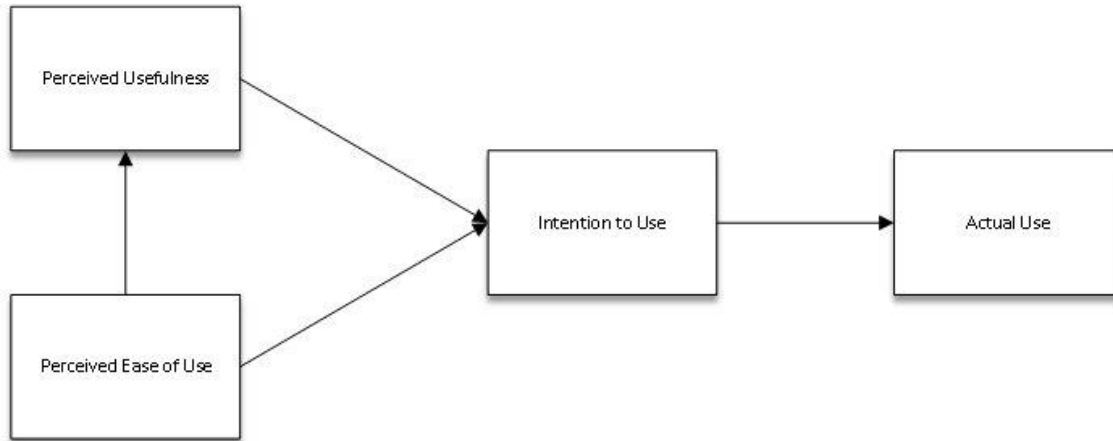
Theory Extensions

TAM2

Given the established relationship between technology acceptance in organisations and firms' productivity, the exploration of technology acceptance remained at the centre of the research agenda after the development of the original TAM (e.g. (Goodhue & Thompson, 1995; Davis, Bagozzi & Warshaw, 1992)). Although the wide application of TAM confirmed the robustness of the theory (it accounted for around 40% of the variance in technology acceptance on average), the authors of the model aimed to increase its predictive power further. The rationale for extending the model was the limited understanding of the conditions underpinning users' perception of technology utilisation. Perceived usefulness was confirmed to be the strongest predictor of intention to use, with an effect size of .6 on average (Venkatesh & Davis, 2000). However, the literature lacked evidence about the factors that underlie the perception of technology usefulness. Investigation of the antecedents of usefulness perception was required to understand acceptance, as well as to provide guidelines on the development of systems beyond suggesting that users' perception of usefulness and ease of use predict intention (e.g. (Venkatesh & Davis, 1996)). The investigation of key antecedents of perceived usefulness aimed to provide a comprehensive framework for explaining and predicting the acceptance of technology in organisational settings. (Venkatesh & Davis, 2000).

The proposed extension, named TAM2, consisted of five additional exogenous variables and two moderators (Fig 2). The new constructs and moderators incorporated in TAM2 were: subjective norm, image, job relevance, output quality, result demonstrability, experience and voluntariness. Subjective norm is defined as

"a person's perception that most people who are important to him think he should or should not perform the behaviour in question" (Venkatesh & Davis, 2000). This construct was thought to affect intention directly and indirectly through image and perceived usefulness (Venkatesh & Davis, 2000). The justification for incorporating subjective norms in the extended TAM derived from prior studies which had found that subjective norms had a significant direct effect on behaviour (Ajzen, 2011). The construct is a direct predictor of behaviour in the Theory of Reasoned Action, which acted as a parental theory for developing TAM, and the Theory of Planned Behaviour (Davis, 1989; Ajzen, 2011). Subjective norm postulates that when an individual does not want to perform a certain behaviour, but valued social group members think that he or she should perform that behaviour, the individual will follow the opinion of the social group (Venkatesh & Davis, 2000). In the IS domain, the examination of subjective norm yielded mixed results. The direct effect of subjective norm on intention to use was not consistent across studies (Davis, 1989; Taylor & Todd, 1995; Mathieson, 1991). This inconsistency raised the need for further exploration of the effect of subjective norm on behavioural intention to use. The indirect effect of subjective norm on intention to use through image and perceived usefulness could be explained by the internalisation mechanisms (Venkatesh & Davis, 2000). Internalisation is described as a process during which an individual perceives and thinks that a referent's suggestions are significant (Kelman, 1958; Warshaw, 1980). Over time, the ideas of a referent person become perceived as his or her own. For example, in the context of technology acceptance, an employee might value a manager's or co-worker's advice about the benefits of the use of certain technology. The direct and indirect effects of subjective norms on intention to use were considered to be moderated by experience, while voluntariness moderated only the direct effect on intention (Venkatesh & Davis, 2000).

The second construct introduced in TAM2 was image. Moore and Benbasat (Moore & Benbasat, 1991) defined image as "the degree to which use of an innovation is perceived to enhance one's status in one's social system". This definition followed that of the Theory of Diffusion of Innovation proposed by Rogers (Mahajan, 2010). TAM2 theorises that subjective norm has a positive correlation with image. The link was supported by prior studies confirming that image has a significant effect on behaviour if individuals follow their peers' advice to maintain the individual's status in the group (Pfeffer, 1992; Chassin, Presson & Sherman, 1990). In addition, TAM2 theorises a positive link between image and perceived usefulness. By exhibiting the behaviour endorsed by group norms, an individual "achieves membership and the social support that such membership affords as well as possible goal attainment which can occur only through group action or group membership" (Pfeffer, 1992). Therefore, TAM2 proposes that a favourable image among peers in the social group can increase the likelihood of the positive perception of technology productivity (Venkatesh & Davis, 2000).

The third antecedent of perceived usefulness is job relevance, which has a direct and interactive effect on perceived usefulness (Venkatesh & Davis, 2000). Job relevance is defined as "an individual's perception regarding the degree to which the target system is applicable to his or her job". The direct effect of job relevance is supported by other theoretical frameworks explaining technology acceptance. Task-technology fit and cognitive fit constructs became the basis for proposing the relationship between job relevance and perceived usefulness (Goodhue, 1995; Vessey, 1991). It was postulated that the effect of job relevance on perceived usefulness is moderated by output quality (Venkatesh & Davis, 2000). Output quality

refers to the perception of the quality of technology in performing the task. While prior studies validated the direct and individual effect of output quality on perceived usefulness (Davis, Bagozzi & Warshaw, 1992), TAM2 proposes that output quality increases the likelihood of a positive perception of technology, by enhancing the judgement of the technology's relevance for the job (Venkatesh & Davis, 2000).

Result demonstrability is defined as the "tangibility of the results of using the innovation" (Moore & Benbasat, 1991) The inclusion of this construct in the model was based on the argument that advanced technology might not be accepted, if a user fails to embrace the benefits of technology use (Venkatesh & Davis, 2000). The effect of result demonstrability suggests that the increase in individuals' performance resulting from the use of technology should be explicit, tangible and communicable. The link between result demonstrability and perceived usefulness is in line with the principles of the Job Characteristic Model, which postulates that the knowledge of work results increases people's motivation (Hackman & Oldham, 1976; Loher et al., 1985).

Empirical examination of the newly proposed model demonstrated that TAM2 can account for 60% of the variance in perceived usefulness and between 37% and 52% of the variance in usage intention (Venkatesh & Davis, 2000). The theory has contributed to the literature on the factors underpinning the perception of technology. It addressed the gap in the research that had explored the factors contributing to perceived ease of use (Venkatesh & Davis, 1996), but had overlooked the determinants of perceived usefulness. By encompassing both social influence factors (i.e. subjective norm, use voluntariness and image) and cognitive factors (i.e. evaluation of job relevance, result demonstrability, output quality and perceived ease of use), the TAM extension provided a detailed account of the key determinants of judgment about technology usefulness (Venkatesh & Davis, 2000).

**Figure 2: Technology Acceptance Model 2**
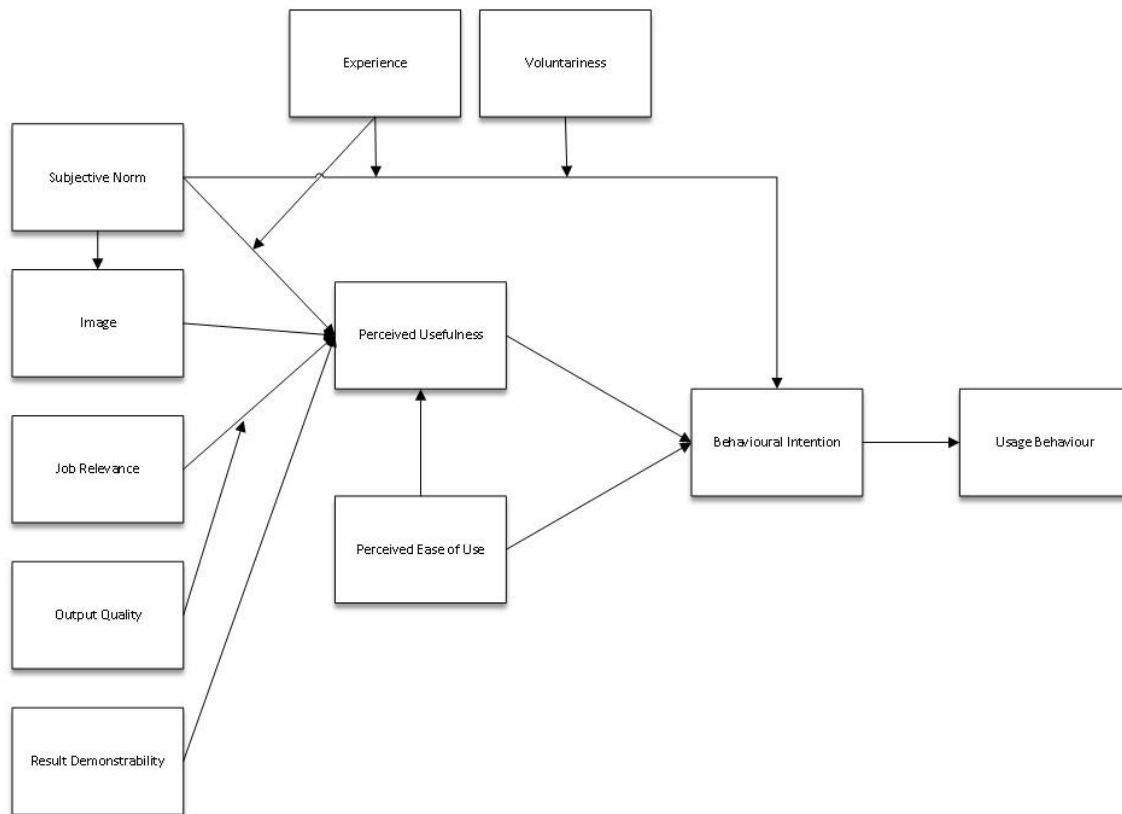
TAM3

TAM, TAM2 and evidence from other studies had provided rich explanations about key determinants of use intention (Davis, 1989; Venkatesh & Davis, 2000; Venkatesh & Davis, 1996). Still, there had been limited research on interventions which could be used to increase the technology adoption rate (Venkatesh & Speier, 1999). Given that TAM was criticised for providing few actionable guidelines to practitioners (Lee, Kozar & Larsen, 2003), Venkatesh and Bala (Venkatesh & Bala, 2008) combined the antecedents of perceived usefulness and perceived ease of use in a single model and investigated the relationship between antecedents and perception variables to exclude cross-over effects. Such an approach was to provide a nomological network explaining the adoption of technology in a comprehensive way. The aim of theorising distinctive effects of variables on perceived usefulness and perceived ease of use was to add clarity to the literature, which had been inconsistent in terms of the predictors of the two perception factors (Agarwal & Karahanna, 2000; Venkatesh & Davis, 2000).

Figure 3 illustrates the extended theoretical framework, which postulates that actual behaviour is predicted by behavioural intention, and behavioural intention is underpinned by perceived usefulness and perceived ease of use, each of which has a set of antecedents. The determinants of perceived usefulness include subjective norm, image, job relevance, output quality and result demonstrability, which remained unchanged from TAM2 (Venkatesh & Davis, 2000). New to this model were the direct predictors of perceived ease of use, which include computer self-efficacy, perception of external control, computer anxiety, computer

playfulness, perceived enjoyment and objective usability (Venkatesh & Bala, 2008). The rationale for incorporating these antecedents derived from evidence on human decision making. The antecedents of perceived ease of use represent two sets of anchoring and adjustment factors. While anchoring factors drive the initial judgment of perceived ease of use, adjustment factors come into play after individuals gain direct experience with information systems (Venkatesh, 2000). The anchoring factors are computer anxiety, computer self-efficacy, perception of external control and computer playfulness. The first three anchors reflect users' self-belief about technology and technology use (Venkatesh & Bala, 2008). They differentiate users based on the degree of their apprehension/fear related to the use of technology (Venkatesh, 2000), the belief in their personal capability of performing a task using the technology (Compeau & Higgins, 1995) and the belief that they have access to the organizational and technical resources that can support the use of the system (Venkatesh et al., 2003). Computer playfulness is defined as "the degree of cognitive spontaneity in microcomputer interaction" (Webster & Martocchio, 1992). It represents the intrinsic motivation associated with the use of computers. Adjustment factors include perceived enjoyment and objective usability. They measure the degree to which information systems are perceived to be enjoyable and the level of effort the systems require to complete specific tasks (Venkatesh, 2000). TAM3 also introduces three new moderation effects of experience on the relationships between a) computer anxiety and perceived ease of use, b) perceived ease of use and perceived usefulness, and c) perceived ease of use and intention to use. The effect of experience on perceived ease of use was not tested when developing TAM2, although this perception is weakened when people attain hands-on experience and knowledge about the system (Venkatesh & Davis, 2000).

TAM3 proved to be robust in explaining the use of information systems or use intention. The model accounted for between 40% and 53% of the variance in behavioural intention and around 36% of the variance in use (Venkatesh & Bala, 2008). The explanatory strength was similar to TAM2, which accounted for 37% - 52% of the variance in usage intention (Venkatesh & Davis, 2000). However, the main strength of the extension is the development of the behavioural model of antecedents of both the perception factors (perceived ease of use and perceived usefulness). This provides an exhaustive set of conditions and scenarios under which the acceptance of technology is most likely to occur. By delineating the relationships between antecedents, perceived ease of use and perceived usefulness, TAM3 offers a comprehensive list of interventions that have direct implications for decision-making regarding IT implementation and management (Venkatesh & Bala, 2008).

Figure 3: Technology Acceptance Model 3
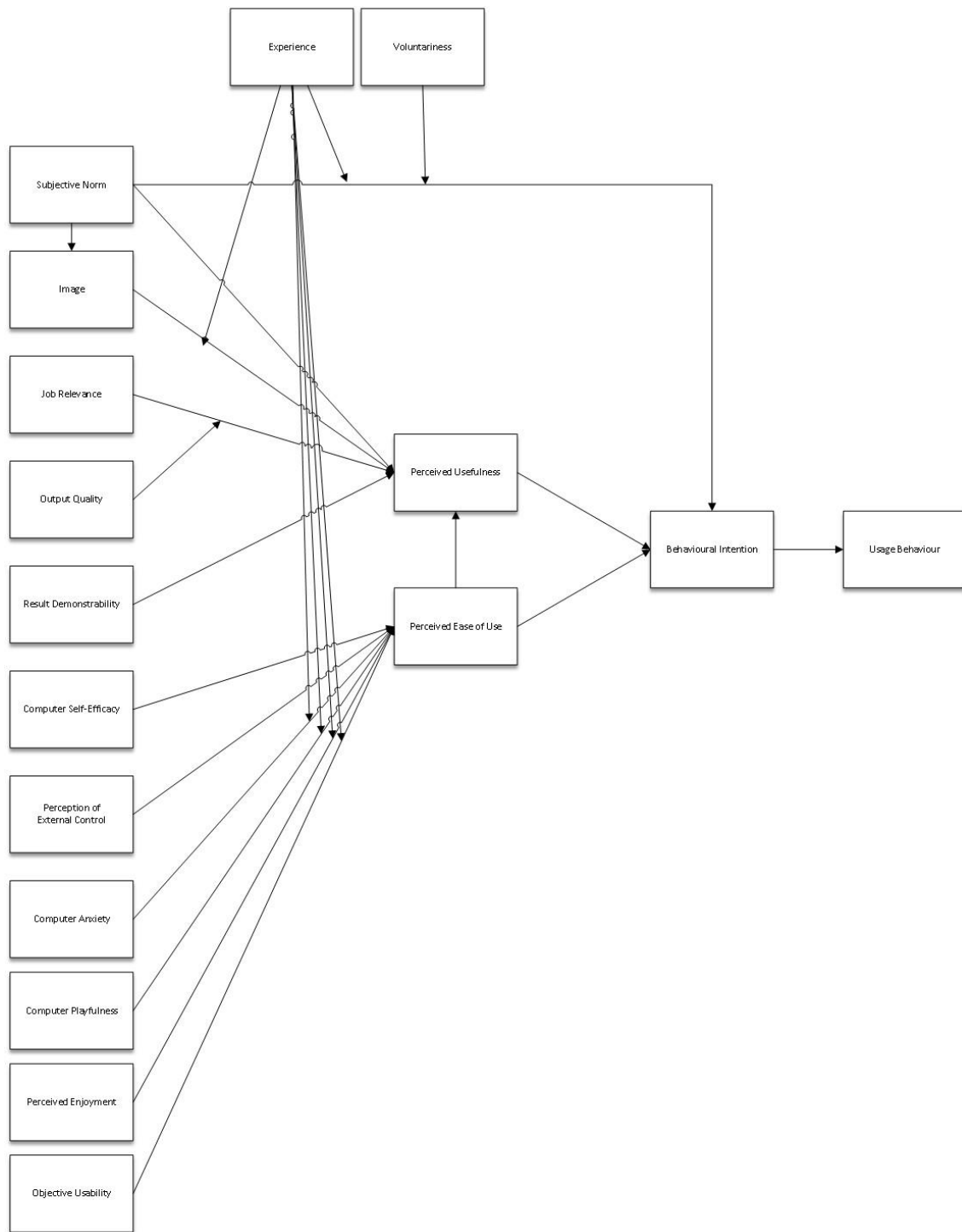
Applications

TAM and its extensions have been used in a wide range of applications in different disciplines, contexts and geographical locations, offering an important theoretical tool when it comes to predicting user behaviour. Apart from the application in the information systems management domain, technology acceptance models have been utilised in other disciplines e.g. marketing and advertising (Gefen, Karahanna & Straub, 2003; Dabholkar & Bagozzi, 2002; Gentry & Calantone, 2002). Given that

information systems are extensively used in the marketing of products and services, TAM became a handy tool to examine the attitude of consumers towards technologies, such as chatbots, e-commerce platforms and online shopping tools, enabling online trading (Gefen, Karahanna & Straub, 2003; Araújo & Casais, 2020). For example, TAM was used to investigate the assessment of online shopping tools by consumers, underpinning their intention to purchase through e-commerce platforms. It was confirmed that along with trust, TAM constructs contribute to a considerable proportion of variance in the attitude towards IS tools and subsequent consumer behaviour (Gefen, Karahanna & Straub, 2003). In addition, TAM was successful in explaining the acceptance of e-commerce chatbots, which contributed to purchasing intention (Araújo & Casais, 2020). However, when the model was tested on both potential and repeated customers of online stores, the model predicted the behaviour of only those customers who already had prior experience with the stores (Gefen, Karahanna & Straub, 2003; Bruner & Kumar, 2005).

Scholars tested the models of technology acceptance in different contexts and explored the acceptance of different technologies, such as mobile banking, telecommunication technology, virtual reality, e-learning systems, to name a few (Adams, Nelson & Todd, 1992; Venkatesh & Davis, 1996; Wilson, 2004; Al-Gahtani, 2016). While the effect of perceived usefulness was almost invariantly significant in relation to all types of technologies, the findings on the effect of ease of use were not consistent. For example, to adopt text-mining tools, it was important that users feel that software is both useful and easy to use (Demoulin & Coussement, 2020). Also, the contribution of TAM constructs to behavioural intention was significant when studying the acceptance of the world wide web (Mathieson, 1991). When TAM was adapted to test the acceptance of virtual reality, intention was predicted by perceived usefulness, although perceived ease of use was not significant for potential users (Singh, Sinha & Liébana-Cabanillas, 2020). When it came to examining TAM2 and TAM3, the effect of factors on perceived usefulness and perceived ease of use varied depending on the context and technology being studied. For instance, when exploring e-learning acceptance and deployment by users, the role of objective usability was found to be insignificant (Al-Gahtani, 2016), while for the utilisation of medical system technology, the effect of subjective norm did not hold true (Kummer, Schäfer & Todorova, 2013). When TAM2 was applied to exploring e-government adoption, only image and output quality were found to contribute to the perception of system usefulness (Sang, Lee & Lee, 2009). The application of TAM3 in the context of mobile commerce and mobile payment technology adoption demonstrated weak predictive strength, with users' perceptions about the technology being affected only by output quality, image, self-efficacy and perceived external control (Faqih & Jaradat, 2015; Jaradat & Mashaqba, 2014).

The theories were also tested in different settings – e.g. agriculture/farming, healthcare institutions and the use of natural resources (Arkesteijn & Oerlemans, 2005; Flett et al., 2004; Kummer, Schäfer & Todorova, 2013). TAM was able adequately to explain the adoption of dairy farming technologies (Flett et al., 2004). However, when assessing the adoption of telemedicine technology by physicians, only perceived usefulness determined the intention of hospital workers to use the technology (Hu et al., 1999). These inconsistent findings can be interpreted in two ways: the effect of perceived ease of using technology is mitigated when

technology 1) has a less functional value, and 2) when the study employs a specific sample of users, who have certain skills required to use the technology.

The strength of TAM variables in predicting behaviour was tested in different cultures and geographical contexts, such as the U.S.A, Japan, India and the Netherlands to name a few (Straub, 1994; Singh, Sinha & Liébana-Cabanillas, 2020). TAM has been found to be sufficiently robust in explaining the acceptance and the usage of websites in the Netherlands (van der Heijden, 2003) and India (Singh, Sinha & Liébana-Cabanillas, 2020). TAM2 and TAM3 held up well in Arabian culture and were helpful in outlining managerial interventions for better organizational e-learning management (Al-Gahtani, 2016; Baker, Al-Gahtani & Hubona, 2010). When the model was compared between countries with different cultural norms and socio-economic development, the antecedents of technology acceptance varied (Straub, 1994). The results reveal that the moderation role of individualism-collectivism in the adoption of mobile commerce is significant. The individualism-collectivism trait moderates the effect of perceived ease of use on perceived usefulness, perceived usefulness and behavioural intention, and behavioural intention to use (Faqih & Jaradat, 2015). The difference in power distance and masculinity affects the strength of the effects of determinants on behavioural intention (Hung et al., 2010).

From a practical point of view, TAM is useful for vendors to estimate the potential demand or stock supplies of new information technology products (Davis, 1989). Practitioners can use TAM to facilitate the acceptance of technology. By understanding the degree to which technology is useful and easy to operate by consumers, they can design consumer-oriented IT products (Davis, 1989). In addition, the understanding of the antecedents of perceived usefulness and perceived ease of use, proposed by TAM2 and TAM3, can help managers make informed decisions about the strategies on technology implementation in organisations. The models can be applied to guide the development of pre-implementation (actions leading to the actual roll-out of a system) and post-implementation interventions (actions following the actual deployment of the system) to address acceptance rates (Venkatesh & Davis, 2000; Venkatesh & Bala, 2008).

Limitations

A number of limitations have been discussed in TAM and its extensions over the years. The simplicity of TAM and the lack of understanding of the antecedents of technology acceptance (perceived usefulness and perceived ease of use) were the subject of criticism in prior research (Venkatesh, Davis & Morris, 2007; Lee, Kozar & Larsen, 2003). The parsimoniousness of the original TAM drove a number of scholars towards identifying and measuring the predictive power of additional constructs which could be integrated into the model, such as trust, technology fit, external variables (e.g. subjective norms, social influence), technology-specific variables (e.g. compatibility, relevance) to name a few (Venkatesh & Davis, 2000; Venkatesh, 2000; Gefen, Karahanna & Straub, 2003; Karahanna & Straub, 1999; Koufaris, 2002). Benbasat and Barki (Venkatesh, Davis & Morris, 2007) argued that the widespread application and use of TAM created an illusion of progress in IS research, while in reality studies replicated prior findings, thus hindering development in the field. It was stated that extensive utilisation of TAM had left blind spots in the IS literature. The theory brought into focus the factors that make people utilise the technology and

blurred the focus on the impact of technology utilisation on performance. TAM research implicitly suggests that the more technology is utilised, the better is the performance, which is not true in practice (Goodhue, 2007). The second blind spot concerns the little attention paid to what makes a system useful – i.e. the system's design and its fit to the user's task, which is equally important both for accepting technology and achieving high performance by utilising it (Goodhue, 2007; Benbasat & Barki, 2007). It is considered that TAM has reached its maturity, thus replication of the model cannot continue (Benbasat & Barki, 2007; Venkatesh, Davis & Morris, 2007).

Extended technology acceptance models had other limitations of their own. For example, TAM2 was criticised for being developed specifically for the organisational context (Venkatesh, Thong & Xu, 2012). Studies recognised the growing segment of consumer technology and developed models (e.g. MATH, UTAUT2) to address the technology acceptance by individuals (Venkatesh, Thong & Xu, 2012; Brown & Venkatesh, 2005). Other limitations of TAM2 were methodological in nature. Some constructs in TAM extensions were measured using only two items (e.g. job relevance, output quality). In addition, nearly all TAM-based models face the limitation regarding the self-reported measurement of use intention and the possibility of common method bias (Venkatesh & Davis, 2000; Venkatesh, Thong & Xu, 2012).

The critiques raised against TAM research point to its methodological issues, some limitations in the theory's applications and the focus on the aspects of systems' utilisation that diverted attention from other important factors and relationships (Venkatesh & Davis, 2000; Goodhue, 2007; Benbasat & Barki, 2007; Venkatesh, Thong & Xu, 2012). Nonetheless, the limitations cannot overshadow the contributions of the theory. TAM has been shown to be theoretically resilient and to have a strong predictive power to assess individuals' intention to use for almost three decades. TAM became the first theory explaining why individuals use information systems, which was once badly needed for IS research and practice (Goodhue, 2007).

Concepts

Perceived Usefulness (Independent): The degree to which a person believes that using a particular system would enhance his or her job performance. (Davis, 1989)

Perceived Ease of Use (Independent): The degree to which a person believes that using a particular system would be free of effort. (Davis, 1989)

Intention to Use (Dependent): A person's subjective probability that he will perform some behavior. (Fishbein & Ajzen, 1975)

Subjective Norm (Independent): A person's perception that most people who are important to him think he should or should not perform the behaviour in question. (Fishbein & Ajzen, 1975)

Image (Independent): The degree to which use of an innovation is perceived to enhance one's... status in one's social system. (Moore & Benbasat, 1991)

Job Relevance (Independent): An individual's perception regarding the degree to which the target system is applicable to his or her job. (Venkatesh & Davis, 2000)

Output Quality (Moderator): The degree to which an individual believes that the system performs his or her job tasks well. (Venkatesh & Davis, 2000)

Result Demonstrability (Independent): The tangibility of the results of using the innovation. (Moore & Benbasat, 1991)

Voluntariness (Moderator): The extent to which potential adopters perceive the adoption decision to be non-mandatory. (Venkatesh & Davis, 2000)

Experience (Moderator): The passage of time from the initial use of a technology by an individual. (Venkatesh, Thong & Xu, 2012)

Computer Self-Efficacy (Independent): The degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer. (Compeau & Higgins, 1995)

Perception of External Control (Independent): The degree to which an individual believes that organizational and technical resources exist to support the use of the system. (Venkatesh et al., 2003)

Computer Playfulness (Independent): The degree of cognitive spontaneity in microcomputer interactions. (Webster & Martocchio, 1992)

Computer Anxiety (Independent): The degree of an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers (Venkatesh, 2000)

Perceived Enjoyment (Independent): The extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use. (Venkatesh, 2000)

Objective Usability (Independent): A comparison of systems based on the actual level (rather than perceptions) of effort required to complete specific tasks. (Venkatesh, 2000)

Attitude (Independent/Dependent): The degree of evaluative affect that an individual associates with using the target system in his or her job. (Davis, 1993)

References

Adams, D.A., Nelson, R.R. & Todd, P.A. (1992). Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication. *MIS Quarterly*, 16 (2), 227.

Agarwal, R. & Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly*, 24 (4), 665.

Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & Health*, 26 (9), 1113-1127.

Al-Gahtani, S.S. (2016). Empirical investigation of e-learning acceptance and assimilation: A structural equation model. *Applied Computing and Informatics*, 12 (1), 27-50.

Araújo, T. & Casais, B. (2020). Customer Acceptance of Shopping-Assistant Chatbots. *Marketing and Smart Technologies*, 278-287.

Arkesteijn, K. & Oerlemans, L. (2005). The early adoption of green power by Dutch households. *Energy Policy*, 33 (2), 183-196.

Bagozzi, R.P. (1981). Attitudes, intentions, and behavior: A test of some key hypotheses. *Journal of Personality and Social Psychology*, 41 (4), 607-627.

Baker, E.W., Al-Gahtani, S.S. & Hubona, G.S. (2010). Cultural Impacts on Acceptance and Adoption of Information Technology in a Developing Country. *Journal of Global Information Management*, 18 (3), 35-58.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37 (2), 122-147.

Benbasat, I. & Barki, H. (2007). Quo vadis TAM?. *Journal of the Association for Information Systems*, 8 (4), 211-218.

Benbasat, I., Dexter, A.S. & Todd, P. (1986). An experimental program investigating color-enhanced and graphical information presentation: an integration of the findings. *Communications of the ACM*, 29 (11), 1094-1105.

Brown, & Venkatesh (2005). Model of Adoption of Technology in Households: A Baseline Model Test and Extension Incorporating Household Life Cycle. *MIS Quarterly*, 29 (3), 399.

Bruner, G.C. & Kumar, A. (2005). Explaining consumer acceptance of handheld Internet devices. *Journal of Business Research*, 58 (5), 553-558.

Chassin, L., Presson, C.C. & Sherman, S.J. (1990). Social Psychological Contributions to the Understanding and Prevention of Adolescent Cigarette Smoking. *Personality and Social Psychology Bulletin*, 16 (1), 133-151.

Compeau, D.R. & Higgins, C.A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, 19 (2), 189.

Dabholkar, P.A. & Bagozzi, R.P. (2002). An Attitudinal Model of Technology-Based Self-Service: Moderating Effects of Consumer Traits and Situational Factors. *Journal of the Academy of Marketing Science*, 30 (3), 184-201.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13 (3), 319.

Davis, F.D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38 (3), 475-487.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35 (8), 982-1003.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace1. *Journal of Applied Social Psychology*, 22 (14), 1111-1132.

De Sanctis, G. (1983). Expectancy Theory as an Explanation of Voluntary Use of a Decision-Support System. *Psychological Reports*, 52 (1), 247-260.

Demoulin, N.T. & Coussement, K. (2020). Acceptance of text-mining systems: The signaling role of information quality. *Information & Management*, 57 (1), 103120.

Faqih, K.M. & Jaradat, M.R.M. (2015). Assessing the moderating effect of gender differences and individualism-collectivism at individual-level on the adoption of mobile commerce technology: TAM3 perspective. *Journal of Retailing and Consumer Services*, 22, 37-52.

Flett, R., Alpass, F., Humphries, S., Massey, C., Morriss, S. & Long, N. (2004). The technology acceptance model and use of technology in New Zealand dairy farming. *Agricultural Systems*, 80 (2), 199-211.

Foley Curley, K. (1984). Are there any real benefits from office automation?. *Business Horizons*, 27 (4), 37-42.

Franz, C.R. & Robey, D. (1986). Organisational context, user involvement, and the usefulness of information systems. *Decision Sciences*, 17 (3), 329-356.

Gefen, Karahanna, & Straub (2003). Trust and TAM in Online Shopping: An Integrated Model. *MIS Quarterly*, 27 (1), 51.

Gentry, L. & Calantone, R. (2002). A comparison of three models to explain shop-bot use on the web. *Psychology and Marketing*, 19 (11), 945-956.

Ginzberg, M.J. (1981). Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions. *Management Science*, 27 (4), 459-478.

Good, M., Spine, T.M., Whiteside, J. & George, P. (1986). *User-derived impact analysis as a tool for usability engineering*.

Goodhue, D. (2007). Comment on Benbasat and Barki's "Quo Vadis TAM" article. *Journal of the Association for Information Systems*, 8 (4), 219-222.

Goodhue, D.L. & Thompson, R.L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, 19 (2), 213.

Goodhue, D.L. (1995). Understanding User Evaluations of Information Systems. *Management Science*, 41 (12), 1827-1844.

Gould, J.D. & Lewis, C. (1985). Designing for usability: key principles and what designers think. *Communications of the ACM*, 28 (3), 300-311.

Hackman, J. & Oldham, G.R. (1976). Motivation through the design of work: test of a theory. *Organizational Behavior and Human Performance*, 16 (2), 250-279.

Hill, T., Smith, N.D. & Mann, M.F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology*, 72 (2), 307-313.

Hu, P.J., Chau, P.Y., Sheng, O.R.L. & Tam, K.Y. (1999). Examining the Technology Acceptance Model Using Physician Acceptance of Telemedicine Technology. *Journal of Management Information Systems*, 16 (2), 91-112.

Hung, C.L., Chou, J.C.L., Chung, R. & Dong, T.P. (2010). *A cross-cultural study on the mobile commerce acceptance model*.

Hwang, Y. (2005). Investigating enterprise systems adoption: uncertainty avoidance, intrinsic motivation, and the technology acceptance model. *European Journal of Information Systems*, 14 (2), 150-161.

Jaradat, M.I.R.M. & Mashaqba, A.M.A. (2014). Understanding the adoption and usage of mobile payment services by using TAM3. *International Journal of Business Information Systems*, 16 (3), 271.

Johnson, E.J. & Payne, J.W. (1985). Effort and Accuracy in Choice. *Management Science*, 31 (4), 395-414.

Karahanna, E. & Straub, D.W. (1999). The psychological origins of perceived usefulness and ease-of-use. *Information & Management*, 35 (4), 237-250.

Kelman, H.C. (1958). Compliance, identification, and internalization three processes of attitude change. *Journal of Conflict Resolution*, 2 (1), 51-60.

Koufaris, M. (2002). Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior. *Information Systems Research*, 13 (2), 205-223.

Kummer, T., Schäfer, K. & Todorova, N. (2013). Acceptance of hospital nurses toward sensor-based medication systems: A questionnaire survey. *International Journal of Nursing Studies*, 50 (4), 508-517.

Lee, Y., Kozar, K.A. & Larsen, K.R. (2003). The Technology Acceptance Model: Past, Present, and Future. *Communications of the Association for Information Systems*, 12.

Loher, B.T., Noe, R.A., Moeller, N.L. & Fitzgerald, M.P. (1985). A meta-analysis of the relation of job characteristics to job satisfaction. *Journal of Applied Psychology*, 70 (2), 280-289.

Mahajan, V. (2010). *Innovation Diffusion*.

Mathieson, K. (1991). Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior. *Information Systems Research*, 2 (3), 173-191.

Moore, G.C. & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, 2 (3), 192-222.

Payne, J.W. (1982). Contingent decision behavior. *Psychological Bulletin*, 92 (2), 382-402.

Pfeffer, J. (1992). Understanding Power in Organizations. *California Management Review*, 34 (2), 29-50.

Robey, D. & Farrow, D. (1982). User Involvement in Information System Development: A Conflict Model and Empirical Test. *Management Science*, 28 (1), 73-85.

Robey, D. (1979). User Attitudes and Management Information System Use. *Academy of Management Journal*, 22 (3), 527-538.

Sang, S., Lee, J. & Lee, J. (2009). E- government adoption in ASEAN: the case of Cambodia. *Internet Research*, 19 (5), 517-534.

Schewe, C.D. (1976). The Management Information System User: An Exploratory Behavioral Analysis. *Academy of Management Journal*, 19 (4), 577-590.

Sharda, R., Barr, S.H. & McDonnell, J.C. (1988). Decision Support System Effectiveness: A Review and an Empirical Test. *Management Science*, 34 (2), 139-159.

Singh, N., Sinha, N. & Liébana-Cabanillas, F.J. (2020). Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence. *International Journal of Information Management*, 50, 191-205.

Srinivasan, A. (1985). Alternative Measures of System Effectiveness: Associations and Implications. *MIS Quarterly*, 9 (3), 243.

Straub, D.W. (1994). The Effect of Culture on IT Diffusion: E-Mail and FAX in Japan and the U.S. *Information Systems Research*, 5 (1), 23-47.

Taylor, S. & Todd, P.A. (1995). Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research*, 6 (2), 144-176.

Venkatesh, Morris, Davis, & Davis (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27 (3), 425.

Venkatesh, Thong, & Xu (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36 (1), 157.

Venkatesh, V. & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39 (2), 273-315.

Venkatesh, V. & Davis, F. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, 27 (3), 451-481.

Venkatesh, V. & Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46 (2), 186-204.

Venkatesh, V. & Speier, C. (1999). Computer Technology Training in the Workplace: A Longitudinal Investigation of the Effect of Mood. *Organizational Behavior and Human Decision Processes*, 79 (1), 1-28.

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, 11 (4), 342-365.

Venkatesh, V., Davis, F. & Morris, M. (2007). Dead Or Alive? The Development, Trajectory And Future Of Technology Adoption Research. *Journal of the Association for Information Systems*, 8 (4), 267-286.

Vessey, I. (1991). Cognitive Fit: A Theory-Based Analysis of the Graphs Versus Tables Literature. *Decision Sciences*, 22 (2), 219-240.

Warshaw, P.R. (1980). A New Model for Predicting Behavioral Intentions: An Alternative to Fishbein. *Journal of Marketing Research*, 17 (2), 153-172.

Webster, J. & Martocchio, J.J. (1992). Microcomputer Playfulness: Development of a Measure with Workplace Implications. *MIS Quarterly*, 16 (2), 201.

Wilson, E.V. (2004). Modeling Patients' Acceptance of Provider-delivered E-health. *Journal of the American Medical Informatics Association*, 11 (4), 241-248.

van der Heijden, H. (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands. *Information & Management*, 40 (6), 541-549.

Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT) examines the acceptance of technology, determined by the effects of performance expectancy, effort expectancy, social influence and facilitating conditions.

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Theory Factsheet

Proposed By: Venkatesh et al., 2003

Parent Theory: Theory of Reasoned Action, Technology Acceptance Model, Motivational Model, Theory of Planned Behaviour, Diffusion of Innovation, Social Cognitive Theory

Discipline: Information systems management

Unit of Analysis: Individual

Level: Micro-level

Type: Theory for Explaining and Predicting

Operationalised: Quantitatively

Introduction

The growth of an e-commerce sector, emerging digital technologies, such as big data, Artificial Intelligence, cloud computing and robotics, drive the implementation of new technologies in organisations (Verhoef et al., 2021). The advances in information communication technology (ICT) have dramatically changed the way organisations conduct business. The application of the technologies in the workplace has redefined inter- and intra-organisational communication has streamlined business processes to ensure benefits, such as higher productivity, the wellbeing of employees and the satisfaction of consumers (Papagiannidis & Marikyan, 2020). To achieve such benefits, companies make massive spending on technologies. However, investment in ICT implementation does not guarantee successful deployment and often bring low returns (Davis, 1989; Venkatesh et al., 2003). The results of market research suggest that the success rate of new technology adoption in organisations, whereby technologies bring expected return on investment (i.e. improved performance), is below 30 percent. The number is less

optimistic if consider the companies, who could improve performance, but could not sustain the improvements in the long-term (De la Boutetière, Montagner & Reich, 2018). Given the consequences of technology adoption on organisations' performance and a cost-revenue structure, the technology utilisation-acceptance gap remains one of the major areas of research in the IS literature.

Research community accelerated its interest towards technology acceptance in the private and organisational contexts almost three decades ago (Davis, 1989; Compeau & Higgins, 1995; Goodhue, 1995; Leonard-Barton & Deschamps, 1988). By 2000, technology acceptance research had resulted in a substantial body of evidence on user behaviour related to technology adoption (Hu et al., 1999). Numerous models/theories had been introduced to understand the acceptance of the technology, which cumulatively explained 40% of the variance in technology use intention (Davis, 1989; Davis, Bagozzi & Warshaw, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000). The models had roots in different disciplines, which limited the applications of these theories to certain contexts. For example, the Theory of Planned Behaviour and the Theory of Reasoned Action offer a psychological perspective on human behaviour by examining the variables, such as perceived behavioural control, attitude and subjective norms (Ajzen, 2011). The theories provide generic insights into individuals' attitudinal underpinnings, which make them applicable to a wide range of research contexts, not limited to information system management. In contrast, Diffusion of Innovation Theory focuses on innovation-specific factors that determine users' behaviour when it comes to new technology adoption (Moore & Benbasat, 1991). In addition, the models had different perspectives, reflecting the type of variables in the model, such as subjective norm, motivational factors, attitudinal factors related to technology performance, social factors, experience and facilitating conditions (Venkatesh et al., 2003; Taylor & Todd, 1995; Ajzen, 2011; Thompson, Higgins & Howell, 1991; Davis, Bagozzi & Warshaw, 1992; Venkatesh & Speier, 1999). The selection of either of the models constrains research findings to particular scenarios and conditions. Therefore, a unified approach was needed to embrace variables reflecting different perspective and disciplines and increase the applications of the theory to different contexts (Venkatesh et al., 2003).

To provide a holistic understanding of technology acceptance, Venkatesh et al. (Venkatesh et al., 2003) set the objective for developing a unified theory of technology acceptance by integrating key constructs predicting behavioural intention and use. To fulfil this objective, the seminal IS acceptance literature was reviewed to draw up theoretical and contextual similarities and differences among technology acceptance theories originating from three research streams – i.e. social psychology, IS management and behavioural psychology (see (Venkatesh et al., 2003)). Given that the theories stem from different disciplines, they cast diverse perspectives on technology acceptance and adoption. The socio-psychological perspective on research on individual behaviour was represented by the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and Social Cognitive Theory (SCT). Based on TRA and TPB, individuals' behaviour is measured by the effect of attitude toward behaviour, subjective norm and perceived behavioural control on behavioural intention (Ajzen, 2011). The theories are used in IS management to explore the role of a perceived difficulty in performing the task, the effect of group norms and attitude on accepting technology (Karahanna, Straub & Chervany, 1999; Zhang & Mao, 2020). TRA contributed greatly to IS acceptance theories, by providing a theoretical framework that explained human behaviour (Ajzen, 2011;

Davis, 1989). SCT is based on the assumption that behavioural, cognitive and environmental factors (i.e. outcome expectations-performance, outcome expectations-personal, self-efficacy, affect and anxiety) have an interactive effect on individuals' behaviour (Bandura, 2001). The theory has been used to investigate human-computer interaction (Compeau & Higgins, 1995; Compeau, Higgins & Huff, 1999). The acceptance of technology from the vantage point of IS management was largely explained by Technology Acceptance Model (TAM), combined TAM and TPB model (C-TAM-TPB), Innovation Diffusion Theory (IDT) and the model of PC utilisation (MPCU). While TAM and C-TAM-TPB stress the importance of cognitive response to IS features in predicting behaviour (Venkatesh et al., 2003; Taylor & Todd, 1995), IDT focuses on system characteristics and properties in determining the adoption of innovation (e.g. relative advantage, complexity, compatibility, image) (Moore & Benbasat, 1991). MPCU has very narrow implications, as the model encompasses the factors underpinning the utilisation of personal computers (i.e. job fit, complexity, long-term consequences, affect towards use, facilitating conditions and social factors) (Thompson, Higgins & Howell, 1991), unlike other theories examining IS and innovation adoption (Venkatesh et al., 2003; Taylor & Todd, 1995; Moore & Benbasat, 1991). The behavioural psychology perspective on technology acceptance was represented by the Motivational Model (MM), suggesting that technology adoption and use behaviour can be explored through user motivations (Davis, Bagozzi & Warshaw, 1992; Venkatesh & Speier, 1999). Users tend to evaluate the likelihood of engaging in behaviour by the degree to which behaviour stimulates instrumental rewards (extrinsic motives) and/or internal reinforcement, such as enjoyment, satisfaction and fun (intrinsic motives) (Davis, Bagozzi & Warshaw, 1992).

The review of the above theories led Venkatesh to identify limitations, which in turn triggered the need to develop the Unified Theory of Acceptance and Use of Technology. The primary limitation was that the literature had not empirically tested and compared dominant technology acceptance models, which left room for speculation on the predictive power of the constructs of each theory. The studies examining technology use behaviour had mainly focused on simple systems (e.g. PC) and overlooked the use of more complex technologies (Venkatesh et al., 2003). The focus on one technology constrains the explanatory power of theories, as individuals' experiences, purchase decisions and use cases vary depending on IT systems and contexts (Brown, Venkatesh & Hoehle, 2015). For example, the motivations of consumers purchasing entertainment technology are not similar to the needs of employees driving the usage of enterprise management systems. The latter technology has a strong utilitarian value and is predominantly used in mandatory settings. Also, there were methodological limitations identified in prior literature. Most studies had used a cross-sectional approach, by measuring variables at pre- or post-acceptance stages (e.g. (Venkatesh et al., 2003; Taylor & Todd, 1995)), although some constructs (e.g. experience) needed to be examined over time. The limitations suggested using a longitudinal approach to fully understand the dynamics of technology acceptance and use. Finally, previous studies had focused on the technology acceptance in a voluntary context (when society does not have an effect on technology use), which put a constraint on the generalisability of the findings. Therefore, to ensure the wider implication of the models, technology acceptance was investigated both in mandatory and voluntary settings. The empirical comparison of the theories enabled authors to develop a unified

acceptance model, which embraced and reflected all key acceptance factors (Venkatesh et al., 2003).

Theory

The theoretical model of UTAUT suggests that the actual use of technology is determined by behavioural intention. The perceived likelihood of adopting the technology is dependent on the direct effect of four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The effect of predictors is moderated by age, gender, experience and voluntariness of use (Venkatesh et al., 2003).

Performance expectancy is defined as "*the degree to which an individual believes that using the system will help him or her to attain gains in job performance*" (Venkatesh et al., 2003). Performance expectancy is based on the constructs from Technology Acceptance Model (TAM), TAM2, Combined TAM and the Theory of Planned Behaviour (CTAMTPB), Motivational Model (MM), the model of PC utilisation (MPCU), Innovation Diffusion Theory (IDT) and Social Cognitive Theory (SCT) (i.e. perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations). It is the strongest predictor of use intention and is significant in both voluntary and mandatory settings (Zhou, Lu & Wang, 2010; Venkatesh, Thong & Xu, 2016).

Effort expectancy is defined as "*the degree of ease associated with the use of the system*" (Venkatesh et al., 2003). Effort Expectancy is constructed from perceived ease of use and complexity driven from TAM, MPCU, IDT, which share a similarity in definitions and scales. The effect of the construct becomes nonsignificant after extended usage of technology (Gupta, Dasgupta & Gupta, 2008; Chauhan & Jaiswal, 2016).

Social Influence is defined as "*the degree to which an individual perceives that important others believe he or she should use the new system*" (Venkatesh et al., 2003). Social influence is similar to the subjective norms, social factors and image constructs used in TRA, TAM2, TPB, CTAMTPB, MPCU, IDT in the way that they denote that the behaviour of people is adjusted to the perception of others about them. The effect of social influence is significant when the use of technology is mandated (Venkatesh et al., 2003). In the mandatory context, individuals might use technology due to compliance requirement, but not personal preferences (Venkatesh & Davis, 2000). This might explain the inconsistent effect that the construct demonstrated across further studies validating the model (Zhou, Lu & Wang, 2010; Chauhan & Jaiswal, 2016).

Facilitating conditions is defined as "*the degree to which an individual believes that an organisation's and technical infrastructure exists to support the use of the system*" (Venkatesh et al., 2003). The facilitating conditions construct is formed from compatibility, perceived behavioural control and facilitating conditions constructs drawn from TPB, CTAMTPB, MPCU and IDT. Facilitating conditions have a direct positive effect on intention to use, but after initial use, the effect becomes nonsignificant. Therefore, the model proposes that facilitating conditions have a direct significant effect on use behaviour (Venkatesh et al., 2003).

The moderation effects of age, gender, experience and voluntariness of use define the strength of predictors on intention. Age moderates the effect of all four predictors. Gender effects the relationships between effort expectancy, performance expectancy and social influence. Experience moderates the strength of the relationships between effort expectancy, social influence and facilitating conditions. Voluntariness of use has a moderating effect only on the relationship between social influence and behavioural intention (Venkatesh et al., 2003).

UTAUT has made several contributions to the literature. The model provides empirical insight into technology acceptance by comparing prominent technology acceptance theories, which often offer competing or partial perspectives on the subject. UTAUT demonstrates that proposed factors account for 70 percent of the variance in use intention (Venkatesh et al., 2003), offering stronger predictive power compared to the rest of the models that examine technology acceptance (e.g. (Davis, 1993; Sheppard, Hartwick & Warshaw, 1988)). The interactive effect of some constructs with personal and demographic factors demonstrates the complexity of the technology acceptance process, which is dependent on individuals' age, gender and experience (Venkatesh et al., 2003).

The model is presented in figure 1.

Figure 1: UTAUT
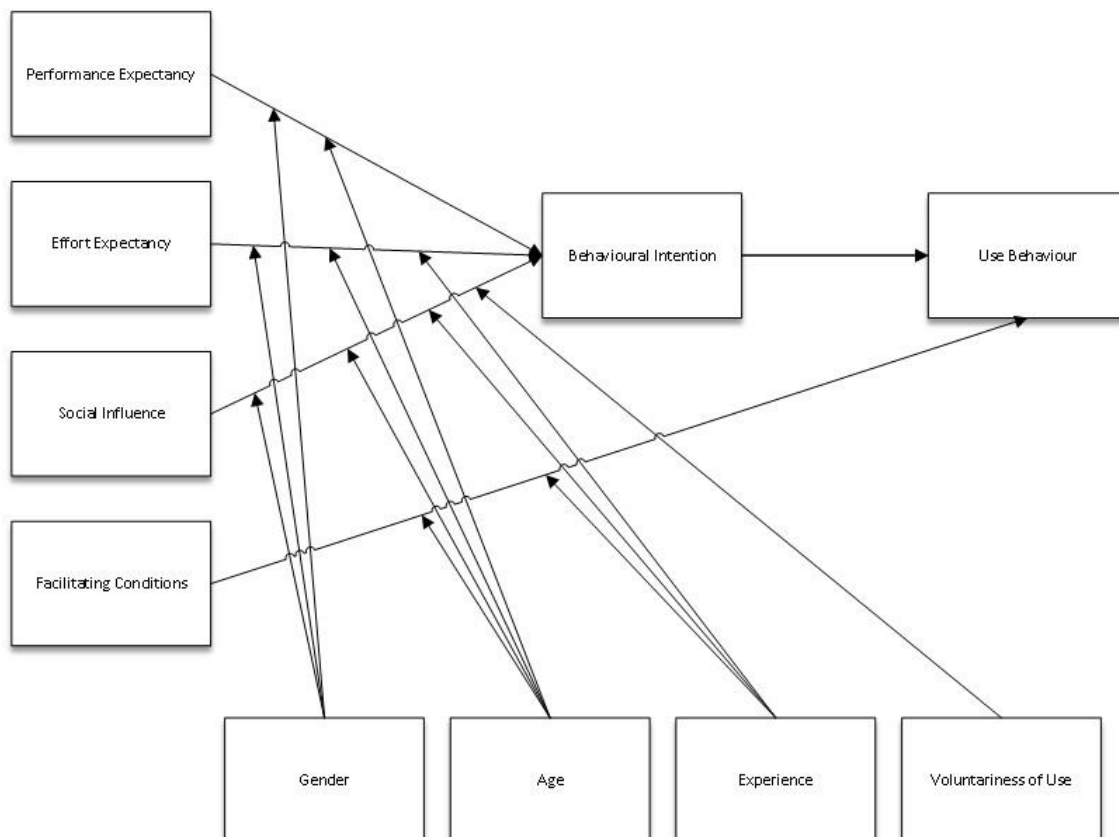
UTAUT2 and other extensions

The original UTAUT framework was developed to explain and predict the acceptance of technology in an organisational context (Venkatesh et al., 2003), although, later it was tested in non-organisational settings too (Venkatesh, Thong & Xu, 2012; Venkatesh, Thong & Xu, 2016). Over the years, UTAUT showed wide application, which enhanced the generalisability of the theory (Venkatesh, Thong & Xu, 2012; Neufeld, Dong & Higgins, 2007). Given the variance of information communication technologies and the advances in the sector, a number of scholars extended UTAUT to adapt it to the context or improve its predictive power (Venkatesh, Thong & Xu, 2012).

The adaptations of the model were underpinned by four main approaches, reflecting a) the modification of the model to different contexts, b) the alterations of the endogenous variables, c) the addition of attitudinal antecedents, and d) the examination of various moderating variables. The first stream of research extended the model to apply it to new technologies (e.g. enterprise systems, e-health systems), focus on new user segments (e.g. healthcare professionals), and examine it in new geographical and cultural settings (e.g. India, China) (Chang et al., 2007; Yi et al., 2006; Gupta, Dasgupta & Gupta, 2008). For instance, the model was extended by a set of web-specific constructs, including trust and personal web innovativeness to explore how well it predicts the use of web tools (Casey & Wilson-Evered, 2012). Another stream of research extended UTAUT by incorporating additional endogenous variables (e.g. (Sun, Bhattacherjee & Ma, 2009)), such as satisfaction and continuous intention to use (Maillet, Mathieu & Sicotte, 2015). The third stream of research scrutinised additional determinants of use and behavioural intention, such as task-technology fit and personality traits (Zhou, Lu & Wang, 2010; Wang, 2005). Finally, some studies extended UTAUT by introducing new contextual and moderating variables, such as culture, ethnicity, religion, employment, language, income, education and geographical location, among others (Im, Hong & Kang, 2011; Al-Gahtani, Hubona & Wang, 2007; Riffai, Grant & Edgar, 2012).

Although the adaptations of the model enriched the understanding of the theory applications, the research was mainly limited to organisational settings (Chang et al., 2007; Yi et al., 2006; Gupta, Dasgupta & Gupta, 2008; Im, Hong & Kang, 2011; Al-Gahtani, Hubona & Wang, 2007). The literature lacked evidence about a user behavioural model, which could explain the utilisation of technology by consumers rather than employees. However, such evidence was important, given arguments in prior studies suggesting that the determinants of acceptance in organisational and non-organisational (i.e. consumer) settings are not the same. It was found that the importance of the factors reflecting the costs and benefits of behaviour varied based on the context (e.g. (Brown & Venkatesh, 2005; van der Heijden, 2004; Brown, Venkatesh & Bala, 2006; Brown & Venkatesh, 2005; Kim, Malhotra & Narasimhan, 2005)).

Given the above limitations, Venkatesh et al. proposed an extension of UTAUT, named UTAUT2 (Venkatesh, Thong & Xu, 2012). The model (Figure 2) set out to address two main objectives. First, compared to all prior attempts to extend the model, UTAUT2 was not designed to have a specific focus (e.g. new technology, geographical location). Instead, the goal of the theory was to represent an overarching framework for examining technology acceptance. The extension was

designed to give a higher precision in explaining user behaviour (Venkatesh, Thong & Xu, 2012; Alvesson & Kärreman, 2007). The second objective was to propose a behavioural model of consumer technology acceptance, in contrast to UTAUT, which was developed to examine technology in organisational settings. To fulfil the objective, Venkatesh et al. planned to extend the UTAUT model with new constructs, tackling behavioural and attitudinal determinants of the utilisation of technology in the non-organisational context (Venkatesh, Thong & Xu, 2012). The authors developed UTAUT2 by introducing three new constructs and altering some relationships (e.g. removing the voluntariness) in the original model to adapt it to the consumer technology use context. Such an approach offered a new theoretically justified mechanism for predicting technology acceptance, which was encouraged and endorsed by prior research (Bagozzi, 2007; Venkatesh, Davis & Morris, 2007). In addition to advancing the technology acceptance literature (Venkatesh, Thong & Xu, 2012), UTAUT2 aimed to achieve wider generalisability by addressing the private user segment .

UTAUT 2 postulates that the use of technology by individuals is underpinned by the effect of the three additional constructs, namely, hedonic motive, cost/perceived value and habit, moderated by age, gender and experience. Hedonic motivation is defined "*as the fun or pleasure derived from using technology, and it has been shown to play an important role in determining technology acceptance and use*" (Venkatesh, Thong & Xu, 2012). The inclusion of this construct was justified by the findings of prior studies in the IS and marketing domains which found that the perceived hedonic nature of the outcome (e.g. perceived enjoyment) was a significant predictor of consumer technology use (Brown & Venkatesh, 2005; van der Heijden, 2004). The rationale for integrating cost in the new model was based on the relative importance of the factor in the context of consumer product use compared to the usage of technology in workplace settings. For example, when technology is used by employees in organisations, users do not feel responsible for the cost that is associated with the use of technology, due to the lack of direct financial implications for them (Venkatesh, Thong & Xu, 2012). In contrast, the use of consumer technology implies a higher perception of the responsibility, due to direct costs borne by the use of technology. The lower the costs, the more intensive is the use of technology (Venkatesh, Thong & Xu, 2012; Brown, Venkatesh & Bala, 2006; Brown & Venkatesh, 2005). Since UTAUT and UTAUT2 utilised subjective measures, the cost factor was represented by price value. Price value is defined as "*consumers' trade-off between the perceived benefits of the applications and the monetary cost for using them*" (Venkatesh, Thong & Xu, 2012). A positive relationship between perceived value and intention to use indicates that a user perceives the benefits of technology use as higher and more important than the associated monetary costs. The third variable included in UTAUT2 is habit, which is defined as "*the extent to which people tend to perform behaviours automatically*" (Venkatesh, Thong & Xu, 2012). The construct was operationalised based on prior studies which had brought the automaticity perspective into the research. In contrast to a reason-oriented framework (e.g. TRA and TPB), which states that behavioural intention results from deliberate evaluations, the automaticity perspective considers technology use to be an automatic and unconscious behaviour (e.g. (Limayem, Hirt & Cheung, 2007; Kim, Malhotra & Narasimhan, 2005)). Habit was hypothesised to have a direct and indirect effect on actual use through behavioural intention (Venkatesh, Thong & Xu, 2012). However, the effect of either of the paths is dependent on the degree to which people rely on routinised behaviour in accepting/using technology

(Venkatesh, Thong & Xu, 2012; Ajzen, 2011). The extended version of UTAUT resulted in a number of theoretical contributions. The model explains 74 %of the variance in behavioural intention and 52 % of the variance in technology use, which suggests that the model has high predictive validity when applied to the consumer segment. The supported effects of price value, hedonic motivation and habit indicate three significant drivers of consumers' intention to use or actual use of technology (Venkatesh, Thong & Xu, 2012). Specifically, the introduction of the habit factor demonstrated the alternative theoretical mechanism in examining technology use (Bagozzi, 2007). Such an approach challenged the role of intention (Venkatesh, Davis & Morris, 2007), which was commonly used as a proxy for behaviour (e.g. (Venkatesh et al., 2003; Ajzen, 2011)). The inclusion of hedonic motivation in the model was found to be more important than performance expectancy and was significant across a wide range of studies (Alalwan, Dwivedi & Rana, 2017; Megadewandanu, Suyoto & Pranowo, 2016). In addition, the integration of price value in UTAUT2 addressed the need to measure the costs of IS use in the consumer context. Finally, extended UTAUT determines the role of personal factors (gender, age, and experience) in moderating the effect that hedonic motivation, price value and habit have on behavioural intention and/or use (Venkatesh, Thong & Xu, 2012).

Figure 2: UTAUT2
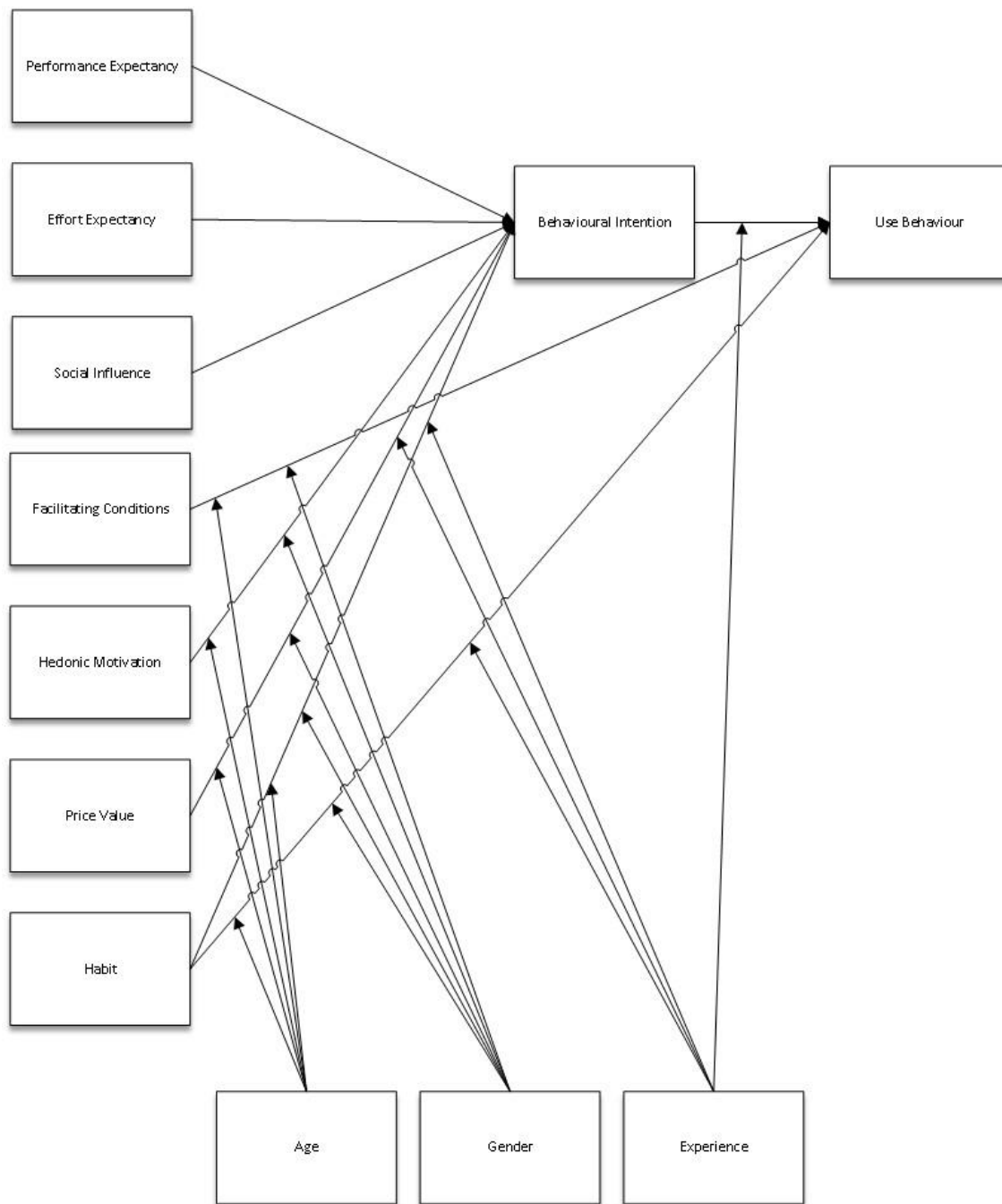
Applications

UTAUT and UTAUT2 have been tested in different geographical contexts to understand the role of culture in technology adoption and solidify the generalisability of the theory tenets (Gupta, Dasgupta & Gupta, 2008; Im, Hong & Kang, 2011; Venkatesh, Thong & Xu, 2012). The majority of findings showed that the role of UTAUT constructs was significant irrespective of the difference in cultures. For example, the employment of the model in a comparative study on technology acceptance in the USA and China demonstrated the high explanatory power of the model across the two geographical settings. However, the model accounts for a

greater variance in the behavioural intention when fewer moderators are tested (Venkatesh, Thong & Xu, 2012). When UTAUT was examined in Korea and the USA, the strength of the relationships slightly varied, although the significance was invariant across the two samples (Im, Hong & Kang, 2011). Similar results were observed when the UTAUT model was tested cross-culturally in individualistic vs. collectivistic nations. The model was shown to be viable in both types of cultures, but the strength of the relationships was different, suggesting a strong moderating role of culture on the model paths (Udo, Bagchi & Maity, 2016). UTAUT2 was also validated in different countries with contrasting cultures, economies and level of technology penetration. In Jordan, mobile banking adoption was not affected by social influence (Alalwan, Dwivedi & Rana, 2017). When comparing the adoption of education technology in Korea, Japan and the US, both the strength of the relationships and the significance of the effects were different across samples. For Korean users, the intention to use e-learning correlated with habit and perceived efficacy. For Japanese users, the behavioural intention was underpinned by habit, price value and social influence, while US users stressed only the habit and price value factors. Surprisingly, effort expectancy was not significant for any country, which might indicate that the technology being tested did not demand any effort to operate it (Jung & Lee, 2020). UTAUT2 applications demonstrate that insight into the conditions associated with culture is required, such as nations' socio-economic status or norms.

The original and extended UTAUT models have been used to examine technology acceptance in a number of different sectors, such as healthcare (Chang et al., 2007), e-government (Gupta, Dasgupta & Gupta, 2008; Chan et al., 2010), mobile internet (Venkatesh, Thong & Xu, 2012; Thong et al., 2011), enterprise systems (Chauhan & Jaiswal, 2016; Ling Keong et al., 2012) and mobile banking and apps (Zhou, Lu & Wang, 2010; Mütterlein, Kunz & Baier, 2019). The applications of UTAUT demonstrated a strong dependence of behavioural intention on the two perception factors, namely perceived performance and perceived ease of use. For example, the technology acceptance framework was used to understand the acceptance of a pharmacokinetics-based clinical decision support systems. All constructs had significant effects on intention, except for facilitating conditions, which influenced only the actual utilisation of the technology (Chang et al., 2007). The investigation of the factors driving the adoption of e-government by employees in a state organisation in a developing country demonstrated the significant influence of all the UTAUT variables moderated by gender, while performance and effort expectancy showed the strongest effects (Gupta, Dasgupta & Gupta, 2008). When the model was used to explore the acceptance of ERP software training, three out of four predictors of use intention were found to be significant. While effort expectancy, performance expectancy and facilitating conditions influenced employees' intention to adopt training tools, the effect of social influence was not supported. Such findings were probably due to the instrumental nature of ERP software and the high contingency of its use on utility factors that overshadow the role of social influence on users' decisions (Chauhan & Jaiswal, 2016). The applications of UTAUT2 showed that the significance and the strength of behavioural determinants differed across cases. The utilisation of UTAUT2 to investigate the antecedents of mobile app adoption confirmed the role of performance expectancy, social influence, hedonic motivation and habit (Mütterlein, Kunz & Baier, 2019). However, in two other studies investigating mobile banking adoption,

the role of social influence was not confirmed (Ajzen, 2011; Baptista & Oliveira, 2015). The strongest observed effects were demonstrated by performance expectancy, hedonic motivation and habit (Baptista & Oliveira, 2015).

Practical Implications

UTAUT and UTAUT2 could have a number of applications in practice. UTAUT can be used to examine the anticipated acceptance rate of a product and ensure sufficient stock to satisfy the consumers' demand. Evidence that the model provides can be used by practitioners to design more user-oriented products. UTAUT underscores the role of social influence and facilitating conditions, thus highlighting the importance of contextual analysis in strategies for technology implementation and promotion (Venkatesh, Thong & Xu, 2012). The application of UTAUT2 enables technology producers and vendors to measure how the trade-off between monetary price and the value of the product influences the utilisation of their technology. Companies have the opportunity to reconsider cost-structures to adjust the pricing policy to the relative value attached to the product, because the benefits that users get from the purchase of technology may not justify the price that they pay. By investigating the effect of habit on users' intention, technology producers and distributors are able to define the marketing communication strategies that may address the beliefs that fuel automatic behaviour (e.g. advertising the utility of the product in various scenarios). By measuring the effect of hedonic motivation, product developers and managers can adjust the offering in such a way as either to enhance the hedonic value of technology or augment hedonic cues for marketing the product. Finally, the moderation effects in UTAUT2 enable practitioners to identify which user segment demands more marketing effort to address habits, deliver hedonic value and demonstrate better value for money (Venkatesh, Thong & Xu, 2012).

Limitations

The Unified Theory of Acceptance and Use of Technology provides a holistic tool to measure technology acceptance and technology use (Venkatesh et al., 2003; Venkatesh, Davis & Morris, 2007). However, despite the rigorousness of the model, UTAUT has some theoretical and methodological limitations that were not addressed in further studies (Venkatesh et al., 2003; Venkatesh, Davis & Morris, 2007). UTAUT faced critique with regards to its inability to explain behavioural intention in different settings. Limited external validity of the model motivated further studies to extend the model by adding additional determinants of behaviour, such as trust, self-efficacy, computer self-efficacy, innovativeness, perceived threats, perceived risk (Martins, Oliveira & Popovič, 2014; Slade et al., 2015). Also, the model was extended by introducing new moderating effects, such as income, location, culture, technology readiness (Im, Hong & Kang, 2011; Borrero et al., 2014) (for a more comprehensive insight see the review by (Venkatesh, Thong & Xu, 2016)). Still, some key factors, like computer self-efficacy, remained under-researched. Although it was confirmed that this factor plays a role in behavioural intention (Bandura & Locke, 2003), only an indirect effect of self-efficacy on intention was tested while developing UTAUT (Venkatesh et al., 2003).

The concern over the wide application of UTAUT was noted by Dwivedi et al. (Dwivedi et al., 2019), who stated that the majority of studies in the IS context cite the original UTAUT paper without using the model. Those surprising findings lead to the conclusion that UTAUT might not be as robust as it claimed to be, given overrated citations compared to the actual implication of the theory. Thus, based on the analysis of MASEM (Combined meta-analysis and structural equation modelling), a revised version of UTAUT was proposed, which included attitude construct as a partial mediator of the effects of exogenous constructs on behavioural intentions (Dwivedi et al., 2019).

The major methodological limitation of UTAUT concerns the development of the scales that were used to measure the core constructs. For the final measurement development, the study used the highest loading items for each scale. While this approach was supported by the literature (Hevner et al., 2004), there was debate as to whether it may be useful to validate the measurements or even develop new ones to eliminate potential content validity issues (Venkatesh et al., 2003). In addition, the intention to use and use behaviour scales were adopted from prior studies (e.g. (Davis, 1989)), but alternative measurements should be developed and validated in future studies (Venkatesh et al., 2003).

UTAUT2 also has some limitations inherent in the methodology. The model utilises a self-reported scale to measure intention to use (Venkatesh, Thong & Xu, 2012), which jeopardises the accuracy and validity of the research conclusions. UTAUT2 shares this limitation with many other technology acceptance models (e.g. TAM, original UTAUT) (Venkatesh et al., 2003; Davis, 1989)). In addition, similar to other technology acceptance models, UTAUT 2 can face a threat of common method variance (Straub & Burton-Jones, 2007; Sharma, Yetton & Crawford, 2009). To reduce the potential of common method bias, different methodological approaches need to be used (e.g. using experimental settings that can make manipulation checks possible).

Concepts

Performance Expectancy (Independent): The degree to which an individual believes that using the system will help him or her to attain gains in job performance. (Venkatesh et al., 2003)

Effort Expectancy (Independent): The degree of ease associated with the use of the system. (Venkatesh et al., 2003)

Social Influence (Independent): The degree to which an individual perceives that important others believe he or she should use the new system. (Venkatesh et al., 2003)

Facilitating Conditions (Independent): The degree to which an individual believes that an organisations and technical infrastructure exist to support use of the system. (Venkatesh et al., 2003)

Behavioural Intention (Independent/Dependent): A person's subjective probability that he will perform some behavior. (Fishbein & Ajzen, 1975)

Use Behaviour (Dependent): The actual use of the system/technology (Venkatesh et al., 2003)

Experience (Moderator): The passage of time from the initial use of a technology by an individual. (Venkatesh, Thong & Xu, 2012)

Voluntariness of Use (Moderator): The degree to which use of the innovation is perceived as being voluntary, or of free will (Moore & Benbasat, 1991)

Hedonic Motivation (Independent): The fun or pleasure derived from using a technology, which has been shown to play an important role in determining technology acceptance and use (Venkatesh, Thong & Xu, 2012)

Price Value (Independent): A consumer's trade-off between the perceived benefits of the applications and the monetary cost of using them. (Venkatesh, Thong & Xu, 2012)

Habit (Independent): The extent to which people tend to perform behaviours automatically. (Limayem, Hirt & Cheung, 2007)

References

Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & Health*, 26 (9), 1113-1127.

Al-Gahtani, S.S., Hubona, G.S. & Wang, J. (2007). Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management*, 44 (8), 681-691.

Alalwan, A.A., Dwivedi, Y.K. & Rana, N.P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 37 (3), 99-110.

Alvesson, M. & Kärreman, D. (2007). Constructing mystery: Empirical matters in theory development. *Academy of Management Review*, 32 (4), 1265-1281.

Bagozzi, R. (2007). The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift. *Journal of the Association for Information Systems*, 8 (4), 244-254.

Bandura, A. & Locke, E.A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88 (1), 87-99.

Bandura, A. (2001). Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology*, 52 (1), 1-26.

Baptista, G. & Oliveira, T. (2015). Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, 50, 418-430.

Borrero, J.D., Yousafzai, S.Y., Javed, U. & Page, K.L. (2014). Expressive participation in Internet social movements: Testing the moderating effect of technology readiness and sex on student SNS use. *Computers in Human Behavior*, 30, 39-49.

Brown, & Venkatesh (2005). Model of Adoption of Technology in Households: A Baseline Model Test and Extension Incorporating Household Life Cycle. *MIS Quarterly*, 29 (3), 399.

Brown, S., Venkatesh, V. & Bala, H. (2006). Household technology use: Integrating household life cycle and the model of adoption of technology in households. *The Information Society*, 22 (4), 205-218.

Brown, S.A., Venkatesh, V. & Hoehle, H. (2015). Technology adoption decisions in the household: A seven-model comparison. *Journal of the Association for Information Science and Technology*, 66 (9), 1933-1949.

Casey, T. & Wilson-Evered, E. (2012). Predicting uptake of technology innovations in online family dispute resolution services: An application and extension of the UTAUT. *Computers in Human Behavior*, 28 (6), 2034-2045.

Chan, F., Thong, J., Venkatesh, V., Brown, S., Hu, P. & Tam, K. (2010). Modeling Citizen Satisfaction with Mandatory Adoption of an E-Government Technology. *Journal of the Association for Information Systems*, 11 (10), 519-549.

Chang, I., Hwang, H., Hung, W. & Li, Y. (2007). Physicians' acceptance of pharmacokinetics-based clinical decision support systems. *Expert Systems with Applications*, 33 (2), 296-303.

Chauhan, S. & Jaiswal, M. (2016). Determinants of acceptance of ERP software training in business schools: Empirical investigation using UTAUT model. *The International Journal of Management Education*, 14 (3), 248-262.

Compeau, D., Higgins, C.A. & Huff, S. (1999). Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study. *MIS Quarterly*, 23 (2), 145.

Compeau, D.R. & Higgins, C.A. (1995). Application of Social Cognitive Theory to Training for Computer Skills. *Information Systems Research*, 6 (2), 118-143.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13 (3), 319.

Davis, F.D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38 (3), 475-487.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35 (8), 982-1003.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace1. *Journal of Applied Social Psychology*, 22 (14), 1111-1132.

De la Boutetière, H., Montagner, A. & Reich, A. (2018). *Unlocking success in digital transformations*.

Dwivedi, Y.K., Rana, N.P., Jeyaraj, A., Clement, M. & Williams, M.D. (2019). Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model. *Information Systems Frontiers*, 21 (3), 719-734.

Goodhue, D.L. (1995). Understanding User Evaluations of Information Systems. *Management Science*, 41 (12), 1827-1844.

Gupta, B., Dasgupta, S. & Gupta, A. (2008). Adoption of ICT in a government organization in a developing country: An empirical study. *The Journal of Strategic Information Systems*, 17 (2), 140-154.

Hevner, March, Park, & Ram (2004). Design Science in Information Systems Research. *MIS Quarterly*, 28 (1), 75.

Hu, P.J., Chau, P.Y., Sheng, O.R.L. & Tam, K.Y. (1999). Examining the Technology Acceptance Model Using Physician Acceptance of Telemedicine Technology. *Journal of Management Information Systems*, 16 (2), 91-112.

Im, I., Hong, S. & Kang, M.S. (2011). An international comparison of technology adoption. *Information & Management*, 48 (1), 1-8.

Jung, I. & Lee, J. (2020). A cross- cultural approach to the adoption of open educational resources in higher education. *British Journal of Educational Technology*, 51 (1), 263-280.

Karahanna, E., Straub, D.W. & Chervany, N.L. (1999). Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs. *MIS Quarterly*, 23 (2), 183.

Kim, S.S., Malhotra, N.K. & Narasimhan, S. (2005). Research Note—Two Competing Perspectives on Automatic Use: A Theoretical and Empirical Comparison. *Information Systems Research*, 16 (4), 418-432.

Leonard-Barton, D. & Deschamps, I. (1988). Managerial Influence in the Implementation of New Technology. *Management Science*, 34 (10), 1252-1265.

Limayem, Hirt, & Cheung (2007). How Habit Limits the Predictive Power of Intention: The Case of Information Systems Continuance. *MIS Quarterly*, 31 (4), 705.

Ling Keong, M., Ramayah, T., Kurnia, S. & May Chiun, L. (2012). Explaining intention to use an enterprise resource planning (ERP) system: an extension of the UTAUT model. *Business Strategy Series*, 13 (4), 173-180.

Maillet, ?., Mathieu, L. & Sicotte, C. (2015). Modeling factors explaining the acceptance, actual use and satisfaction of nurses using an Electronic Patient Record in acute care settings: An extension of the UTAUT. *International Journal of Medical Informatics*, 84 (1), 36-47.

Martins, C., Oliveira, T. & Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34 (1), 1-13.

Megadewandanu, S., Suyoto, & Pranowo (2016). *Exploring mobile wallet adoption in Indonesia using UTAUT2: An approach from consumer perspective.*

Moore, G.C. & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, 2 (3), 192-222.

Mütterlein, J., Kunz, R.E. & Baier, D. (2019). Effects of lead-usership on the acceptance of media innovations: A mobile augmented reality case. *Technological Forecasting and Social Change*, 145, 113-124.

Neufeld, D.J., Dong, L. & Higgins, C. (2007). Charismatic leadership and user acceptance of information technology. *European Journal of Information Systems*, 16 (4), 494-510.

Papagiannidis, S. & Marikyan, D. (2020). Smart offices: A productivity and well-being perspective. *International Journal of Information Management*, 51, 102027.

Riffai, M., Grant, K. & Edgar, D. (2012). Big TAM in Oman: Exploring the promise of on-line banking, its adoption by customers and the challenges of banking in Oman. *International Journal of Information Management*, 32 (3), 239-250.

Sharma, Yetton, & Crawford (2009). Estimating the Effect of Common Method Variance: The Method—Method Pair Technique with an Illustration from TAM Research. *MIS Quarterly*, 33 (3), 473.

Sheppard, B.H., Hartwick, J. & Warshaw, P.R. (1988). The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer Research*, 15 (3), 325.

Slade, E., Williams, M., Dwivedi, Y. & Piercy, N. (2015). Exploring consumer adoption of proximity mobile payments. *Journal of Strategic Marketing*, 23 (3), 209-223.

Straub, D. & Burton-Jones, A. (2007). Veni, Vidi, Vici: Breaking the TAM Logjam. *Journal of the Association for Information Systems*, 8 (4), 223-229.

Sun, Y., Bhattacherjee, A. & Ma, Q. (2009). Extending technology usage to work settings: The role of perceived work compatibility in ERP implementation. *Information & Management*, 46 (6), 351-356.

Taylor, S. & Todd, P.A. (1995). Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research*, 6 (2), 144-176.

Thompson, R.L., Higgins, C.A. & Howell, J.M. (1991). Personal Computing: Toward a Conceptual Model of Utilization. *MIS Quarterly*, 15 (1), 125.

Thong, J.Y.L., Venkatesh, V., Xu, X., Hong, S. & Tam, K.Y. (2011). Consumer Acceptance of Personal Information and Communication Technology Services. *IEEE Transactions on Engineering Management*, 58 (4), 613-625.

Udo, G., Bagchi, K. & Maity, M. (2016). Exploring Factors Affecting Digital Piracy Using the Norm Activation and UTAUT Models: The Role of National Culture. *Journal of Business Ethics*, 135 (3), 517-541.

Venkatesh, Morris, Davis, & Davis (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27 (3), 425.

Venkatesh, Thong, & Xu (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36 (1), 157.

Venkatesh, V. & Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46 (2), 186-204.

Venkatesh, V. & Speier, C. (1999). Computer Technology Training in the Workplace: A Longitudinal Investigation of the Effect of Mood. *Organizational Behavior and Human Decision Processes*, 79 (1), 1-28.

Venkatesh, V., Davis, F. & Morris, M. (2007). Dead Or Alive? The Development, Trajectory And Future Of Technology Adoption Research. *Journal of the Association for Information Systems*, 8 (4), 267-286.

Venkatesh, V., Thong, J. & Xu, X. (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. *Journal of the Association for Information Systems*, 17 (5), 328-376.

Verhoef, P.C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N. & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889-901.

Wang, H. (2005). The Role of Personality Traits in UTAUT Model under Online Stocking. *Contemporary Management Research*, 1 (1), 69-82.

Yi, M.Y., Jackson, J.D., Park, J.S. & Probst, J.C. (2006). Understanding information technology acceptance by individual professionals: Toward an integrative view. *Information & Management*, 43 (3), 350-363.

Zhang, J. & Mao, E. (2020). Cash, credit, or phone? An empirical study on the adoption of mobile payments in the United States. *Psychology & Marketing*, 37 (1), 87-98.

Zhou, T., Lu, Y. & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. *Computers in Human Behavior*, 26 (4), 760-767.

van der Heijden (2004). User Acceptance of Hedonic Information Systems. *MIS Quarterly*, 28 (4), 695.

Upper Echelons Theory

The Upper Echelons Theory postulates that the idiosyncratic characteristics (e.g., cognitive base and values) of a firm's top-level managers play a key role in explaining and/or predicting strategic decisions and organisational performance. Top-level managers' cognitive base and values exert influence on how they interpret strategic situations, shaping their decisions and resulting in market and financial performance outcomes.

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Theory Factsheet

Proposed By: Hambrick & Mason, 1984

Parent Theory: Bounded rationality theory

Related Theories: Organization theory, Theory of Strategic Choice

Discipline: Economics, management and business studies

Unit of Analysis: Top Management Team

Level: Meso-level

Type: Theory for Explaining and Predicting

Operationalised: Qualitatively / Quantitatively

Introduction

The Upper Echelons Theory (UET) was first put forward by Hambrick and Mason (1984) in an attempt to provide a new perspective on the two prevailing questions of organisational theory: (1) why organisations act as they do, and (2) why organisations perform the way they do. Before UET was introduced, organisational strategies and their performance outcomes were mostly viewed through deterministic theoretical lenses, such as population ecology (Hannan & Freeman, 1977) and institutional theory (DiMaggio & Powell, 1983). According to this line of thought, managers have little bearing on organisational outcomes because organisations are exceedingly inertial and are constrained by their external environment (Hannan & Freeman, 1977; DiMaggio & Powell, 1983). Furthermore, strategic management theorists tended to attribute strategic choices and organisational performance to techno-economic factors such as competition-

related and industry-specific contingencies (Porter, 1980), while the strategy process research (Mintzberg, Raisinghani & Theoret, 1976) centred on explaining the different routines of strategic decision-making without accounting for the influences of the people who are actually involved in the process. Essentially, the field of management was shrouded by the assumption that organisations can make optimal, economically rational and objective decisions by analysing the situations (e.g., market threats and opportunities) they are faced with.

UET addresses this theoretical gap by building upon the premises of the Carnegie School of Thought and bounded rationality theory (Cyert & March, 1992; March, 1993). The theory suggests that strategic situations contain highly complex and ambiguous information, so making perfectly rational decisions is not feasible. Although organisations may strive to be rational and base their choices on a thorough analysis of internal (e.g., resources and capabilities) and external (e.g., market trends) conditions, the bounded rationality theory (Simon, 1990) acknowledges that decision-makers have inherent cognitive limitations, such as limitations in knowledge and computational capacity, that restrict their ability to achieve technical rationality in their decisions. Under this view, strategic situations are merely interpretable rather than objectively "*knowable*", and strategic choices are the product of behavioural factors rather than a mechanical quest for economic optimisation (Cyert & March, 1992; March, 1993). Managers fall back on previous experiences, take mental shortcuts and place their own personal interpretations on strategic issues and alternatives (March, 1993), and, therefore, a firm's strategic decisions largely depend on how its decision-makers perceive "*actual situations*" (Hambrick, 2007). Perceptions of strategic issues, however, are highly subjective as they emanate from decision-makers' personal biases, including their cognitive base (e.g., knowledge or assumptions about future events, alternatives, and their consequences) and values (e.g., principles for ordering alternatives and their consequences) (Hambrick & Mason, 1984; March, 1993). Against this backdrop, while also considering that senior executives are the most powerful actors in organisations, UET posits that strategic choices and resulting performance outcomes are significantly affected by the idiosyncrasies of a firm's top-level managers (i.e., managers significantly involved in strategic decision-making such as a firm's CEO and his/her direct reports) (Carpenter, Geletkanycz & Sanders, 2004).

Theory

UET can be diagrammatically portrayed as a conceptual model explaining the inter-relationships among four key concepts: strategic situations, top managers' (or upper echelon) characteristics, strategic choices, and organisational performance (Figure 1). At the heart of UET lies the proposition that senior-level executives' cognitive base and values, reflected in observable characteristics such as age and education, affect how they interpret and respond to strategic situations through their choices, thereby influencing organisational performance (Hambrick & Mason, 1984).

Figure 1: The upper echelons conceptual model
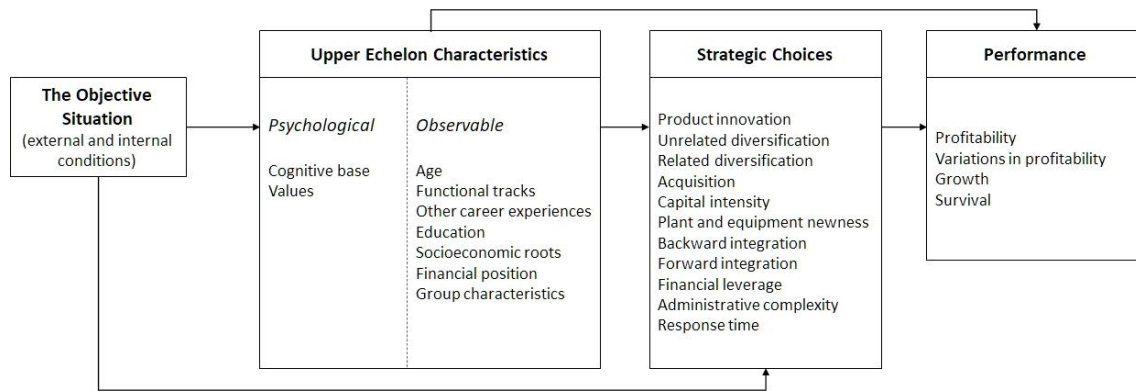
More specifically, the upper echelons perspective encapsulates three subordinate ideas (Carpenter, Geletkanycz & Sanders, 2004; Hambrick, 2007), discussed in detail below: (1) senior managers' cognitive base and values become reflected in strategic outcomes; (2) observable demographic characteristics are reliable indicators of executives' cognitive frames and, as a result, can be used to predict strategic outcomes; (3) studying the characteristics of a firm's upper echelons as a whole (i.e., entire top management team) yields stronger predictions of strategic outcomes than focusing on the chief executive officer (CEO) alone.

The upper echelons logic of strategic choice

The first tenet of UET builds upon the premise that strategic situations encapsulate far more stimuli than decision-makers can comprehend (Cyert & March, 1992). Therefore, UET posits that managers try to interpret strategic issues and devise alternative courses of action by taking mental shortcuts and relying on their previous experiences (Hambrick, 2018). For instance, when faced with an unprecedented environmental shock, managers may utilise their previous experience when handling other types of business crises in order to analyse the situation and develop an appropriate response and a set of actions. The underlying perceptual process is delineated in Figure 2.

Figure 2: The upper echelons logic of strategic choice
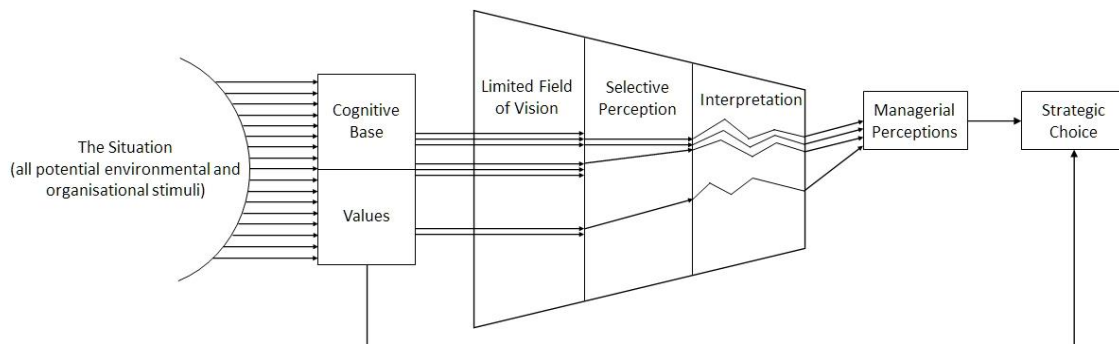
Each business manager carries their own cognitive base and set of values (e.g., experiences and personality) to the decision-making process, which serve as a way of filtering strategic situations. As illustrated in Figure 1, the cognitive base and values "*create a screen between the situation and the eventual perception of it*" (Hambrick & Mason, 1984: p195). There are three sequential mechanisms through which this "*perceptual screen*" operates: (i) limited field of vision, whereby managers' personal biases pose a sharp limitation on the environmental and/or organisational stimuli to which attention is directed; (ii) selective perception, which implies that managers have limited information processing capacity, and therefore analyse only some of the phenomena encompassed in their field of vision; and (iii) interpretation, whereby managers utilise their cognitive frames to interpret the selected phenomena. Eventually, managerial perceptions of the actual strategic situation provide the basis for strategic choice.

Observable managerial characteristics as proxy indicators of cognitive base and values

The second main tenet of the UET is anchored in organisational demography (Pfeffer, 1985). It suggests that managers' cognitive base and values are reflected in observable characteristics such as age, education, functional background, and other career experiences such as organisational tenure and aspirations (Wiersema & Bantel, 1992). Admittedly, there are several difficulties in obtaining psychometric data on top executives' cognition, values, and perceptions (Nielsen, 2009). Unobservable, psychological constructs are not convenient to measure and, at times, are not even amenable to direct measurement (Hambrick & Mason, 1984). Considering also that an individual's cognition is shaped by their background characteristics and life experiences, demographic variables are thought to be valid and reliable indicators of the psychological processes that shape how managers interpret strategic situations and formulate appropriate strategic alternatives (Carpenter, Geletkanycz & Sanders, 2004). In fact, a plethora of empirical studies has demonstrated that executives' demographic profiles are strong predictors of strategic choices and performance outcomes (Hambrick, Cho & Chen, 1996; Boeker, 1997; Ferrier, 2001; Carpenter, 2002). Although this tenet does not account for the actual processes that drive executive behaviour (Lawrence, 1997; Priem, Lyon & Dess, 1999), it ensures the reproducibility of empirical findings and facilitates the genesis of an ongoing research program. As Weick (1979) states, empirical research can become more cumulative if theoretical concepts can be defined in terms of observable indicators.

UET emphasizes seven key demographic variables that can be used to predict strategic outcomes: age, functional background, career experiences, education, socioeconomic background, financial position, and the heterogeneity of these characteristics within a firm's top management team (TMT). Age indicates executives' receptivity to change and willingness to take risks (Hambrick & Mason, 1984). Compared to older managers, young managers tend to pursue more risky choices, such as strategic change (Wiersema & Bantel, 1992) and significant investments in research and development (R&D) (Barker & Mueller, 2002). Functional background plays a central role in strategic decision-making as individuals working in different functional areas develop distinct perceptions about a firm's strategic goals (Geletkanycz & Black, 2001). Managers that have accrued their experience mainly from throughput functions, such as production and accounting, place

emphasis on efficiency-related issues, whereas managers with more experience in output functions, such as marketing and R&D, favour innovative strategies that can enable business growth (Barker & Mueller, 2002).

UET further argues that executives with different career experiences, such as organisational tenure (i.e., the length of time an executive has worked for a specific organisation) and industry or organisational experience (i.e., the different types of industries or organisations an executive has worked for), differ in their strategic choices, due to their exposure to diverging perspectives and environments (Hambrick & Mason, 1984). For instance, chief executives that are new to an organisation tend to make more strategic changes as they are less committed to the status quo and bring new perspectives into the organisation (Boeker, 1997). Longer-tenured executives tend to be more attached to an organisation, and, as such, exhibit emotional and/or political resistance to change (Hambrick, Geletkanycz & Fredrickson, 1993). In a different vein, a decision maker's educational background is regarded as an indicator of cognitive ability and skills (Wiersema & Bantel, 1992). Higher levels of education have been associated with an enhanced ability to process information (Hambrick & Mason, 1984), creatively deal with complex administrative situations (Bantel & Jackson, 1989), and tolerate ambiguity (Dollinger, 1984). Hence, highly educated managers are more likely to pursue innovative strategies (Kimberly & Evanisko, 1981) and exhibit greater awareness of and receptivity to the need for strategic change (Wiersema & Bantel, 1992).

According to the upper echelons perspective, socioeconomic background and financial position characteristics can also affect decision-makers' choices. Managers from lower socioeconomic groups seek greater recognition and esteem through their actions (Hambrick & Mason, 1984). As such, firms whose top managers come from relatively disadvantaged backgrounds tend to be more aggressive in their strategic actions and exhibit higher levels of acquisition activity and unrelated diversification (Channon, 1979). Top managers' financial position, which refers to the extent of stock ownership and total compensation, is thought to be an indicator of their inclination towards short-term versus long-term, highly rewarding / profitable actions (Luo, Wieseke & Homburg, 2012). Managers with substantial stockholdings are more committed to the maximisation of shareholder wealth and undertake actions that pay off in the long run, such as R&D investments (Barker & Mueller, 2002). However, managers without significant wealth at risk focus on current profitability and avoid risky investments, yet highly rewarded by the stock market (MAY, 1995).

Finally, UET posits that TMT heterogeneity, or the amount of dispersion within a managerial group regarding members' characteristics, is highly pertinent to the study of strategic decision-making, as it represents the diversity of a team's cognitive base and values (Finkelstein, Cannella & Hambrick, 1996). Heterogeneous TMTs encapsulate divergent perspectives, expertise, and knowledge bases, enhancing decision-making quality, especially when encountering ill-defined and novel situations (Nielsen, 2009). Diverse teams are willing to challenge each other's viewpoints and be more comprehensive when making strategic decisions (Simons, Pelled & Smith, 1999). Diverse teams also show high levels of creativity and innovativeness (Bantel & Jackson, 1989). On the other hand, TMT heterogeneity can be associated with inferior decision-making (Hambrick, Cho & Chen, 1996). At high levels of diversity, conflict is more likely to occur, which in turn, leads to a low group consensus on strategic choices (Knight et al., 1999).

## The Top Management Team (TMT) as the unit of analysis

The third subordinate idea introduced by Hambrick and Mason (1984) posits that studying entire top management teams instead of individual chief executives yields stronger predictions of organisational outcomes. Chief executives typically share decision-making responsibilities and power with other members of the TMT. Therefore, the cognitive frames of the entire team enter into the process of interpreting and responding to strategic situations (Hambrick, 2007). If two firms have CEOs exhibiting similar characteristics while their management teams consist of executives with highly distinctive backgrounds, studying the entire team would improve confidence in predicting the two firms' strategies. This is consistent with empirical research showing that TMT characteristics matter more in decision-making than CEO characteristics alone (Papadakis & Barwise, 2002).

Theory Updates/Extensions

Moderators of the upper echelons logic

Since the seminal postulation of UET (Hambrick & Mason, 1984), a substantial stream of research has focused on establishing the boundary conditions of UET. Scholars have identified various moderators of the relationship between upper-echelon characteristics and strategic outcomes, including managerial discretion (UET1), TMT structure (Hambrick, 1995; Hambrick, Humphrey & Gupta, 2015), executive job demands (Hambrick, Finkelstein & Mooney, 2005), and managerial power (Finkelstein, 1992). According to this stream of research, UET has greater predictive strength in some contexts than in others (Figure 3).

Figure 3: The moderated upper echelons model
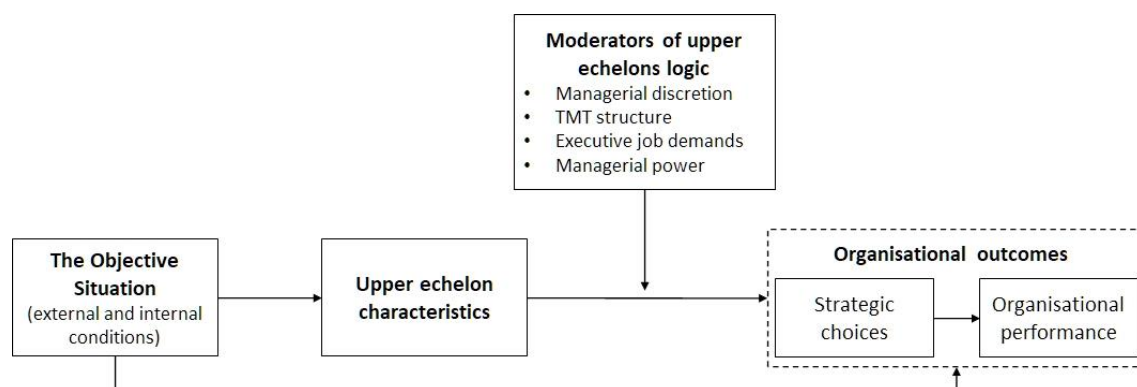
The first and most notable refinement of UET has been the introduction of "*managerial discretion*" as a moderator of the upper echelons logic (UET1). Although UET posits that strategic outcomes reflect executives' characteristics, it cannot be neglected that some executives have greater control over what happens in their companies than others (Haleblian & Finkelstein, 1993). Managers

with little or no control would not be able to influence their organisations' strategies to the same degree as managers with high levels of discretion. Thus, strategic decisions and performance outcomes can be predicted by upper-echelon characteristics depending on the extent to which they have a "*latitude of action*" (Finkelstein & Hambrick, 1990). If managers have great discretion, their characteristics will be highly reflected in organisational outcomes. However, managerial characteristics cannot predict organisational outcomes if discretion is lacking. Empirical research has consistently supported the importance of managerial discretion as a boundary condition of UET. The effect of CEO characteristics on organisational performance was found to be significantly stronger in high-discretion (e.g., US) than in low-discretion (e.g., Japan) national contexts (Crossland & Hambrick, 2011). Also, TMT characteristics have a greater influence on strategic change decisions in high-discretion industries (e.g., computer industry) than in low-discretion ones (e.g., natural gas industry) (Finkelstein & Hambrick, 1990). The relationship between upper-echelon characteristics (i.e., TMT size and CEO dominance) and firm performance has been found to be significant in high-discretion environments but non-significant under conditions of low managerial discretion (Haleblian & Finkelstein, 1993).

In a further refinement of UET, scholars contend that UET predictions can be improved by paying closer attention to the structure of a firm's TMT, including the extent of behavioural integration (Hambrick, 1995) and structural interdependence (Hambrick, Humphrey & Gupta, 2015). Many TMTs do not exhibit "*team properties*" but instead consist of semi-autonomous sub-teams of managers that engage in bilateral interactions with the CEO and have limited interactions with each other (Hambrick, 2007). Hambrick (1995) introduced the concept of "*behavioural integration*", arguing that a TMT qualifies as a behavioural integrated team to the extent its members engage in mutual and collective interactions, such as information exchange, resource sharing, and joint decision-making. If TMTs are not behaviourally integrated, specific sub-groups of managers are responsible for certain types of decisions (Hambrick, 1995). For instance, a firm's CEO, CFO, and top managers representing the functions of R&D and marketing (e.g., VP of R&D and VP of marketing) would be the relevant decision body in regard to R&D-related strategic decisions. It is, therefore, more plausible for upper echelons research to focus on the characteristics of those managers in charge of the specific decision under investigation rather than accounting for the TMT as a whole (UET2). Hambrick et al. (2015) suggested that a TMT is a meaningful entity only when there is high structural interdependence, which refers to the extent to which a TMT is structured in such a way that top managers have periodic and significant interactions with each other. When there is high structural interdependence, studying the characteristics of a firm's TMT as a whole can yield strong predictions of strategic outcomes as top managers engage in joint decision-making. However, when managers operate independently and have distinct decision-making roles and responsibilities, there is no point in focusing on the TMT as the unit of analysis. In fact, it was empirically demonstrated that the association between TMT heterogeneity and organisational performance depends on the extent of TMT structural interdependence (Hambrick, Humphrey & Gupta, 2015).

The concept of "*executive job demands*" is thought to be another moderator of the upper echelons logic (Hambrick, Finkelstein & Mooney, 2005). Defined as "*the degree to which a given executive experiences his or her job as difficult or challenging*" (Hambrick, Finkelstein & Mooney, 2005: p473), executive job demands

significantly influence the rationality of strategic decisions. Even though higher job demands may actually encourage executives to be more rational and comprehensive, the job pressures (e.g., lack of time, pressure to perform) urge managers to take mental shortcuts, rely on previous experiences, and inject a great deal of their dispositions when making decisions (Hambrick, 2007). As such, strategic choices closely reflect the characteristics of decision-makers when job demands are high. On the other hand, executives with lower job demands can afford to be more rational in their decision-making since they have the resources (e.g., time and attention) to thoroughly analyse strategic situations and search for solutions (Hambrick, Finkelstein & Mooney, 2005). Hence, their choices will closely match the objective conditions they confront.

Managerial power, or the extent to which managers have the requisite power/capacity to exert their will, is also thought to influence the extent to which top managers' characteristics can influence strategic choices (Finkelstein, 1992). According to this line of thought, powerful managers have much more say in strategy discussions than others, and, consequently, their characteristics should be given more attention when predicting strategic choices. In fact, it was found that the relationship between TMT members' characteristics and strategic outcomes is strengthened when considering the distribution of power among members of a firm's TMT (Finkelstein, 1992).

Process mechanisms

Another stream of research has attempted to establish the underlying processes/mechanisms through which managerial characteristics shape strategic choices and resulting performance outcomes. According to the original UET model (Hambrick & Mason, 1984), observable managerial characteristics serve as proxy indicators of the psychological processes that affect strategic decision-making. However, this approach does not capture the black box processes that shape strategic outcomes (Carpenter, Geletkanycz & Sanders, 2004). Scholars have therefore suggested that the effect of upper echelon characteristics on strategic decisions and organisational performance is mediated through cognitive processes. These may include managerial attention (Cho & Hambrick, 2006), decision-making processes (e.g., decentralisation, communication, and comprehensiveness) (Papadakis & Barwise, 2002), as well as TMT-related processes such as conflict (Knight et al., 1999), psychological empowerment (Lin & Rababah, 2014), and group functioning (Peterson et al., 2003) (Figure 4).

Figure 4: The mediated upper echelons model
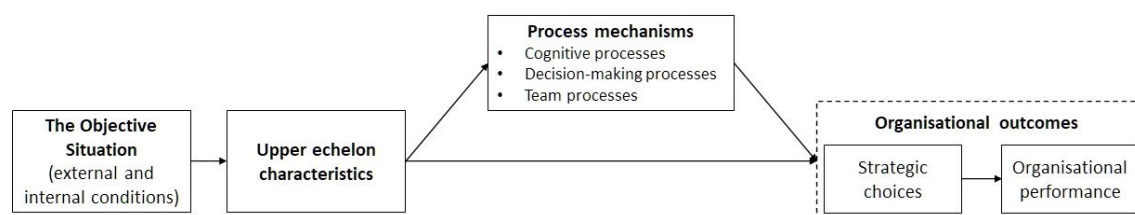
For instance, Cho and Hambrick (2006) proposed "*managerial attention*" as a key mediator of the upper echelons logic because strategic action largely depends on what strategic stimuli managers direct their attention to. Managers with different characteristics differ in how they notice, interpret, and focus time and effort on strategic issues and action alternatives, thereby arriving at a different set of strategic decisions (Ocasio, 1997). Thus, it was empirically demonstrated that the relationship between TMT characteristics and strategy is partially mediated by managerial attention (Cho & Hambrick, 2006). Papadakis and Barwise (2002) suggested that upper-echelon characteristics influence strategic choices through their effect on four dimensions of the decision-making process: comprehensiveness/rationality, hierarchical decentralisation, lateral communication, and politicisation. It was reported that both CEO and TMT characteristics affect the process of decision-making, but in different ways. CEO characteristics influence the degree of hierarchical decentralisation, while characteristics of the TMT relate more to the dimensions of lateral communication and comprehensiveness.

In a different vein, scholarly work (Peterson et al., 2003) indicates that a CEO's characteristics indirectly influence organisational outcomes by affecting the dynamics of the management team. Since CEOs have significant discretion over decisions about the composition and structure of their management teams, their personality characteristics could potentially shape the decision-making environment of the TMT. For example, CEOs high in "*agreeableness*" prefer cooperative and cohesive teams characterised by decentralised decision-making, whilst CEOs high in "*conscientiousness*" favour a centralised power structure. This, in turn, induces performance differences among firms. In confirmation of this logic, Peterson et al. (2003) empirically demonstrated that the relationship between CEO personality and organisational performance is fully mediated by TMT decision-making dynamics. Lin and Rababah (2014) proposed TMT psychological empowerment as another mediator of UET predictions. Defined as senior managers' "*collective beliefs in their autonomy and capability to perform meaningful work that can impact their organisation*" (Lin & Rababah, 2014: p944), TMT psychological empowerment is strongly affected by characteristics of top-level managers, including CEO-TMT exchange quality and TMT personality composition. In turn, it was found that when executives feel empowered, they are more likely to arrive at strategic decisions of higher quality.

Applications

UET has been mainly applied in the field of management, but it has also sparked research across various other domains, including: marketing (Chung & Low, 2022; Kashmiri & Mahajan, 2017), international business (Herrmann & Datta, 2005; Tihanyi et al., 2000), leadership (Waldman, Javidan & Varella, 2004; Lin & Rababah, 2014), psychology (Peterson et al., 2003; West & Anderson, 1996), accounting (Naranjo-Gil, Maas & Hartmann, 2009; Pavlatos, 2012) and economics (Bertrand & Schoar, 2003). Significant empirical support has been offered to the upper echelons logic, thereby highlighting its applicability across various disciplines and decision-making situations. Scholarly work has consistently documented managerial characteristics' influence on various strategic choices – such as strategic changes (Wiersema & Bantel, 1992; Waldman, Javidan & Varella, 2004), alliance formation (Eisenhardt & Schoonhoven, 1996), competitive attacks (Ferrier, 2001), international diversification (Tihanyi et al., 2000), innovation (Bantel & Jackson, 1989; West & Anderson, 1996), R&D investments

(Kor, 2006), new product introductions (Kashmiri & Mahajan, 2017), marketing management (Chung & Low, 2022), and management accounting and control (Naranjo-Gil, Maas & Hartmann, 2009; Pavlatos, 2012) – and the resulting performance outcomes. Table 1 summarises the most commonly studied upper-echelon characteristics and strategic choice variables.

Table 1: Most commonly studied upper echelon characteristics and strategic choice variables

Variable type	Variables
Upper echelon characteristics	CEO and average TMT demographic characteristics (e.g., age, educational background, functional background, tenure, career experiences), TMT heterogeneity, TMT size, CEO Compensation, Insider/Outsider CEO, CEO power, CEO and TMT ownership, CEO personality traits, Leadership behaviours, TMT turnover, CEO succession/turnover, Successor CEO characteristics, CEO duality, CEO-Founder, CEO Locus of Control, CEO Overconfidence, CMO presence, Executive migration, Internal and external network ties, Corporate governance and Board of Directors
Strategic choices	Innovation, Strategic change and renewal, Strategic dynamism, Strategic reorientation, Strategic conformity, New product introduction, R&D intensity, Diversification, Differentiation, Alliance Formation, Competitive behaviour, Marketing and advertising intensity, Risk taking, Internationalisation, Market entry mode, Strategic decision quality

For instance, Chung and Low (2022) sought to understand the influence of CEO regulatory focus on myopic marketing management, which refers to the tendency to make short-term oriented marketing decisions. The authors showed that promotion-focused CEOs are more likely to engage in myopic marketing management as short-term performance aspirations drive their decisions. On the other hand, prevention-focused CEOs are less prone to making myopic marketing decisions, driven mainly by their need for security and loss avoidance. In line with UET predictions, Chung and Low (2022) find that strategic decisions (myopic marketing management) mediate the impact of upper echelon characteristics (CEO regulatory focus) on long-term organisational performance. Marketing scholars have also investigated whether and to what extent the inclusion of a chief marketing officer (CMO) in the top management team affects organisational performance (Germann, Ebbes & Grewal, 2015; Nath & Mahajan, 2008; Whitler, Krause &

Lehmann, 2018). Considering that CMOs bring a customer perspective to the strategy table and facilitate decision-making (Bommaraju et al., 2019), it was found that firms benefit financially by employing CMOs on their management teams (Germann, Ebbes & Grewal, 2015). However, Nath and Mahajan (2008) reported neither a positive nor a negative effect of CMO presence on organisational performance.

Upper echelons research in the fields of accounting and economics has broadened the set of decision-makers and decision-making situations that are relevant to UET. For example, Pavlatos (2012) examined how chief financial officers' (CFO) characteristics influence the use of cost-management systems for decision-making, control, and performance evaluation, while Naranjo-Gil et al. (2009) investigated the role of CFO characteristics in adopting management accounting innovations. It was found that firms with younger CFOs and CFOs with business-related educational backgrounds exhibit more comprehensive use of cost management systems (Pavlatos, 2012) and are more likely to adopt innovative management accounting systems (Naranjo-Gil, Maas & Hartmann, 2009).

In addition, scholars have established the applicability of UET beyond classic, demographic variables, and, therefore, have considered the effects on decision-making and the performance of senior managers' political ideologies (Kashmiri & Mahajan, 2017), personality factors (Chatterjee & Hambrick, 2007), leadership behaviours (Waldman, Javidan & Varella, 2004), governance orientation (Kwee, Van Den Bosch & Volberda, 2011), power concentration (Greve & Mitsuhashi, 2007), network ties (Collins & Clark, 2003), and compensation (Luo, Wieseke & Homburg, 2012). As an example, Chatterjee et al. (2007) argued that narcissistic CEOs differ from non-narcissistic CEOs in how they make strategic decisions due to their inflated self-views and need for attention. The authors suggested that narcissistic CEOs are more likely to engage in novel and bold strategic actions with uncertain payoffs. In fact, CEO narcissism was found to be positively associated with strategic dynamism and intense acquisition activity. Firms led by narcissistic CEOs were also found to exhibit extreme (big wins or losses) and fluctuating performance. However, there were no significant performance differences between firms headed by narcissistic versus non-narcissistic chief executives. From a power relations perspective, Greve (2007) demonstrated that power concentration at the CEO level (i.e., when the CEO possesses excessive power compared to other organisational members) or TMT level (i.e., when a small number of senior managers have significantly more power than others) is associated with higher levels of strategic change. It was argued that power strongly affects the decision-making process as powerful managers favour decisions that signal and reinforce their position of power, such as strategic changes. Greve (2007:p.1200) pointed out that "*strategic changes have a symbolic value because a high level of change indicates that the TMT has an active hand in strategy making*".

Scholars have established the applicability of UET across different national contexts, including both Western and Eastern countries (Geletkanycz & Black, 2001; Wiersema & Bantel, 1992; Wiersema & Bird, 1993), different industries, including both the services and manufacturing sectors (Lee & Park, 2006; Lin & Rababah, 2014; van Doorn, Heyden & Volberda, 2017), and different types of firms, including large, mature organisations as well as SMEs and newly founded companies (Carpenter, 2002; Escriba-Esteve, Sanchez-Peinado & Sanchez-Peinado, 2009; Reuber & Fischer, 1997). For instance, Geletkanycz and Black (2001) utilised data from 20 countries to confirm UET predictions that managerial characteristics (i.e., functional experience)

exert significant influence on decision-making (i.e., the tendency to change organisational strategies). Lee and Park (2006) applied the upper echelons logic using data from 14 industries to find that firms headed by managers with heterogeneous characteristics are more likely to establish international alliances, which in turn leads to higher levels of internationalisation. Carpenter (2002) addressed the performance effects of TMT heterogeneity in large and medium-sized organisations, while Escriba-Esteve et al. (2009) established the link between managerial characteristics (e.g., age, education, previous experience), strategic behaviour and organisational performance in small and medium-sized enterprises.

Limitations

Three major limitations accompany the upper-echelon perspective. First, UET has been mainly criticised for a significant lack of attention to the underlying mechanisms through which top executives impact organisational outcomes – also known as the "*black box problem*" (Lawrence, 1997). The use of managers' demographic and background characteristics as proxy indicators of their cognitive base and values places more emphasis on broad tendencies, thereby neglecting the actual psychological processes that drive strategic choices and performance (Neely et al., 2020). Although observable managerial characteristics are convenient to use and facilitate the reproducibility of empirical findings, they encapsulate more noise than pure psychological measures and are often imprecise and unreliable indicators of psychological variables (Markóczy, 1997; Priem, Lyon & Dess, 1999). Hence, ambiguous and inconsistent findings may be observed.

Another critique challenges the predictive power of UET (Carpenter, Geletkanycz & Sanders, 2004; Hoskisson et al., 2017; Hutzschenreuter, Kleindienst & Greger, 2012). The upper echelons' logic posits that managerial characteristics shape organisational outcomes, but desired organisational outcomes may influence the types of executives serving in a firm's top management team (Finkelstein, Cannella & Hambrick, 2005). Top-level managers are often selected purposefully because they have the appropriate characteristics to execute actions desired by the board of directors (Hambrick, 2007). For instance, companies appoint new CEOs outside the organisation to overcome inertia and enact strategic change (Schepker et al., 2017). In this case, managers enact specific strategic actions due to a mandate rather than their personalised interpretation of strategic situations as posited by UET (Carpenter, Geletkanycz & Sanders, 2004). The relationship between managerial characteristics and organisational outcomes described by UET can be further confounded if we consider that strategic actions often hinge on a plethora of internal and/or external contingencies (Neely et al., 2020). For instance, firms that adopt a "*prospector*" strategy type typically pursue innovative strategic decisions not because of their executives' volition but because of the ingrained character of a "*prospector*" strategy that encapsulates a constant search for new products and markets (Miles & Snow, 2003). In a similar vein, national institutions can place significant restrictions on executive actions. Scholars have demonstrated that managers have great latitude of action in countries with strong national values of individualism and tolerance for uncertainty (e.g., the US), but have little leeway to enact whatever actions they deem appropriate in countries where collectivism and uncertainty avoidance is high (e.g., Japan) (Crossland & Hambrick, 2011). Thus, the predictive strength of UET is minimal in the latter type of context.

Finally, UET has been criticised for advocating the top management team as the unit of analysis (Carpenter, Geletkanycz & Sanders, 2004). This approach assumes that all senior managers contribute equally to decision-making, but the reality is that specific sub-groups of managers are primarily responsible for certain types of decisions (UET2). Furthermore, the factors (i.e., functional roles and group processes) that might influence each manager's contribution to group decision-making are not considered (Jensen & Zajac, 2004). Although strategic work is a shared activity, CEOs are the most powerful actors and are considered the principal architects of strategic decisions (Child, 1972). In fact, scholarly work has shown that CEO characteristics are significant predictors of strategic choices and organisational performance (Barker & Mueller, 2002; Bigley & Wiersema, 2002; Carpenter, Sanders & Gregersen, 2001; Chatterjee & Hambrick, 2007; Chung & Low, 2022). It has therefore been argued that the application of UET does not require a focus on TMTs as a whole (Hambrick, 2007; Hambrick, 2018).

Concepts

Strategic Situation (Independent): The set of all potential environmental and organisational stimuli that strategic decision-makers are faced with. (Hambrick & Mason, 1984)

Bounded Rationality (Concept): The idea that informationally complex, uncertain situations are not objectively knowable but, rather, are merely interpretable. (Hambrick, 2007)

Upper Echelon Characteristics (Independent): The psychological (e.g., cognitive base and values) and observable (e.g., age, functional background, career experiences, education, socioeconomic background, and financial position) characteristics of a firm's top-level managers. (Hambrick & Mason, 1984)

Top Management Team Heterogeneity (Independent): The degree of dispersion, or heterogeneity, within a top management team in regard to top management team members' demographic and cognitive characteristics. (Hambrick & Mason, 1984)

Decision Making Process (Concept): A set of actions and dynamic factors that begins with the identification of a stimulus for action and ends with the specific commitment to action. (Mintzberg, Raisinghani & Theoret, 1976)

Strategic Choices (Independent/Dependent): A set of organisational choices that are complex and of major significance to an organisation, including choices made formally and informally, indecision as well as decision, major administrative choices (e.g., reward systems and structure) as well as the domain and competitive choices more generally associated with the term strategy. (Hambrick & Mason, 1984)

Organisational Performance (Dependent): A firm's performance in terms of profitability, variation in profitability, growth and survival. (Hambrick & Mason, 1984)

Managerial Attention (Independent/Dependent): The noticing, encoding, interpreting, and focusing of time and effort by organisational decision-makers on both (a) issues: the available repertoire of categories for making sense of the environment (e.g., problems, opportunities, and threats); and (b) answers: the available repertoire of action alternatives (e.g., proposals, routines, projects, programs, and procedures). (Cho & Hambrick, 2006)

Top Management Team Structural Interdependence (Moderator): The extent to which a TMT is structured in such a way that top managers have periodic and significant interactions with each other. (Hambrick, Humphrey & Gupta, 2015)

Top Management Team Behavioural Integration (Moderator): The extent to which top management team members engage in mutual and collective activities, such as information exchange, resource sharing, and joint decision making. (Hambrick, 1995)

Managerial Power (Moderator): The capacity of a firm's managers to exert their will. (Finkelstein, 1992)

Executive Job Demands (Moderator): The degree to which a given executive experiences his or her job as difficult or challenging. (Hambrick, Finkelstein & Mooney, 2005)

References

Bantel, K.A. & Jackson, S.E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference?. *Strategic Management Journal*, 10 (S1), 107-124.

Barker, V.L. & Mueller, G.C. (2002). CEO Characteristics and Firm R&D Spending. *Management Science*, 48 (6), 782-801.

Bertrand, M. & Schoar, A. (2003). Managing with Style: The Effect of Managers on Firm Policies. *The Quarterly Journal of Economics*, 118 (4), 1169-1208.

Bigley, G.A. & Wiersema, M.F. (2002). New CEOs and Corporate Strategic Refocusing: How Experience as Heir Apparent Influences the Use of Power. *Administrative Science Quarterly*, 47 (4), 707-727.

Boeker, W. (1997). Strategic Change: The Influence Of Managerial Characteristics And Organizational Growth. *Academy of Management Journal*, 40 (1), 152-170.

Bommaraju, R., Ahearne, M., Krause, R. & Tirunillai, S. (2019). Does a Customer on the Board of Directors Affect Business-to-Business Firm Performance?. *Journal of Marketing*, 83 (1), 8-23.

Carpenter, M.A. (2002). The implications of strategy and social context for the relationship between top management team heterogeneity and firm performance. *Strategic Management Journal*, 23 (3), 275-284.

Carpenter, M.A., Geletkanycz, M.A. & Sanders, W.G. (2004). Upper Echelons Research Revisited: Antecedents, Elements, and Consequences of Top Management Team Composition. *Journal of Management*, 30 (6), 749-778.

Carpenter, M.A., Sanders, W.G. & Gregersen, H.B. (2001). Bundling Human Capital with Organizational Context: The Impact of International Assignment Experience on Multinational Firm Performance and CEO Pay. *Academy of Management Journal*, 44 (3), 493-511.

Channon, D. (1979). LEADERSHIP AND CORPORATE PERFORMANCE IN THE SERVICE INDUSTRIES. *Journal of Management Studies*, 16 (2), 185-201.

Chatterjee, A. & Hambrick, D.C. (2007). It's All about Me: Narcissistic Chief Executive Officers and Their Effects on Company Strategy and Performance. *Administrative Science Quarterly*, 52 (3), 351-386.

Child, J. (1972). Organizational Structure, Environment and Performance: The Role of Strategic Choice. *Sociology*, 6 (1), 1-22.

Cho, T.S. & Hambrick, D.C. (2006). Attention as the Mediator Between Top Management Team Characteristics and Strategic Change: The Case of Airline Deregulation. *Organization Science*, 17 (4), 453-469.

Chung, T.S. & Low, A. (2022). CEO regulatory focus and myopic marketing management. *International Journal of Research in Marketing*, 39 (1), 247-267.

Collins, C.J. & Clark, K.D. (2003). Strategic Human Resource Practices, Top Management Team Social Networks, and Firm Performance: The Role of Human Resource Practices in Creating Organizational Competitive Advantage. *Academy of Management Journal*, 46 (6), 740-751.

Crossland, C. & Hambrick, D.C. (2011). Differences in managerial discretion across countries: how nation-level institutions affect the degree to which ceos matter. *Strategic Management Journal*, 32 (8), 797-819.

Cyert, R.M. & March, J.G. (1992). *A behavioral theory of the firm*. Blackwell Business.

DiMaggio, P.J. & Powell, W.W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48 (2), 147.

Dollinger, M.J. (1984). Environmental Boundary Spanning and Information Processing Effects on Organizational Performance. *Academy of Management Journal*, 27 (2), 351-368.

Eisenhardt, K.M. & Schoonhoven, C.B. (1996). Resource-based View of Strategic Alliance Formation: Strategic and Social Effects in Entrepreneurial Firms. *Organization Science*, 7 (2), 136-150.

Escriba-Esteve, A., Sanchez-Peinado, L. & Sanchez-Peinado, E. (2009). The Influence of Top Management Teams in the Strategic Orientation and Performance of Small and Medium-sized Enterprises. *British Journal of Management*, 20 (4), 581-597.

Ferrier, W.J. (2001). Navigating the Competitive Landscape: The Drivers and Consequences of Competitive Aggressiveness. *Academy of Management Journal*, 44 (4), 858-877.

Finkelstein, S. & Hambrick, D.C. (1990). Top-Management-Team Tenure and Organizational Outcomes: The Moderating Role of Managerial Discretion. *Administrative Science Quarterly*, 35 (3), 484.

Finkelstein, S. (1992). Power in Top Management Teams: Dimensions, Measurement, and Validation. *Academy of Management Journal*, 35 (3), 505-538.

Finkelstein, S., Cannella, B. & Hambrick, D.C. (1996). *Strategic leadership*. West Pub. Co.

Finkelstein, S., Cannella, B. & Hambrick, D.C. (2005). *Strategic Leadership*. Oxford University Press.

Geletkanycz, M.A. & Black, S.S. (2001). Bound by the past? Experience-based effects on commitment to the strategic status quo. *Journal of Management*, 27 (1), 3-21.

Germann, F., Ebbes, P. & Grewal, R. (2015). The Chief Marketing Officer Matters!. *Journal of Marketing*, 79 (3), 1-22.

Greve, H.R. & Mitsuhashi, H. (2007). Power and Glory: Concentrated Power in Top Management Teams. *Organization Studies*, 28 (8), 1197-1221.

Haleblian, J. & Finkelstein, S. (1993). Top Management Team Size, CEO Dominance, and firm Performance: The Moderating Roles of Environmental Turbulence and Discretion. *Academy of Management Journal*, 36 (4), 844-863.

Hambrick, D.C. & Mason, P.A. (1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. *Academy of Management Review*, 9 (2), 193-206.

Hambrick, D.C. (1995). Fragmentation and the other Problems CEOs Have with Their Top Management Teams. *California Management Review*, 37 (3), 110-127.

Hambrick, D.C. (2007). Upper Echelons Theory: An Update. *Academy of Management Review*, 32 (2), 334-343.

Hambrick, D.C. (2018). Upper Echelons Theory. *The Palgrave Encyclopedia of Strategic Management*, 1782-1785.

Hambrick, D.C., Cho, T.S. & Chen, M. (1996). The Influence of Top Management Team Heterogeneity on Firms' Competitive Moves. *Administrative Science Quarterly*, 41 (4), 659.

Hambrick, D.C., Finkelstein, S. & Mooney, A.C. (2005). Executive Job Demands: New Insights for Explaining Strategic Decisions and Leader Behaviors. *Academy of Management Review*, 30 (3), 472-491.

Hambrick, D.C., Geletkanycz, M.A. & Fredrickson, J.W. (1993). Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal*, 14 (6), 401-418.

Hambrick, D.C., Humphrey, S.E. & Gupta, A. (2015). Structural interdependence within top management teams: A key moderator of upper echelons predictions. *Strategic Management Journal*, 36 (3), 449-461.

Hannan, M.T. & Freeman, J. (1977). The Population Ecology of Organizations. *American Journal of Sociology*, 82 (5), 929-964.

Herrmann, P. & Datta, D.K. (2005). Relationships between Top Management Team Characteristics and International Diversification: an Empirical Investigation*. *British Journal of Management*, 16 (1), 69-78.

Hoskisson, R.E., Chirico, F., Zyung, J. & Gambeta, E. (2017). Managerial Risk Taking. *Journal of Management*, 43 (1), 137-169.

Hutzschenreuter, T., Kleindienst, I. & Greger, C. (2012). How new leaders affect strategic change following a succession event: A critical review of the literature. *The Leadership Quarterly*, 23 (5), 729-755.

Jensen, M. & Zajac, E.J. (2004). Corporate elites and corporate strategy: how demographic preferences and structural position shape the scope of the firm. *Strategic Management Journal*, 25 (6), 507-524.

Kashmiri, S. & Mahajan, V. (2017). Values that Shape Marketing Decisions: Influence of Chief Executive Officers' Political Ideologies on Innovation Propensity, Shareholder Value, and Risk. *Journal of Marketing Research*, 54 (2), 260-278.

Kimberly, J.R. & Evanisko, M.J. (1981). Organizational Innovation: The Influence of Individual, Organizational, and Contextual Factors on Hospital Adoption of Technological and Administrative Innovations. *Academy of Management Journal*, 24 (4), 689-713.

Knight, D., Pearce, C.L., Smith, K.G., Olian, J.D., Sims, H.P., Smith, K.A. & Flood, P. (1999). Top management team diversity, group process, and strategic consensus. *Strategic Management Journal*, 20 (5), 445-465.

Kor, Y.Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, 27 (11), 1081-1099.

Kwee, Z., Van Den Bosch, F.A.J. & Volberda, H.W. (2011). The Influence of Top Management Team's Corporate Governance Orientation on Strategic Renewal Trajectories: A Longitudinal Analysis of Royal Dutch Shell plc, 1907-2004. *Journal of Management Studies*, 48 (5), 984-1014.

Lawrence, B.S. (1997). Perspective—The Black Box of Organizational Demography. *Organization Science*, 8 (1), 1-22.

Lee, H. & Park, J. (2006). Top Team Diversity, Internationalization and the Mediating Effect of International Alliances*. *British Journal of Management*, 17 (3), 195-213.

Lin, H. & Rababah, N. (2014). CEO–TMT exchange, TMT personality composition, and decision quality: The mediating role of TMT psychological empowerment. *The Leadership Quarterly*, 25 (5), 943-957.

Luo, X., Wieseke, J. & Homburg, C. (2012). Incentivizing CEOs to build customer- and employee-firm relations for higher customer satisfaction and firm value. *Journal of the Academy of Marketing Science*, 40 (6), 745-758.

MAY, D.O. (1995). Do Managerial Motives Influence Firm Risk Reduction Strategies?. *The Journal of Finance*, 50 (4), 1291-1308.

March, J.G. (1993). *Organizations*. Blackwell.

Markóczy, L. (1997). Measuring Beliefs: Accept no Substitutes. *Academy of Management Journal*, 40 (5), 1228-1242.

Miles, R.E. & Snow, C.C. (2003). *Organizational Strategy, Structure, and Process (Stanford Business Classics)*. Stanford Business Books.

Mintzberg, H., Raisinghani, D. & Theoret, A. (1976). The Structure of "Unstructured" Decision Processes. *Administrative Science Quarterly*, 21 (2), 246.

Naranjo-Gil, D., Maas, V.S. & Hartmann, F.G.H. (2009). How CFOs Determine Management Accounting Innovation: An Examination of Direct and Indirect Effects. *European Accounting Review*, 18 (4), 667-695.

Nath, P. & Mahajan, V. (2008). Chief Marketing Officers: A Study of Their Presence in Firms'Top Management Teams. *Journal of Marketing*, 72 (1), 65-81.

Neely, B.H., Lovelace, J.B., Cowen, A.P. & Hiller, N.J. (2020). Metacritiques of Upper Echelons Theory: Verdicts and Recommendations for Future Research. *Journal of Management*, 46 (6), 1029-1062.

Nielsen, S. (2009). *Top management team diversity: A review of theories and methodologies.*

Ocasio, W. (1997). Towards an attention- based view ofthe firm. *Strategic Management Journal*, 18 (1), 187-206.

Papadakis, V.M. & Barwise, P. (2002). How Much do CEOs and Top Managers Matter in Strategic Decision-Making?. *British Journal of Management*, 13 (1), 83-95.

Pavlatos, O. (2012). The impact of CFOs' characteristics and information technology on cost management systems. *Journal of Applied Accounting Research*, 13 (3), 242-254.

Peterson, R.S., Smith, D.B., Martorana, P.V. & Owens, P.D. (2003). The impact of chief executive officer personality on top management team dynamics: One mechanism by which leadership affects organizational performance. *Journal of Applied Psychology*, 88 (5), 795-808.

Pfeffer, J. (1985). Organizational Demography: Implications for Management. *California Management Review*, 28 (1), 67-81.

Porter, M.E. (1980). *Competitive Strategy*. The Free Press.

Priem, R.L., Lyon, D.W. & Dess, G.G. (1999). Inherent Limitations of Demographic Proxies in Top Management Team Heterogeneity Research. *Journal of Management*, 25 (6), 935-953.

Reuber, A.R. & Fischer, E. (1997). The Influence of the Management Team's International Experience on the Internationalization Behaviors of SMES. *Journal of International Business Studies*, 28 (4), 807-825.

Schepker, D.J., Kim, Y., Patel, P.C., Thatcher, S.M. & Campion, M.C. (2017). CEO succession, strategic change, and post-succession performance: A meta-analysis. *The Leadership Quarterly*, 28 (6), 701-720.

Simon, H.A. (1990). Bounded Rationality. *Utility and Probability*, 15-18.

Simons, T., Pelled, L.H. & Smith, K.A. (1999). Making Use of Difference: Diversity, Debate, and Decision Comprehensiveness in Top Management Teams. *Academy of Management Journal*, 42 (6), 662-673.

Tihanyi, L., Ellstrand, A.E., Daily, C.M. & Dalton, D.R. (2000). Composition of the Top Management Team and Firm International Diversification. *Journal of Management*, 26 (6), 1157-1177.

Waldman, D.A., Javidan, M. & Varella, P. (2004). Charismatic leadership at the strategic level: A new application of upper echelons theory. *The Leadership Quarterly*, 15 (3), 355-380.

Weick, K.E. (1979). *Social Psychology of Organizing*. McGraw-Hill Humanities/Social Sciences/Languages.

West, M.A. & Anderson, N.R. (1996). Innovation in top management teams. *Journal of Applied Psychology*, 81 (6), 680-693.

Whitler, K.A., Krause, R. & Lehmann, D.R. (2018). When and how Board Members with Marketing Experience Facilitate Firm Growth. *Journal of Marketing*, 82 (5), 86-105.

Wiersema, M.F. & Bantel, K.A. (1992). Top Management Team Demography and Corporate Strategic Change. *Academy of Management Journal*, 35 (1), 91-121.

Wiersema, M.F. & Bird, A. (1993). Organizational Demography in Japanese Firms: Group Heterogeneity, Individual Dissimilarity, and Top Management Team Turnover. *Academy of Management Journal*, 36 (5), 996-1025.

van Doorn, S., Heyden, M.L. & Volberda, H.W. (2017). Enhancing Entrepreneurial Orientation in Dynamic Environments: The Interplay between Top Management Team Advice-Seeking and Absorptive Capacity. *Long Range Planning*, 50 (2), 134-144.