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HOW DO PSYCHOLOGICAL FACTORS AFFECT INNOVATION AND ADOPTION DECISIONS?

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Interest in the significant impact of psychological factors on innovation outcomes is growing rapidly. Our understanding of cognitive processes is, however, evolving, and research on the specific forms and role of these factors within innovation-related decisions is limited. We propose a theory of decision-making that offers consilience across research areas, is grounded in both physical and social sciences, explains the constructs already established by innovation, adoption and resistance research, and serves the needs of innovation researchers and practitioners as a pragmatic tool. Using a variety of established research tools in novel ways including semantic field and bibliometric analysis and by drawing on research from diverse disciplines, we identify evolved psychological mechanisms as influences on adoption decision processes. We conclude that Evolutionary Choice Theory, defined as the collective influence of these evolved psychological mechanisms, should be adopted by innovation practitioners and researchers and provide specific pragmatic applications to inform this adoption.

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Introduction

Cognitive processes and psychological factors, including motivation, perception, and affective states, underly and influence all adoption decisions and thus all innovation outcomes. It has been empirically shown that psychological factors influence a variety of phenomena specifically relevant to innovation research and practice including creative and problem-solving abilities, decisions to adopt technology, and decisions in a wide variety of management contexts (Abraham *et al*., 2016; Griskevicius *et al*., 2011; Saad, 2017; Timming, 2019). While there is growing interest amongst innovation researchers (Bhimani *et al*., 2022; Engelsberger *et al*., 2022; Marzi *et al*., 2022; Roberts *et al*., 2021), research on the human side or the role of psychological factors in adoption and innovation-related decisions is nonetheless highly limited. In their recent systematic literature review Ghasemzadeh *et al*. (2022) highlight the limited availability of research on the "microfoundations" of innovation decision-making and the limited nature of our "knowledge about the attitudes, mindsets, and values that encourage employees inside a firm to effectively collaborate with users on the outside" (p. 8). Van Oorschot *et al*. (2018) go further in their bibliometric review of research on adoption within innovation stating all "adoption involves decision-making, we expected that cognitive processes underlying human thought, knowledge and decision-making would hold a more prominent position in innovation adoption research" (p. 16).

Questions regarding the role of psychological factors in influencing decision-making have been further complicated by research over the last several decades which has established that Rational Choice Theory (RCT) and its progeny including the Theory of Planned Behaviour, Theory of Reasoned Action (TRA), and Expected Utility Theory, hereinafter collectively referred to as RCTS, are ineffective at predicting decisions in real-world conditions (Gigerenzer, 2016, 2018; Kahneman, 2011; Kahneman and Tversky, 2013; Kenrick *et al*., 2009, 2010; Tversky and Kahneman, 1974). This finding has brought about a substantial evolution in economic theory and practice. This evolution in our understanding of psychology and decision-making is also having an increasing impact on management (Acciarini *et al*., 2021; Gino, 2017; Power *et al*., 2019; Sund *et al*., 2020). Critically, all four of the dominant models or themes of adoption research in the innovation literature identified by van Oorschot (2018) are reliant on RCTS and, while often supported by substantial bodies of empirical research, are limited by the absence of explanations for why the variables and moderators they identify

have the influence on decisions they do (Lee *et al*., 2003; Maruping *et al*. 2017; Venkatesh and Bala, 2008).

As yet, there is no consensus on a theory of decision-making that satisfies the needs of innovation and management researchers and practitioners who seek predictive accuracy and clarity regarding the factors that influence the essential decisions impacting innovation opportunities, including the decision to select or pursue an opportunity within an organisation and the decision to adopt or resist something new as a consumer (Kwon and Silva, 2020; McPhetres *et al*., 2021; Ryan and Deci, 2019; Schaller *et al*., 2017; Taylor, 2018).

Set against this backdrop, the aim of this paper is to determine if a theory of decision-making can be developed that: (1) offers consilience across arenas of research rather than divergent interpretations due to the unique ontological and epistemological foundations and assumptions that underpin theories drawn from each, (2) is grounded in physical sciences—not just behavioural sciences and debated theories of mind, and (3) serves the ultimate aim and pragmatic need of innovation researchers and practitioners.

An effective model of decision-making, as well as an understanding of not only what influences adoption and innovation-related decisions but why, is essential to innovation practitioners whose goal is to choose and deliver winners. A robust and pragmatically useful theory is essential to the ability to predict and to positively intervene and thus impact innovation outcomes. Addressing this need will assist to improve how innovators and researchers select and develop ideas, secure the decisions of others to support those efforts, effectively communicate to the market such that individual users and buyers decide to adopt and sustain use, guide interventions, and better direct innovation research.

The importance of each of these goals is evident from both the volume of research on decision-making across diverse disciplines and the number of theories proposed to explain behaviour, decisions, and related phenomena (Ryan and Deci, 2019; Kwon and Silva, 2020; McPhetres *et al*., 2021). Further, innovation, new product development, and digital transformations are hard. While estimates vary (Tidd and Bessant (2020)), recent research shows that between 70% and 90% fail (Cooper, 2019), costing trillions of dollars. While such failures have a variety of causes (van der Panne *et al*., 2003), innovation efforts are regularly challenged by the decision processes of participants (Sutcliff *et al*., 2019). Understanding the role of psychological factors on the decisions of individuals who significantly impact the progression of all efforts from one stage to the next is a required component to understanding why many of the factors identified by innovation researchers as influencing progression and success have the impact they do. Inquiry of this nature may also cast light on new factors influencing the outcomes of innovation processes, contribute to an explanation of why failure rates remain high, and add to

our foundational and interdisciplinary understanding of innovation processes and outcomes (Tidd and Bessant, 2018).

In addressing these questions, we make several contributions. First, we introduce the Consilience by Semantic Field (CSF) method and demonstrate the utility of its application to innovation research. The CSF has been validated as an efficient means of identifying prospect evolved psychological mechanisms (EPMs), confirming their highly generalised nature, and providing more concrete yet generalised definitions for their influence, boundaries, targeted outcomes, and associated behaviours. Second, we provide specific evidence in support of Evolutionary Choice Theory (ECT) as a holistic and inclusive alternative to the RCTS for use by innovation researchers and practitioners. We identify several unique forms of value motivated by the EPMs comprising ECT and discuss how these factors ought to be considered by innovators and managers when selecting, developing, and communicating about innovations. We conclude that ECT offers both a pragmatically useful tool to innovation practitioners and a rich area for further investigation for researchers.

Theories of Decision-Making in Innovation

As the result of advancing research tools and methods ranging from fMRI studies to the analysis of massive amounts of online behavioural data, psychology research and theory have evolved at a rapid pace in recent decades. Given at least 60 and potentially hundreds of theories of behaviour and decision-making (Kwon and Silva, 2020; McPhetres *et al*., 2021), it is not surprising that different theories produce different and even contradictory interpretations of the same observations and thus lead to different conclusions regarding how to structure goal-oriented interventions. While a powerful modelling tool, Rational Choice Theory (RCT) and its progeny the RCTS, have been shown to have prohibitive limitations in real-world conditions, as have other widely used foundational theories of behaviour and choice underpinning models of adoption as well as other popular theories such as Maslow's hierarchy of needs (Ajzen, 2011; Boudon, 1998; Claudy *et al*., 2015; Foka-Kavalieraki and Hatzis, 2011; Gigerenzer, 1991, 2016, 2018; Griskevicius *et al*., 2011; Li *et al*., 2012; Kenrick *et al*., 2010; Małecka, 2020; Schaller *et al*., 2017; Verweij *et al*., 2015).

While we have come a long way since Freud and Maslow, despite the advances and the widespread acceptance of biases, heuristics, and the default mode network, the research streams primarily responsible for exposing RCTS limitations have themselves been shown to exhibit numerous inhibiting limitations including unresolved contradictory findings and unresolved biases (Gigerenzer, 1991, 2016, 2018).

This is highly problematic across many disciplines given the considerable number of widely used theories built on RCTS as the explanation for why decisions are

made. Within innovation research, user-led innovation is specifically premised on an acceptance of the rational pursuit of self-interest or personal benefits in the form of hedonic pleasure, enhanced reputation, or utility gain in the form of superior performance or monetary returns (Stock *et al*., 2015, von Hippel, 2001). While recent research reveals the economically irrational trade-off that occurs between these two motivations (hedonic vs. monetary), it remains premised on a core rational decision-making system pursuing one outcome or the other (Stock *et al*., 2015).

While research has established several economically irrational variables and moderators that impact on open innovation outcomes including such phenomena as Not-Invented-Here (Hannen *et al*., 2019; Katz and Allen, 1982) and Fear-of-Looking-Foolish syndrome (Bez and Chesbrough, 2020), even recent work is premised on the acceptance of a core rational decision system that is either directly applied to the pursuit of economic gain or self-interest or which indirectly does so by generating the responses that are aggregated as heuristics for making such decisions (Marzi *et al*., 2022).

Further, the application of both OI and user-centred research to develop interventions for changing how decisions are made is often limited by an institutional perspective, the treatment of identified factors as characteristics of a type of agent or environment without delving into the ultimate decision-making process that gives rise to the phenomena (e.g., CEO orientation, personality type, employee diversity, the impact of pre-existing attitudes, risk-taking, organisational culture), or the conceptualisation of the observed phenomena based on either perceived (but not verified) benefits, or the acceptance of a cause indicated by a psychological theory without verification of the theory's relevance to the class of decisions or the cause it implies as the causal basis for the phenomena (e.g., Social Identity Theory) (Ahn *et al*., 2017; Bez and Chesbrough, 2020; Bogers *et al*., 2018; Dubouloz *et al*., 2021; Hannen *et al*., 2019; Lendowski, *et al*., 2022; Makkonen *et al*., 2016; Niu, 2022; van der Panne *et al*., 2003).

In addition to a general reliance on RCTS, the four dominant models of adoption within the innovation literature; (1) institutional theory, (2) Technology Acceptance Model (TAM) and TRA, (3) econometric, and (4) diffusion of innovation (van Oorschot *et al*., 2018) share the limitations impacting user-generated and open innovation research. Institutional theory and diffusion of innovation research take a system-wide perspective. As such they do not thoroughly consider or examine the specific role of psychological factors in individual decision processes and thus innovation outcomes. In the case of econometric and TAMS, the most widely cited set of theories and models of adoption which includes Diffusion of Innovation, the Technology Acceptance Model 1, 2, and 3, and the Unified Theory of Adoption and Use of Technology 1 and 2 (Davis, 1989; Rogers, 1995; Venkatesh and Davis, 2000; Venkatesh *et al*., 2003; Venkatesh and Bala, 2008; Venkatesh *et al*., 2012), a

variety of economically irrational variables and moderators have been identified. But both are explicitly built on RCTS foundations and limited by the absence of explanations for why the identified moderators have the impact they do, or how they influence individual cognitive processes and associated decisions (Lee *et al*., 2003; Maruping *et al*., 2017; Venkatesh and Bala, 2008).

In addition to the RCTS, some user-generated and open innovation researchers reference Self Determination Theory (SDT) and one of its sub-theories, Basic Psychological Needs Theory (BPNT). Unlike the RCTS, SDT and BPNT specifically incorporate innate motivations in addition to the rational consideration of extrinsic factors. BPNT is supported by a substantial body of validating research (Ryan and Deci, 2019). Problematically, SDT continues to rely on a core rational decision-making system, albeit motivated to pursue innate basic psychological needs and thus influenced by psychological factors. With respect of BPNT, the sub-theory describing these psychological needs exclusively describes motivations that have negative health consequences when not satisfied and this severely limits the scope of its applicability to innovation research questions.

Evolutionary Psychology

Evolutionary Psychology (EP) has emerged as a promising additional source of robust empirical research on motivation and psychological factors that may influence innovation processes (Anderson *et al*., 2015; Buss *et al*., 2020; Kenrick *et al*., 2010; Saad, 2017; Schaller *et al*., 2017). It has even been proposed as the basis for a reconciliation both within psychological research and across social science disciplines (Badcock, 2012; Brase, 2014; Capra and Rubin, 2011; Saad, 2020). EPMs have also been shown to increase the ability of TAMS to explain variation in technology adoption (Abraham *et al*., 2016).

EP is supported by research from a diversity of disciplines as well as empirical research (Buss, 2020; Confer *et al*., 2010; Sundie *et al*., 2011). Like the widely accepted BPNT and its parent SDT (Ryan and Deci, 2019), EP combines research on less tangible phenomena, such as motivation and behaviour, with research on more definitively ascertainable physical phenomena, such as neurological features, hormone responses, and cross-species traits (Ryan and Deci, 2019; Saad, 2017, 2020). This combination allows EPMs to be tested and empirically supported in more ways and thus produce grounded, consilient, and more robust conclusions relative to alternative theories of motivation or decision-making.

Unlike BPNT, EP is not limited to psychological mechanisms or innate motivations that have negative health and well-being consequences when unsatisfied. EPMs encompass a broad spectrum of motivations or decision influences and also offer an ultimate explanation rather than a proximate one (e.g., a physiological,

emotional, or affective state in isolation represents only a proximate explanation, the ultimate explanation must address why the physiological response or affective state occurs, why the same hormone or emotion can have differing impacts on decisions given different contextual triggers, and why it has the impact it does on behaviour and decisions) (Ahn and Shin, 2015; Saad, 2017).

While the list of EPMs is limited, (1) individual EPMs are well substantiated, (2) offer consilience across disciplines of research, and (3) their widespread impact on decisions of diverse types—from choice of tourism destination to the adoption of technology—is well established (Abraham *et al*., 2013, 2016; Griskevicius and Kenrick (2013); Kock *et al*., 2019a, 2019b, 2020; Nørfelt, *et al*., 2020; Saad, 2017).

In the absence of any physical fossil record, one of the methods used by EP researchers to substantiate the existence and evolved nature of hypothesised psychological mechanisms is the completion of a nomological network of evidence. Nomological networks of evidence synthesise research gathered from both the physical sciences and the social sciences to support or refute a hypothesised EPM (Saad, 2017, 2020; Schmitt and Pilcher, 2004). These consolidations of evidence often include research from evolutionary biology, phylogenic or traits shared cross-species, genetics, physiology (hormonal or other responses to stimuli that always accompany categories of stimuli or behaviours), and neuroscientific evidence such as fMRI studies. Like physical traits, phylogenic research on behaviours or psychological mechanisms shared across modern species with a common evolutionary ancestor, establishes both support for an evolutionary origin of the phenomena and suggests the point of the EPM's evolution in the shared ancestor. Such physical evidence is combined with research and observation of behaviours from psychology, economics, sociology, anthropology, and archeology as well as mathematical or computer simulations to unequivocally establish that a hypothesised EPM explains all available evidence and that alternative theories regarding the observed behaviour or influence on decision processes can be ruled out by one or more elements of the nomological network of evidence. In isolation, the individual elements of research may be insufficient to draw a robust conclusion. In aggregate, however, by combining research on physically verifiable phenomena with diverse behavioural research, and by defining motivations or decision influences, associated triggers, and target outcomes in a non-discipline-specific way, EPMs avoid the limitations created by the unique assumptions and paradigms underpinning most other theories of behaviour, motivation, and decision-making.

EP has firmly established a variety of EPMs. The Fundamental Motives Framework includes motivations to pursue Affiliation or make friends, attain Status, Disease Avoidance (or disgust), Self-preservation or evade physical harm, Mate Acquisition, Mate Retention, and to Nurture or care for family (Griskevicius and Kenrick, 2013; Schaller *et al*., 2017). Additional EPMs have also been proposed by

Table 1. Validated EPM Motivations supported by nomological networks.

	Decision influence or motivated behavioural response
1	Default neurological functioning includes storage and perception based on association to or of stored patterns
2A	Affiliation, Social Relatedness, Social group bonding
2B	Avoidance of Ostracism
3	Self-image or self-identity
4	Autonomy or self-directed choice
5A	Pursuit of Relative Status
5B	Resistance to the loss of relative status
6	Challenge avoidance (Noting this may be a product of fear of ostracism and fear of status loss. It is also significantly influenced by culture or learned norms. Challenge avoidance is, however, supported by core elements of a nomological network, is a cultural universal, and the posture, submit, fight, or flight behaviour pattern with posturing specifically serving to avoid a challenge is observed across species.)
7A	Relative Capability or Competence
7B	Avoidance of actions that allow others to view you being demonstrably inferior at a task to most others (relative capability)
8	Pursuit of Novelty
9	Reasoning
10	Disease Avoidance including disgust and outgroup avoidance (e.g., Xenophobia)
11	Self-preservation
12	Mate Acquisition
13	Mate Retention
14	Play

Aunger *et al*. (2021) for Lust, Hunger, Hoard, Create, Justice, Curiosity, and Play, by Stroh (2018) for Relative Capability and Novelty, and by Mercier and Sperber (2011, 2017) for Reasoning. In addition, the motivations specified by BPNT are also supported by nomological networks and are EPMs. BPNT establishes Social Relatedness as the equivalent to Affiliation, Autonomy, Competence as the equivalent to Relative Capability, and Novelty as BPNs (Bagheri and Milyavskaya, 2019; Ryan and Deci, 2019; Vansteenkiste *et al*., 2020). Table 1 provides a list of EPMs that are supported by nomological networks and are likely to be relevant to innovation or adoption decisions.

Given these findings across diverse fields, we propose Evolutionary Choice Theory (ECT) as an inclusive and holistic theory of decision-making to replace RCTS. ECT is defined as the collective influence on decision-making of all evolved psychological mechanisms (EPMs) including EPMs that enable reasoning and produce affective states coupled with the identifiable influence of the fundamental

neurological structures and electro-chemical functioning of the nervous system. It is the aim of the present research to substantiate or refute ECT as a replacement for RCTS as the foundation for considering and predicting decision process within innovation and adoption processes, and the consideration of "new" things by innovation practitioners and related parties.

Method

Given the diversity of activities, stages, and contexts in which decisions are made within innovation practice and encompassed by innovation research, as well as the potential uniqueness of decision processes involved, including decisions made by individuals, perceived as made by organisations, and entire markets considering adoption, there are several requirements of any construct based on EPMs and ECT as a theory. First, the limited number of EPMs thus far established by EP and comprising ECT with clear relevance to innovation decisions must be ruled out as a limiting factor. Second, where a hypothesised EPM has been substantiated by methods other than a nomological network of evidence, its generalised or specific contextual influence and associated definitions of triggers, behaviours, and targeted outcomes need to be determined. More specifically, its limitations as determined by the breadth of contexts within which it has been empirically tested need to be considered. Finally, it must be confirmed that some or all EPMs have a highly generalised or near universal impact on decisions rather than contextually specific ones that may or may not impact on the breadth of decisions involved within innovation processes and outcomes.

In this study, ECT is tested in three ways to both validate and simultaneously address these requirements. First, ECT is tested by the assembly of a nomological network of evidence that provides both physical and social science evidence. If it is not possible to assemble a nomological network of evidence, ECT will not be validated. If a robust nomological network of evidence can be created, it will simultaneously validate ECT and establish the range of research, observations, and decision arenas or disciplines across which ECT provides a consilient explanation. Second, ECT must offer an explanation for the variables and moderators already identified by innovation and technology researchers as influencing ideation, adoption, and resistance. Specifically, if ECT is substituted for RCTs currently underpinning existing innovation, adoption, and resistance research and models, does ECT offer a single consistent explanation? If not, this would refute ECT. If it does, this consilience represents further support for ECT and establishes ECT as a demonstrably useful tool for innovation researchers and practitioners. Third, ECT must pass E. Fama's (1998) four-part test for adopting a new theory over an accepted one. It must be (1) supported by evidence, (2) be simpler, (3) explain more, and (4) be testable.

The consilience by semantic field (CSF) method was developed as an innovative and interdisciplinary approach to answer our core questions and address these requirements. It specifically tests the hypothesis that if EPMs influence decisions in a generalised way as required by ECT, evidence for the persistent and consistent influence of EPMs should be found in research across discipline boundaries irrespective of their unique assumptions, paradigms, and ontological and epistemological foundations. CSF does this by using a collection of established methods drawn from different disciplines including semantic field analysis, bibliometric analysis, and nomological networks (Boyack and Klavans, 2010; Hedgecoe, 2003; Saad, 2017, 2020; Schmitt and Pilcher, 2004; Small, 1974; Small and Grifith, 1974; Van Eck and Waltman, 2014; Vasil *et al*., 2020; Zupic and Cater, 2015).

In summary, the CSF method starts with the identification of a behavioural phenomenon observed, uniquely labelled, studied, and hypothesised about within a starting discipline. An iterative process of semantic field analysis and bibliometric analysis is then used to identify comparable phenomena being uniquely labelled, studied, and theorised about in other types of decision-making and disciplines of study that share characteristics and could be attributable to a common EPM. This iterative process is continued across discipline-specific bodies of research and accompanied by checks of both the internal or discipline-specific consistency of the phenomena and external or cross-discipline consistency of the phenomena being studied using bibliometric analysis to confirm the behaviour or influence on decisions is the same despite the different disciplines all proposing unique explanations and theories for it. A nomological network of evidence is then built to validate or refute the hypothesised EPM by drawing on the diverse results obtained by this iterative approach.

Finally, where the generalised impact of EPMs on decision-making is established, the specific influence of ECT or an EPM on decisions of a specific type not already incorporated into the Nomological network can be assessed. This is done by cross-referencing the definitions of the variables and moderators identified by a target theory or body of research and the observable outcomes associated with the phenomena with the EPM-based motivations and their associated target outcomes. Where not self-evidently describing common phenomena, an objective determination can be achieved by applying the semantic field analysis method used within the CSF to the defined terms and key descriptive elements used by the theory specific variable or moderators with those used for the EPMs and/or contained within the associated semantic field already generated for an EPM.

Assessed in this way, research from the target arena, in this case innovation adoption and resistance literature, either becomes an additional supporting element within one or more nomological networks or where there is no logical and semantic support, the role of EPMs as influences in that category of decision-making can be ruled out.

The CSF method leverages the universal evolution of cultural norms and unique nomenclature within each discipline, as well as modern digital access to the collective corpus of published research. The combination of methods and the iterative steps used require several pages to describe and so a detailed description is provided in Appendix A.

The CSF method specifically provides (1) an accelerated pathway to identify additional EPMs without requiring expertise across multiple discipline boundaries and without the limitation of BPNT for the observation of a negative health impact associated with the motivation being thwarted, (2) a holistic basis by which to define EPM triggers, target outcome, and associated behaviours, and (3) validation of the generalised influence of EPMs across decision types and discipline boundaries. Further, definitions based on motivated relative outcomes rather than the subjective descriptions of extrinsic characteristics of a situation or innovation provide an explanation for why a described variable or moderator has an influence, reduce the risk of subjective interpretation or variation when applied, and provide a clear directional intent to those crafting interventions.

Research Findings

The CSF method identified multiple sets of comparable behavioural phenomena or decision influences attributable to individual EPMs, with each being labelled, studied, and theorised about in each different discipline in unique discipline-specific ways. In doing so, it validates the generalised nature of EPM influence on decision processes, including innovation and adoption decisions.

The CSF produced a complete nomological network of evidence for the previously known EPM motivating us to pursue relative status, identified the previously unvalidated EPM motivating us to participate in gossip and produced a nomological network of evidence validating it, generated more holistic definitions for both and generated the necessary elements for completing a nomological network of evidence validating ECT. Evidence of individual EPMs influencing decisions was found in arenas as diverse as international relations and strategic decision by military officers through to the irrational consideration of new peer reviewed medical research by individual researchers and practitioners (He and Feng, 2022; Watve, 2017).

The nomological networks of evidence compiled supporting the EPM motivating the pursuit of relative status, the EPM motivating participation in gossip, and ECT include both physical sciences such as research in neuroscience, evolutionary biology and physiology, as well as supporting evidence across a variety of social science disciplines. Representative research comprising the nomological network of evidence for each and the ECT are provided in Table B.1. in Appendix B.

Collectively these results: (1) validate the CSF method as a new and efficient method for identifying and validating prospect EPMs corresponding to discrete fundamental motivations, (2) confirm the hypothesis that the influence of EPMs is observable across a wide variety of decision types and disciplines of research, and (3) that the influence of some EPMs on decision-making and behaviour is highly generalised rather than context-specific and is thus widely applicable across all types of decisions.

The definition of ECT was further clarified and extended to include the newly identified EPM of 'gossip'.

Evidence in support of ECT, its specific applicability, and the usefulness of the CSF method to innovation practitioners and scholars was established by testing ECT against the body of existing TAMS, Active Innovation Resistance, and a select sample of Open Innovation literature to determine if ECT explains the variables and moderators these bodies of research have previously identified.

For example, "System Playfulness" used in TAMS clearly describes extrinsic characteristics of an innovation that represent the same targeted outcomes or affective states motivated by the EPMs for play and relative capability. The economically irrational influence of moderators in TAMS, AIR, P-TAF, and OI such as Fear of Looking Foolish, personal image, social influence, what important others think, social norms, and norm barriers all describe the moderating effect of the perceived expected impact on an individual based on their decision or action to adopt or reject something. The associated definitions for these factors all describe impacts on relative outcomes motivated by our EPM drives to affiliate with others, avoid ostracism, avoid challenging others, and our drives to acquire and avoid the loss of relative status.

Table 2 shows a partial list of EPMs and the moderators or variables identified by TAMS, AIR, P-TAF, and OI that they explain. Given the length, a complete list is provided in Appendix C (Table C.1).

ECT and its component EPMs fill the identified gap in the adoption and resistance literature for a robust explanation of why the variables and moderators established by TAMS, AIR, and other reviewed innovation research addressing the consideration, adoption, or resistance of new ideas, information, technologies, and products occur. ECT thus represents a superior alternative foundation to RCTS for these and other theories commonly relied on by adoption researchers and practitioners. The CSF method represents a valuable tool for innovation researchers seeking to identify and validate other ultimate influences on decision-processes in relation to innovation. ECT and EPMs supported and defined by nomological networks of evidence and thus the relative outcomes they motivate rather than subjective descriptions of extrinsic characteristics of a context also provide both a more granular understanding of what influences decisions and one more easily applied to craft interventions in diverse conditions.

Table 2. A partial listing of EPMs as well as the variables and moderators explained and partially or entirely causally attributable to them.

A sampling of variables and moderators identified by TAMS, AIR, or other adoption and resistance model causally attributable to an EPM	EPMs
Subjective norms, social influence, not thought of here	Social group bonding, Avoidance of ostracism
Fear of looking foolish, social influence, image barrier, norm barrier, risk aversion, as well as perception of certainty, value barrier, perceived ease of use, perceived usefulness, price value, etc.	Relative status, Resistance to loss of relative status, Challenge avoidance
Personal image, fear of technology, perceived distance from self, passion for technology, perceived ease of use, perceived usefulness, job relevance, effort expectancy, not thought of here	Competence, Relative capability, Self-Identity
Hedonic motivation, perceived enjoyment, system playfulness	Play
Value barrier, perceived ease of use, perceived usefulness, price value	Reasoning

Finally, ECT effectively rules out or expressly incorporates the most widely accepted alternative theories for decision-making and behaviour including RCTS, psychoanalytic explanations, and BPNT. ECT specifically passes E. Fama's (1998) four-part test for selecting or using a new or proposed theory over others. EPMs and ECT (1) are supported by evidence, (2) explain more than other individual theories (e.g., RCTs even accompanied by biases, cognitive dissonance, psychoanalysis, and Maslow's hierarchy of needs do not provide a consistent explanation for all observed behaviour and research results), (3) represent a simpler or less complex explanation than other theories, especially in the combinations required to accommodate exceptions and anomalies, and (4) are testable or can be refuted by experimentation if wrong.

Discussion and Practical Application

ECT explains resistance to externally sourced or new information observed in Open Innovation and Absorptive Capacity research as well as fills the gap in explanations of why variables and moderators in TAMS and Active Innovation Resistance have the impact they do. It thus enables the integration of adoption and resistance research as well as providing a consistent base for crafting interventions. Resistance is caused by the perception of a threat to the individual or group's relative status or the basis of that status and thus identity. Perceptions of relative

capability, affiliation or fear of ostracism, self-identity and relative status also explain the role of TAMS moderators such as Personal Image, Social Influence, the opinions of important others, and subjective norms.

In addition to validating the new CSF method, this study has shown that EPMs influence decisions, choices, and behaviours of virtually all types across discipline or traditionally considered decision arena boundaries. EPMs specifically motivate the pursuit of (as well as resistance to the loss of) several relative, scarce, and contextual outcomes. Relative status, for example, is only assessable by comparison to others within a group who collectively accept a shared set of criteria. This relative nature also makes it scarce. At the top of the status hierarchy, if everyone had it no one would have it.

In many cases, EPMs fully satisfy the definition of BPNs in that they produce an effect in a broad variety of "daily" or non-adverse conditions and have an adverse effect on health and wellbeing when not met (Ryan and Deci, 2019; Vansteenkiste *et al*., 2020). The EPM construct is, however, more useful to innovation and management practitioners given that EPMs framed as fundamental motivations encompass or explain BPNs but also describe a far wider range of discernible, persistent, and consistent influences on decision processes and behaviours equally supported by both physical and cross-cultural evidence but not limited to those that have negative health consequences.

Importantly, many EPMs target outcomes that can only be assessed or perceived relative to others and unlike both basic psychological and physical needs (Vansteenkiste *et al*., 2020), they cannot necessarily be satiated like thirst or hunger but are motivations to perpetually pursue and resist the loss of comparative positions relative to others within "in-groups" a person perceives themselves a member of or wants to be a part of.

As with BPNs, evidence demonstrates that there is not one single core rational system that makes decisions from which we are occasionally biased away. Rather, our decisions are the product of competing interacting, interconnected evolved neural functions that can have concurrent influence on decisions. As such, predicting choices and behaviours requires ECT and thus both independent and holistic consideration of all EPMs that may be relevant or activated by any set of conditions at a given point in time and that may have an impact on a decision.

For example, a prerequisite for comparing oneself to others is a self-image and a shared set of criteria that is accepted by the audience or group to which one belongs. Thus, status is determined by learned socially or culturally accepted cosmetic parameters as well as innate parameters such as attractiveness and physical size (Buss *et al*., 2020; Cheng *et al*., 2013).

The relative, group and individual identity specific, and scarce nature of the target outcomes makes it impossible to reduce the corresponding forms of value to

utils, or to rationally assess them in terms of each other or money. The outcomes we are motivated to pursue by each EPM represent unique and not universally interchangeable forms of value interpreted and perceived by unique psychological mechanisms or evolved neurological structures. Critically, they can have negative values not just zero or positive values. A new product may offer positive economic utility but have a negative impact on individual status. Each of these forms of value needs to be considered by innovation researchers and practitioners when attempting to guide decision processes at each stage, including how to better choose innovation opportunities, solicit support for them, develop them to deliver or confer the different forms of value, and present them for adoption to make clear the overall value profile rather than just the economic utility of an innovation.

Of specific relevance is the opportunity for information, ideas, methods, and other innovations to enhance or undermine the relative status of individuals within the groups that form part of the decision maker's identity. Those that are perceived as a threat to status or the basis for status will be resisted. Products, ideas, or methods that offer relative status or belonging as well as utility will be more valued, resisted less, and hence be more likely to be supported and adopted. In addition, choices to adopt new things that may be perceived as challenges to a group's identity and norms will be resisted if individuals fear ostracism or exclusion if they choose to adopt them.

The motivation to pursue these different unique forms of value and to actively resist their loss, requires consideration of a value profile rather than a simple value equation where value is defined as a single differential between monetary cost and some quantified utility. A value profile would include specific consideration of economic cost and utility as well as status, belonging, novelty, competency, and any of the other EPM motivated outcomes that may be triggered by a new thing or proposition.

For practical application within innovation research and practice, we differentiate between the pursuit of and the resistance to loss of key outcomes with specific relevance and focus on a subset of validated EPM drives including (1) non-familial grouping and belonging, (2) avoidance of ostracism or resistance to the loss of belonging, (3) the pursuit of relative status, (4) resistance to the loss of relative status, (5) the development of a self-image as a prerequisite for comparison to others and thus a basis for all relative outcomes, (6) avoidance of challenging others and the associated risk of ostracism or a loss of status without a relative certainty of winning and securing status, (7) reasoning as an EPM (which appears as a means of both social bonding and status defence), (8) novelty, and (9) relative capability or competence. Each of these factors represents a unique, not necessarily interchangeable, form of value to consider.

Clearly imperative for innovation and technological transformation practitioners is the need to avoid triggering resistance. Resistance is triggered by any threat to

status, identity, belonging, or competence either specific to the individual or to the basis of status within the groups a person perceives themself to be a part of.

The relative nature of outcomes targeted by EPMs, the finding that EPMs motivate the pursuit of and resistance to the loss of those relative outcomes, and the equal impact of perceived relative outcomes (as distinct from actual) supports ECTs proposition of a social and iterative nature to decision-making. Decision-making regarding the adoption or resistance of any new thing will be influenced by the perception of multiple forms of value as dictated by EPMs and the iterative social process of decision-making generated by the perception of value being dependent on relative comparison. Decisions are thus not an individual or exclusively rational process based on self-interest or personal preference in isolation.

Other practical applications of these insights include focusing on building team and organisation culture that defines itself and confers status on those who pursue objectivity or the open-minded consideration of new ideas and technologies, confers status on members who learn, validate, and share learning at least equally to those who generate any other form of value, and that proactively eliminate any fear in members of ostracism. These characteristics will leverage the motivational influence of EPMs on members in a way that aligns them with desired innovation outcomes rather than risk triggering them in ways that produce resistance and a defence of self-identify or pre-existing paradigms at the expense of innovation.

The identification of multiple unique forms of value that are not universally interchangeable and that motivate decisions independent of personal preference can be applied by practitioners to reduce the current high failure rate of innovation and transformation initiatives. These innate motivations and influences on decisions provide the basis for enhanced predictive accuracy for decisions by staff, executives, and consumers and thus augment existing means of assessing new ideas, innovation opportunities, and transformation initiatives as well as guiding their roll-out.

Limitations and Future Directions

While the relevance and applicability of ECT is not limited by the current number of EPMs thus far identified and substantiated, it seems likely that there may be additional EPMs not yet considered. Until a more exhaustive list is produced, it must be assumed that additional EPMs relevant to innovation decisions and innovation research and practice will be discovered. In addition, some proposed EPMs not yet substantiated by nomological networks are specifically relevant and require further research. Lead amongst these is the hypothesised EPM that motivates a desire to create. Further application of the CSF method to clarify the boundaries of

all EPMs and thus establish more complete nomological networks encompassing relevant research across all disciplines would also be of value.

Potentially of greatest value would be empirical work to determine under what conditions the EPM that enables rational and conscious consideration is activated and what determines its ability to override the influence of other EPMs.

Conclusions

This study adds to the research on the role of psychological factors impacting decisions throughout innovation processes. Specifically, we show that ECT offers a single theory of decision-making that satisfies the requirements stated earlier and serves the ultimate aim of innovation researchers and practitioners to improve the effective selection, development, and presentation of beneficial innovations. ECT is grounded in both the physical and social sciences. It has broad consistent application. It offers a single explanation for the variables and moderators identified in and consilience across the existing innovation, adoption, and resistance literature. ECT offers an ultimate explanation for why decisions are made and eliminates the contradictory or divergent interpretations produced by other theories of decision-making that have historically impeded pragmatic application and the development of consistent interventions. Finally, ECT provides both a robust alternative to RCTs and a set of pragmatically useful tools, including multiple defined forms of value that influence adoption and, therefore must be considered by innovation and technology researchers and practitioners.

Acknowledgement

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Appendix A. The CSF Method

EP has established that the influence of generalised EPMs on decision-making produces evidence in many areas of research (Bolhuis *et al*., 2011). The Consilience via Semantic Field (CSF) method leverages this alongside research databases (Youngblood *et al*., 2021; Robledo *et al*., 2021) by taking advantage of discipline-specific but semantically related words used to describe behavioural phenomena (e.g., power and dominance, prestige and status) (Hedgecoe, 2003; Vasil *et al*., 2020). Potential EPMs are identified by first establishing the set of terms used by a discipline to describe a behaviour or decision influence. An iterative

search process is then used to expand the semantic field of terms to incorporate the unique labels used to describe the same or similar phenomenon in other disciplines. Generic terms share the same sememe, and thus semantic field, are also included (see Fig. A.1).

Bibliometric analysis is then used to objectively identify similar and connected behavioural phenomena and concepts and thus relevant research across those disciplines. Bibliometric analysis is a well-established method for identifying research on related subject matter (Boyack and Klavans, 2010; Small, 1974; Small and Grifith, 1974; Van Eck and Waltman, 2014; Zupic and Cater, 2015). Consistent behavioural phenomena or decision influences thus allow the identification of potential EPMs as the shared cause. These are then validated via the assembly of nomological network of evidence derived from the collective results generated by

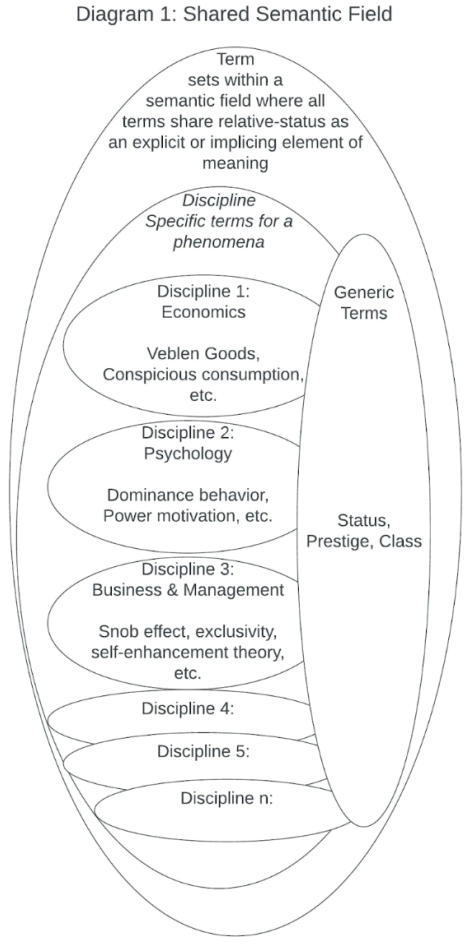

Fig. A.1. Examples of terms sets that share sememes and a semantic field.

the CSF method. Fig. A.2. below shows the summarised steps of the CSF method. Fig. A.3. shows the iterative nature of the CSF method applied across multiple disciplines in order to identify research containing semantically linked and potentially conceptually related papers on which to undertake bibliometrics analysis.

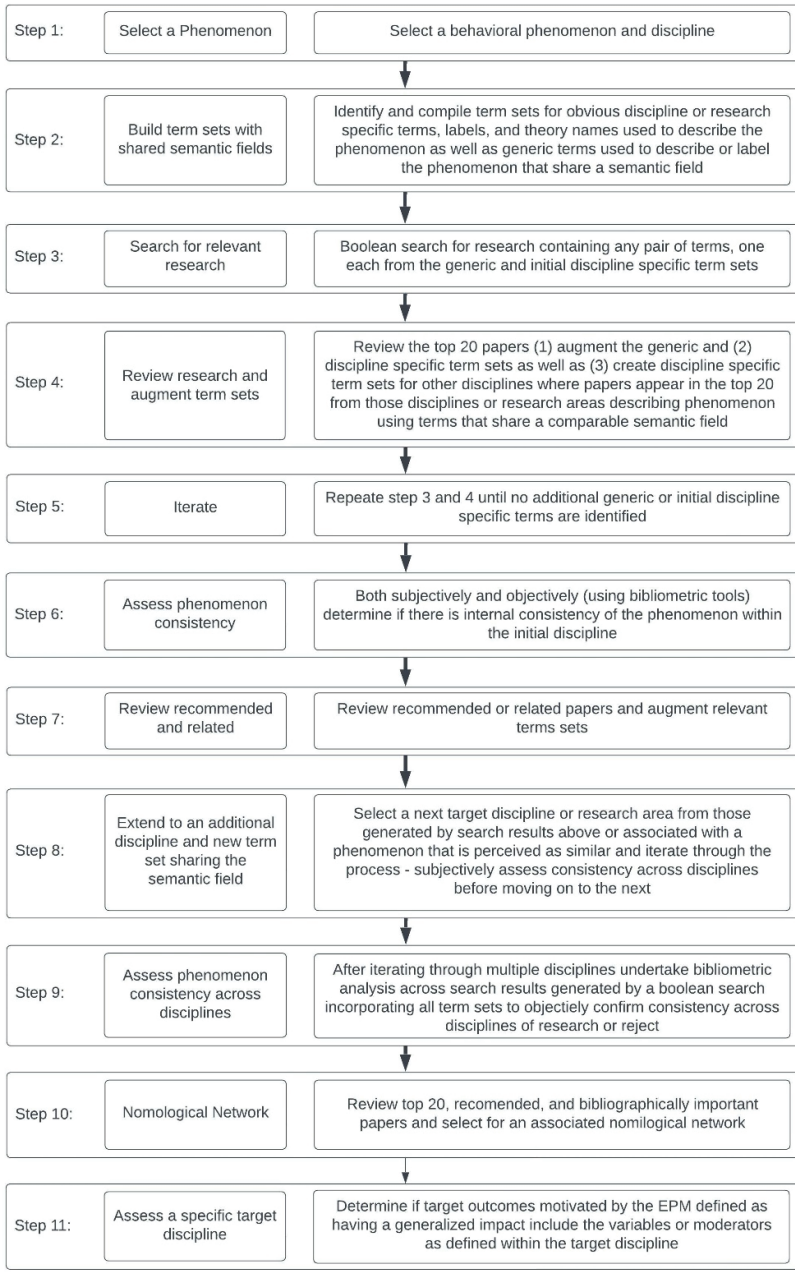

Fig. A.2. The steps of the consilience by semantic field method.

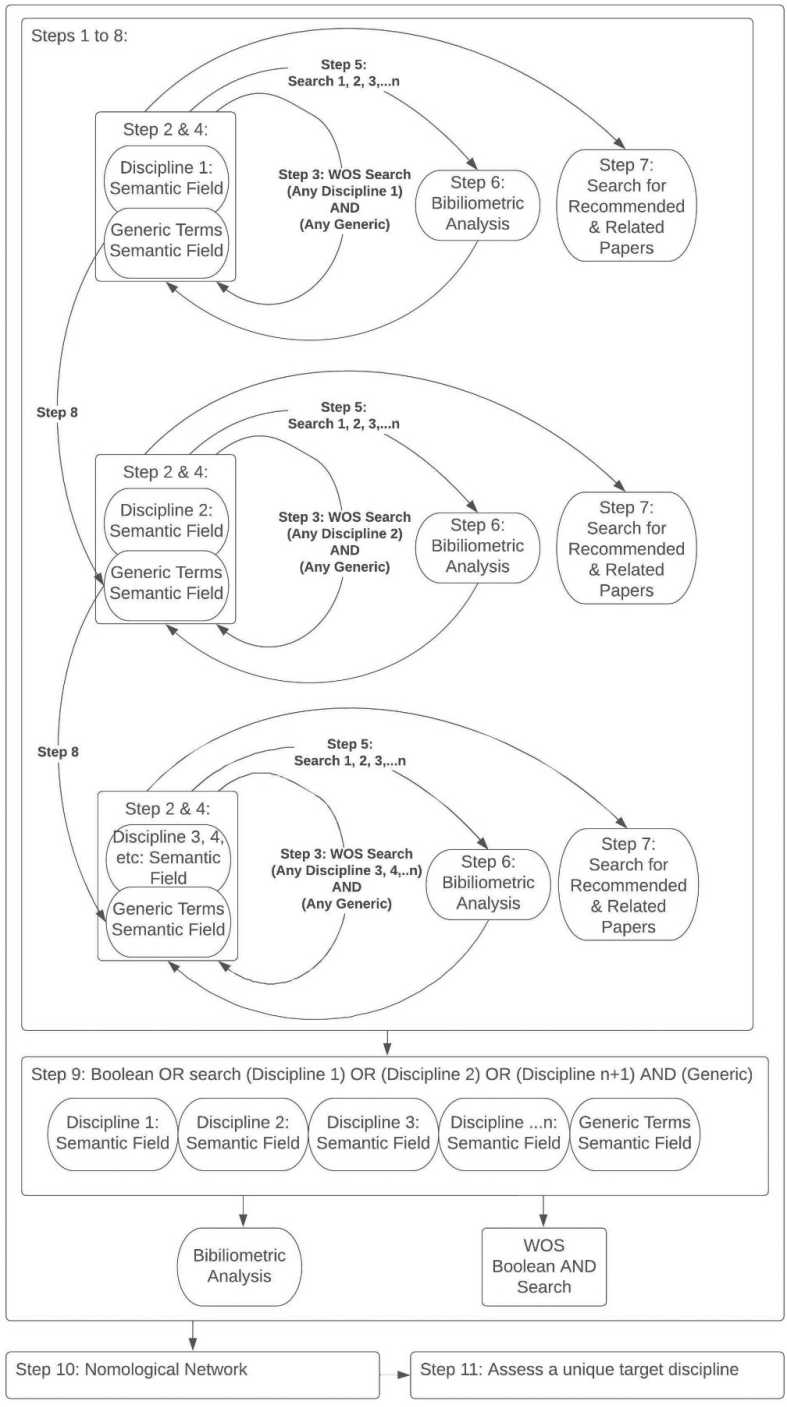

Fig. A.3. The iterative steps of the CSF method.

For this research, Web of Science (WOS) was used as the source of academic research. VOS Viewer was used for bibliometric analysis (Waltman *et al*., 2010).

The explicit step-by-step approach is as follows:

1. Select an initial observed behavioural phenomenon within a discipline (A).
2. Identify obvious associated descriptive labels, terms, and theory names used by discipline (A) that have a shared semantic field and establish an initial term set (A_1, A_2, A_3...A_n) as well as generic descriptive terms that share the semantic field (G_1, G_2, G_3...G_n).
3. Undertake a WOS Boolean search for "(A_1 OR A_2, A_3...A_n) AND (G_1 OR G_2, G_3...G_n)"
4. Rank the results by number of citations and review the top 20 to identify additional discipline-specific and generic terms or phrases to incorporate into A_n and G_n. For results in top 20 from other disciplines, create additional discipline-specific term sets for each discipline (B_1, B_2, B_3...B_n), (C_1, C_2, C_3...C_n), etc.
5. Repeat steps 3 and 4 using the incrementally larger term set until no new additional discipline-specific (A) terms are identified.
6. Determine the Internal Consistency of the behavioural phenomena or decision influence within discipline A.
   - 6.1. Using the WOS analysis tools, determine if the concept(s) represented by the semantic field terms and thus the behavioural phenomena within discipline A are:
     - 6.1.1. long-standing, a temporary fad, emergent, or an abandoned concept
     - 6.1.2. How widely accepted within the discipline
     - 6.1.3. How widely cited by papers in other research areas
   - 6.2. Review the top 20 papers to confirm all use the terms to refer to the same or sufficiently similar phenomena or concept.
   - 6.3. Identify papers from disparate years from within the discipline (A) search results. Select a highly cited early, middle, and recent paper and review to confirm the term(s) are used to refer to the same or sufficiently similar phenomena or concepts.
   - 6.4. Perform bibliometric analysis and co-citation analysis on the search result to obtain objective or independent confirmation of related subject matter and term usage.
7. For the top 20 results, perform a search for each individual article title using a data search service that returns related articles or makes recommendations for related reading. Alternately use Google, search for only select words from the article title such that the target article appears in the top 3 to 5 results but the search results also contain additional papers. Review these additional papers for relevance to the behavioural phenomena. This will provide further and

more holistic understanding of the discipline's perspective on the phenomena. Augment term sets appropriately.

8. Iterate the above based on a second, third, and so on target discipline (B) chosen from the list of research categories associated with the final A_n AND G_n search results. Using the last A_n AND G_n results as a basis, exclude papers outside the current target discipline or research category. Review the top papers and augment the list of words or phrases included in (B_1 OR B_2, B_3... B_n) and the generic term set if appropriate (G_1 OR G_2, G_3...G_n). Repeat steps 3 to 7 substituting the (B_1 OR B_2, B_3...B_n) for (A_1 OR A_2, A_3...A_n). In addition to reviewing search results to confirm the terms being used within the new discipline are used to refer to the same or sufficiently similar phenomena or concepts, also subjectively confirm B_n refers to sufficiently similar phenomena that an EPM could be responsible for both. Iterate step 8 for additional disciplines C, D, etc. until sufficient areas of research have been analysed to test consilience for an EPM-based theory.
9. Undertake bibliometric analysis of search results generated using the collection of discipline-specific term sets sharing a semantic field to validate or objective confirm relatedness of terms and concepts across disciplines:
   9.1. Perform a Boolean OR search for terms from all term sets ((((G_1 OR G_2, G_3,...G_n) AND ((A_1, OR A_2, A_3,...A_n) OR (B_1 OR B_2, B_3,...B_n)...OR (N_1 OR N_2, N_3,...N_n))). Complete bibliometric analysis of the results. Review prominent papers that link clusters as well as outlier papers to further determine or refute the behavioural phenomena is consistent across focus areas.
   9.2. Complete a Boolean AND search for terms from all term sets e.g., ((((G_1 OR G_2, G_3,...G_n) AND ((A_1 OR A_2, A_3...A_n) AND (B_1 OR B_2, B_3,...B_n)... AND (N_1 OR N_2, N_3,...N_n))) or a search requiring at least one term from each of at least three discipline-specific term sets. Review prominent papers and highly linked papers.
10. To validate or refute an EPM as the generalised cause or influence on decisions, build a nomological network of evidence from the assessed research or establish that one cannot be built from the collection of all reviewed papers. Based on the nomological network, confirm the EPM based theory offers consilience across disciplines and passes Eugene Fama's (1998) four-part test for replacing an old theory with a new.
11. Test an EPM as an explanation for variables or moderators in decisions for an arena not already reflected in the associated nomological network by cross-referencing the definitions of the variables and moderators identified by the target theory or body of research with those of the EPM-based motivations. Where not self-evident describing common phenomena (e.g., an extrinsic variable

representing a target outcome motivated by an EPM), an objective analysis can be achieved by applying the semantic field analysis generated earlier to the term definitions and key descriptive elements used by the theory-specific variable or moderator definitions with those used for the EPM. Further support *may* also be provided by including a domain of literature as a target discipline within the iterative steps defined above. It is important to note, however, that due to differences in describing motivations and extrinsic outcomes as variables semantic field analysis on individual terms alone by inclusion in the iterative process may be insufficient and thus an analysis of the definition of motivated outcomes to the extrinsic outcomes described as variables as described in step 11 may be required.

Appendix B. Nomological Networks of Evidence

Table B.1. Nomological networks of evidence with representative examples of identified research.

	EPM motivation to pursue relative status	EPM motivation to participate in gossip	ECT
Phylogenic or cross-species	Koyama and Aureli (2019) provide evidence of relative status hierarchy interactions amongst chimpanzees.	Whitehouse and Meurnier (2020) report that primates pay unique attention to and maintain an understanding of third-party friendships and events. Cheney (2011) discuss extensive literature regarding animal motivation in a variety social species to learn about other individuals' relationships, competitive abilities, and dominance ranks.	The collective phylogenic evidence for individual EPMs also represents phylogenic evidence for ECT. In addition, Boysen *et al*., (1996, 1999) establishes that some primates can override EPMs when abstract representation or symbols are used but are not able to do so when the desired outcome (food) is physically present. The ability to use abstraction emerges in humans at a specific stage in childhood development indicating the expression of the same trait. This provides phylogenic confirmation for the EPM motivated pursuit of the outcome, a trait that enables use of abstraction, and the EPM for reasoning.
Neuroscience	Beasley *et al*. (2012) and Zink *et al*. (2008) provide neurological evidence for Social Rank theory and the neural processing of social hierarchy in humans. Kumaran *et al*. (2012) discusses the different neurological structures associated with social vs. non-social hierarchies.	Peng *et al*. (2015) provide direct evidence for neurological regions associated with gossip. Wang *et al*. (2017) describe a specific neurological architecture for social knowledge retrieval. Le Hunte and Golembiewski (2014) provide a neurological framework for the imperative to tell and communicate stories.	Badcock *et al*. (2019a,b) propose the Hierarchical Mechanistic Mind theory of neurological functioning which describes the concurrent and interconnected functioning or neural modules. This conclusion is also supported by findings that multiple EPMs influence decisions concurrently (Griskevicius *et al*., 2006).

(*Continued*)

Table B.1. (*Continued*)

	EPM motivation to pursue relative status	EPM motivation to participate in gossip	ECT
Physiological, Genetic, or Evolutionary biology	Saad and Vongas (2009) provide evidence showing the effect of conspicuous consumption or status signalling on men's testosterone levels. Leongómez *et al*. (2017) show that status differences predict speaker's vocal characteristics.	Dunbar (1993) describes how the relative neocortical volume covaries with group size in non-human primates and predicts group size for modern human hunter-gatherers (Physiological / Morphological). Research shows that humans are irrationally trusting of strangers and normally operate on the presumption that the reputation of others is intact unless indicated by observation or gossip (Dunning *et al*, 2014). This builds on the consensus that the bulk of gossip is punitive or appropriately described as social aggression intended to cause reputational harm (Wert and Salovey, 2004). This makes the evolution of a concept of reputation, its storage, and the behaviour of gossip unique requirements and distinct from competition for relative status. Evidence supporting the existence of EPMs for lie detection and specifically assessing the veracity of gossip (Hess and Hagen, 2006) are consistent with a pre-existing EPM for gossip.	Garin *et al*. (2022) discuss a specific difference between primate and human neurology associated with the default mode network and self-directed thinking or choice. This difference represents an evolved trait that is part of what differentiates humans as a subspecies from other primates and is specifically consistent with ECT. The bell curve distribution of the expression of the EPM for status for all criteria and amongst all different populations found in (Buss *et al*., 2020) is consistent with the prediction of a "normal" distribution predicted for polygenic traits by genetic research.
Cross-culture	The pursuit of status is shown to produce irrational economic decisions contrary to RCT in a wide variety of studies. Conspicuous consumption is identified as a cultural universal (Leguizamon and Ross, 2012; van Den Bos *et al*. 2013; Wohlforth and Kang, 2009).	Gossip behaviours are observed and have been studied both across cultures and amongst hunter-gatherer cultures including the Ashanti of West Africa, the Ju Wasi of Kalahari, and others (Gluckman, 1963; Yang, 2013; Stirling, 1956; Dollard *et al*., 1950).	The collective EP research shows both EPM impact cross-culture and concurrent impacts of multiple EPMs cross-culture. This represents cross-culture evidence in support of ECT.
Other empirical	The pursuit or maintenance of status is identified as a primary influence on decisions in radically diverse areas supporting an EPM as a single effective explanation. Influence was found in (1) irrational or poor decision-making in the	McAndrew and Milenkovic (2002) establish consistent interest in gossip, a preference for information about similar others and exploitable information such as damaging or negative news regarding non-allies and positive news about allies. Mesoudi *et al*. (2006) show that humans	Abraham *et al*. (2013, 2016) as well as ECT's effectiveness in providing explanations for all moderators and variables identified in existing adoption, resistance, and absorption literature described in this paper.

Table B.1. (*Continued*)

	EPM motivation to pursue relative status	EPM motivation to participate in gossip	ECT
	military (Dixon and Dixon, 2011), (2) international relations (He and Feng, 2022; Wohlforth and Kang, 2009; Wohlforth, 2009; Wohlforth *et al*., 2018), political discontent (Petersen *et al*., 2021), and (3) as the motivation for moral grandstanding in public discourse (Grubbs *et al*., 2019).	have a preferential bias toward social information. Feinberg *et al*. (2012) conducted experiments establishing the role of prosocial motivations and negative affective reactions to unfair conditions to maintain reputational information. Studies have also established Gossip as a more effective method to spread information compared to random seeding and education (Banerjee *et al*., 2019; Kim *et al*., 2020). Gossip also plays a role in the workplace (Kurland and Pelled, 2000; Waddington, 2016), in relation to technology (Bertolotti, 2011; Okazaki *et al*., 2014), and as impacts consumer purchasing (Söderlund and Sagfossen, 2015; Goldsmith *et al*., 2012).	
Cross temporal	Cross-temporal evidence is provided by Twiss (2012) and McGuire and Hildebrandt (2005) which provide archaeological evidence from diverse cultures spanning millennia outlining the use of food and hunting to establish prestige and status.	Cross-temporal evidence is provided or cited by Foster (2004) and represented by Feeley and Frost (2014) as well as in Bilyeau's (2021) article "Bridgeton, Lady Whistledown, and the Secret History of High-Society Gossip".	The collective EP research has established EPM impact over time and represents equal support for ECT.
Modelling and Theoretical support	Gould (2002) provides a formal theory and mathematical modelling based on individual pursuit of status. The model successfully predicts the emergence of status hierarchies observed in empirical testing.	dos Santos and Wedekind (2015) and Feinberg *et al*. (2014) show support for gossip as an innate behaviour in concluding that cooperation in groups is unlikely to have evolved due to positive reinforcement or reciprocal altruism in isolation. Their modelling instead suggests that it was likely to evolve where reputation-based punishment and ostracism via gossip were present. A theoretical role for gossip and communication serving to "align individual's mental states with respect to events in the shared environment" is outlined by (Vasil *et al*., 2020).	

Appendix C—EPM Explanations for Existing Variables and Moderators

Table C.1. Constructs found in theories of adoption, resistance, and consideration of knowledge as well as the EPM(s) that explain why they have an impact on decision processes for both decisions that produce rational and irrational outcomes.

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
TAMS taken from Diffusion of Innovation, the Technology Acceptance Model 1, 2, and 3, and the Unified Theory of Adoption and Use of Technology 1 and 2 (Davis, 1989; Rogers, 1995; Venkatesh and Davis, 2000; Venkatesh et al., 2003; Venkatesh and Bala, 2008; Venkatesh et al., 2012)		
Perceived Ease of Use	TAMS	Default neurological functioning, Pursuit or defence of relative status, Competence or relative capability
Perceived Usefulness	TAMS	Default neurological functioning, Pursuit or defence of relative status, Competence or relative capability, Self-identity
Job Relevance	TAMS	Relative capability (competence)
Output quality	TAMS	Pursuit or defence of relative status
Results demonstrability	TAMS	Pursuit or defence of relative status
Performance expectancy	TAMS	Pursuit or defence of relative status
Price value	TAMS	Pursuit or defence of relative status
Effort expectancy	TAMS	Pursuit or defence of relative status, Competence or relative capability
Objective usability	TAMS	Pursuit or defence of relative status, Relative capability (competence)
Habit	TAMS	Default neurological functioning, Pursuit or defence of relative status, Self-identity
Self-efficacy / Perceived behavioural control	TAMS	Autonomy, Relative capability (competence)
System anxiety	TAMS	Relative capability (competence), Pursuit or defence of relative status
Facilitating conditions / Perception of external control	TAMS	Autonomy, Relative capability (competence)
System playfulness	TAMS	Play, Autonomy, Relative capability (competence)
Hedonic motivation	TAMS	Play, Autonomy, Relative capability (competence)

Table C.1. (*Continued*)

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
Perceived Enjoyment	TAMS	Play, Autonomy, Relative capability (competence)
Attitude toward	TAMS	Default neurological functioning, Pursuit or defence of relative status, Self-identity
Voluntariness	TAMS	Autonomy, Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Challenge avoidance
Personal Image	TAMS	Default neurological functioning, Self-identity
Social influence	TAMS	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Challenge avoidance
Subjective norms	TAMS	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Challenge avoidance
AIR barrier definitions taken from Joachim et al. (2018)		
Value barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Complexity barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Co-dependence barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Trialability barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Compatibility barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Amenability barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Realisation barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Visibility barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Communicability barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)

(*Continued*)

Table C.1. (*Continued*)

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
Functional risk barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Personal risk barrier	AIR	Self-preservation, Pursuit or defence of relative status, Relative capability (competence)
Economic risk barrier	AIR	Pursuit or defence of relative status, Relative capability (competence)
Social risk barrier	AIR	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Challenge avoidance
Information barrier	AIR	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Challenge avoidance, Default neurological functioning, Self-identity
Image barrier	AIR	Affiliation or relatedness, Avoidance of ostracism, Pursuit of relative status, Resistance to the loss of relative status, Challenge avoidance
Norm barrier	AIR	Affiliation or relatedness, Avoidance of ostracism, Pursuit of relative status, Resistance to the loss of relative status, Challenge avoidance
Usage barrier	AIR	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Challenge avoidance, Default neurological functioning, Self-identity
		Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Pursuit of relative status, Relative capability (competence), Challenge avoidance, Default neurological functioning, Self-identity

Table C.1. (*Continued*)

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
Psychological Technology Adoption Framework (P-TAF) taken from Roberts et al. (2021)		
Innovativeness—Personality	P-TAF	Novelty, Resistance to the loss of relative status, Pursuit of relative status, Relative capability (competence), Self-identity
Risk Aversion—Personality	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity
Personal Incentive—Motivation	P-TAF	Resistance to the loss of relative status, Pursuit of relative status, Relative capability (competence), Self-identity
Fear of Technology—Motivation	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Self-identity
Technology—Attitude	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity
Trust—Attitude	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status
Risk Perception—Cognitive Factor	P-TAF	Resistance to the loss of relative status, Self-identity
Technical Knowledge—Cognitive Factor	P-TAF	Resistance to the loss of relative status, Relative capability (competence), Self-identity
Perceptions of Certainty—Cognitive Factor	P-TAF	Resistance to the loss of relative status, Self-identity
Previous Experience—Cognitive Factor	P-TAF	Resistance to the loss of relative status, Self-identity
Social Influence—Social Cognition Factor	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Self-identity

(*Continued*)

Table C.1. (*Continued*)

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
Subjective Norms—Social Cognition Factor	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Self-identity
Leadership—Organisational Factor	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Self-identity
Collaboration Culture—Organisational Factor	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Self-identity
Technology Adoption Culture—Organisational Factor	P-TAF	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Self-identity
Open Innovation—taken from Bhimani et al. (2022)		
Perceived distance from 'self'	Disengagement due to MCD	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity
Forced compliance	Disengagement due to MCD	Autonomy, Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity
Knowledge sourcing and sharing challenge	Disengagement due to MCD	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity
Normative commitment	Disengagement due to MCD	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity

Table C.1. (*Continued*)

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
Managerial cognitive dissonance (MCD)	Disengagement due to MCD	Affiliation or relatedness, Avoidance of ostracism, Resistance to the loss of relative status, Relative capability (competence), Self-identity
Cognitive discrepancy reduction process	Disengagement due to MCD	Resistance to the loss of relative status, Relative capability (competence), Self-identity
Disengagement due to MCD		Resistance to the loss of relative status, Relative capability (competence), Self-identity
Absorptive Capacity—taken from Sjodin et al. (2018)		
Passion for technology (Motivation to assimilate)	Absorptive Capacity	Resistance to the loss of relative status, Relative capability (competence), Self-identity
Inner drive for development (Motivation to assimilate)	Absorptive Capacity	Resistance to the loss of relative status, Relative capability (competence), Self-identity
Problem solving opportunity (Motivation to assimilate)	Absorptive Capacity	Resistance to the loss of relative status, Relative capability (competence), Self-identity
Potential of obtaining personal rewards (Motivation to assimilate)	Absorptive Capacity	Resistance to the loss of relative status, Self-identity
Analysing technological potential (Evaluating feasibility)	Absorptive Capacity	Resistance to the loss of relative status
Appraising value of technology (Evaluating feasibility)	Absorptive Capacity	Resistance to the loss of relative status
Assessing challenges in technology integration (Evaluating feasibility)	Absorptive Capacity	Resistance to the loss of relative status
Showing customer value (Demonstrating business value)	Absorptive Capacity	Resistance to the loss of relative status
Communicating business potential of knowledge (Demonstrating business value)	Absorptive Capacity	Resistance to the loss of relative status
Assessing commercial viability (Demonstrating business value)	Absorptive Capacity	Resistance to the loss of relative status
Leveraging personal status (Ensuring legitimacy)	Absorptive Capacity	Pursuit or defence of relative status, Relative capability (competence)

(*Continued*)

Table C.1. (*Continued*)

Constructs (Moderators, themes, variables)	Theory or theory family	EPMs (including BPNs) (Note: The reasoning EPM is relevant to many but not listed for all.)
Aligning with other high-status individuals (Ensuring legitimacy)	Absorptive Capacity	Pursuit or defence of relative status, Relative capability (competence), Affiliation or relatedness, Avoidance of ostracism.
Using strong internal networks (Ensuring legitimacy)	Absorptive Capacity	Pursuit or defence of relative status, Affiliation or relatedness, Avoidance of ostracism.
Showing a solid track record (Ensuring legitimacy)	Absorptive Capacity	Resistance to the loss of relative status
IT Resistance taken from Lapointe and Rivard (2005)		
Loss of status	Resistance	Resistance to the loss of relative status
Power loss for a group or power gain for another group	Resistance	Resistance to the loss of relative status
Distress of inequity or loss of equity	Resistance	Resistance to the loss of relative status
Stress and fear	Resistance	Default neurological functioning, Pursuit or defence of relative status, Self-identity
Efficacy expectations, Outcome expectations	Resistance	Pursuit or defence of relative status

References

Abraham, C, MC Boudreau, I Junglas and R Watson (2013). Enriching our theoretical repertoire: The role of evolutionary psychology in technology acceptance. *European Journal of Information Systems*, 22(1), 56–75, https://doi.org/10.1057/ejis.2011.25.

Abraham, C, I Junglas, RT Watson and MC Boudreau (2016). Explaining the unexpected and continued use of an information system with the help of evolved evolutionary mechanisms. *Journal of the Association for Information Science and Technology*, 67(1), 212–231, https://doi.org/10.1002/asi.23344.

Acciarini, C, F Brunetta and P Boccardelli (2021). Cognitive biases and decision-making strategies in times of change: A systematic literature review. *Management Decision*, 59(3), 638–652, https://doi.org/10.1108/MD-07-2019-1006.

Ahn, D and DH Shin (2015). Differential effect of excitement versus contentment, and excitement versus relaxation: Examining the influence of positive affects on adoption of new technology with a Korean sample. *Computers in Human Behavior*, 50, 283–290, https://doi.org/10.1016/j.chb.2015.03.072.

Ahn, JM, T Minshall and L Mortara (2017). Understanding the human side of openness: The fit between open innovation modes and CEO characteristics. *R & D Management*, 47(5), 727–740, https://doi.org/10.1111/radm.12264.

Ajzen, I (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & Health* 26(9), 1113–1127, https://doi.org/10.1080/08870446.2011.613995.

Anderson, C, JAD Hildreth and L Howland (2015). Is the desire for status a fundamental human motive? A review of the empirical literature. *Psychological Bulletin*, 141(3), 574–601, https://psycnet.apa.org/doi/10.1037/a0038781.

Aunger, R, D Foster and V Curtis (2021). Psychometric analysis of a postulated set of evolved human motives. *Frontiers in Psychology*, 12, article 680229, https://dx.doi.org/10.3389%2Ffpsyg.2021.680229.

Badcock, PB (2012). Evolutionary systems theory: A unifying meta-theory of psychological science. *Review of General Psychology*, 16(1), 10–23.

Badcock, P.B., Friston, K.J., Ramstead, M.J., (2019a). The hierarchically mechanistic mind: a free-energy formulation of the human psyche. *Physics of Life Reviews* 31, 104–121. https://doi.org/10.1016/j.plrev.2018.10.002.

Badcock, P.B., Friston, K.J., Ramstead, M.J., Ploeger, A., Hohwy, J., (2019b). The hierarchically mechanistic mind: an evolutionary systems theory of the human brain, cognition, and behavior. Cognitive, Affective, & Behavioral Neuroscience 19 (6), 1319–1351. https://doi.org/10.3758/s13415-019-00721-3.

Bagheri, L and M Milyavskaya (2019). Novelty–variety as a candidate basic psychological need: New evidence across three studies. *Motivation and Emotion*, 44(1), 32–53.

Banerjee, A, AG Chandrasekhar, E Duflo and MO Jackson (2019). Using gossips to spread information: Theory and evidence from two randomised controlled trials. *The Review of Economic Studies*, 86(6), 2453–2490.

Beasley, M, D Sabatinelli and E Obasi (2012). Neuroimaging evidence for social rank theory. *Frontiers in Human Neuroscience*, 6, 123.

Bertolotti, T., (2011). Facebook has it: The irresistible violence of social cognition in the age of social networking. *International Journal of Technoethics*, 2(4), 71–83.

Bez, SM and H Chesbrough (2020). Barriers in searching for alternative business models: An essay on the fear of looking foolish. In *Business models and cognition*. Emerald Publishing Limited.

Bhimani, H, AL Mention and D Salampasis (2022). Disengagement in open innovation: A cognitive perspective. *British Journal of Management*. doi:10.1111/1467-8551.12594.

Bilyeau, N (2021). Bridgeton, Lady Whistledown, and the Secret History of High-Society Gossip. Town and Country. Available at https://www.townandcountrymag.com/leisure/arts-and-culture/a34908967/bridgerton-lady-whistledown-gossip-scandal-sheets-history/. Accessed on 1 January 2021.

Bogers, M, NJ Foss and J Lyngsie (2018). The "human side" of open innovation: The role of employee diversity in firm-level openness. *Research Policy*, 47(1), 218–231, https://doi.org/10.1016/j.respol.2017.10.012.

Bolhuis, J. J., Brown, G. R., Richardson, R. C., & Laland, K. N. (2011). Darwin in mind: New opportunities for evolutionary psychology. *PLoS Biology*, 9(7), e1001109–e1001109. https://doi.org/10.1371/journal.pbio.1001109

Boudon, R (1998). Limitations of rational choice theory. *American Journal of Sociology*, 104(3), 817–828. https://doi.org/10.1086/210087.

Boyack, KW and R Klavans (2010). Co-citation analysis, bibliographic coupling, and direct citation: Which citation approach represents the research front most accurately? *Journal of the American Society for information Science and Technology*, 61(12), 2389–2404.

Boysen ST, GG Berntson, MB Hannan and JT Cacioppo (1996). Quantity-Based Interference and Symbolic Representations in Chimpanzees (Pan troglodytes). *Journal of Experimental Psychology. Animal Behavior Processes*, 22(1), 76–86, https://doi.org/10.1037/0097-7403.22.1.76.

Boysen ST, KL Mukobi and GG Berntson (1999). Overcoming response bias using symbolic representations of number by chimpanzees (Pan troglodytes). *Learning & Behavior*, 27(2), 229.

Brase, GL (2014). Behavioral science integration: A practical framework of multi-level converging evidence for behavioral science theories. *New Ideas in Psychology*, 33, 8–20, https://doi.org/10.1016/j.newideapsych.2013.11.001.

Buss, DM, PK Durkee, TK Shackelford, BF Bowdle, DP Schmitt, GL Brase, JC Choe, L Trofimova (2020). Human status criteria: Sex differences and similarities across 14 nations. *Journal of Personality and Social Psychology*, 119(5), 979–998, https://psycnet.apa.org/doi/10.1037/pspa0000206.

Capra, CM, PH Rubin (2011). Rationality and utility: Economics and evolutionary psychology. In *Evolutionary Psychology in the Business Sciences*. G. Saad (Ed.), pp. 319–338. Springer.

Cheng, JT, JL Tracy, T Foulsham, A Kingstone and J Henrich (2013). Two ways to the top: Evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *Journal of Personality and Social Psychology*, 104(1), 103–125, https://doi.org/10.1037/a0030398.

Cheney, DL (2011). Extent and limits of cooperation in animals. *Proceedings of the National Academy of Sciences*, 108(supplement 2), 10902–10909.

Claudy, MC, R Garcia, A O'Driscoll (2015). Consumer resistance to innovation: A behavioral reasoning perspective. *Journal of the Academy of Marketing Science*, 43(4), 528–544, https://doi.org/10.1007/s11747-014-0399-0.

Cooper, RG, (2019). The drivers of success in new-product development. *Industrial Marketing Management*, 76, 36–47, https://doi.org/10.1016/j.indmarman.2018.07.005.

Confer, JC, JA Easton, DS Fleischman, CD Goetz, DM Lewis, C Perilloux and DM Buss (2010). Evolutionary psychology: Controversies, questions, prospects, and limitations. *American Psychologist*, 65(2), 110.

Davis, FD (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13, 319–340, https://doi.org/10.2307/249008.

Dixon, M and NF Dixon (2011). *On the Psychology of Military Incompetence*. Random House.

dos Santos, M and C Wedekind (2015). Reputation based on punishment rather than generosity allows for evolution of cooperation in sizable groups. *Evolution and Human Behavior*, 36(1), 59–64.

Dubouloz, S, R Bocquet, C Equey Balzli, E Gardet and R Gandia (2021). SMEs' Open Innovation: Applying a Barrier Approach. *California Management Review*, 64(1), 113–137, https://doi.org/10.1177/00081256211052679.

Dunbar, RI (1993). Coevolution of neocortical size, group size and language in humans. *Behavioral and Brain Sciences*, 16(4), 681–694.

Dunning, D, JE Anderson, T Schlösser, D Ehlebracht and D Fetchenhauer (2014). Trust at zero acquaintance: More a matter of respect than expectation of reward. *Journal of Personality and Social Psychology*, 107(1), 122.

Engelsberger, A, B Halvorsen, J Cavanagh and T Bartram (2022). Human resources management and open innovation: The role of open innovation mindset. *Asia Pacific Journal of Human Resources*, 60(1), 194–215, https://doi.org/10.1111/1744-7941.12281.

Feeley, K and J Frost (2014). *When Private Talk Goes Public: Gossip in American History*. Springer.

Feinberg, M, R Willer, J Stellar and D Keltner (2012). The virtues of gossip: Reputational information sharing as prosocial behavior. *Journal of Personality and Social Psychology*, 102(5), 1015.

Feinberg, M, R Willer and M Schultz (2014). Gossip and ostracism promote cooperation in groups. *Psychological Science*, 25(3), 656–664.

Foka-Kavalieraki, Y, AN Hatzis (2011). Rational after all: Toward an improved theory of rationality in economics. *Revue de philosophie économique*, 12(1), 3–51, https://doi.org/10.3917/rpec.121.0003.

Foster, EK (2004). Research on gossip: Taxonomy, methods, and future directions. *Review of General Psychology*, 8(2), 78–99.

Garin, CM, Y Hori, S Everling, CT Whitlow, FJ Calabro, B Luna, M Froesel, M Gacoin, SB Hamed, M Dhenain and C Constantinidis (2022). An evolutionary gap in primate default mode network organisation. *Cell Reports*, 39(2), 110669.

Ghasemzadeh, K, G Bortoluzzi and Z Yordanova (2022). Collaborating with users to innovate: A systematic literature review. *Technovation*, 116, 102487, https://doi.org/10.1016/j.technovation.2022.102487.

Gigerenzer, G (1991). How to make cognitive illusions disappear: Beyond "heuristics and biases". *European Review of Social Psychology*, 2(1), 83–115.

Gigerenzer, G (2016). Towards a rational theory of heuristics. In *Minds, Models and Milieux*, pp. 34–59. London: Palgrave Macmillan.

Gigerenzer, G (2018). The bias bias in behavioral economics. *Review of Behavioral Economics*, 5(3–4), 303–336.

Gino, F (2017). The rise of behavioral economics and its influence on organisations. Harvard Business Review, 2–4. Retrieved March 9, 2022, from https://hbr.org/2017/10/the-rise-of-behavioral-economics-and-its-influence-on-organizations.

Gluckman, M (1963). Papers in honor of Melville J. Herskovits: Gossip and scandal. *Current Anthropology*, 4(3), 307–316.

Goldsmith, RE, LR Flynn and RA Clark (2012). Motivators of market mavenism in the retail environment. *Journal of Retailing and Consumer Services*, 19(4), 390–397.

Gould, RV (2002). The origins of status hierarchies: A formal theory and empirical test. *American Journal of Sociology*, 107(5), 1143–1178.

Griskevicius, V, NJ Goldstein, CR Mortensen, RB Cialdini, DT Kenrick (2006). Going along versus going alone: When fundamental motives facilitate strategic (non)conformity. *Journal of Personality and Social Psychology*, 91(2), 281–294, https://psycnet.apa.org/doi/10.1037/0022-3514.91.2.281.

Griskevicius, V, JM Ackerman, BVD Bergh and YJ Li (2011). Fundamental motives and business decisions. In *Evolutionary Psychology in the Business Sciences*, pp. 17–40. Berlin, Heidelberg: Springer.

Griskevicius, V, DT Kenrick (2013). Fundamental motives: How evolutionary needs influence consumer behavior. *Journal of Consumer Psychology* 23(3), 372–386, https://doi.org/10.1016/j.jcps.2013.03.003.

Grubbs JB, B Warmke, J Tosi, AS James and WK Campbell (2019). Moral grandstanding in public discourse: Status-seeking motives as a potential explanatory mechanism in predicting conflict. *PloS One*, 14(10), e0223749–e0223749, https://doi.org/10.1371/journal.pone.0223749.

Hannen, J, D Antons, F Piller, TO Salge, T Coltman and TM Devinney (2019). Containing the Not-Invented-Here Syndrome in external knowledge absorption and open innovation: The role of indirect countermeasures. *Research Policy*, 48(9), 103822, https://doi.org/10.1016/j.respol.2019.103822.

He and H Feng (2022). Role status and status-saving behaviour in world politics: The ASEAN case. *International Affairs (London)*, 98(2), 363–381, https://doi.org/10.1093/ia/iiab232.

Hedgecoe, AM (2003). Terminology and the construction of scientific disciplines: The case of pharmacogenomics. *Science, Technology, & Human Values*, 28(4), pp.513–537.

Hess, NH and EH Hagen (2006). Psychological adaptations for assessing gossip veracity. *Human Nature*, 17(3), pp.337–354.

Joachim, V., Spieth, P., & Heidenreich, S. (2018). Active innovation resistance: An empirical study on functional and psychological barriers to innovation adoption in different contexts. *Industrial Marketing Management*, 71, 95–107. https://doi.org/10.1016/j.indmarman.2017.12.011

Kahneman, D (2011). *Thinking, Fast and Slow*. Macmillan.

Kahneman, D and A Tversky (2013). Prospect theory: An analysis of decision under risk. In *Handbook of the Fundamentals of Financial Decision Making*: *Part I*, pp. 99–127. World Scientific.

Katz, R and T Allen (1982). Investigating the Not Invented Here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R&D project groups. *R&D Management*, 12(1), 7–20.

Kenrick, DT, V Griskevicius, JM Sundie, NP Li, YJ Li and SL Neuberg (2009). Deep rationality: The evolutionary economics of decision making. *Social Cognition*, 27(5), 764–785, https://doi.org/10.1521/soco.2009.27.5.764.

Kenrick, DT, V Griskevicius, SL Neuberg and M Schaller (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations. *Perspectives on Psychological Science*, 5(3), 292–314.

Kim, DK, KK Kee and JW Dearing (2020). Applying the communication theory of Diffusion of Innovations to economic sciences: A response to the 'Using gossips to spread information' experiments conducted by the 2019 Nobel Laureates. *Journal of Applied Communication Research*, 48(2), 157–165.

Kock, F, A Josiassen and AG Assaf (2019a). The xenophobic tourist. *Annals of Tourism Research*, 74, 155–166.

Kock, F, A Josiassen, AG Assaf, I Karpen and F Farrelly (2019b). Tourism ethnocentrism and its effects on tourist and resident behavior. *Journal of Travel Research*, 58(3), 427–439.

Kock, F, A Nørfelt, A Josiassen, AG Assaf and MG Tsionas (2020). Understanding the COVID-19 tourist psyche: The evolutionary tourism paradigm. *Annals of Tourism Research*, 85, 1–13.

Koyama, NF and F Aureli (2019). Social network changes during space restriction in zoo chimpanzees. *Primates*, 60(3), 203–211.

Kurland, NB and LH Pelled (2000). Passing the word: Toward a model of gossip and power in the workplace. *Academy of Management Review*, 25(2), 428–438.

Kwon and EA Silva (2020). Mapping the landscape of behavioral theories: Systematic literature review. *Journal of Planning Literature*, 35(2), 161–179, https://doi.org/10.1177/0885412219881135.

Kumaran, D, HL Melo and E Duzel (2012). The emergence and representation of knowledge about social and nonsocial hierarchies. *Neuron*, 76(3), 653–666.

Lee, Y, KA Kozar, K Larsen (2003). The technology acceptance model: Past, present, and future. *Communications of the Association for Information Systems*, 12(50), 752–780, https://aisel.aisnet.org/cgi/viewcontent.cgi?article=3217&context=cais.

Leguizamon, SJ and JM Ross (2012). Revealed preference for relative status: Evidence from the housing market. *Journal of Housing Economics*, 21(1), 55–65.

Le Hunte, B., & Golembiewski, J. (2014). Stories have the power to save us: A neurological framework for the imperative to tell stories. *Arts and Social Sciences Journal*, 5, 73–77. doi:10.4172/2151-6200.1000073.

Lendowski, E, A Oldeweme and G Schewe (2022). Drivers of innovation performance and firm performance: Examining the inter-relationship of risk-taking, risk management and open innovation. *International Journal of Innovation Management*, 26(2), https://doi.org/10.1142/S1363919622500153.

Leongómez, JD, VR Mileva, AC Little and SC Roberts (2017). Perceived differences in social status between speaker and listener affect the speaker's vocal characteristics. *PloS one*, 12(6), e0179407.

Li, YJ, DT Kenrick, V Griskevicius and SL Neuberg (2012). Economic decision biases and fundamental motivations: How mating and self-protection alter loss aversion. *Journal of Personality and Social Psychology*, 102(3), 550–561, https://doi.org/10.1037/a0025844.

Makkonen, H, WJ Johnston and R Javalgi (Raj) G., (2016). A behavioral approach to organisational innovation adoption. *Journal of Business Research*, 69(7), 2480–2489, https://doi.org/10.1016/j.jbusres.2016.02.017.

Małecka. M (2020). The normative decision theory in economics: A philosophy of science perspective. The case of the expected utility theory. *The Journal of Economic Methodology*, 27(1), 36–50, https://doi.org/10.1080/1350178X.2019.1640891.

Maruping, LM, H Bala, V Venkatesh, SA Brown (2017). Going beyond intention: Integrating behavioural expectation into the unified theory of acceptance and use of technology. *Journal of the Association for Information Science and Technology*, 68(3), 623–637, https://doi.org/10.1002/asi.23699.

Marzi, G, M Fakhar Manesh, A Caputo, MM Pellegrini and B Vlačić (2022). Do or do not. Cognitive configurations affecting open innovation adoption in SMEs. *Technovation*, 102585, https://doi.org/10.1016/j.technovation.2022.102585.

McAndrew, FT and MA Milenkovic (2002). Of tabloids and family secrets: The evolutionary psychology of gossip 1. *Journal of Applied Social Psychology*, 32(5), 1064–1082.

McGuire, K. R., & Hildebrandt, W. R. (2005). Re-Thinking Great Basin Foragers: Prestige Hunting and Costly Signaling during the Middle Archaic Period. *American Antiquity*, 70(4), 695–712. https://doi.org/10.2307/40035870.

McPhetres, J, N Albayrak-Aydemir, A Barbosa Mendes, EC Chow, P Gonzalez-Marquez, E Loukras, A Maus, A O'Mahony, C Pomareda, MA Primbs and SL Sackman (2021). A decade of theory as reflected in Psychological Science (2009–2019). *PloS one*, 16(3), e0247986.

Mercier, H and D Sperber (2011). Why do humans reason? Arguments for an argumentative theory. *Behavioral and Brain Sciences*, 34(2), 57–74.

Mercier, H and D Sperber (2017). *The Enigma of Reason*. Harvard University Press.

Mesoudi, A, A Whiten and R Dunbar (2006). A bias for social information in human cultural transmission. *British Journal of Psychology*, 97(3), 405–423.

Niu, H-J (2022). From Inner to Outer: Exploring the R&D Employee Innovative Behaviro in High-Tech Industry. *International Journal of Innovation Management*, 26(2), https://doi.org/10.1142/S136391962250013X.

Nørfelt, AW, F Kock, A Josiassen (2020). Tourism Xenophilia: Examining Attraction to Foreignness. *Journal of Travel Research*, 59(8), 1386–1401, https://doi.org/10.1177/0047287519883037.

Okazaki, S, N Rubio and S Campo (2014). Gossiping behavior on social networking sites: Does gender matter? *International Journal of Human-Computer Interaction*, 30(9), 718–726.

Peng, X, Y Li, P Wang, L Mo and Q Chen (2015). The ugly truth: Negative gossip about celebrities and positive gossip about self entertain people in different ways. *Social Neuroscience*, 10(3), 320–336.

Petersen, MB, M Osmundsen and A Bor (2021). Beyond Populism: The Psychology of Status-Seeking and Extreme Political Discontent. In *The Psychology of Populism*, pp. 62–80. Routledge.

Power, DJ, D Cyphert and RM Roth (2019). Analytics, bias, and evidence: The quest for rational decision making. *Journal of Decision Systems*, 28(2), 120–137, https://doi.org/10.1080/12460125.2019.1623534.

Roberts, R, R Flin, D Millar and L Corradi (2021). Psychological factors influencing technology adoption: A case study from the oil and gas industry. *Technovation*, 102, 102219.

Robledo, S., Grisales Aguirre, A. M., Hughes, M., & Eggers, F. (2021). "Hasta la vista, baby" — will machine learning terminate human literature reviews in entrepreneurship? *Journal of Small Business Management*, ahead-of-print(ahead-of-print), 1–30. https://doi.org/10.1080/00472778.2021.1955125.

Rogers, E (1995). *Diffusion of Innovations*, New York: Free Press.

Ryan, RM and EL Deci (2019). Brick by brick: The origins, development, and future of self-determination theory. In *Advances in Motivation Science*, Vol. 6, pp. 111–156. Elsevier.

Saad, G (2017). On the method of evolutionary psychology and its applicability to consumer research. *Journal of Marketing Research*, 54 (3), 464–477, https://doi.org/10.1509%2Fjmr.14.0645.

Saad, G. (2020). Building a Global Database of Nomological Networks of Cumulative Evidence. *Evolutionary Behavioral Sciences*, 14(4), 368–372. https://doi.org/10.1037/ebs0000223.

Saad, G and JG Vongas (2009). The effect of conspicuous consumption on men's testosterone levels. *Organisational Behavior and Human Decision Processes*, 110(2), 80–92.

Schaller, M, DT Kenrick, R Neel and SL Neuberg (2017). Evolution and human motivation: A fundamental motives framework. *Social and Personality Psychology Compass*, 11(6), e12319.

Schmitt, DP and JJ Pilcher (2004). Evaluating evidence of psychological adaptation: How do we know one when we see one? *Psychological Science*, 15(10), 643–649.

Small, H (1974). Co-citation in scientific literature-new measure of relationship between 2 documents. *Current Contents*, 7, 7–10.

Small, H and BC Griffith (1974). The structure of scientific literatures I: Identifying and graphing specialties. *Science Studies*, 4(1), 17–40.

Söderlund, M and S Sagfossen (2015). The consumer experience and the absorbing story. *Nordic Journal of Business*, 64(2), 103–118.

Stirling, RB (1956). Some psychological mechanisms operative in gossip. *Social Forces*, 34(3), 262–267, https://doi.org/10.2307/2574050.

Stock, RM, P Oliveira and E von Hippel (2015). Impacts of hedonic and utilitarian user motives on the innovativeness of user-developed solutions. *The Journal of Product Innovation Management*, 32(3), 389–403, https://doi.org/10.1111/jpim.12201.

Stroh, T (2018). *A Deeper Truth: The New Science of Innovation, Human Choice, and Societal Scale Behavior*. Wilde Griffen Publishing.

Sund, KJ, RJ Galavan and M Bogers (2020). Exploring the connections between business models and cognition: A commentary. In *Business Models and Cognition*. Emerald Publishing Limited.

Sundie, JM, DT Kenrick, V Griskevicius, JM Tybur, KD Vohs and DJ Beal (2011). Peacocks, Porsches, and Thorstein Veblen: Conspicuous consumption as a sexual signaling system. *Journal of Personality and Social Psychology*, 100(4), 664.

Sutcliff, M, R Narsalay, A Sen (2019). "The Two Big Reasons That Digital Transformations Fail." Harvard Business Review online. Available at https://hbr.org/2019/10/the-two-big-reasons-that-digital-transformations-fail. Accessed on 1 May 2020.

Taylor, J. E. (2018). Following the Drum: Motivation to Engage and Resist. In V. Wang (Eds.), Handbook of Research on Program Development and Assessment Methodologies in K-20 Education (pp. 244-274). IGI Global. https://doi.org/10.4018/978-1-5225-3132-6.ch012.

Tidd, J and J Bessant (2018). Innovation Management Challenges: From Fads to Fundamentals. *International Journal of Innovation Management*, 22(5), 1840007. https://doi.org/10.1142/S1363919618400078.

Tidd, J and J Bessant (2020). *Managing Innovation: Integrating Technological, Market and Organisational Change*. Third Edition. John Wiley & Sons.

Timming, AR (2019). Evolutionary psychological theory and human resource management. In *Elgar Introduction to Theories of Human Resources and Employment Relations*. Edward Elgar Publishing.

Twiss, K (2012). The archaeology of food and social diversity. *Journal of Archaeological Research*, 20(4), 357–395.

Tversky, A and D Kahneman (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science*, 185(4157), 1124–1131.

Van den Bos, W, P Golka, D Effelsberg and S McClure (2013). Pyrrhic victories: The need for social status drives costly competitive behavior. *Frontiers in Neuroscience*, 7, 189.

Van der Panne, G, C Van Beers and A Kleinknecht (2003). Success and failure of innovation: A literature review. *International Journal of Innovation Management*, 7(03), 309–338.

Van Eck, NJ and L Waltman (2014). Visualising bibliometric networks. In *Measuring Scholarly Impact*, pp. 285–320. Cham: Springer.

Van Oorschot, JA, E Hofman, JL Halman (2018). A bibliometric review of the innovation adoption literature. *Technological Forecasting and Social Change* 134, 1–21, https://doi.org/10.1016/j.techfore.2018.04.032.

Vasil, J, PB Badcock, A Constant, K Friston and MJ Ramstead (2020). A world unto itself: Human communication as active inference. *Frontiers in Psychology*, 11, 417.

Vansteenkiste, Ryan, RM and B Soenens (2020). Basic psychological need theory: Advancements, critical themes, and future directions. *Motivation and Emotion*, 44(1), 1–31, https://doi.org/10.1007/s11031-019-09818-1.

Venkatesh, V and H Bala (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273–315.

Venkatesh, V and F Davis (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186–204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh V, JY Thong and X Xu (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157–178.

Verweij, M, TJ Senior, DJF Dom nguez and R Turner (2015). Emotion, rationality, and decision-making: How to link affective and social neuroscience with social theory. *Frontiers in Neuroscience*, 9, 332.

von Hippel, E (2001). Innovation by user communities: Learning from Open-Source Software. *MIT Sloan Management Review*, 42(4), 82.

Waddington, K (2016). Rethinking gossip and scandal in healthcare organisations. *Journal of Health Organisation and Management*, 30(6), 810–817. https://doi.org/10.1108/JHOM-03-2016-0053.

Waltman, L, NJ Van Eck and EC Noyons (2010). A unified approach to mapping and clustering of bibliometric networks. *Journal of Informetrics*, 4(4), 629–635.

Wang, Collins, JA, J Koski, T Nugiel, A Metoki and IR Olson (2017). Dynamic neural architecture for social knowledge retrieval. *Proceedings of the National Academy of Sciences*, 114(16), E3305–E3314, https://doi.org/10.1073/pnas.1621234114.

Watve, M (2017). Social behavioural epistemology and the scientific community. *Journal of Genetics*, 96, 525–533, https://doi.org/10.1007/s12041-017-0790-y.

Wert and P Salovey (2004). A social comparison account of gossip. *Review of General Psychology*, 8(2), 122–137, https://doi.org/10.1037/1089-2680.8.2.122.

Whitehouse, J and H Meunier (2020). An understanding of third-party friendships in a tolerant macaque. *Scientific Reports*, 10(1), 1–11.

Wohlforth, WC (2009). Unipolarity, status competition, and great power war. *World Politics*, 61, 28.

Wohlforth, WC, B De Carvalho, H Leira and IB Neumann (2018). Moral authority and status in International Relations: Good states and the social dimension of status seeking. *Review of International Studies*, 44(3), 526–546.

Wohlforth, WC and DC Kang (2009). Hypothesis on status competition. Prepared for the 2009 Annual Meeting of the American Political Science Association, Toronto, Canada.

Yang, C (2013). Telling Tales at Work: An Evolutionary Explanation. *Business Communication Quarterly*, 76(2), 132–154, https://doi.org/10.1177/1080569913480023.

Youngblood, M, K Baraghith and PE Savage (2021). Phylogenetic reconstruction of the cultural evolution of electronic music via dynamic community detection (1975–1999). *Evolution and Human Behavior*, 42(6), 573–582.

Zink, CF, Y Tong, Q Chen, DS Bassett, JL Stein and A Meyer-Lindenberg (2008). Know your place: Neural processing of social hierarchy in humans. *Neuron*, 58(2), 273–283.

Zupic, I and T Čater (2015). Bibliometric methods in management and organisation. *Organisational Research Methods*, 18(3), 429–472.