

RESEARCH PAPER

From the myth of Prometheus to strategic resilience: two cognitive paradigms linking risk and innovation

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We argue that cognition linking risk to innovation is influenced by two distinct cognitive paradigms which have deep roots in personality and culture and are closely bound up with political identity. We differentiate between a paradigm of Promethean conservatism where innovation is perceived as threatening, and a paradigm of 'Strategic Resilience', where the status quo is perceived as threatening and innovation is perceived to reduce this threat. We find an evidence base for these paradigms in the personality psychology literature, which shows a strong tendency for psychometric measures of risk and innovation to correlate positively with each other and negatively with measures of conservatism and authoritarianism. We develop four theoretical elaborations from this greatly underutilised evidence base: (1) we seem to possess powerful 'implicit personality theories' (IPTs) which conflate the risk taker with the innovator; (2) these IPTs lead us to evaluate risk-taking innovation either positively or negatively; (3) these evaluations also manifest the positions we adopt, as we undertake identity work, along the rich and complex personological and cultural continuum that contrasts risk-averse conservatism with liberal radicalism; and (4) this highly political self-positioning carries multiple implications for how we identify and evaluate risk within the context of organisational innovation.

Introduction

The terms 'risk' and 'innovation' are regularly – and often uncritically – juxtaposed within business and management rhetoric. Google searches for 'risk and innovation' are likely to produce around 11 million hits.¹ One reason why we think about risk and innovation together is that riskiness and innovativeness co-apply as descriptive properties for many strategic and managerial actions involving change or novelty. Yet we cannot assume direct covariance in quantities of riskiness and innovativeness whenever these terms are drawn together to describe actions. Highly innovative action may be conceived as carrying very low risk; for example, where there is good reason to suppose it will be effective in achieving its objective, or where the actor has guarded against any possible loss which it might precipitate. Risky action need not be innovative at all; for example where it involves the perpetuation of some old practice which is becoming dangerously maladaptive to the times. Innovative actions can also have complex effects upon actors' overall risk exposures. As well as creating new risks, innovations can increase or mitigate old risks, sometimes modifying overall risk exposures in ways not easily anticipated. The practical implication arising from all this is that we should resist naive assumptions regarding where organisational risk

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is situated in relation to organisational innovation. For risk to be managed effectively within the context of organisational innovation, it should be clear that: (1) innovations can vary considerably in their inherent riskiness with respect to their objectives; (2) risks can increase both with innovation and with failure to innovate; and (3) the effects of innovations upon overall risk exposures may be very mixed. Put simply, organisational innovation can create, increase, reduce and eliminate organisational risk.

This paper argues that: (1) we sometimes fail to think comprehensively along these lines because our thought at the interface of risk and innovation is easily influenced by cognitive paradigms which lead us to emphasise innovation *either* as a source of risk *or* as a means to reduce risk; (2) these paradigms can exert a powerful influence upon our thoughts because they derive from our faculty of person cognition, and more fundamentally from important personological and cultural influences upon that faculty; and (3) our overuse of these paradigms within general cognition, wherever there are cognitive challenges relating to both risk and innovation, manifests our general tendency to overuse person cognition within general cognition.

This paper is structured around six sections, commencing with this introduction. In the second section of the paper, we suggest that risk and innovation are not internally related through any necessary functional relationship. This provides a springboard for our central argument: we ourselves impose connectedness, owing to the situatedness of thought within cognitive paradigms. The third and fourth sections outline two such paradigms which correspond roughly to conservative and liberal ways of thinking about risk in relation to innovation. We label our conservative paradigm one of 'Promethean conservatism' in particular. To be clear, the Greek myth of Prometheus is usually taken to signify not a conservative mindset at all, but rather a liberal – and even revolutionary, rebellious and unrepentant – passion for innovation in the teeth of resistance from established authority. However, we feel the myth is sufficiently rich to allow different meanings to emerge to suit different purposes. Our purpose is to use it to understand better conservative mind and cultural understanding. Hence we view the myth as richly signifying a dread of innovation, rooted in suspicion of human nature, which is both a hallmark of a conservative worldview and is richly embedded within Western and Christian culture. Our reading of the myth will not contest conventional liberal interpretations of what it means to be Promethean, but we will contend that our cognitive paradigm of Promethean conservatism situates conservative dread of risk and innovation within a valuable psychological and cultural context. We then label our liberal paradigm the 'strategic resilience' paradigm because it emphasises the dread of *failure* to innovate which increasingly informs the modern business worldview, and which also reflects liberal dissatisfaction with the *status quo*. To link risk to innovation in the strategic resilience paradigm, then, is to regard firms as having to cultivate strategic resilience through ceaseless innovation if they wish to survive and prosper. At the end of this section we clarify our normative purpose, which is to emphasise that both paradigms provide valuable insight and should be considered when managing risk within the context of organisational innovation. In the fifth section of the paper, we establish a theoretical framework for our empirical evidence base which demonstrates that these paradigms are real. In our conclusion, we argue that, of our two paradigms, Promethean conservatism is likely to exert the stronger influence upon thought. We conclude that organisations should reflect carefully upon how its overuse might bring adverse consequences.

Risk and innovation differentiated

Risk usually means threat, yet it increasingly means threat or opportunity (Ward, 2005, p.39). Risks always exist within the gulf between present reality and some possible future (Ben-Ari and Or-Chen, 2009). Irrespective of whether we mean threat or opportunity, risk is always a function of uncertainty (Knight, 1921) and it is always something that matters because it holds loss or gain implications for someone (Murray-Webster and Hillson, 2007). Innovation also comes in different forms. Its more common forms include product innovation, process innovation, and innovative solutions to dilemmas (McKeown, 2008; Baregheh *et al.*, 2009). Irrespective of form, innovation always refers to novel human productivity. Innovation arises usually (but not necessarily) from a prior sequence of creative imagination leading to invention (Amabile, 1996). It is always a function of change (usually progressive or forwards change rather than sideways or backwards change) and as such it always varies with the contrast struck against the old and the familiar (Tushman and Anderson, 2004). Risk and innovation, then, are wholly unrelated concepts. Risk refers to a range of properties associated with possibility. Innovation refers to a range of properties associated with novel action. To say that innovation is not inherently any more risky than its absence is obviously true. At least this sentence makes sense, because actions can have possibility properties which contextualise them. The converse idea that risk is not inherently any more innovative than its absence, on the other hand, does not make sense at all. That sentence commits a category error because possibilities cannot have action properties. To be clear, even opportunity and innovation imply nothing whatsoever about each other. We may encounter opportunities both to innovate and to avoid innovation. To conclude therefore, if we think about risk and innovation together, it is not because these two concepts are internally linked.

Risk and innovation in the paradigm of Promethean conservatism

We decided to label our first paradigm one of ‘Promethean conservatism’, rather than one of ‘conservatism’ in general, to capitalise on much of the richness of meaning that the Prometheus myth has signified down the ages within Western culture, particularly within classic literary works whose enduring fame and popularity attest to their status as powerful cultural signifiers. Either label would have sufficed to convey the basic idea that within this paradigm the mind evaluates innovation as risky. However, the myth of Prometheus has particular mnemonic value because it brings together a number of fundamental cultural themes and in so doing leads us to reflect more upon why, and in what contexts, we might harness our cultural understandings to regard innovation as posing unacceptable risk.

Let us be clear that the myth of Prometheus is widely understood to represent a liberal rather than conservative disposition towards innovation. Our discussion will clarify the liberal reading *en route* to interpreting the myth as a powerful allegory for how the conservative mind experiences risk and innovation. According to the myths of Hesiod and Aeschylus (see Dougherty, 2006), the Titan Prometheus, whose name meant ‘forethought’, stole the creative element of fire from Olympus and gifted it to men so that they might have a unique nature separate from animals.² Prometheus then showed men how to use fire, and to think ahead to what they might achieve with it. The core symbolism of Prometheus’ gift, then, was that sovereignty of human mind over human action began when forethought appeared within consciousness. Once in place, the history of human creation, and indeed of human self-creation, could

commence. When we consider how the myth has been received throughout history, we see that Prometheus' fire has become broadly equated with the human spirit that carries creativity forward into purposeful action (just as innovation emerges from creativity and invention). Fire has become the human spirit which builds, creates, competes, acquires and dominates, transforming both nature and itself through technology, science, farming, industry, organisation etc. Hence we are well acquainted with Prometheus the innovator. As Loehle (1992) puts it, modern day technological innovators who dare to challenge conventional wisdom and authority in their ambition to progress their new inventions are just like 'Prometheus the Innovator' because they embody the Promethean flame in its creative aspect.

Of course, fire also has its destructive aspect, and the Prometheus myth has been widely used to reference the idea that a dualism of creation and destruction is forever present within human innovation. Many critics of technology (perhaps most famously Mary Shelley) and mechanised warfare (perhaps most famously Jules Verne) have harnessed the myth to convey the warning that our drive to create, change and grow easily leads us to destroy, and to be destroyed. Many writers have followed Goethe by drawing together the myths of Prometheus and Faust to warn of reckless ambition (Wutrich, 1995), or have cited Milton's recreation of Prometheus within Satan in *Paradise Lost* to explore pride. Today, many environmentalists, and critics of globalisation or genetic technology, follow in the footsteps of writers such as William Blake and Percy Bysshe Shelly, who used the Prometheus myth to explore destructiveness within industrialisation and the misery created within what Blake famously called its dark satanic mills (Lewis, 1992). Millions continue to find meaning in the Promethean misanthropy of Jonathan Swift's *Gulliver's Travels*, which explores the myopic abuse of power by those who would go to war to settle such a trivial matter as the correct way to open a boiled egg. Of course, the life of Robert Oppenheimer, labelled by recent biographers as the 'American Prometheus' (Bird and Sherwin, 2005), illustrates rather more grimly than Gulliver's treatment at the hands of the fictional Lilliputians, the moral turmoil and misgiving that can result when science is pressed into the service of government and military power.

All of these perspectives refer back to the dualism of fire, which we suggest is fundamental to the Promethean paradigm, and whose persistence as an important influence upon our cultural understanding emerges often within classic literature and its Hollywood representations. Each perspective emphasises that innovation brings risk. Each comes closest to the myth where it cites the universal human nature that acts upon the world and is transformed by the world as the ultimate reason for this. Each also displays a literary or poetic imagination which relies upon a particular kind of reductionist understanding: all technological, scientific, and industrial innovation is treated as a manifestation of human spirit, considerable for the extent to which it bears both creation and destruction in accordance with its nature. This reductionist understanding itself constitutes an important and enduring cultural theme which we suggest should be considered part of the Promethean paradigm. Perhaps its most famous and influential manifestation has been the Hegelian reading of history as a *bildungsroman* of spirit which has profoundly influenced Western philosophy and politics in the twentieth century (Hyppolite, 1979).

If we are condemned by our restless and acquisitive natures to produce risk, and we also possess the gift of forethought, then we are condemned to worry. The Promethean myth emphasises this tragedy of the human condition in the strongest symbolic terms. And it is here that we begin to see Prometheus not just as an 'innovator',

but as a suffering Christ figure who is both spectator of, and participant in, the human story he has set in motion. Prometheus' punishment for going too far in enabling humanity to shape its own destiny, free from the controlling influence of the gods, was to be chained to a rock in eternity (a symbol of endless dread), and to have his liver eaten each day by a bird of prey (a symbol of the endless testing and depletion of courage). We suggest that the object of dread here is not simply the punishment arranged by Zeus; rather it is the destructive fire. As Grene (1940) put it, Prometheus thus becomes a symbol for the suffering of man, and more fully, for the suffering of the creator to atone for the sins of man. Of course, this Christianisation of meaning has profound implications for the myth's power over consciousness. However, we suggest that Prometheus' binding and torture simultaneously provides an effective metaphor for how the conservative mind experiences the unfolding human story of risk and innovation. If we are to view the Prometheus myth as providing a valuable perspective from which we can theorise anxiety, fear or dread, in relation to organisational risk and innovation, then we must consider what it means to possess conservative sensibilities in a business world where the *status quo* is rarely a lasting option, and where inevitable changes are both fast-paced and often likely to produce failure. We suggest that the conservative mind, forced to participate in the long human story of creation and destruction, is Promethean in its suffering. Loehle (1992) understands Prometheus' daily torture by the bird of prey as finding its modern day parallel in the technological innovator who faces many obstacles which test their courage. He interprets Prometheus' refusal to repent as affirming that the innovator must be a determined rebel. However, we suggest, with reference to the literature that has grown around the myth, that the full power of the Prometheus bound metaphor emerges only when we consider how the conservative, who takes a grim view of human nature, yet is nonetheless condemned to be swept along by its works, must, as it were, suffer.

From this perspective, the configuration of conservative attitudes towards human nature, innovation, risk and dread suggested by the allegory of the bound Prometheus, provides a rich mnemonic for business and management academics and practitioners concerned with the relationship between risk and innovation. It seems reasonable to expect this to exert a powerful hold on our thoughts, especially where these thoughts move towards realistic or misanthropic views of human nature, and especially where, perhaps subliminally, we consider innovation our hubris and risk our nemesis.

If we are to set this paradigm of Promethean conservatism firmly within a modern organisational context where it can be seen to have more specific value, it is worth considering how it translates into a particular view of corporate governance. If organisational innovation is viewed as risky for reasons that ultimately relate back to human nature, then it makes sense to frame the principal objectives of corporate governance as being to curb abuses of power rather than to create corporate value through cooperative activity between key governance players. Our decision to label our paradigm one of Promethean conservatism rather than simply of conservatism in general, was made partly in view of the fact that in political theory the fundamental concern to correct for frailties of human nature by curbing power through the use of rules, checks and balances has been emphasised as both a conservative and a liberal theme. Minogue (1996) called it 'conservative realism'; Shklar (1998) called it the 'liberalism of fear'. Both, however, are essentially Promethean positions which illustrate the richness of thought, concerning the need for checks and balances in all types of organisation, which can be produced within the paradigm of Promethean conservatism.

Risk and innovation in the strategic resilience paradigm

In our second paradigm, the mind links risk and innovation by evaluating failure to innovate as risky. This reflects the modern liberal business mindset which perceives the *status quo* as never remaining an option for long. Brown and Eisenhardt (1998) represent this position in their influential suggestion that strategic decision makers should ‘manage on the edge of chaos’. They suggest that strategic concern to reduce or overcome risk and uncertainty should be replaced with a superior concern to ensure that strategic repositioning always preserves a large measure of risk and uncertainty within the competitor environment, thus adding urgency and dynamism to the endless struggle for competitive advantage.

Arguably the emergence of this mindset helps explain why, in recent decades, risk and innovation have co-emerged to take centre stage within the lexicon of management theory and practice, slowly displacing the old conservative themes of order, structure, stability and continuity. Arguably this also helps explain why common usages of the word ‘risk’ have evolved to include both threat and opportunity, leading to the current state of best practice within the risk management profession where practitioners are advised to follow the same techniques and processes to manage opportunity as they would to manage threat.³ In a high velocity business world where survival and prosperity require capacity to innovate and change, risk and innovation are inevitably closely bound. We must innovate and change to deal with the risks we face; we create new risks every time we innovate. Hence risk management is necessarily cyclical. The more risk and innovation precipitate one another, the more convenient it becomes to use these terms as substitution instances for each other. In modern business rhetoric, to say ‘we need to take more risks’ or ‘we need to increase our risk appetite’ or ‘we need to innovate more’ is to convey exactly the same meaning with alternative wordings. And it is to communicate within the strategic resilience paradigm.

Some management literature draws attention to a resilience gap where business environments have become volatile much faster than businesses have cultivated strategic resilience (Hamel and Valikangas, 2003). An important implication is that there is a plain need for business to focus less on risks produced by innovation and more on risks associated with failure to innovate. To recast this point in the language of our paper, businesses need to prise themselves free from linking risk and innovation within the Promethean conservative paradigm. To increase their odds of surviving and prospering, they may need to link risk and innovation more within the strategic resilience paradigm. We suggest, nonetheless, that *both* paradigms are important if organisational innovation is to be risk managed, because when both operate together, they provide complementary insights likely to establish a much richer context for risk identification.

Cognitive paradigms: IPTs rooted within personality and culture

Here we explain what we mean when we suggest that thought concerning risk and innovation can be situated within a cognitive paradigm. Our discussion provides a theoretical framework for the evidence base that follows. To begin, we might say that a cognitive paradigm corresponds to a general mental template through which we produce cognition. However, here we will be concerned with templates used for person cognition in particular. These are sometimes called ‘lay personality theories’ (Bruner and Taguiri, 1954), but are now more commonly called ‘implicit personality theories’ (IPTs). Essentially they comprise our assumptions concerning both how and

why mental attributes combine, for both self and others. A simple risk and innovation IPT might assume that risk takers also tend to be innovators (the how IPT dimension) because of an underlying competitiveness or entrepreneurial dynamism (the why IPT dimension).

However, IPTs can be much more complex than this. They may comprise broader or looser trait constellations, and the explanatory assumptions they make about these constellations may develop towards elaborate theoretical supposition. Hence IPTs can sometimes be domain specific (Reich and Ray, 2006); or they might root themselves within culture (Guthrie and Bennett, 1971). Our two basic Promethean conservative and strategic resilience paradigms are of the latter nature because they bear distinct cultural hallmarks. They have at their core mental templates used for person cognition, yet what is really important about them is that they sink deep roots into psychologies and cultures of conservatism and liberalism.

We have no wish to oversimplify here. As George Kelly (1955) argued, these personal constructs are often highly individualised. We reinforce or disassemble them, depending upon their explanatory and predictive value as suggested by individual – and not necessarily shared – cultural experience. We also vary in how flexibly we apply IPTs. From childhood onwards, some of us are entity theorists who regard personality as highly permanent, and use IPTs rigidly to make long term social judgments about others; others are incremental theorists whose IPTs are more adaptable (Erdley and Dweck, 1993).

IPT literature has concerned itself with both personality and character traits. Traits are descriptive terms which refer to consistency in our thoughts, emotions and behaviours across diverse situations (Allport, 1937). Character traits are personality traits whose meanings contain some element of moral evaluation (Kupperman, 1991). Crucially, IPT processes include evaluations which link into the processes by which we gain and regulate identity (Wegner and Vallacher, 1981). Hence, for example, in the branch of IPT theory which considers how we attribute traits to leader roles (called ‘implicit leadership theory’), it is argued that leadership identity is widely linked through our IPTs to masculine traits. This means women find it harder both to develop leader identities and to have their identities accepted when they become leaders (Ayman and Korabik, 2010).

One founding contribution to IPT theory was a study by Edward Thorndike (1920). This proposed a halo effect whereby we tend to evaluate others as possessing either largely positive or largely negative character traits. Later, Solomon Asch (1946) provided us with a much richer understanding of the mental processes involved in IPT formation and maintenance. He described a highly organised and efficient mental process characterised by holistic impression formation where each trait both becomes a property of, and represents, the entire person. Subsequently, it has been emphasised that IPTs consist not just of trait associations, but also of simplifying, integrative or holistic thoughts or assumptions concerning *why* traits cluster (Sedikides and Anderson, 1994).

Hence our IPTs do not operate in isolation from other cognitive processes. Rather they are things that can lead us to link our evaluations of risk-taking innovators to those evaluative frameworks through which we undertake our identity work. Positive evaluations of risk-taking innovators will support the self-regulatory work of liberal identity, which looks towards the ego ideal or positive role model represented by liberal personality, and which aggresses against or moves away from the perceived bad example set by conservative personality; similarly, negative evaluations of risk-taking

innovators will support the self-regulatory work of conservative identity as it moves in the opposite direction. IPT theory suggests that all such identity work will oversimplify and employ stereotypy.

This notion that we rely on IPTs for our identity work hinges upon our use of the same IPTs to evaluate both self and others. IPT literature is clear that this happens. As Bem's (1972) theory of self perception established, we perceive ourselves observationally as we perceive others, based on similar assumptions and stocks of knowledge. This happens because our faculty of social cognition strains towards integration to increase mental economy (Beer and Ochsner, 2006). We also know that tendencies towards simplification and holism are relatively weak for self cognition and more pronounced for cognition of unfamiliar others (Beer and Watson, 2008). There also seems to be an acquaintance effect where we more accurately rate the personalities of those we know well (Biesanz *et al.*, 2007). IPTs, therefore, have free reign in their rawest forms when used to make sense of persons and behaviours within distal and unfamiliar social environments. For example, they have a very powerful influence on interpersonal impression formation across cyberspace (Goldstein, 1998).

Accordingly, Schneider's (1973) review of the IPT literature shows how, from Thorndike's classic (1920) study onwards, it has been noticed that perceptions of trait relationships in others exaggerate trait relationships revealed by self-report psychometric instruments. More recently, Beer and Watson (2008) have observed that research based on the five factor model of personality has shown the Big Five model to be supported by very different types of personality judgment, including self ratings, peer ratings, ratings within different cultures, and even ratings of traits across different animal species. Perhaps the most interesting thing about this line of research is that it shows that psychometric evidence can have validity in allowing us to map the fundamental assumptions we make about trait relationships, for ourselves, for familiar others, for unfamiliar others, and even for cats and dogs. Hence, psychometric studies can provide a rich evidence base which allows us to explore whether we really do possess IPTs which heap positive or negative evaluations onto risk-taking innovators.

We need to be a little clearer about the assumptions we make when we suggest this. IPTs comprise: (1) assumptions about trait clusters; and (2) evaluative positions with respect to these clusters. IPT theory suggests that if we believe levels of risk taking and innovativeness will tend to vary directly in others, then we will assume similar covariance for ourselves. It also suggests that we engage in evaluative processes, closely integrated with our identity work, where we take positions along risk and innovation continua by indicating our preferred levels of risk taking and innovation both for ourselves and for others. We regard Likert-formatted psychometric data as tapping both these assumptions (1) and these evaluative positions (2). Furthermore, we regard the tendency towards holism within IPTs as manifesting within the simplifying patterns that give psychometric findings their validities.

This latter assumption helps explain one of the basic riddles and sources of ongoing disagreement within risk psychology: whether risk taking corresponds to a general individual difference (see Dahlbäck, 1990). Some general individual difference, involving a tendency either to move towards or away from risky situations, across different life domains, has long been noted (Knowles *et al.*, 1973). Some research has linked this to willingness to engage in high-risk criminality (Dahlbäck, 1995) and to general or problem gambling (Mishra *et al.*, 2010). Some have constructed arguments for this individual difference which emphasise the statistical co-occurrences of these

and other forms of risky behaviour, such as delinquency, sexual promiscuity and dangerous driving (Mishra and Lalumière, 2009). Sceptics, however, follow Mischel's (1968) classic critique of trait theory by emphasising the variability and situational specificity of risk behaviour. Correspondingly, many have tried to produce a more finely grained risk psychology. Some have refined more specific individual difference constructs such as financial risk tolerance (Grable, 2000). Others have considered influences of loss or gain framing effects on risk-taking behaviour (Highhouse and Yüce, 1996). Yet another critical perspective seeks to move risk research away from the lower order risk preferences represented by a general individual difference, towards more sophisticated higher order risk preferences based on the Thomistic virtues of prudence, fortitude and temperance, which are thought to better reflect complexity within risk preference (Kimball, 1990; Eeckhoudt and Schlesinger, 2006).

One obvious approach to resolving these *pro* and *contra* perspectives is to argue that general risk propensity influences behaviour only to the extent that situations afford opportunities for trait expression and engage principles of trait activation (Tett and Guterman, 2000). However, here we suggest that IPT theory yields further insight. Tendencies towards simplification and holism within our IPTs help explain why, on the one hand, many trait measures of general risk propensity should prove reliable and valid, and yet, on the other hand, actual risk behaviour should display much greater variability and contextual dependence. IPT theory, as discussed above, suggests that whenever we complete individual difference questionnaires, we are articulating those simplifying holistic assumptions which comprise our IPTs. Whenever we answer batteries of questions comprising multiple measures, which allow researchers to undertake correlational studies, we are articulating how our IPTs situate traits within clusters, both for ourselves and for others. And as we take positions along each Likert scale we tick, essentially what we are doing is engaging those evaluative components of our IPTs that connect to our identity work.

It follows from these assumptions that all we need do to supply an evidence base for our two basic cognitive paradigms connecting risk and innovation is locate a cluster within psychometric space which sets risk and innovation within some broader trait constellation. The next section confirms that such a cluster does exist. Its implications for how we think about both risk and innovation have gone unrecognised for decades.

Our evidence base

This subsection considers how studies have consistently situated individual difference measures of risk and innovation within psychometric space. It also looks at explanatory theories for this cluster. We will make two different kinds of assumption, based on arguments in the preceding section. Firstly, psychometric trait configurations will be presented as providing valid evidence for IPT configurations. Secondly, and more speculatively, theoretical perspectives which allow us to make sense of these trait configurations will be represented as corresponding, to some very limited extent at least, to those explanatory theories and evaluative positions which also comprise our IPTs. In making this second point, we can at best only assume a highly imperfect symmetry between the two. What we can accomplish more effectively here is to highlight some of the most relevant theoretical issues. Specifically, we will consider theory which helps us understand how our risk-innovation IPTs may be rooted within culture and modified by shared experience. What we will see is that the positions we take along

risk and innovation continua are subject to temporary shifts, on shared social and cultural levels, towards conservative disdain of risk and innovation. This seems to happen whenever our shared exposures to social threat – for example, economic depression or military confrontation – are raised. The significance of this phenomenon within our analysis is that it adds weight to our suggestion that risk and innovation IPTs must be theorised as mental templates that integrate within personality and culture, and which are malleable under the influence of broad patterns of personological and cultural change.

Marshall (2007) meta-reviews and adds to psychometric evidence which has accumulated over decades to show: (1) individual difference measures of risk and innovation cluster tightly and inversely with measures of conservatism and authoritarianism; and (2) we move towards conservative–authoritarian positions (characterised by negative evaluation of risk and innovation) when we encounter social threat. We take this as the basic evidence framework from which we differentiate our conservative and liberal risk and innovation paradigms.

The evidence provided below seeks to confirm, firstly, that psychological conservatism and authoritarianism make negative evaluations of risk and innovation. We interpret this evidence as providing us with a psychological and cultural foundation for our Promethean conservative paradigm, whose power to influence thought we theorise as varying with level of social threat. Secondly, it follows from this same evidence that psychological liberalism makes positive evaluations of risk and innovation. We interpret this evidence as supplying the psychological and cultural foundation for our strategic resilience paradigm.

Psychometric conservatism is based on work by Glenn Wilson (1973), whose analysis of conservative attitude syndrome argues that conservative attitudes towards such diverse matters as religion, rules, punitiveness, militarism, convention, anti-hedonism, minorities, and superstition, are linked by a generalised fear of uncertainty underpinned by feelings of insecurity and inferiority. For Wilson, underlying feelings of insecurity have multiple and diverse origins including parental coldness, punitiveness and rigidity. Psychometric authoritarianism runs close to this, in terms of both its trait components and its explanatory theory. This literature has its roots in Adorno *et al.*'s (1950) classic study of authoritarian personality. This monumental work theorised nine trait components of authoritarianism which would later overlap considerably with the attitudinal dimensions which Wilson attributed to conservatism. Their psychoanalytic perspective led them to focus their explanation of authoritarian personality towards psychodynamic conflict produced by harsh parenting. Although this early effort to develop psychometric authoritarianism failed, Altemeyer (1981) was able to revive the idea by developing his right wing authoritarianism (RWA) scale. The RWA's dimensional structure is based on just three of Adorno *et al.*'s nine dimensions: conventionalism, aggression and submission. The Wilson–Patterson (1970) C scale and RWA now have rich and closely intertwined psychometric histories. Hundreds of studies using either or both scales suggest they intercorrelate very strongly and share criterion validities against a range of further well established measures (e.g. Thornhill and Fincher, 2007). Several studies emphasise that RWA and C are linked by a fear of, and resistance to, change (Jost *et al.*, 2003).

Various measures of general risk preference and propensity have been found to correlate with both RWA and C. Marvin Zuckerman's (1994) sensation-seeking scale (SSS) is perhaps the most widely used of these measures, although other prominent measures which follow this general pattern relate to impulsivity (e.g. Eysenck *et al.*,

1985) and self control (e.g. Marcus, 2003). SSS has been associated strongly and negatively with both authoritarianism (Kish and Donnenwerth, 1972) and C (Kish *et al.*, 1973). This makes sense in view of Zuckerman's (1994, p.155) observation that low sensation seekers are 'just cautious and conservative with a preference for a world that is safe and secure'. Further insight into the link between conservatism–authoritarianism and risk comes from Lambert *et al.*'s (1999) finding that high RWA scorers perceive risks as more serious because of their tendency to see the world in threatening terms. Literature on authoritarianism continues to stress that RWA involves heightened perception of social threat (see Stenner, 2005).

Zuckerman's sensation seekers are distinguished by low levels of anxiety when confronted with novelty. They score highly on measures of openness to experience (Zuckerman, 1994; Garcia *et al.*, 2005), which we can take here as representing innovativeness, noting in particular its very close relationship to creative skill (Silva, 2008). Many studies also link conservatism–authoritarianism to innovation aversion. Bart and Bart (2006) find that low openness to experience directly and powerfully influences RWA. Dollinger (2007) reports openness to experience, and scores on a creative behaviour inventory, as strongly and inversely correlating with C.

Jost *et al.* (2003) explore and interrelate many of these themes to conclude that political conservatism arises from motivated social cognition. They describe this motivation as a concern with the management of fear, uncertainty and threat, manifest within the following psychological predictors of political conservatism: death anxiety ($r=0.50$), system instability (0.47), dogmatism–intolerance of ambiguity (0.34), openness to experience (-0.32), uncertainty tolerance (-0.27), needs for order, structure and closure (0.26), integrative complexity (-0.20) and fear of threat or loss (0.18). Such evidence does much to suggest that an IPT which interweaves the themes of risk and innovation may well exist, finding widespread use for cognition of persons along the conservative–liberal political spectrum, and thus facilitating our political identity work.

Lastly, we can focus more squarely upon explanatory theories for this psychometric pattern. From the foregoing it would appear that there is a thematically simple denominator: uncertainty and threat aversion. Arguably, thematic simplicity helps qualify this denominator as a strong contributor to the theoretical-explanatory component of our IPT linking risk to innovation. In other words, negative evaluations of risk and innovation, made from conservative positions, will probably rest upon theories that emphasise threats arising from risk and innovation. The argument grows when we consider evidence showing that conservatism and authoritarianism intensify, alongside negative evaluations of risk and innovation, with increasing exposure to social threat. Conservatism–authoritarianism is not just a highly permanent set of traits, attitudes and cognitions; it is also something that intensifies and weakens in many people, even in non-conservative individuals, depending on the levels of crisis or threat they encounter in their lives. Katz (1992) reported that levels of C temporarily increased within both Jewish and Arab populations during the first Gulf War. Duckitt and Fisher (2003) cite similar studies suggesting that authoritarianism intensifies with increasing social threat. Here the role of superstitious or magical belief, which has commonly been attributed to both conservative and authoritarian personality, becomes explicable in terms of its function. Several studies (e.g. Keinan, 1994; Dudley, 1999) suggest that such beliefs intensify under threatening circumstances because they preserve the illusion of control within highly uncontrollable circumstances. This protects personality against a slide into learned helplessness.

Risk and innovation also seem to follow this pattern. In the case of risk, Highhouse and Yüce (1996) link risk aversion to threat, even taking into account Kahneman and Tversky's (1979) prospect theory. They found, in line with prospect theory, that when study subjects were placed in loss-making situations, they perceived additional risk taking as opportunity rather than threat; however, when these same decision scenarios were framed in terms of opportunity and threat, risk aversion was greatest for threat-framed problems. Hence, they reported their findings as consistent with many previous studies arguing that where risk taking is associated with threat of loss, risk aversion increases. Similar studies inversely relate innovation to threat. Of course, threat can spur innovations which reduce threat. Nonetheless, we know that political crisis precipitates temporary drops in the integrative complexity of the thoughts of those affected (Simonton, 1990, p.675). In the business world, top management teams become less creative when problems are framed as threat, and more creative when problems are framed as opportunity (Dewett, 2004).

This section has sketched out an evidence framework within which it can reasonably be argued that, depending on where we position ourselves along all of the relevant individual difference continua, we will tend to think about risk and innovation from within either of our two basic cognitive paradigms. However, one vital link in our argument remains. We have rooted our Promethean conservative and strategic resilience paradigms in IPTs whose main purpose is to understand and evaluate persons (i.e. risk-taking innovators or risk-averse conservatives). Next we argue that these IPTs can exert more general influence over how we produce cognition for organisational risk and innovation.

Psychological and sociological cognition

We define psychological cognition as cognition of self and specific others within interpersonal contexts. Sociological cognition then corresponds to cognition of social phenomena involving participation of numerous others across distal social contexts, which are not easily explained by the intentions of specific persons. Hence, cognition of a risk-averse colleague in the same office requires psychological cognition; cognition of a risk-averse organisational culture, or indeed of most organisational risk, will probably require a strong element of sociological cognition; cognition of a corporate strategy driven by a powerful and risk-averse CEO whom we have never met, will probably involve a blend of both forms of cognition. Below we suggest that we often overuse psychological cognition to produce sociological cognition. Taking this approach, we establish that our risk and innovation IPTs are likely to influence general cognition of risk and innovation.

Perhaps the most appropriate way to differentiate between psychological and sociological cognition of risk is to use dual process theory. Slovic *et al.*'s (2004) discussion of this follows Epstein's (1994) differentiation between experiential and rational cognitive systems. They argue that we must consider how the very different modes of thinking of both systems interact to produce risk cognition. They distinguish between risk as feelings and risk as analysis. The experiential system experiences risk; the rational system analyses it. They present Epstein's experiential system as an early evolutionary adaptation involving affect-laden cognition designed to function within interpersonal and small group social environments. The rational system is a later evolutionary adaptation which harnesses memory, language, symbol and logic to

produce cognitions which allow us to make sense of larger social group phenomena across more distal social environments. The former uses unconscious, spontaneous, simplifying and economising mental processes which integrate self and person perception (i.e. IPTs). The latter operates more consciously and with recourse to individual, social and cultural processes involving information gathering, group deliberation, trial-and-error learning, models, metaphors and ideal-typical formulations, to produce cognitions of social objects too complex for simple voluntaristic explanation. Slovic *et al.* (2004) re-label Epstein's rational system the 'analytic system' to warn against thinking of interplay between these systems as a clash between the irrational and the rational. Each system has a distinct purpose. Both must cooperate and integrate to produce risk cognition.

To a large extent, this cooperation involves a constructive integration of emotion and reason to produce good judgment. Epstein's experiential system is 'intuitive, automatic, natural, non-verbal, narrative and experiential'. His rational system is deliberative, verbal and rational. Whereas the experiential system relies upon positive or negative affect (emotion) to trigger immediate responses to fast moving events, the rational system includes more protracted processes involving gathering and appraising evidence, and using logic to make decisions. Slovic *et al.* characterise interaction between these systems as interplay between emotion and reason, which is essential for good judgment. This point integrates well with the literature on evolutionary neuroanatomy which recognises interdependency among the amygdala, hippocampus and hypothalamus, which together constitute the brain's ancient seat of emotion, and the more recently evolved cerebral cortex, which remains viewed as the seat of reason and language (Gardner and Cory, 2002). This literature feeds into modern theories of affective intelligence which emphasise that emotional appraisal always occurs spontaneously and automatically before cognition enters consciousness (e.g. Marcus *et al.*, 2000).

Essentially what this means for the role of IPTs within general cognition is that our emotional appraisal systems allow our IPTs to mould cognition before they enter consciousness to become manipulable by our rational-analytic systems. This carries important implications for organisational risk cognition, particularly where we need to produce cognition within that substantial grey area where both experiential and rational-analytic systems must cooperate. The experiential system may inform our immediate intuitive and affective impressions of risk. Our rational-analytic systems may be led by these intuitions into information searches which may or may not lead to their taking over productive processes leading to risk cognition. Of course, considering business pressures to take quick decisions, and related epistemological challenges which often go unmet, the experiential system may often continue to play an important role. To the extent that risks remain unquantified, they may persist as intuitive impressions when they are pushed through risk management process frameworks and entered in risk registers.

Generally speaking, then, it can be argued that the scope for influence of the experiential system upon risk cognition will vary inversely with the quantity and quality of risk information available. In information poor environments, the risk feelings created by experiential systems will be more likely to persist unchecked. Cognition will become more vulnerable to forms of sense making which very subtly confuse evaluation of organisational risk with evaluation of persons perceived to have produced these risks. These possibilities, we suggest, give our risk-innovation IPTs a great deal of power to influence general risk cognition. In this paper, we rely on them to justify

our decision to situate our risk-innovation IPTs right at the centre of our two basic cognitive paradigms.

Conclusion

Production of risk cognition within information poor environments is more likely to lapse into an evaluation of persons, heavily influenced by our risk-innovation IPTs, if we possess underlying propensities to think in this way. The propensity in question must be one which motivates us to root our sociological understanding in voluntaristic and intentionalistic explanation; that is, explanation which understands complex sociological phenomena with reference to a small number of actors who are considered to be engaging in willed, purposeful actions which produce these phenomena. The interesting thing about this propensity is that it does seem to exist, and we have already mentioned it in this paper, because it matches exactly what we have said about our Promethean conservative paradigm. Let us reconsider that this paradigm is characterised by what we called a 'particular kind of reductionist explanation' which emphasises manifestations of human nature within complex social phenomena. Let us also consider how this idea plays with our evidence base, which tried to situate the Promethean conservative paradigm within conservative and authoritarian personality patterns. Two important strands of literature confirm that such personality patterns are indeed more likely to engage in this kind of reductionist explanation. Our first literature links conservatism to misanthropy; our second literature suggests conservatives apply this misanthropy by allowing their sociological understanding to be influenced by a blame game which seeks, where possible, to reduce complex sociological phenomena to human fault.

First, then, there is a long research literature linking the conservative mind to misanthropy, which contests the precise nature of this misanthropy by comparing it with closely related constructs such as cynicism, realism, paranoia, distrust, and lack of faith in people (Ray, 1981). Literature on authoritarianism has reached similar conclusions. Adorno *et al.* (1950) present authoritarian personality as taking a cynical and pessimistic view of human nature. Altemeyer (1981) emphasises this trait as a misanthropic mistrust. Many subsequent RWA studies continue to reaffirm its existence (e.g. Mirels and Dean, 2006). We agree with Ray's (1981) argument that we need to be very careful not to confuse this trait with a thoroughgoing and dogmatically applied misanthropy. Ray calls it a 'sensitivity to the faults in man' and suggests that it often constitutes a 'mature form of adjustment'. We support Ray's suggestion with the further observation that future RWA and conservatism researchers who explore it would do well to consider that it corresponds to the Promethean phenomenon of ambivalence towards human spirit, which easily moves towards a Swifitean misanthropy where it perceives a seed of destructiveness within human creativity.

Secondly, then, let us also consider research evidence for that peculiar form of reductionism which we earlier attributed to the Promethean conservative paradigm. Evidence confirms that it is the conservative personality pattern that indulges most in this reductionism. Skitka *et al.* (2002) point out that psychologically conservative persons, unlike psychologically liberal persons, possess baseline propensities (fundamental dispositions) to explain diverse societal phenomena relating to such matters as crime, health, homelessness and international relations with reference to highly critical evaluations of those perceived to have produced the phenomena. Liberals, on

the other hand, are much more likely to emphasise situational or structural causes for these same phenomena.

Hence we conclude that the potential for thought linking risk to innovation to be influenced by cognitive paradigms is probably more of an issue for psychologically conservative individuals who think within our Promethean conservative paradigm than for psychologically liberal individuals who think within our strategic resilience paradigm. It could well be that the resilience gap, whereby many businesses are failing to adapt to the modern world, might be explained in part by overuse of the Promethean conservative paradigm to produce cognition of organisational risk and innovation. Organisations need to reflect more on what it means to contemplate risk and innovation within the Promethean conservative paradigm if they wish to guard against, and correct for, this overuse.

The inspiration for this paper was our observation that despite the fact that risk and innovation evidently refer to completely different things, they are frequently woven together within business and management rhetoric with little or no self reflexivity around the nature of the connectedness imposed upon them. Hence, cognitive bias can very easily – and with great subtlety – misdirect our thought unless we reflect very carefully upon the connections we impose. Our method was first to look at *how* we can link risk and innovation. Here we differentiated between our two alternative cognitive paradigms. One manifests psychological conservatism and serves managerial conservatism by emphasising risks produced by innovation; the other manifests psychological liberalism and serves managerial commitment to change and adaptation by emphasising innovation as a strategy for managing risk. This exercise leads us to conclude that the hallmark of a good self-reflexive link between risk and innovation is surely that it is situated clearly within one of these paradigms, and that we are therefore attuned to both its advantages and its limitations.

Notes

1. This compares with 20 million hits for ‘risk management’, fewer than four million for ‘strategic management’, and just 85,000 for ‘stakeholder theory’. Searches were undertaken at www.google.com on 28 August 2010, using quotation marks to contain search terms.
2. No gender bias is intended here. The word ‘men’ is used because the gift of fire was specifically for men. Zeus was so angered by this gift that he later sent Pandora, the first woman, to live with men.
3. See, for example, the documentation provided on the webpage of the Institute of Risk Management’s Special Interest Group on Innovation, Value Creation and Opportunity, and in particular the presentation by David Hillson entitled *Extending the Risk Process to Manage Opportunities*, available from http://www.theirm.org/events/Innovation_SIG.htm [accessed July 2010].

References

- Adorno, T., Frenkel-Brunswik, E., Levinson, D. and Sanford, R. (1950) *The Authoritarian Personality*, Harper, New York.
- Allport, G. (1937) *Personality: A Psychological Interpretation*, Constable & Company, London.
- Altemeyer, R. (1981) *Right-Wing Authoritarianism*, University of Manitoba Press, Winnipeg.
- Amabile, T. (1996) *Creativity in Context*, Westview Press, Boulder, CO.
- Asch, S. (1946) ‘Forming impressions of personality’, *Journal of Abnormal & Social Psychology*, 41, 3, pp.258–90.
- Ayman, R. and Korabik, K. (2010) ‘Why gender and culture matter’, *American Psychologist*, 65, 3, pp.157–70.

- Baregheh, A., Rowley, J. and Sambrook, S. (2009) 'Towards a multidisciplinary definition of innovation', *Management Decision*, 47, 8, pp.1323–39.
- Bart, D. and Bart, S. (2006) 'Personality, identity styles and authoritarianism: an integrative study among late adolescents', *European Journal of Personality*, 20, 5, pp.397–417.
- Beer, A. and Watson, D. (2008) 'Asymmetry in judgments of personality: others are less differentiated than the self', *Journal of Personality*, 76, 3, pp.535–59.
- Beer, J. and Ochsner, K. (2006) 'Social cognition: a multi level analysis', *Brain Research*, 1079, pp.98–105.
- Bem, D. (1972) 'Self-perception theory' in Berkowitz, L. (ed.) *Advances in Experimental Social Psychology*, Academic Press, New York, pp.1–62.
- Ben-Ari, A. and Or-Chen, K. (2009) 'Integrating competing conceptions of risk: a call for future direction of research', *Journal of Risk Research*, 12, 6, pp.865–77.
- Biesanz, J., West, S. and Millevoi, A. (2007) 'What do you learn about someone over time? The relationship between length of acquaintance and consensus and self–other agreement in judgments of personality', *Journal of Personality and Social Psychology*, 92, pp.119–35.
- Bird, K. and Sherwin, M. (2005) *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer*, Knopf, New York.
- Brown, S. and Eisenhardt, K. (1998) *Competing on the Edge: Strategy as Structured Chaos*, Harvard Business Press, Boston, MA.
- Bruner, J. and Taguiri, R. (1954) 'Person perception' in Lindzey, G. (ed.) *Handbook of Social Psychology*, Vol. 2, Addison Wesley, Reading, MA.
- Dahlbäck, O. (1990) 'Personality and risk-taking', *Personality and Individual Differences*, 11, 12, pp.1235–42.
- Dahlbäck, O. (1995) 'Criminality and risk-taking', *Personality and Individual Differences*, 11, 3, pp.265–72.
- Dewett, T. (2004) 'Creativity and strategic management: individual and group considerations concerning decision alternatives in the top management teams', *Journal of Managerial Psychology*, 19, 2, pp.156–69.
- Dollinger, S. (2007) 'Creativity and conservatism', *Personality and Individual Differences*, 43, 5, pp.1025–35.
- Dougherty, C. (2006) *Prometheus*, Taylor & Francis, Abingdon.
- Duckitt, J. and Fisher, K. (2003) 'The impact of social threat on worldview and ideological attitudes', *Political Psychology*, 24, 1, pp.199–222.
- Dudley, R. (1999) 'The effect of superstitious belief upon performance following an unsolvable problem', *Personality and Individual Differences*, 26, 6, pp.1057–64.
- Eeckhoudt, L. and Schlesinger, H. (2006) 'Putting risk in its proper place', *American Economic Review*, 96, 1, pp.280–89.
- Epstein, S. (1994) 'Integration of the cognitive and the psychodynamic unconscious', *American Psychologist*, 49, pp.709–24.
- Erdley, C. and Dweck, C. (1993) 'Children's implicit personality theories as predictors of their social judgments', *Child Development*, 64, 3, pp.863–78.
- Eysenck, S., Pearson, P., Easting, G. and Allsopp, J. (1985) 'Age norms for impulsiveness, venturesomeness and empathy in adults', *Personality and Individual Differences*, 6, pp.613–19.
- Garcia, L., Aluja, A., Garcia, O. and Cuevas, L. (2005) 'Is openness to experience an independent personality dimension? Convergent and discriminant validity of the openness domain and its NEO-PI-R facets', *Journal of Individual Differences*, 26, 3, pp.132–38.
- Gardner, R. and Cory, G. (2002) *The Evolutionary Neuroethology of Paul Maclean: Convergences and Frontiers*, Praeger, New York.
- Goldstein, M. (1998) 'Formation and testing implicit personality theories in cyberspace', *Teaching of Psychology*, 25, 3, pp.216–20.
- Grable, J. (2000) 'Financial risk tolerance and additional factors that affect risk-taking in everyday money matters', *Journal of Business Psychology*, 14, 4, pp.625–30.
- Grene, D. (1940) 'Prometheus bound', *Classical Philology*, 35, 1, pp.22–38.
- Guthrie, G. and Bennett, A. (1971) 'Cultural differences in implicit personality theory', *International Journal of Psychology*, 6, 4, pp.305–12.
- Hamel, G. and Valikangas, L. (2003) 'The quest for resilience', *Harvard Business Review*, September, pp.52–63.

- Highhouse, S. and Yüce, P. (1996) 'Perspectives, perceptions, and risk-taking behaviour', *Organizational Behaviour and Human Decision Processes*, 65, 2, pp.159–67.
- Hyppolite, J. (1979) *Genesis and Structure of Hegel's Phenomenology of Spirit*, Northwestern University Press, Evanston, IL.
- Jost, J., Kruglanski, A., Glaser, J. and Sulloway, F. (2003) 'Political conservatism as motivated social cognition', *Psychological Bulletin*, 129, 3, pp.339–75.
- Kahneman, D. and Tversky, A. (1979) 'Prospect theory: an analysis of decision under risk', *Econometrica*, 47, pp.263–91.
- Katz, Y. (1992) 'Conservatism of Israeli Jews and Arabs in the aftermath of the Gulf war', *Personality and Individual Differences*, 13, 3, pp.335–36.
- Keinan, G. (1994) 'Effects of stress and tolerance of ambiguity on magical thinking', *Journal of Personality and Individual Differences*, 67, pp.48–55.
- Kelly, G. (1955) *Theory of Personality: The Psychology of Personal Constructs*, Norton, New York.
- Kimball, M. (1990) 'Precautionary saving in the small and in the large', *Econometrica*, 58, 1, pp.53–73.
- Kish, G. and Donnenwerth, G. (1972) 'Sex differences in the correlates of stimulus-seeking', *Journal of Consulting Psychology*, 38, 1, pp.42–49.
- Kish, G., Netterberg, E. and Leahy, L. (1973) 'Stimulus-seeking and conservatism', *Journal of Clinical Psychology*, 29, 1, pp.17–20.
- Knight, F. (1921) *Risk, Uncertainty and Profit*, Houghton Mifflin, Boston, MA.
- Knowles, E., Cutter, H., Walsh, D. and Casey, N. (1973) 'Risk-taking as a personality trait', *Social Behaviour and Personality: An International Journal*, 1, 2, pp.123–36.
- Kupperman, J. (1991) *Character*, Oxford University Press, Oxford.
- Lambert, A., Burroughs, T. and Nguyen, T. (1999) 'Perceptions of risk and the buffering hypothesis; the role of just world beliefs and right wing authoritarianism', *Personality and Social Psychology Bulletin*, 25, 6, pp.643–56.
- Lewis, L. (1992) *The Promethean Politics of Milton, Blake and Shelley*, University of Missouri Press, Columbia, MO.
- Loehle, C. (1992) 'The modern Prometheus', *R&D Innovator* 1,5, available from http://www.winstonbrill.com/brill001/html/article_index/articles/1-50/article15_body.html [accessed October 2010].
- Marcus, B. (2003) 'An empirical examination of the construct validity of two alternative self-control measures', *Educational and Psychological Measurement*, 63, pp.674–706.
- Marcus, G., Neuman, W. and Mackuen, M. (2000) *Affective Intelligence and Political Judgment*, University of Chicago Press, Chicago, IL.
- Marshall, A. (2007) *Vilfredo Pareto's Sociology: A Framework for Political Psychology*, Ashgate, Aldershot.
- McKeown, M. (2008) *The Truth about Innovation*, Prentice-Hall, London.
- Minogue, K. (ed.) (1996) *Conservative Realism: New Essays on Conservatism*, Harper Collins, London.
- Mirels, H. and Dean, J. (2006) 'Right-wing authoritarianism, attitude salience, and beliefs about matters of fact', *Political Psychology*, 27, 6, pp.839–66.
- Mischel, W. (1968) *Personality and Assessment*, Wiley, New York.
- Mishra, S. and Lalumière, M. (2009) 'Is the crime drop of the 1990s in Canada and America associated with a general decline in risky and health-related behaviours?', *Social Science and Medicine*, 68, pp.39–48.
- Mishra, S., Lalumière, M. and Williams, R. (2010) 'Gambling as a form of risk-taking: individual differences in personality, risk-accepting attitudes, and behavioural preferences for risk', *Personality and Individual Differences*, 49, 6, pp.616–21.
- Murray-Webster, R. and Hillson, D. (2007) *Managing Group Risk Attitude*, Gower Press, Aldershot.
- Ray, J. (1981) 'Conservatism and misanthropy', *Political Psychology*, 3, pp.158–72.
- Reich, W. and Ray, S. (2006) 'Domain specific effects of central traits in impression formation', *Psychological Reports*, 98, 3, pp.885–91.
- Schneider, D. (1973) 'Implicit personality theory: a review', *Psychological Bulletin*, 79, pp.294–319.

- Sedikides, C. and Anderson, C. (1994) 'Causal perceptions of intertrait relations: the glue that holds person types together', *Personality and Social Psychology*, 20, 3, pp.294–302.
- Shklar, J. (1998) 'The liberalism of fear' in Hoffman, S. (ed.) *Political Thought and Political Thinkers*, University of Chicago Press, Chicago, IL.
- Silva, P. (2008) 'Discernment and creativity: how well can people identify their most creative ideas', *Psychology of Aesthetics, Creativity and the Arts*, 2, 3, pp.139–46.
- Simonton, D. (1990) 'Personality and politics' in Pervin, L. (ed.) *Handbook of Personality*, Guilford Press, New York.
- Skitka, L., Mullen, E., Griffin, T., Hutchinson, S. and Chamberlin, B. (2002) 'Dispositions, scripts, or motivated correction? Understanding ideological differences in explanations for social problems', *Journal of Personality and Social Psychology*, 83, 2, pp.470–87.
- Slovic, P., Finucane, M., Peters, E. and Macgregor, D. (2004) 'Risk as analysis and risk as feelings: some thoughts about affect, reason, risk and rationality', *Risk Analysis*, 24, 2, pp.1–12.
- Stenner, K. (2005) *The Authoritarian Dynamic*, Cambridge University Press, Cambridge.
- Tett, R. and Guterman, H. (2000) 'Situation trait relevance, trait expression, and cross-situational consistency: testing a principle of trait activation', *Journal of Research in Personality*, 34, pp.397–423.
- Thorndike, E. (1920) 'A constant error on psychological rating', *Journal of Applied Psychology*, 4, pp.25–29.
- Thornhill, R. and Fincher, C.L. (2007) 'What is the relevance of attachment and life history to political values?', *Evolution and Human Behaviour*, 28, 4, pp.215–22.
- Tushman, M. and Anderson, P. (2004) *Managing Strategic Innovation and Change*, Oxford University Press, New York.
- Ward, S. (2005) *Risk Management Organisation and Context*, Witherby & Co., London.
- Wegner, D. and Vallacher, R. (1981) *Implicit Psychology*, Oxford University Press, Oxford.
- Wilson, G. (1973) *The Psychology of Conservatism*, Academic Press, London.
- Wilson, G. and Patterson, J. (1970) *The Conservatism Scale*, National Foundation for Educational Research, Windsor.
- Wutrich, T. (1995) *Prometheus and Faust*, Greenwood Press, Burnham.
- Zuckerman, M. (1994) *Behavioural Expressions and Biosocial Bases of Sensation Seeking*, Cambridge University Press, Cambridge.