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Chapter 1

Introduction

The introduction reviews the core focus of the study, its fundamental motivation and philosophical positioning as an academic work. The chapter argues the importance of an investigation into a deeper understanding of the antecedents of decision-making quality, and describes the angle adopted by the author to achieve this.

1.1 Background

This document investigated the research question whether individual value systems and risk propensities have an influence on decision-making quality in value clashing circumstances, and how it can it be addressed. It delved into the hypothesised relationship between the personalistic attributes (both value- and risk orientations) of people and their observed decision-making behaviour. More specifically, the study examined whether the decision-making quality produced by the participants were attribute dependent and whether it could be altered and/or improved using scenario reframing.

The extant literature on decision-making behaviour still contains several gaps. As the literature review will show, most authors opted for prescriptive rather than descriptive approaches in addressing decision-making behaviour. Managers are given models of optimal decision-making or informed what ethical or good decision-making is. Little though has been done to describe the decision-making process, especially from a personal value-system and risk preference standpoint. Since most studies then focused retrospectively on the outcome of decisions, they neglected to note how managers behave during decision-making. This study differed in that it dealt with a specific component of decision-making, decision-quality, as the decision was being made. This approach was argued to be of greater importance and relevance to participating decision-makers as it presented practitioners with a real-time practical assessment and intervention route through which to improve decision-making quality whilst the process was is in progress.

This study has wider application than individual decision-making and personality attributes though, as macroeconomic themes dominating the business landscape can attest. The world-wide recession of 2008/2009 has placed severe pressure on business resources and has redefined what success, survival and profitability means to organisations. (Amit and Zott, 2010; Barbier, 2011). The far reaching influence of globalisation (Bunker & Ciccantell, 2005), continually reshapes and reconstitutes an already challenging decision-making landscape and it seems that society gets exposed to ever more permeable moral boundaries. With the

possibility of business failures, a clear and present threat and multi-culturalism blurring expected behaviour, managers may be tempted to compromise on personal value systems or force their personal risk-taking profiles to gain access to critical firm resources. In this vulnerable state, managers are confronted with the variety of cultural orientations introduced by the global village. It therefore stands to reason that a decision-making landscape made more complex with dwindling resources and varying value sets, will have a negative impact on decision-making behaviour.

The literature review produced a thorough understanding of decision-making behaviour and how the literature describing it is positioned within the business science body of knowledge. Our knowledge of organisational behaviour stands central to our understanding and explanation of the complex interactions occurring in the firm environment and as such is an important perspective on business science. The organisational behaviour body of knowledge deals with both micro and macro aspects of behaviour in firms, but it is the former focus that relates best to value clashes - the setting of the study. Closer scrutiny of the micro focus revealed both individual and interpersonal perspectives on human behaviour in the organisation, with the former relating to the attributes of the actors within the system, and the latter referring to interactions between said actors. To understand the factors influencing people at the individual level (the level of analysis chosen for this study), a better understanding of personal psychology was required. To this end the areas around individual decision-making, personal motivators such as values, beliefs and attitudes, and personality traits such risk propensities were investigated. The research was therefore set within the behavioural paradigm of decision theory.

Although substantial work has been done to enlighten our understanding of value- and risk-driven decision-making (Rokeach, 1973; Braithwaite & Law, 1985; Schwartz, 1994), the focus to date has been prescriptive rather than descriptive. Authors cared more for an investigative line ensuring people make the right decisions, instead of trying to find out how to make good (or higher quality) decisions. Perhaps a focus on quality can shed some light. Literature distinguishes between two concepts: fitness of purpose - doing the right things, and fitness for purpose doing things right (Reeves & Bednar, 1994). This is an important distinction, as it differentiates between two core interpretations of decision quality. The position taken for this study was to move away from a preconceived notion of what is right or wrong towards the idea of what is better. This was therefore not a study of decision ethics, but rather a study of decision-making behaviour aimed at improving the quality of the process rather than judging its outcome.

This study did not pretend to consider all individual, interpersonal and system factors impacting on decision-making in the organisation, but was rather positioned to examine one specific phenomenon in detail. The expectation of this investigation was thus to further our understanding of decision-making under difficult and value-conflicting situations through the development of an effective management intervention.

1.2 Problem Statement

It stands to reason that the modern decision-making process has become extremely complex and laboured. Managers make decisions from a point of bounded rationality (Bazerman & Moore, 2013; Cyert & Marsh, 1963; Kahneman, 1991; Slovic, Fischhoff, & Lictenstein, 1984; Tversky & Kahneman, 1975), limiting their cognisance of all aspects of the decision hence negatively impacting the opportunity for optimal decision-making.

Organisations on the other hand operate in a confined environment, often containing limited resources and direct competitors. They do not fully understand all the influences on and drivers behind decision-making and as such have exposed themselves to undue risk and organisational inefficiencies. Resource-dependence theory (Graetz & Smith, 2010) holds that organisational behaviour will be affected by access to valuable resources and that resource scarcity would contribute to firm uncertainty and its related risk exposure. With most firms not in possession of the critical resources required to survive in a very tough environment, access to these resources becomes a high priority. This invariably leads to pressure on managers to facilitate this access on behalf of the firm resulting in a complication of the decision-making space.

Thus, against this tension and considering the complexities brought about by a post-recession (Acharya, Philippon, Richardson, & Roubini, 2009; Roubini, 2008), post globalisation context (G. A. Wilson, 2012), intra-firm and inter-firm value clashes due to differences in individual motivations, value-sets and risk propensities are unavoidable (Kocet & Herlihy, 2014; MacMillan & Wastell, 2008). Managers with varying motivations, agendas and personal convictions can hardly be expected to agree on all decisions (McGraw & Tetlock, 2005; Schoemaker & Tetlock, 2012). A new understanding of the decision-making process, specifically under stressed situations, is therefore required.

Literature is far from ignorant of the stresses impacting on the modern decision-making landscape, as the review in Chapter 2 will show (Ariely, 2008; Connor & Becker, 2003; Edwards, 1954; Hanselmann & Tanner, 2008; Kahneman, 1991; Lovallo & Kahneman, 2000; Nonis & Swift, 2001; Ruedy & Schweitzer, 2010; Simon, 1991; Simon, Dantzig, Hogarth, Plott, Raiffa, Schelling, Shepsle, Thaler, Tversky & Winter, 1987; Slovic et al., 1984). Sixty years'

worth of study and exploration into behavioural decision-making has produced a field influenced by a multitude of viewpoints and philosophies. Adopting a perspective-driven framework of the literature, the contributions generally report to one of three viewpoints:

- decision-making is an analytical process driven by processes, data analysis and logic,
- decision-making is driven by human cognition, and whilst it benefits from heuristics, it suffers from systematic biases
- decision-making is a psychological process driven by human needs, motivations, value-systems and preferences.

Naturally, each viewpoint represents a cardinal truth about decision-making, but it seems more pertinent to consider all three perspectives when crafting a decision-making model. Research on both the normative (prescriptive) (French, Simpson, Atherton, Belton, Dawes, Edwards, Haemaelaeinen, Larichev, Lootsma, Pearman & Vlek, 1998; Phillips & von Winterfeldt, 2007; Stillwell, Seaver, & Edwards, 1981) and cognitive limitations perspectives (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1975) abound, but the work on psychologically influenced decision-making is still limited (Bazerman & Moore, 2013). The sub-field of personal value-driven decision-making is dominated by a drive towards ethical decision-making (Ferguson, 2014; Finegan, 1994; Kreie & Cronan, 2000; Ruedy & Schweitzer, 2010). This is perfectly understandable, given the legacy left by the sub-prime lending irregularities leading up to the 2008/2009 US housing market collapse (Roubini, 2008), or the incidents of blatant corporate abuse of Enron, Worldcom and others (Coffee Jr, 2002; Simms & Brinkman, 2003). The result has been a push-back in literature towards a more prescriptive approach to decision-making evaluation (Ferguson, 2014; Kreie & Cronan, 2000). Managers no longer had an interest in understanding decision-making, but rather opted for fixing it. Ethical decision-making emerged as a prominent field, and psychological attributes were studied to determine processes and frameworks to eliminate unethical behaviour (Fritzsche & Oz, 2007). With this interest tapering down, it is important that academics readjust and adopt a descriptive view of this important field (Bazerman & Moore, 2013). To complete the third perspective on decision-making, and to fully understand how psychological drivers influence decision-making, we need to not only understand how to cause ethical decision-making, but also how to cause quality decision-making. The ethics view assumes a very simplistic right/wrong view of the world (Kern & Chugh, 2009). But what if the matter at hand is not that simple or clear? What if the scenario is nuanced, complex, and subjective of the viewpoint and value-system of the decision-maker?

A recent contribution on Taboo Scenarios (Schoemaker & Tetlock, 2012) described the impact of exactly such value clashes, situations where personal value orientations are tested by

external influences, on decision-making. They argued that varying value-orientations would lead to varying interpretations of the merits of the decision and foresaw complexities in managerial decision-making thus. Although the authors suggested remedies for these difficult scenarios, no focussed academic study has resulted to address this need yet. This was study designed to address just this gap in the literature.

With the positions of both the business world and the literature considered, it seems a sound and gainful course of action to consider a research endeavour into the decision-making behaviour of individuals of varying value- and risk-orientations faced with difficult value-clashing situations. They are bound to become common place in the modern business landscape.

1.3 Purpose Statement

The phenomenon of value clashes presents a vivid illustration of the tension between resource scarcity, value-driven decision-making and rationally bounded managers (Hanselmann & Tanner, 2008). This is because they present the decision-maker with a situation that calls on these limitations simultaneously. The complexity of the decision-making context introduced above indicates that in specific circumstances (such as those hallmarked by difficult trade-offs), personal values, situational limitations and organisational needs could be at odds with each other. Studying these scenarios where extreme conflicts could arise, thus presented an ideal setting through which to study the intricacies of value-driven decision-making (Schoemaker & Tetlock, 2012).

The purpose of this investigation was two-fold. Firstly, it was to gain a deeper understanding of the decision-making behaviour through incorporation of a fresh theoretical lens. To date, both the cognitive limitations (Slovic et al., 1984) and normative (prescriptive) (Simon, 1959) perspectives have dominated the decision-making literature space in favour of the psychological (values/emotions/motivations) perspective (although a substantial amount of work has been done in this area). Thus, an integrative approached taking learnings from all three perspectives was introduced with the expressed expectation of generating a more complete framework of the decision-making process.

Secondly, the study targeted determining whether the introduction of an intervention into the decision-making process, such as reframing (Tetlock & McGraw, 2005), could be employed to influence the quality of decisions taken during serious value-clashes. Tetlock (1986) indicated that the integrative complexity variable (employed and repositioned as a decision-making quality variable), consisting of the sub-constructs contextual differentiation and integration, could be used to describe the complexity of thinking during decision-making.

The study is thus positioned to investigate the influence of reframing on decision-making quality in the presence of value clashes, to see whether it could be employed by practitioners to influence decision-making behaviour.

1.4 Research Objectives

Taking the need for higher quality decision-making required by a complex business landscape (Bazerman & Moore, 2013), and the gap in the contributions on behavioural decision-making into account (Morton & Fasolo, 2009), a focussed investigation into decision-making in a value-complex setting was direly needed. The core objective of the study therefore was to establish, using proven research instruments (Blais & Weber, 2006; Schwartz, Cieciuch, Vecchione, Davidov, Fischer, Beierlein, Ramos, Verkasalo, Lönnqvist, Demirutku & Dirilen-Gumus, 2012), whether a relationship between personalistic attributes and measurable attributes of the decision-making process existed and whether social-relational framing could be used to improve decision-making.

The personalistic attributes investigated for the individuals participating in the study were personal value orientations (Schwartz et al., 2012) and domain-specific risk-taking attitudes (Weber, Blais, & Betz, 2002). The expectation was that these characteristics (or combination thereof) could be used as predictors of higher quality decision-making behaviour.

It was hypothesised that the combination of the value system evaluation with the risk attitude questionnaire would produce a new framework of decision-making personalities and would yield a fresh perspective on the characterisation of people faced with difficult decisions.

The study also targeted implementation of scenario re-framing to adjust decision-making behaviour. This approach, taken from the Schoemaker and Tetlock (2012) paper on Taboo scenarios, is expected to impact decision-making behaviour by emphasising the value-clashes in the scenarios and forcing a more considered response to the decisions.

This research therefore aimed to establish a framework was aimed at explaining individual decision-making behaviour, whilst at the same time shining some light on the effectiveness of the reframing interventions.

1.5 Proposed Benefits of the Study

The study targeted the following contributions to the extant literature, to research methodology and to practitioners.

- Present an integrated framework for the decision-making literature, incorporating the three dominant schools of thought (normative (prescriptive), cognitive limitations and psychological (values/emotions/motivations)) currently at play.
- Develop an understanding of the value orientations and risk propensities of the individuals participating in the value clash experiments
- Develop a revised classification framework for individuals face with value clashing scenarios, based on the combination of both value orientations and risk propensities.
- Present an updated and fully-integrated research methodology aimed at testing human response to value-clashing decision-making scenarios.
- Confirm a relationship between personal value orientations, risk-taking attitudes and attributes of decision-making behaviour establishing the importance of the psychological (values/emotions/motivations) perspective to decision-making literature.
- Present evidence for the notion that the application of social-relational framing to value clashes will impact the resultant decision-making quality.
- Propose an improved decision-making framework that will enable managers to deal more effectively with value-clashing scenarios.

1.6 Assumptions and Research Paradigm

The research has been positioned to address a very specific research question pertaining to decision-making under severe value-clashing circumstances. This focus has necessitated a significant narrowing of the literature field and resultant research design. The core assumptions for the study therefore stems from the boundaries dictated by the researcher's point of view and conceptual understanding of the literature.

The researcher chose to position the investigation in the organisational behaviour space taking specific cognisance of the behavioural economics paradigm (Simon, 1991). The bulk of the constructs employed in the study hails from the decision-making literature field, but as this is a very complex field, a measure of systematisation had to be incorporated. The literature is thus organised along three popular perspectives emergent from the latest contributions to the field and resultantly directs the literature study as well as the research design.

The incorporation of a schema to depict the decision-making space through three popular perspectives (normative (prescriptive), cognitive limitations and psychological (values/emotions/motivations)), led the researcher to apply the epistemology entrenched in these viewpoints as well as to adopt the philosophical approaches prescribed therein to the research design. As such, the research design incorporated both positivist and interpretivist assumptions. The design of the value and risk orientation questionnaires represented the

aspect of the research leaning towards objective measurement, whereas the decision-making quality assessment rather suggested an observed relational measure. With the research boundaries thus set, the specific delimitations for the thesis was now set.

1.7 Delimitations of the Study

With the assumptions listed above, the following delimitations resulted. The study was limited to consider only the influence of the variables mentioned (personalistic attributes and social-relational framing) on decision-making quality. Although numerous other influences exist (Kim, 2012; Rangel, Camerer, & Montague, 2008; Ruedy & Schweitzer, 2010; Steptoe-Warren, Howat, & Hume, 2011), the experimental design was constructed such to isolate these variables. The decision-making variable will be discussed at great length later, but suffice to say at this point that it will speak towards the integrative complexity of the decision-making process, consisting of measures of the individual's ability to allow for both conceptual differentiation and integration of aspects of the decision.

Due to practical considerations and a drive towards maintaining the good sentiments of the respondents, the questionnaires was kept a short as possible. A previous draft of the research design called for the use of five different value clash scenarios (Atzmüller & Steiner, 2010). The current thinking is that this will overload the respondents and could possible skew the results. Thus, only three scenarios were included in the design. This limited the opportunities available to illustrate the application of the framing intervention. Additional studies might have to be conducted to address this limitation.

The main sample set was collected from a single firm in the fast-moving consumer goods sector. Although it might be argued that this approach could limit the application of the findings to other sections, it was deemed necessary to follow this approach to counter the influence of extraneous variable, such as organisational culture. A check was however conducted on samples collected during the pilot phase (from various other sectors) to test the sector to sector variance.

The study was limited to the emerging market context and as such was conducted within the borders of South Africa. This excluded inputs from other nationalities and economic groupings and might have limited the richness of the findings of this report. Conversely though, it yielded a positive point at it certainly sharpened the focus on the emerging market context and resulting in a fresh and insightful interpretation of the decision-making literature.

1.8 Definition of Key Terms

The following definitions were supplied to illuminate and contextualise the research proposal.

Integrative complexity – "*defined by two cognitive structural variables, conceptual differentiation and integration*" and used to measure the extent to which people were willing to complicate the decision-making process (Tetlock, 1986, p. 819).

Conceptual differentiation – "*the variety of aspects or components of an issue that a person recognizes"* (Tetlock, 1986, p. 819).

Integration – "*the development of conceptual connections among differentiated characteristics*" (Tetlock, 1986, p. 819).

Decision-making quality – author defined: the extent to which an individual is willing and able to consider and link alternative options toward reaching a decision on a specific matter.

Human values – "*an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or common mode of conduct or end-state of existence"* (Rokeach, 1973, p. 5).

Human value set - "*an enduring organization of beliefs concerning preferable modes of conduct or end-state of existence along a continuum of relative importance*" (Rokeach, 1973, p. 5)

Risk attitude – "*a person's standing on the continuum from risk aversion to risk seeking*" (Weber, Blaise & Betz, 2002, p. 264).

Taboo trade-offs - "*any explicit mental comparison or social transaction that violates deeply held normative intuitions about the integrity, even sanctity of certain forms of relationships and of the moral political values that derive from these relationships*" (Fiske & Tetlock, 1997, p. 255).

Taboo scenarios – "*notions that challenge deep values, fly in the face of conventional wisdom, or cross a line into the region of the 'unspeakable' or 'unthinkable'" (Schoemaker & Tetlock, 2012, p. 6).*

Value clash – author defined: a situation or scenario where the human value set (defined above) of an individual is brought into conflict or put under pressure by external influences.

Social-relational framework – "*an explicit and comprehensive taxonomy of the relational schemas that guide behaviour"* and forms *"qualitative boundaries that people place on the acceptability of certain forms of social cognition*" (McGraw & Tetlock, 2005, p. 2).

Social-relational framing – author defined: the process of repositioning a situation or scenario in terms of the social-relational framework is such a way as to guide behaviour.

1.9 Conclusion

This study addressed the research question whether individual value systems and risk propensities have an influence on decision-making quality in value clashing circumstances. This chapter contextualised the study within both an academic debate as well as within the chosen research context (the value-laden emerging market setting presented by the South African business landscape), and briefly discussed the delimitations, assumptions and proposed benefits of the study.

Chapter 2

Literature Review

2.1 Introduction

This chapter gave a focussed review of decision-making literature with the aim of illustrating the existence of three different perspectives, and highlighting the need for a deeper understanding of the psychological (values/emotions/motivations) aspect of decision-making. The review investigated each perspective individually, then concluded with a consolidated model incorporating the core tenets of all three viewpoints. The literature review illustrated a gap in our current understanding of decision-making behaviour. Previous authors have shown very little consideration for decision-making driven by personal value systems and risk considerations, and where they have, no thoughts were given to its impact on the quality of decision-making produced by decision-makers. This study endeavoured to address this gap.

The literature describing managerial decision-making has evolved much over the last 60 years and as such has become very complex. Since the pioneering work of Edwards (1954, 1961) and Simon (1955, 1959) cast doubt on the “economic man” (man as a rational, effective decision-maker) postulate, alternative interpretations for decision-making behaviour has abounded. Edwards arguable started the movement by refuting the classical economic view towards decision-making, and pointing out that assumptions supporting the utility maximisation approach postulated by Neumann and Morgenstern in the 1940’s probably did not reflect decision-making reality (Edwards, 1954). Edwards, an avid reader of Jimmy Savage’s contributions on Bayesian statistics, resultantly introduced subjective probability estimates as an improvement to the reigning decision-making model.

Simon’s interest in decision-making sprouted from the apparent disconnect between psychological and economic theories of the day. He incorporated the psychology contributions of Skinner, Piaget and others (Simon, 1992) to explain the seemingly suboptimal economic behaviour manifesting in consumer satisficing rather than maximising, the disparate outcomes caused by misalignment of organisational goals and managerial motivation, labour economics and goal conflicts, and decision-making in times of uncertainty (Simon, 1959). Simon’s paradigm shifting position on the bounded rationality of man propelled the field of decision-making into uncharted waters and lead to his famous paper introducing behavioural decision theory (Simon, 1959). This was soon followed by his colleagues Cyert and Marsh (1963) who

authored the classic Behavioural Theory of the Firm and explored the implications of organisation/manager goal misalignment further.

By 1977, mentored students of Edwards penned the behavioural decision theory (Slovic, Fischhoff, & Lictenstein, 1977) and distinguished explicitly between normative (prescriptive) and descriptive approaches in the literature. This distinction talked toward the core of behavioural decision theory and highlighted the difference in what managers ought to do (as prescribed by their values and beliefs) against what they really do (as limited by the reality of their environment and shortcomings).

Numerous other authors contributed to this debate. Kahneman and Tversky (1979) penned the prospect theory, a behavioural economic theory analysing decisions under risk and investigated the influences of both heuristics and biases on the decision-making process. Through this work, the authors opened the field to thorough investigation of the cognitive limitations perspective of decision-making.

Stanovich and West (1998) furthered the discussion by proposing the System I and System II thinking dichotomy. System I refers to the intuitive, unfiltered response to decision, whereas System II refers to a more deliberate, focussed and analytical approach to the process, perhaps not incidentally echoing the call by Slovic and co for "*deliberate decision-making*" (Slovic et al., 1977).

Behavioural psychology re-entered the debate, but this time to with the aim of explaining decision-making behaviour as a product of basic human motivational drivers. Exploring the viewpoint that personal human values play a role in human motivation, Rokeach proposed a psychological (values/emotions/motivations) perspective to decision-making and argued strongly for a value-based decision-making rule-set (Rokeach, 1973). His views were complemented by other contributors in the field such as Braithwaite and Law (1985) and Schwartz (1994), acted with the contributions of Maslow (1943) on human needs and Wyer (1965) on personal attitudes, to form a more complete picture of human motivation, and by extension, decision-making behaviour.

From the paragraphs above, it is thus quite clear that the study field of decision-making is extremely complex, multi-faceted and fragmented. This is completely understandable and expected, as this is a field exposed to the influences of numerous areas of interest. Decision-making has been studied from areas as far afield as risk management, psychology, leadership and strategy. It is, to a large extent, at the centre of the managerial process and as such has received much attention over the last five decades.

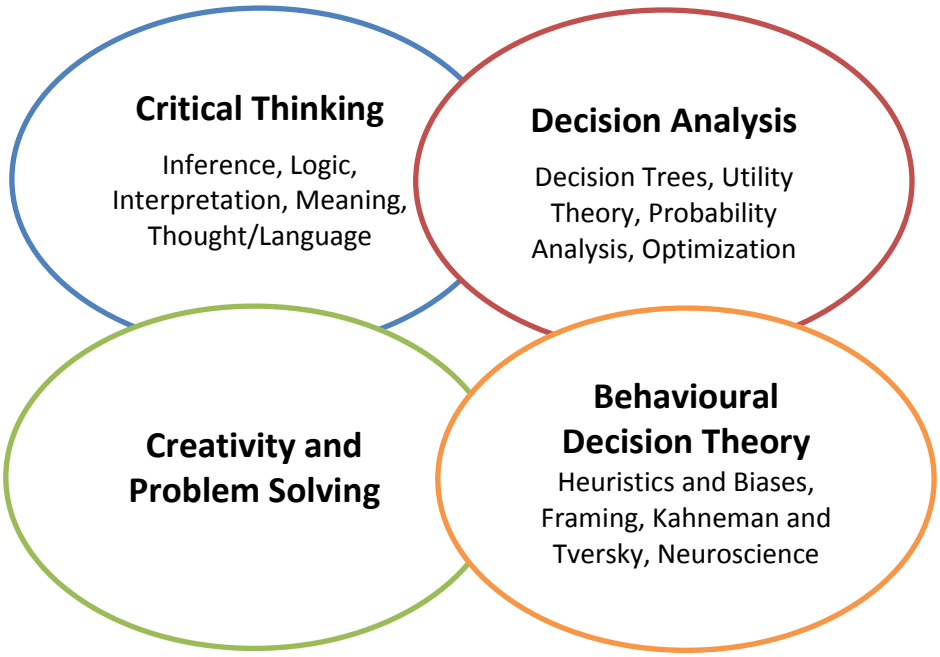
It was therefore opinioned by the author that a consolidated theoretical decision-making model would be of value to future students of the subject. The need clearly exists to attempt a consolidation of the various views into a single albeit simple model. This should aid studying of the multitude of phenomena in the decision-making field as it would structure the various viewpoints into a single model and highlight areas for future research. The section below was therefore structured to give an exposition of three governing perspectives on decision-making theory (normative/ prescriptive, cognitive limitations and psychological (values/ emotions/ motivations) in the hopes of consolidate some of the various viewpoints mentioned above.

The literature review concluded with the author's interpretation of the field in the form of an integrative decision-making framework, giving cognisance of most of the theories discussed. Naturally, given the title and core aim of the study, the discussion of the theoretical framework pivoted around the study's purpose, namely an investigation into the interrelatedness of personalistic decision-making traits (human values and risk propensities), value clashes and decision-making quality.

2.1.1 Decision Sciences

A number of models, frameworks and interpretations of decision-making theory exists. Schoemaker's interpretation of the decision-making field comprises of four specific areas of research. Figure 1 reflects Schoemaker's interpretation of the field of decision sciences.

Figure 1. The Field of Decision Sciences



Source: (Schoemaker, 2013)

Schoemaker (2013) presented the following distinct areas of interest.

1. **Critical thinking** that included disciplines such as logic, interpretation, inference and thought language. This area was specifically popular in the ex-business arenas such as logic, philosophy, language and statistics.
2. **Decision analysis** that contained the quantitative approach to decision-making and supported then use of decision trees, probability analysis, optimization and the utility theory.
3. **Creativity and problem solving**, which resulted in the very popular contributions of Edward De Bono (1977) on creative and lateral thinking.
4. **Behavioural decision theory**; the school of thought preoccupied with the human element in the decision-making process containing the contributions of Tversky and Kahneman (1975) on heuristics and biases, as well as their work on the prospect theory (Kahneman & Tversky, 1979).

Schoemaker produced this model to reflect the complexity of the decision-making space and showed it to have stemmed from research in the fields of mathematics, economics and behavioural sciences. Co-authoring an overview of decision-making in text book format, Schoemaker further suggested that not only did the topic of decision-making need to concern it with multiple levels of analysis (individual, group, organisation and society), but he also pointed out that both descriptive and prescriptive approaches warranted mention (Kleindorfer, Kunreuther, & Schoemaker, 1993).

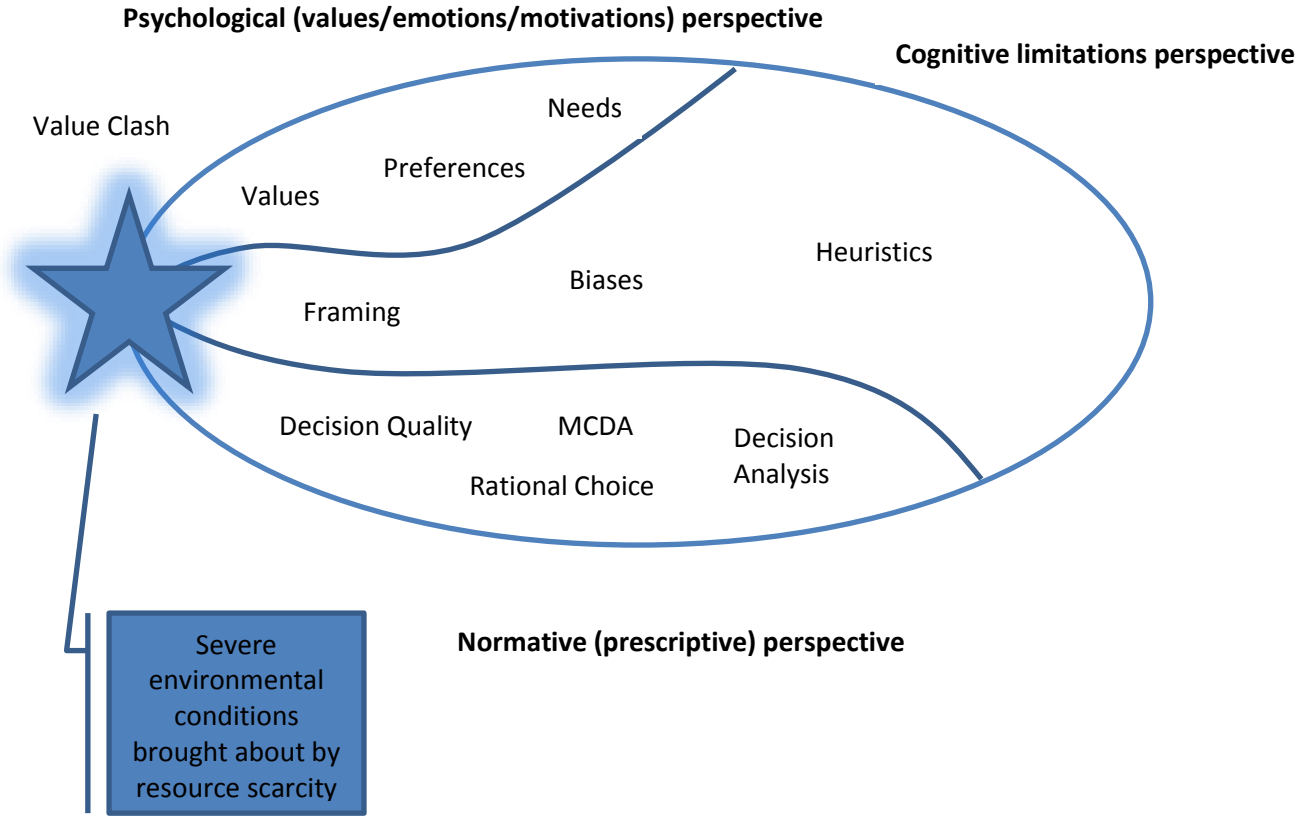
Contributing to this debate, and building on Schoemaker's model, was the Kahneman and Tversky contribution (1984) on Choices, Values and Frames. Their model clearly identified the decision field as an area comprising of both prescriptive and descriptive viewpoints. Like Schoemaker, they positioned the research paradigm dealing with rational choice, logic and decision process and analysis firmly in the prescriptive segment of decision-making research, also labelling it the normative (prescriptive) approach.

The descriptive paradigm, in their view, reflected the contributions of authors more focussed on exhibited behaviour, and as such dealt with motivational factors during decision-making. They differed from Schoemaker by making explicit mention of a subdivision on the descriptive paradigm, suggesting the two areas of cognitive limitations and psychological (values/emotions/motivations) approaches. As such, the field contained research on how people's values, beliefs and preferences influenced their decision-making behaviour, as well as to what extent their relationship between environment and human cognition played a role in understanding decision-making behaviour.

2.1.2 Positioning the Literature According to the Psychological (values/ emotions/ motivations), Cognitive limitations and Normative (prescriptive) Perspectives

Taking guidance from the frameworks suggested by Kleindorfer et al. (1993) and Kahneman and Tversky (1984), the literature was approached keeping the dual nature of the decision science in mind. The proposed framework adhered to the basic Schoemaker (2013) structure, but evolved slightly to show the Kahneman/Tversky view. This model better suited the research question at hand as it dealt with elements from all three perspectives. The author of this thesis therefore proposed a decision-making landscape discussing the cognitive limitations and psychological aspects separately producing a framework consisting of three distinct core perspectives: psychological (values/emotions/motivations), cognitive limitations and normative (prescriptive). Figure 2 shows the framework put forward for the literature review.

Figure 2. Decision-making Literature Encompassing Three Perspectives



The **psychological (values/emotions/motivations) perspective** represents the work popularised by Rokeach (1973) through his work "Nature of Human Values" and the resultant Rokeach Value Survey. Rokeach suggested that human decision-making was more in line with value systems than preferences and needs, thus proposing a value-driven decision-

making framework. The work was supported by Braithwaite and Law (1985) and later by Schwartz (1994). Schwartz updated the Rokeach Value Survey to a two-dimensional plane with essentially two axes – conserving/open to change and self-centric/self-transcending. The resulting four quadrants contained all of his ten previously identified motivational value sets, as was positioned as a universalistic model for human values.

The **cognitive limitations perspective** of decision-making reflects the interpretation promoted by Kahneman and Tversky (1984) and attempts to explain decision-making as a continuous process of sense-making of the environment. The contribution by the authors suggested the existence of two cognitive processes applied to address the information overload problem that occurs when trying to assess inputs from a very complex arena. Heuristics are conducive to improved decision-making through the effective reduction of a complex environment. Biases represent systematic sub-optimal decision-making due to ineffective attempts at reducing complexity. The framing effect is one such cognitive bias, "*in which people react differently to a particular choice depending on whether it is presented as a loss or as a gain*" (Plous, 1993, p. 64).

The **normative (prescriptive) interpretation,** having a strong process focus (Dean & Sharfman, 1996)**,** yields the rational choice theory and suggests that logic, analysis, careful consideration and weighing of all probable outcomes and their respective probabilities should result in an optimal decision. The approach is popular in fields where masses of data are available and where complex mathematical modelling, such as used during Multi Criteria Decision Analysis, (Morton & Fasolo, 2009) is favoured. This perspective typically prescribes guidelines on how to go about the decisions-making process.

One wonders how these different perspectives on decision-making interrelate, and whether a study aimed at the nexus of these viewpoints could bring forth a novel understanding of decision-making behaviour.

2.1.3 Intersection of the Three Perspectives

The star in Figure 2 highlights the intersection of the three perspectives allowing for instances where value clashes and cognitive influences co-occurred in the decision-making process and where meticulous analysis was required. It was suggested by Fiske and Tetlock (1997) that an intersection of value driven decision-making **(psychological (values/ emotions/ motivations perspective))** with social-relational framing **(cognitive limitations perspective)**, discussed in full in the latter stages of the review, forced the occurrence of "*taboo trade-offs*". The authors' view on these trade-offs was that the perceived nature or level of a relationship between parties would guide the appropriateness of the exchanges allowed

between them. Added to and building on this work, was the suggestion by Schoemaker and Tetlock (2012) that "*taboo scenarios"* could be caused by extreme circumstantial events brought about by resource scarcity. These occurrences, referred to as **value clashes** for the purpose of this study, present particularly difficult decision-making considerations bound to cause levels of discomfort, rejection and even repulsion from people of varying value orientations.

The contribution by Schoemaker and Tetlock (2012) further proposed that manipulation of the relational framing of the situation could ease the acceptability of the decision and improve the tolerability of the exchange. Taking a **normative (prescriptive) perspective**, the attributes of the decision-making process could be measured to determine whether the intervention was successful. It leads therefore, that a deeper understanding of what occurs in the decision-making process during situations hallmarked by serious value clashes, presents a productive research avenue.

2.1.4 Literature Review Structure

The literature study was therefore structured to gain a deeper understanding of interrelationships between the three core perspectives. Each interpretation was critically assessed to determine its importance to the proposed decision-making framework and its relevance to the research question posed for this investigation.

Following the exposition of the integrative view of the decision-making literature, an overview of behavioural risk management literature and its relation to individual risk propensity was conducted. This was done to examine the importance of this psychological aspect of decision-making, deemed by the author to be a worthwhile contribution to the decision-making framework.

The literature review concluded with a consolidated view of the important theories produced by the three perspectives and the resulting proposal of an updated decision-making framework. The discussion of this framework naturally culminated in gap in the extant literature, leading the argument towards the research question and resultant research design.

2.2 Integrative View of the Decision-making Literature

Section 2.2 discusses the three key perspectives dominating the peer reviewed literature on decision-making. The perspectives were discussed in turn, starting with the normative (prescriptive) perspective, followed by the cognitive limitations perspective, and concluded by the psychological (values/emotions/motivations) perspective. This process laid the foundation for the development of a core research question, as well as a few subsequent questions.

The normative (prescriptive) perspective of the decision-making body of knowledge proposes an analytical approach to solving problems. Within this field we find the decision analysis arena that deals with the application of prescriptive models to facilitate decision-making. The normative (prescriptive) perspective was therefore studied with the aim of finding a suitable model or process through which to measure decision-making quality, the proposed outcome variable for the research model.

2.2.1 Decision Analysis and Rational Choice Theory – The Normative (prescriptive) Perspective

In a classic and comprehensive overview of the decision-making literature, Kleindorfer, et al. define decision-making as "*intentional and reflective choice in response to perceived needs*" (1993, p. 3). This definition hints at a directed process managed with preconceived control mechanisms. To a large extent, this is the viewpoint adopted to shed light on the prescriptive perspective of decision-making. The early days of decision research exhibited a number of concerns with a purely prescriptive approach, though. Some of the core assumptions of rationality and information availability were questioned by the pioneering contributions of Simon (1955, 1959), Edwards (1954, 1959, 1961) and Marsh and Cyert and Marsh (1963), and it became clear that a pure probabilistic evaluation of decision options was not a true representation of reality. The following section discusses the evolution of aspect of utility in decision-making.

2.2.1.1 Utility in Decision-making

By the mid 1950's, sufficient overlap of economic and psychological theories had occurred to start a debate on the fundamental notion of an "*economic man*". Edwards produced the seminal Theory of Decision Making in 1954 and successfully twated the core assumptions of rational behaviour, as purported by the then leading minds in economic theory. He rejected the assumptions of man being fully informed, rational and perfectly sensitive in chosing between options, and opted for an alternative interpretation (Edwards, 1954).

Herbert Simon meanwhile supported the core premise of Edwards work, but added a number of modifications on the core assumptions in an attempt to better resemble real-life decision-making behaviour (Simon, 1955). Simon suggested incorporating concepts such as a simple pay-off function and the partial ordering of pay-offs to illustrate the complexity of possible decision outcomes. By 1959, Simon had furthered this work to include the influences of psychology on economic theory, and producing a behavioural theory of decision-making (Simon, 1959). Simon revisited the utility function of Neumann and Morgenstern, but questioned the logic of perfect probability estimations and rejecting the concept of decision

maximising in favour of satisficing. Simon held that firms generally opted short of the perfect decision in favour of a “good enough” option.

Edwards reentered the discussion and produced his behavioural decision theory (Edwards, 1961) by also illustrating the shortcommings of the Von Neuman/Morgenstern model and introducing the concept of subjective expected utility. Edwards incorporated the valuable work of Savage on Bayes’s Theorem to show a the progression of subjective probability estimates as governed by personal experience. This insight opened Edward’s work to contributions on dynamic decision-making (with the insight that life rarely present us with single, perfect choices, but rather a series of interlinked sequential and cocurrent events) and insights on bargaining and negotiations. Edward’s invoking of the popular prisoner’s dilemma underlined the complexity of multi-party decision-making and showed that the flow of information in that instance could result in a rejection of the utility maximasation assumption.

Slovic et al. (1977) furthered the work of Simon and Edwards and formalised behavioural decision theory. Although this paper paved the way for a field of research dedicated to the cognitive limitations perspective on decision-making, they also produced a thorough overview of the descriptive theories. Through this, the authors discussed a number of decision-making models prominent in this field.

For low-risk decisions they identified models such as Tversky’s (1972) EBA heuristic (elimination by aspects), process descriptions, script processing and the process of consumer choice. High risk decisions were modelled after Edward’s (1961) SEU (subjectively expected utility), Coombs (1975) portfolio theory and Payne’s (1973) information processing theory. However, these options proved to have too narrow a focus, suggesting that an ideal solution would consist of the combined use of models.

Slovic et al.’s (1977) review concluded with a careful consideration of the merits of MAUT (multi attribute utility theory). Through this advanced approach to decision-making, the model uses the following formula to assess the various options: $MAU_j = \Sigma_i w_i u_{ij}$. This representation indicates that the outcome of the decision-making process should be directed towards the best aggregation of the product of the gauged importance of attribute “i” and the utility of object “j” on attribute “i”. They illustrate this model beautifully through the decision-making process required for the selection of a car. For car j, thus, and important attribute could be the design, w_i, of the car. How well the car j is designed would then be reflected in the term as u_{ij}. The product of these the attribute and the extent it which it was achieved, then gives the importance of this consideration.

A number of concerns have however been identified with this approach. The **selection of attributes** to be considered will obviously affect the quality of the decision. Should important attributes be left out, the decision would most probably be flawed. Also, the **judgement** of the respective utilities of the various attributes is the source of much debate. Direct allocation of the weights or utilities for the attributes is favoured for its ease and speed, but could be flawed on the grounds of subjectivity. However, the indirect allocation of attribute utilities, though much more trustworthy, is cumbersome and often times impractical.

It is clear that for complex decisions, this process would quickly spiral into a considerable mathematical exercise. It is for this reason thus that the authors called for the incorporation of computing power in the execution of these analyses. The author of this report argues therefore that a logical pursuit would be to gain a deeper understanding of decision analysis in search of a simplified decision performance metric. This following section gives a brief overview of this area of research, and leads into the motivation of **decision-making quality** as a suitable outcome variable for the investigation.

2.2.1.2 Decision Analysis

Through the normative (prescriptive) lens, decision-making is a logical-analytical process consisting of formal decision-making instruments and analysis tools. Decision analysis, a subset of the analytical approach to decision-making, was defined "*a decomposition technique for structuring and solving single or multi-attributed decision problems*". (Corner & Corner, 1995, p. 304). The authors of this definition conducted an analysis of the characteristics of decisions as reported through 86 papers employing decision analysis techniques. Their findings suggested a basic organisation of decision analysis under three main categories: **problem structuring**, **assessing uncertainty** and performing **sensitivity analysis**.

Although **problem structuring** and formulation is less process than skill, less technique than art, some processing methodologies are commonly used during this phase. Assessing the 86 papers, Corner and Corner (1995) found 64 papers detailing some form of decision structuring. Common techniques included decision-tree analysis and the use of objective hierarchy. As reflected later in the data analysis section, the use of decision-tree analysis was particularly helpful in determining the structure of this investigations core findings.

The **assessment of uncertainty** is key to the multi attribute approach to decision-making analysis. As each attribute of the problem is associated with a specific probability of occurrence, analysis of this aspect stood central to decision analysis. Corner and Corner (1995) found the occurrence of studies using two possible outcomes (two-point discrete distributions) dominated the 86 paper set, whilst three-point distributions were slightly less

common. The fact that each of the papers dealt specifically with probability assessments, stressed the importance of this phase of the process.

The third part of decision analysis is **sensitivity analysis**. With the problem structure, important attributes and associated probabilities established, decision-makers would have to understand the robustness of the model. Of the 86 papers assessed, 38 reported specific consideration of sensitivity (Corner & Corner, 1995). The bulk of these contributions focussed on the role played by uncertainty estimates on sensitivity, whist other focussed on the choice of trade-off weights. The fact that not all papers dealt with model testing was attributed to the fact that the authors were more concerned with establishing the model than testing its applicability.

In a related piece, Corner and Kirkwood (1991) reviewed the contributions to the operations research literature for the period 1970 – 1989 and found the application of these techniques to be popular in a number of divergent industries. They chose to define decision analysis as "*set of quantitative methods for analyzing decisions based on the axioms of consistent choice*" and positioned the decision analysis framework somewhat differently. They proposed splitting it into the following subsets: Problem structuring/formulation, Decision Trees, Probability assessment, Utility assessment, Communication/Facilitation and Group decisions.

The structure largely overlaps the approach described by Corner and Corner (1995), but added to the discussion by highlighting the importance of group decision-making. This approach added to the quality of the decisions by allowing for the combination of individual's selections into an aggregated utility function.

Finally, Smith and von Winterfeldt (2004) conducted a 50 year review of decision analysis on papers in the Management Science journal. This resulted in an in-depth structuring of the field and suggested a framework distinguishing between normative (prescriptive), descriptive and prescriptive perspectives. The **normative (prescriptive) perspective** dealt with the process of rational choice and used Bayesian statistics as its core guiding principle. The **descriptive perspective** was concerned with observed behaviour and studied people making decisions in real-life scenarios. The Prospect Theory (Kahneman & Tversky, 1979) was an example of this line of thinking and tried to explain deviations between actual and predicted behaviours. Lastly, the **prescriptive perspective** took the viewpoint that people needed to be advised on the decision analysis tool or approach to be employed to solve a specific problem. Smith and von Winterfeldt (2004) concluded their review with a call for continued research in the decision analysis field.

The contributions above are clearly linked with the expected utility approach discussed above as it describes the specific processes employed to determine problem structuring, probability assessments and model assessments. They suggested that decision analysis in a complex environment could very likely produce a multi attribute solution. With this in mind it seemed logical to presume that a measure able to describe decision-making quality adhered to the rigours prescribed by a multi-attribute analysis. However, which attributes to consider and how to assess adherence to these aspects towards describing decision-making quality have not been discussed yet. The next paragraph discussed some of the leading views.

2.2.1.3 Decision-making quality

Literature is clearly divided on the topic of decision-making quality. Some authors hold a position that quality resides in rigor of process, whereas other focus on decision outcomes. The Reeves and Barron (1994) framework applies, distinguishing between fitness for purpose (doing things right) and fitness of purpose (doing the right things). The first school hails from the prescriptive interpretation of decision-making, and includes the views of Leonard (1995), Dean and Sharfman (1996) and Warnock and Grantz (2017). These authors focussed on measuring adherence to a predetermined decision-making process for quality determination.

The second school of thought was results-based and showed that quality decision-making could be measured by evaluating the outcomes produced by the decision after the fact. This approach included “true measure” comparisons, where the decision outcomes of respondents were compared against a predetermined ideal answer or an expert contribution (Boyle, Hanlon, & Russo, 2012; Hess, Quees & Patterson, 2012; Lejarraga et al., 2016).

Neither viewpoint provide a satisfactory answer. Process-specific requirements are often tailored for a specific decision-making regime, making it resistant to adaptation. The analysis required are often cumbersome, requiring time-consuming analysis, and says more about the process than the actual decision. Outcome-based analyses occur after the fact and is therefore less ideal. Practically speaking, we have no need of knowing the quality of decision after it was made. It presents a teachable moment, but does little to encourage quality decision-making during the process. The comparative nature of this approach also requires a decision standard or model answer prior to evaluation. In most cases, such a target answer simply won’t exist, making this an impractical approach for practitioner.

What was required for this study, and the world of decision-making in general, was a measure able to evaluate the quality of decision-making as the decision was being taken, simple enough to provide a quick analysis, rigorous enough to be applied to a variety of circumstances, and proven to deliver reliable, just decision evaluations. The researcher could

find only one approach able to address this requirement list, and that was the integrative complexity measure.

2.2.1.4 Integrative Complexity and Decision-making Quality

Direction was taken from the paper by Tetlock (1986) on the value pluralism model, the idea that that decision-makers tend to react to value conflicts by increasing the complexity of their reasoning and entering into a process of alternative trade-offs. This contribution to the extant literature fits better under the psychological (values/emotions/motivations) perspective on decision-making discussed in paragraph 2.4. However, the discussion of their outcome variable, integrative complexity, and how it relates to decision-making quality as the outcome variable for this study, fits here. This is because the instrument is a decision analysis tool and requires discussion under the normative (prescriptive) perspective.

Integrative complexity was first introduced by Schroder in 1971 to investigate differences in the cognitive styles exhibited by individuals during the decision-making process. Tetlock in turn employed the variable as a measure of the complexity or "*quality of thinking*" employed during severe value-clashing circumstances. The term consisted of two cognitively conceived variables namely **construct differentiation** and **integration**. Construct differentiation referred to "*the variety of aspects or components of an issue that a person recognises*" (Tetlock, 1986, p. 819) and integration meant the "*development of conceptual connections among differentiated constructs*" (Tetlock, 1986, p. 819). Thus, restating the construct through its use in the Tetlock paper, it seems the author used the combined measure of construct differentiations and integration to measure the complexity with which the individual was willing to deal with during value clashes. The term is still widely used in academic writing and has been the topic of a number of leading decision-making papers.

The outcome variable chosen for this study, was **decision-making quality,** a direct operationalisation of Tetlock's integrative complexity measure. It proved to be a sufficiently rigorous and effective decision-making attribute measurement tool because it presented the researcher with an approach sufficiently powerful to describe decision-making in the fitness of purpose paradigm (per the Reeves and Baron's (1994) framework), without having to compare it to an artificial standard. The decision scenarios created for this research (detailed in Chapter 3) were clearly unique, complex and value-laden. They were written specifically to target personal value and risk orientation clashes, and to elicit a wide range of decision-making responses. What was clearly required for this research, was a process able to measure this spectrum of responses efficiently and accurately.

Therefore, since integrative complexity, a measure of complexity (or quality) of thought, measures the extent to which a person has involved themselves with a cognitive process (such

as decision-making) it was deemed the ideal decision-making quality assessment tool. In this application, it produced a determination of both the conceptual differentiation (number of alternatives considered before making a decision) and integration (extent to which these options were linked and consolidated towards a creative alternative decision option) exhibited by the respondent in answering the question. It is the view of the author thus that integrative complexity is a workable measure of decision-making quality for the purpose of this investigation.

It presented the first building block in answering the research question by presenting the outcome variable of decision-making quality. For the purpose of this study thus, and with the background mentioned above, decision-making quality is defined as: "*the extent to which an individual is willing and able to consider and link alternative options toward reaching a decision on a specific matter*." A full discussion on the methodology adopted during the manual integrative complexity coding, as well as the use of the automated coding process, was discussed in paragraph 3.6.5 of the report.

Suefeld and Tetlock (2014) revisited integrative complexity to comment on the progress of the field over the last 40 years. Their overview reported the application of the integrative complexity construct in the fields of international and domestic politics, law, ethics, history, sociology, decision-making in business management and studies of religious tolerance.

A recent flurry of contributions repositioned the integrative complexity construct as very valuable and usable decision-making tool. The most notable area of research has been towards automation of the integrative complexity coding process. Conway, Conway, Gornick and Houck (2014) produced an automated coding algorithm achieving an alpha of 0.72 when compared to human coding efforts. The authors made a strong case for automated coding, citing its popularity, its underutilisation, coder cost and fatigue and the uniqueness of integrative coding in the contextual analysis arena as motivation for automating the process. Houck, Conway and Gornick (2014) delved further into challenges facing the automation process, stating the benefits and drawbacks of both systems.

Human coding, though still consider to be the superior approach, is exposed to human bias. Scorers tend to over-estimate the integrative complexity scores of people they feel aligned with and underestimate the scores of people the feel animosity towards (Tetlock, Metz, Scott, & Suedfeld, 2014). Given that the roots of integrative complexity coding lie in the political landscape, it is not unreasonable to allow for partisan biases when assessing the complexity of thought of rival political leader.

But, automated systems have similar biases. Says, Tetlock et al. (2014), automated systems tend to underscore in instances when distinction between different dimensions is not clear. Also, for cases where integration coding words such as “yet” and “however” are used in a different sense, automated systems tend to over score. It seems though that the authors agree upon the safest way forward, namely a blended system. Tetlock et al. (2014) suggests regularly checking automated coding against human efforts, and Houck et al. (2014) proposes a “super system” incorporating the best of both worlds.

2.2.1.5 Confidence

An additional dependent variable to emerge from the research was that of the **confidence variable**. Tetlock (1986) incorporated a test to determine the measure of confidence the respondents felt towards the correctness of their choice between the values in conflict. This yielded additional support for the Value Pluralism Model as the results indicated lowered confidence levels for value clashes demanding higher differentiation.

The complete theoretical framework and position of Tetlock’s work within the psychological (values/emotions/motivations) perspective will be discussed in paragraph 2.4.1. Now, however, the attention shifts to the cognitive limitations perspective on decision-making and the role played by biases and heuristics.

2.2.2 Heuristics and Biases – The Cognitive Limitations Perspective

The cognitive limitations perspective on decision-making deals with how people interact with and perceive their environment, and is specifically geared towards addressing the impact of both bounded rationality and information overload on human cognition. This section relates the origins of this perspective and illustrates the development of the literature over the last 60 years.

2.2.2.1 The reasonable/economic man hypothesis rejected

The core criticism levied by both Edwards and Simon towards the neo-classical theory of the firm (Coase, 1937) was already covered in paragraph 2.2.1. However, with the rejection of the utility maximisation assumption, an alternative interpretation for managerial decision-making had to be introduced.

Searching for a link between **psychology** and **decision-making** in the world of economics, Herbert Simon (1959) launched what was to become behavioural decision theory through his seminal article, titled “*Theories of Decision-Making in Economics and Behavioral Science*”. Like Cyert and Marsh (1963), Simon (1959) called for a better understanding of the theory of the firm. He saw the need to consider **adaptive and satisficing behaviour** as opposed to perfect decisions, and accepted the marketplace as a complex arena consisting of obscured

knowledge, imperfect competition and containing oligopolistic rather than monopolistic structures. Simon's views were beautifully illustrated with this crisp quote: "*Classic theory is a theory of man choosing among fixed and known alternatives, to each of which is attached know consequences. But when perception and cognition intervene between the decision-maker and his objective environment, this model no longer proves adequate. We need a description of the choice process that recognises that alternatives are not given but must be sought*…" (Simon, 1959, p. 272).

Edwards contributed through his work on the indifference curve, welfare economics and risky decisions to further the implications of subjective utility functions and the psychological implications on the core tenets of classic economics (1954). By 1961, Edwards had progressed to producing a behavioural decision theory incorporating updated ideas on estimating subjective probability estimates, introductory thoughts on dynamic decision-making, and important to this thesis, the role of personality variables on decision-making behaviour. Edwards (1961) spoke towards varying motivations in individuals during the decision-making process, lying the groundwork for value-driven decision-making.

Both Edwards and Simon continues to contribute in the field of decision-making. Edwards, furthered our understanding of subjective probability distributions (Edwards, 1991) weight approximations (Stillwell et al., 1981) and weighed in on risky decision-making (Edwards, 1959). Simon pursued a path aimed a bridging the divide between psychology and economic theory (Simon, 1986) and produced key insights on the impact of bounded rationality on organisational learning (Simon, 1991) and the explanation of managerial behaviour (Simon, 1992) But their most valuable contribution was arguably in setting the table for the decision-making revolution to come.

2.2.2.2 Behavioural Theory of the Firm

Cyert and Marsh (1963) furthered the work of Simon and Edwards, but focussed their attention on the firm as unit of analysis. Their work endeavoured to better explain the observed disparities between the classic economic model and real world explanations of firm behaviour and decision-making in a complex environment. The authors examined the existing literature and found the theory of the firm to be lacking at two main points.

The original theory of the firm firstly neglected to consider the **organisational nature** of the firm through ignoring the impact of control, operating procedures and individual aspirations. Secondly, it gave a skewed picture of **firm motivations** stating the maximisation of profit as its only goal. Closely related to this assumption was the simplification concerning **perfect knowledge** and the notion that the firm operated in a transparent market place.

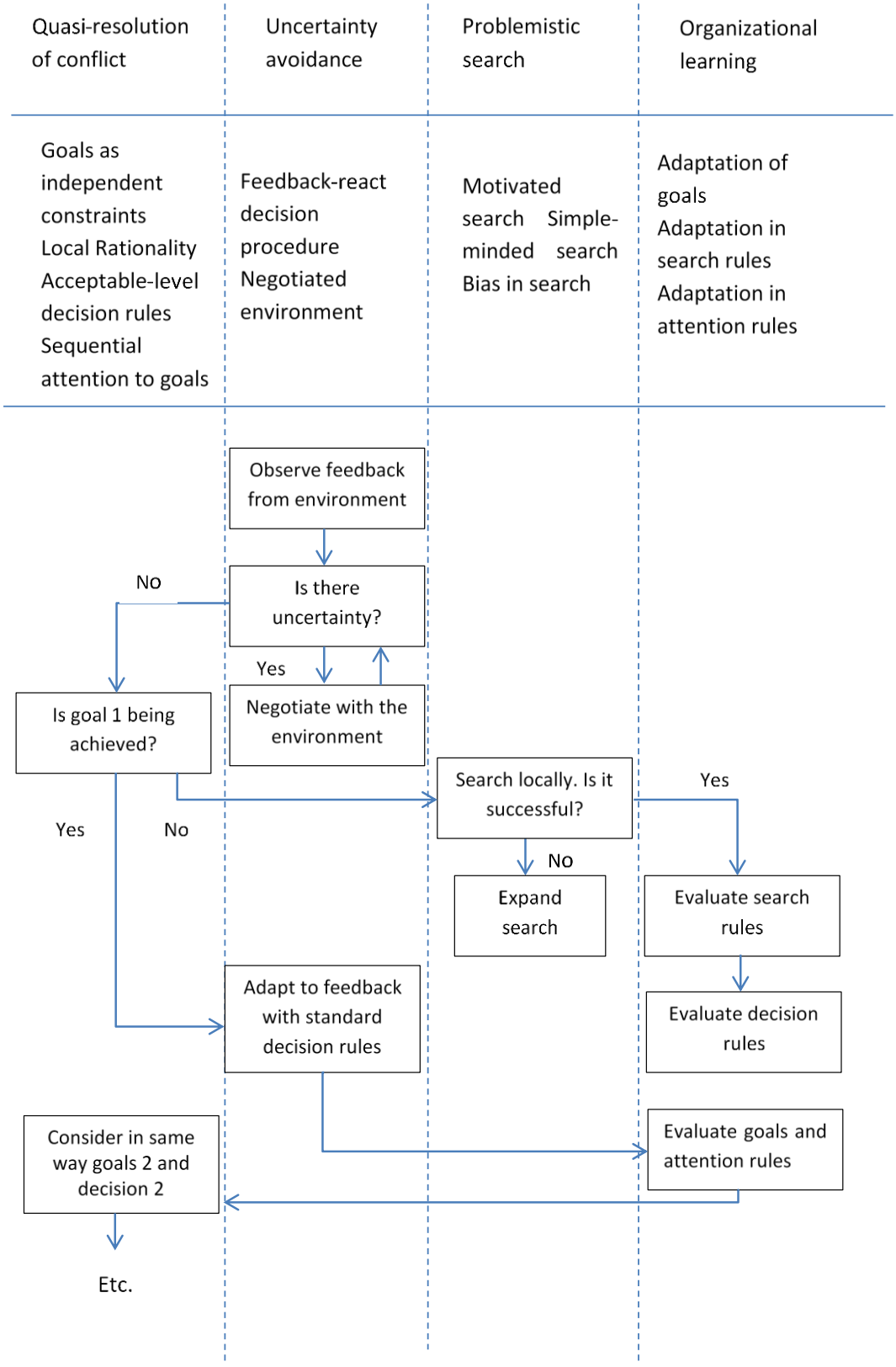
To address the shortages of the theory of the firm, the authors proposed an alternative interpretation. Organisational theory (Weber, 1922), having been organised into three distinct interpretation (sociological, social psychological and administrative) was incorporated in the understanding of the decision-making processes followed in firms. The notion that a firm has the ability to make perfect decisions was waylaid by the "*problem of collective goals*" (Cyert & Marsh, 1963, p. 30). According to Cyert and Marsh individuals have goals, but groups or collectives consisting of individuals with their respective motivations and needs, don't. A bold statement, but made in the context of absolute or ultimate goals. The authors made this statement to illustrate the difference between the simple needs of the individual and the complex and often contradicting needs of the members of the collective.

The organisation of the new theory was hence done around the novel consideration of three constructs: organisational goals, organisational expectations and organisations choice. **Organisational goals** had to be revised under the new model as the economic models for goal setting (entrepreneurial and consensus) lacked appeal. Then authors presented three steps through which to facilitate better goal setting in the collective: **bargaining**, **internal control** and **adjustment of expectations**. Through these new processes the varying need of the different actors in the organisation could be incorporated.

Secondly, the theoretical framework adapted the economic model for **organisational expectations** to allow for both conscious and subconscious biases (pre-empting of course the valuable contributions by Kahneman and Tversky (1984) in this field, discussed later). Through this process the inferences made from the available (albeit limited) information in the market place, could be applied to correct for misaligned expectations. Communication was stressed as the key tool in eradicating such biases.

Lastly, the new model for a behavioural theory of the firm allowed for **organisational choice**. Here Cyert and Marsh (1963) proposed a nine-step plan designed to position the firm as an adaptive system. This approach negated the narrow outlook of the neo-classical theory (theory of the firm) and allowed for more complex problem sets. In short, the organisational choice parameter allowed the firm the luxury of a standard operating rule applicable to problematic situations. Careful positioning of the considerations mentioned above resulted in a concise four-part exposition of the theory: quasi conflict resolution, uncertainty avoidance, problemistic search and organisational learning. Shown in Figure 3 (page 28), Cyert and Marsh (1963) proposed these four concepts in relation to one another in a complete decision-making model for the firm.

Figure 3. Organisational Decision Process in Abstract Form



Source: (Cyert & Marsh, 1963, p. 175)

The model shows a sequential (and continuous) process that alternates between the four core concepts. Quasi-conflict resolution refers to organisational limitation placed on the firm through individual goals. Any reviewed process should therefore give strict cognisance to a negotiation process of sorts to address these varying viewpoints. Uncertainty avoidance speaks to procedures set on managing the firm's exposure to uncertainty. This consists of feedback and interaction with the environment. Problemistic search is of course problem-driven search and is inherently motivated by existing problems and biased at heart. Concluding the new model is the process of organisational learning, where the firm's goals and rules are adapted to incorporate the learnings of the other three steps.

The relevance of this model to the argument in this text is that it illustrated the shortcomings of organisational decision-making processes and highlighted the need for a behavioural perspective. Almost 30 years after the first publication of the behavioural theory of the firm, Cyert and Marsh issued a second edition of the ground-breaking book. In it they added an additional chapter that took specific cognisance of the developments that occurred in the span of 29 years in the field of organisational decision-making. One of the key developments between the two editions was the **maturing of the theoretical language**. The authors could now pinpoint a number of constructs that acted as core drivers behind the theory. The notion of **bounded rationality** introduced by Herbert Simon in 1955 had gained broad acceptance and was perfectly positioned to enrich this theory. Secondly, the concept of **imperfect environmental matching** lay at the centre of the original concerns with the theory of the firm. Lastly, the idea of **unresolved conflict** came to the fore as key driver for the theory. In short, the development of these constructs ratified the behavioural theory of the firm and supported the original logic of the authors. However, a number of other developments occurred during the three decades following the first book, and two decades after the follow-up. The developments highlighted different aspects of this very complex study area and paved the way for an improved model for behavioural decision-making.

2.2.2.3 Behavioural Decision Theory

A contribution by Slovic et al. (1977) furthered our understanding of the decision-making field. As academia following in Herbert Simon's footstep, they had the opportunity to flesh-out the implications of his theory. Slovic et al. *(*1977*)* produced an overview of the theory of behavioural decision-making, touching on all its aspects. They addressed the role played by heuristics and biases and showed human judgements to be susceptible to the influence of **representativeness**, **availability**, **anchoring** and **overconfidence**, thus supporting Kahneman and Tversky's view (1984) on the matter (discussed later in greater detail).

Slovic (1972) progressed as one of the most notable contributors in the decision-making space. His psychological study of human judgement exposed the inherent biases exhibited by people estimating probabilities, variance, correlation and causation, and showed the difficulty experienced by managers attempting to integrate information for the purpose of making judgements. Slovic also dabbled in the field of risky decisions by proposing a new approach towards risk-laden societal decisions (Slovic et al., 1984) and participating in improving our understandings of the public's perception of the modern risk landscape (Burns & Slovic, 2012). These contributions prompted the author of this thesis to consider personal risk taking behaviour as an additional variable able to impact decision-making quality. A discussion of individual risk propensities follows in section 2.3.

Einhorn and Hogart (1981) furthered the complex field of behavioural decision theory with their thought-provoking contribution. Approaching the field through an economics lens, they viewed the process of decision-making within this specific theoretical realm as one akin to the principle of **comparative advantage**. This view illustrated a very pragmatic approach to the bounded rationality interpretation and presented a number of insightful interpretations.

In discussing the antecedents of their viewpoint, the authors gauged the existence of **optimality**, defined by them as "*decisions or judgments that maximize or minimize some explicit and measurable criterion (e.g. profits, errors, time) conditional on certain environmental assumptions and a specified time horizon*." (Einhorn & Hogarth, 1981, p. 3) Their interpretation showcased the absurdity of a notion of optimal decisions, given the restrictions placed on the perfect outcome as presented by a multiple criterion scenario. It would simply not be a practical or probable option to achieve the perfect decision, as the multitude of options, weights and probabilities required by the multi attribute approach would preclude it from ever reaching a definitive answer.

In addition, they also investigated the limitations presented by the problem space and environment encasing specific decision scenarios. Furthering the earlier work of Tversky and Kahneman (1975) on heuristics and biases (discussed at length in par 2.3.3), the authors took the viewpoint that **cognitive limitations representation of the scenarios**, in other words the **formulation of the "*problem space***" will have an impact on how the solution is sought for and what answer is presented.

The matter of optimal model versus intuitive response is also listed as a driver for their specific interpretation of the decision-making process. The authors pondered the abundance of evidence indicating **intuitive response** to problems as opposed to the use of optimal models, furthering their viewpoint that sub-optimal decision-making takes place as the rule rather than the exception.

From this position, Einhorn and Hogart (1981) applied the principles of behavioural decision theory to dig deeper into why sub-optimal decision-making occurs. The authors followed a decomposition process, splitting decision-making into its most recognised sub-parts: **information acquisition**, **evaluation**, **action** and **learning/feedback**. Though not all the information relayed in this voluminous section proved to be pertinent to the developing argument, a number of very useful observations can be recounted.

The authors went to great lengths to illustrate the influences of an **imperfect environment** on each of the sub-processes. The information acquisition process was shown to be specifically marked by heuristics and biases clearly affecting the quality of information available to the decision-making process. The evaluation process seemed prone to **internal conflict considerations** highlighting the viewpoint of Cyert and Marsh (1963) on the complexity of multi objective teams. The action sub-processes seemed to be even more subjected to internal conflict and the authors proposed the application of "*compensatory strategy*" (Einhorn & Hogarth, 1981, p. 18) to best utilise the Slovic et al. (1977) utility approach.

Completing the four-part examination of the decision-making process, Einhorn and Hogart (1981) reflected that even their newly introduced control measures available to decision-makers were exposed to the ravages of "*wide variety of judgemental biases*" (Einhorn & Hogarth, 1981, p. 23). Considering the complexity of the problem at hand and the various drivers impacting the process, the authors concluded their overview of the field with a stark recommendation for continued work in the field. They felt that a broader perspective was required when contributing to the field and that additional topics such as creativity and problem solving warranted further investigation.

Contributing to the work of Cyert and Marsh (1963), Amit and Schoemaker (1993) also sought to better understand firm heterogeneity. Building on the basic concepts embodied in the **resource based view** of the firm, the benefits of **industrial analysis** and **bounded rationality theory**, the authors exposed a number of voids in the extant literature.

Amit and Schoemaker (1993) argued that, even though **industrial analysis** will provide the firm with revenue opportunities available from the external environment, it lacks the ability to shed any light on the internal workings of the firm. The **resource based view** acknowledged systematic firm differences and yielded the valuable contribution of key success factors through which to differentiate between the various resources and capability attributes of the firm. However, this theory ignored the influences of **relational issues** within the firm. Behavioural decision theory however contrasted with these viewpoints and shed light new light on the internal processes required to make decisions and execute plans. Through this

approach, bounded rational managers were given specific consideration, and imperfect decision-making was incorporated as one of the great causes for market opportunities.

The authors specifically investigated three main contributors to impaired decision-making in the firm: **uncertainty**, **complexity** and **conflict**. **Uncertainty** plays a large role on affecting managerial decision-making through the way that natural risk aversion tactics influence the process. Managers appear to either respond to the situation through risk aversive tactics resorting to biased predispositions such as anchoring and the recency effect, or overreacting to uncertainty through overconfidence and overly ambitious targets.

The **complexity** of the market environment necessitates managers to employ natural heuristic tactics to lessen the "noise" and to simplify decisions. This approach often leads to inconsistent decision-making where cognitive limitations and personal biases influence which data sets are included and which ignored during the sifting process.

As firms would always be the social agglomeration of multiple characters and personalities, we can safely assume the existence of **conflict** through the decision-making process. The prioritisation of some resource allocations over another will undoubtedly be to the benefit of some, and detriment of others. Very few internal decisions are to the benefit of all parties, yielding severe firm politics and relational tensions. For a firm to make any form of decision, the internal resistance to decisions and resulting firm inertia need to be overcome before they can be executed.

From the above contributions and new insights, the authors proceeded to introduce a novel multi-dimensional approach to explaining firm heterogeneity. They held that careful consideration of all three theories (industry analysis, resource-based view of the firm and behavioural decision theory) was required to understand why different firms respond differently to similar conditions. They proposed the design of "*heuristic solutions that navigate between the numerous cognitive and affective biases characteristic of humans and organizations*" (Amit & Schoemaker, 1993, p. 44). This leads the researcher to ponder the importance of heuristics and biases to decision-making behaviour, and the role they might play in shaping decision-making quality during value clashes.

2.2.2.4 Heuristics and Biases

Investigating observed uneconomical and sometimes irrational decision-making behaviour of people, Tversky and Kahneman (1975) proposed the existence of techniques (called heuristics) employed by individuals to "*reduce the complex tasks of assessing probabilities and predicting values to simpler judgemental operations*" (Tversky and Kahneman, 1975, p. 142). The authors observed consistent patterns deviating from the expected decision-making

behaviour (as postulated by the utility maximisation assumption) and identified three commonly used heuristics: **representativeness**, **availability** and **adjustment to anchoring**. They hailed heuristics as a natural coping mechanism for people faced with complex and uncertain decision-making tasks, but cautioned however that the unguarded application of these techniques could result in systematic decision errors, called biases.

Representativeness is a heuristic aimed at exploiting the ability to predict the probability of one event occurring based on the known probability of a similar but different event. This technique is unfortunately fraught with errors as it ignores consideration of the base probability of the second event ever occurring. It also ignores any consideration towards sample size or predictability of the event. An illusion of validity occurs just because some observed pattern of resemblance exists and is evident of a fundamental misconception of regression.

The **availability** heuristic addresses the phenomenon observed where people tend to favour "proofs" of events by the ease with which similar events could be **recalled**. This is a useful technique to access frequency data very quickly, but harbours its own limitations. Selective retrievability of information will warp the data available with which the judgement is to be made and will logically limit the effectiveness of the search. In instances where applicable information could not be recalled, frequency rates are imagined or made up to ease the process. The illusory-correlation effect also comes into play when employing the availability heuristic as strong associations between co-occurring events often warp the decision-makers' ability to assess fairly.

Lastly, the authors discussed the **adjustment to anchoring** heuristic where people tend to make judgements and decisions from a specific starting point or set condition. It has value in the sense that the historic benefit of a specific condition could be exploited towards future decisions, but has its own limitations. People tended to limit the amount with which they were comfortable in adjusting from the familiar anchored position. The also seemed to confuse the implications of conjunctive and disjunctive events by seemingly ignoring obvious probability faults. The researchers also found people to be exposed to subjective probability distributions where judgements were made on false interpretations of the data at hand.

The authors concluded with the observation that the biases discussed in their article were only representative of the **cognitive heuristics** applicable to the decision-making process and hence gave no opinion on **motivational and affective influences** on the decision-making process. Through this observation they admitted that this simple framework of heuristics and biases were still a long way short of explaining inconsistent decision-making in people. This of course presented an ideal opportunity to re-evaluate the decision-making literature through additional lenses, as was done in this literature review.

Kahneman and Tversky (1979) next investigated systematic violation of the expected utility theory by subjects making risky decisions and proposed the influential prospect theory. This contribution fleshed out the theoretical model on risky choice and suggested the occurrence of relative risk aversion in situations of certainty compared to situations of mere high probability (**certainty effect**) and risk seeking in situations involving sure losses compared to probable losses (**reflection effect**). They also proposed the existence of the **isolation effect**, as an additional violation of the utility theory. This phenomenon predicts that decision-makers will, in order to simply the choice, ignore similar attributes of a matter at hand, and instead focus on the attributes that distinguish it.

The Expected utility as defined by the authors is the sum of the various probabilities, outcomes and utilities of all the possible options and is depicted as follows: $U(x_1,p_1 \ldots x_n,p_n) = p_1u(x_1)+\ldots p_nu(x_n)$, where $p_1+p_2+p_3\ldots.p_n = 1$.This would suggest that people make optimal decisions when faced with a number of options of varying probability.

Observations of real-life human behaviour suggest that this could not be true, though. Kahneman and Tversky (1979) showed through a number of carefully crafted thought experiments, that human nature violates these expected decision behaviours. The research indicated the existence of **risk aversion** and **risk seeking** behaviour contradicting the expected utility theory through the fact that people seemed to favour less optimal options to either seek out or avert risk. Pertinently, the choice of risk aversion or risk seeking was tied up in the **presentation of the scenario**, with risk aversion prominent in instances where possible gains were discussed, and risk seeking during scenarios featuring possible loss events.

One of the key conclusions of the Kahneman-Tversky paper was that people evidently made decision influenced by subjective and incomplete assessments and that their **personal biases** played a large role in determining how they functioned during the decision-making process. The authors concluded though that this model was not a perfect rendition of the process and suggested further research to illuminate both how the probabilities of the possible outcomes are evaluated and through what measures the gains and losses are assessed.

Kahneman, sometimes collaborating with Tversky, often writing on his own, produced some of the most valuable contributions to the field of heuristics and biases. Kahneman (2003b) investigated the influence of psychology on behavioural economics in Maps of Bounded Rationality. This article produced a schema of decision-making consisting of the three cognitive systems and expanded Stanovich and West's (1998) System1/System2 model to a perception/intuition/reasoning model. Kahneman also proposed that a study of behavioural decision-making should involve "*emotional and motivational*" (1991, p. 145) factors, hinting at

the importance of personal value systems to the field. Paragraph 2.2.3 deals with this perspective on decision-making. But at this point, a discussion of the latest contributions to decision bias research merits discussion.

2.2.2.5 Biases – a Modern Framework

No contemporary overview of the cognitive biases space will be complete without a specific consideration of the work by Dan Ariely. His textbook on "*the hidden forces that shape our decisions*" (Ariely, 2008) gives an exposition of the wide and wonderful world that is behavioural decision-making and contributed to the extant literature by illustrating theoretical models through ordinary day-to-day occurrences. This resulted in a stunningly vivid illustration of behavioural influences on the decision-making process of ordinary people. Ariely discussed biases along the established framework of anchoring and procrastination, but enriched it with his contribution of the problem of too many options, and the impact of social norms and ethics on the decision-making process.

Tracing Ariely's contributions to academic journals revealed an interest in decisions by rules (Amir and Ariely, 2007). Their work revealed that rule-base behaviour was context driven, and that people were more likely to adhere to rule driven decision-making where monetary considerations were explicitly stated. The paper related a number of experiments where expected rule-based decision-making were violated to adhere to personal motivations. This was a fascinating find, as it predicted that decisions to violate rule-based decision-making could be traced to personality differences. Also, rule-driven decision-making tended to be "mindless", whereas the decision to violate rules, were much more deliberate. Ariely thus predicted **personality heterogeneity in rule-based decision-making**; a strong antecedent to the core hypothesis of this thesis.

Goto also contributed to the debate and discussed the role played by human judgement in uncertain decision-making (2007). He introduced the term "j*udgemental risk*" and suggested that **psychological biases** affected decision-making. He called for the biases, habits and attitudes of people participating in decisions with uncertainty, to be re-evaluated. He proposed educating staff on the repercussions of the biases and developing risk-evaluation models to make allowance for the psychological effects. This contribution was helpful to the research conducted for this study as it linked the bias framework with organisational risk exposure. They presented staff education and risk management models to counter for these effects, but, as we will see below, were not the only options available to managers.

Another perspective on cognitive biases was presented by Das and Teng (1999). The authors explored the influences of cognitive biases on strategic decision-making and presented the following four categories of biases: "*Prior hypotheses and focussing on limited targets,*

exposure to limited alternatives, insensitivity to outcome probabilities and illusion of manageability." (Das & Teng, 1999, p. 764). The similarity with the Kahneman and Tversky (1984) framework of anchoring, representativeness and availability, is striking and reiterates the structure presented by them 20 years before.

Their research showed that managerial teams gave very little attention to the influence of biases on the decision-making process even though they clearly affected attributes of the decision-making process. Unfortunately, the authors' only contribution towards addressing this phenomenon was a call on managers to be more aware of their personal biases and to act more careful as a result.

The role played by biases in the decision-making process was specifically illustrated by Lovallo and Sibony (2010) for the McKinsey Quarterly where they delved into the detail of behavioural strategy. They proposed a framework for strategic decision-making sensitive to the most prevalent cognitive biases. Their framework proposed the existence of five categories of biases (action oriented, interest, pattern recognition, stability and social) each with its own exposures and limitations. The article concluded with a practical guide on how to implement a decision-making regime in organisations to "de-bias" the process.

Lovallo and Sibony (2010) were however not alone in their drive for framework describing biases. Looking back at investigations into strategic failures, a fascinating contribution was made by Roxburgh (2003). The author investigated what he referred to as "*hidden flaws in strategy*" and posited eight core flaws to modern strategic management thinking. Pertinently, seven of the flaws (overconfidence, status quo bias, anchoring, sunk cost effect, herding instinct, misestimating future hedonic states and false consensus) fall perfectly into the biases framework presented by Lovallo and Sibony (2010). This was no coincidence and is a sure sign of the strategic management world converging on the important phenomenon of behavioural influences. But in what way were heuristics and biases related to the hypothesised relationship between personal value orientations, risk propensities and decision-making behaviour? The researcher argues that a specific cognitive bias illustrated by the framing effect, formed an important piece of the puzzle.

2.2.2.6 The Framing Bias

A cognitive bias of specific concern to this thesis, is that of the framing effect, defined as a bias that "*arises when trivial changes to the way a decision problem is presented, emphasizing either the potential gains or potential losses, leads to reversals of preference, with decision-makers being risk averse when gains are highlighted and risk seeking when losses are highlighted*" (Hodgkinson, Maule, Bown, Pearman & Glaister, 2002, p. 1069). According to the established frameworks of Lovallo, Sibony and Roxburgh discussed above, the framing bias

probably has its roots in the combination of the anchoring effect, and the confirmation bias and speaks towards people's inability or unwillingness to consider alternative interpretations to most obvious one in front of them.

Okder (2012) studied the framing effect by first distinguishing between it and the reflection effect. With regards to risky decision-making, the author found that the information supplied to the participants in the Asian disease exercise greatly impacted on the outcomes of their decision. This was more than the expected "*reversal of risk preference*" due to the reflection effect. The study illustrated how the different conceptual frameworks or schemas of the respondents and researchers influenced the research findings.

Ojiako, Papadopulos, Thumborisuthi and Fan Yang (2012) delved further into human nature during the decision-making and introduced the concept of variability framing. Incorporating the well-known Hofstede framework (Hofstede, 1983) for cultural dimensions, the authors found that the cultural heritage of Thai workers studied, had no bearing on their risk framing choices. Instead, the **individual personal characteristics** of the test subjects seemed to determine how they framed risk. This viewpoint is of note as it aligns with the core assumption (that individual value and risk propensities play a role in decision-making behaviour) of this research problem. One wonders therefore, with the influence of the framing biases clearly illustrated, whether it could be applied to influence decision-making behaviour during value clashes. This could potentially pave the way towards answering the second part of our research question: what can be done to improve decision-making quality?

However, before this matter is discussed any further, the third interpretation of the decision-making process, the psychological (values/emotions/motivations) perspective, needs to be investigated and understood.

2.2.3 Values – The Psychological (values/emotions/motivations) Perspective

This section deals with the psychological (values/emotions/motivations) perspective on decision-making and has specific reference to the role played by personal value systems and the development of suitable value surveys. This section concluded the three perspectives on decision-making. The relationships between the three perspectives, and the dominant theories within these views will not be apparent yet, but will be discussed in great detail in sections 2.3 to 2.6.

2.2.3.1 The Development of Value-driven Decision-making

A critical contribution to our understanding of the decision-making process came by way of the Rokeach Value Survey (Rokeach, 1973). Milton Rokeach, a prominent psychologist of the 1960's and 1970's, contributed to the then popular belief that human behaviour was related to

needs (Maslow, 1943) and/or attitudes (Wyer, 1965) by proposing that a relationship also existed between **value systems** and behaviour. This theory, built on 25 years' worth of research in the field, culminated in the development of the Rokeach Value Survey (Rokeach, 1973). In a publication titled "*The nature of human values*" Rokeach not only described his value evaluation system, but enriched the literature with a number of valuable definitions. To this end, he defined a **value** as "*an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or common mode of conduct or end-state of existence*" (Rokeach, 1973, p. 5) and a **value system** as "*an enduring organization of beliefs concerning preferable modes of conduct or end-state of existence along a continuum of relative importance*" (Rokeach, 1973, p. 5).

Rokeach's model utilised two sets of 18 descriptive terms, labelled terminal and instrumental values (derived from his definition, focussing on both preferred end-state positions and common mode of conduct).

Terminal values referred to the most preferable end-state people would work towards in life and in projects; listed in Table 1.

Table 1. Rokeach Value Survey – Terminal Values

a comfortable life	inner harmony
an exciting life	mature love
a sense of accomplishment	national security
a world of peace	pleasure
a world of beauty	salvation
equality	self-respect
family security	social recognition
freedom	true friendship
happiness	wisdom

Source: (Rokeach, 1973)

The instrumental values, also aligned with his core definition, referred to "*preferable modes of behaviour*" and included attributes listed in Table 2. In short, Rokeach's research and eventual model was built around his interpretations of the relationships between these values and the socio-economic and demographic specifics of his test subjects. Through this, Rokeach was able to show that human behaviour was more closely related to the value systems people adhered to, than the attitudes they held towards a specific matter and ushered in a deeper understanding of human motivation (Rokeach, 1973).

Table 2. Rokeach Value Survey – Instrumental Values

ambitious	imaginative
broadminded	independent
capable	intellectual
cheerful	logical
clean	loving
courageous	obedient
forgiving	polite
helpful	responsible
honest	self-controlled

Source: (Rokeach, 1973)

A number of concerns have since been raised around the model and the selection of value descriptors. Is this list of 36 values/attributes a complete representation of the human experience (Braithwaite & Law, 1985)? Is it correct to assume a relationship between the specific word and their experiential application in the life of the subjects? (Braithwaite & Law, 1985) Does not the social desirability of these values influence the subjects to place certain sought after attributes ahead of others (M. S. Wilson, 2004)? And how do the terms relate to one another during the testing procedure (Weigert, 2013)? The contribution was thus by no means a "silver bullet" to answering all our questions on human motivation during the process of decision-making, but it did point a number of researchers (Schwartz, 1994; Braithwaite & Law, 1985; Wilson, 2004) to start in the right direction, and left the field richer by two poignant definitions and a very useful value system assessment tool.

Furthering Rokeach's work on the decision-making process was the verification work conducted by Valerie Braithwaite and her associate (Braithwaite & Law, 1985). They conducted a study to establish both the representativeness and comprehensiveness of the Rokeach Values Survey (Rokeach, 1973). Their research revealed that rank-ordering of the value list could be replaced by a **rating scale** thus allowing for values of similar importance to receive equal support. Braithwaite and Law (1985) also proposed adding to the values lists by including overlooked terms. These included descriptors of physical well-being as well as references to fundamental rights such as privacy, freedom and sanctity of human life.

Table 3. Braithwaite and Law – Revised Values List

internal harmony and equality	traditional religiosity
national strength and order	religious commitment
personal growth and inner harmony	positive orientation towards others
physical well-being	competence and effectiveness
secure/satisfying interpersonal relationships	propriety in dress and manner
social standing	assertiveness
social stimulation	getting ahead

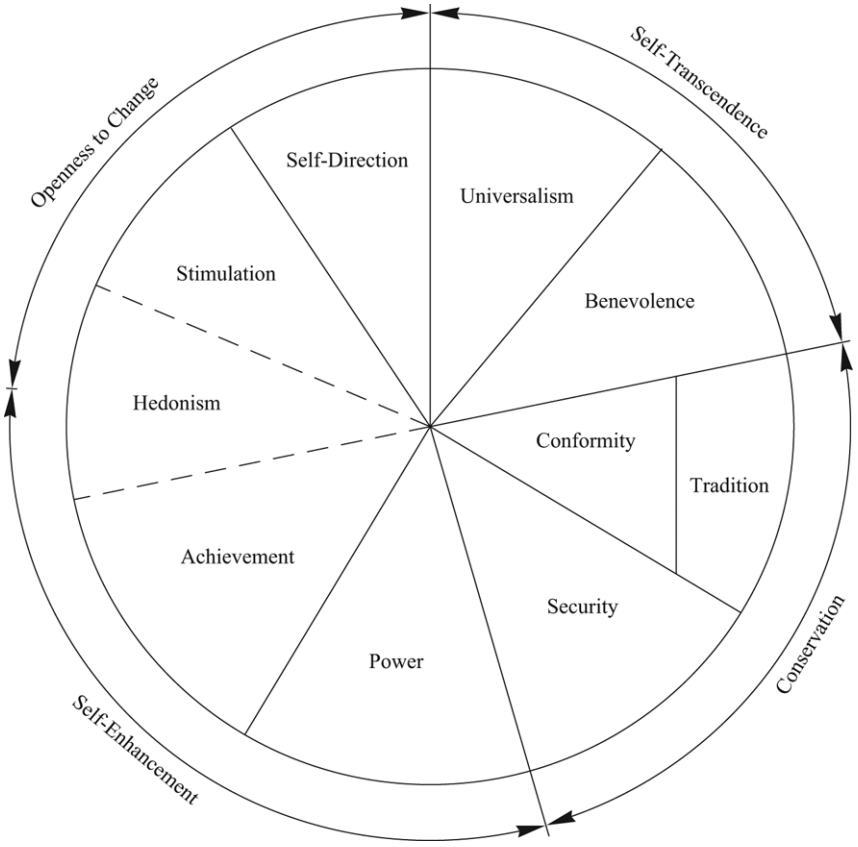
Source: (Braithwaite & Law, 1985, p. 262)

These limitations were addressed by introducing a new survey consisting of 14 terms (Table 3) that proved to be much more rigorous when exposed to test-retest reliability statistics (Braithwaite & Law, 1985).

Following this, was the need for value segmentation. Kamakura and Mazzon (1991) identified the need to subdivide the value lists in sets of discrete value systems. Their work resulted in six specific value groupings indicating the existence of typical value organisations of the response group. This is a development pertinent to the argument presented for this research proposal as it guides the way towards groupings of people based on their value orientations.

Shalom Schwartz in turn was intrigued by whether value systems exhibited universality (Schwartz, 1994). To this end, he proposed ten **value types**, selected from their respective motivational origins, and showed the impact the inter-relation between the values had in constructing a holistic human value map. The research yielded support for Schwartz's hypothesis that 56 basic human values could be categorised into ten value groupings. He went on to arrange the value sets in a two-dimensional orientation (using Smallest Space Analysis, nonmetric multidimensional scaling) to produce the value system shown in Figure 4.

Figure 4. Motivational Types of Values Arranged in Bipolar Space

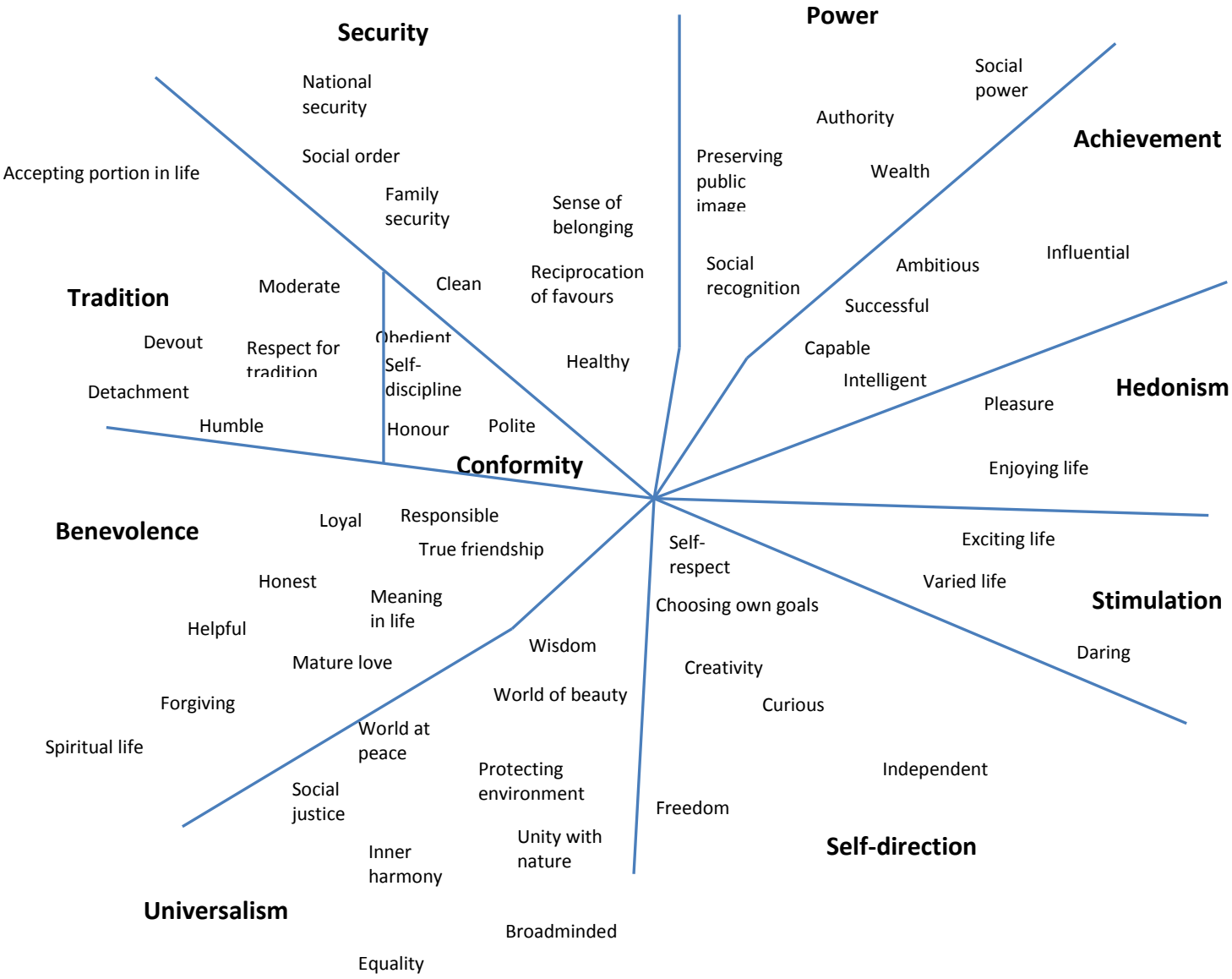


Source: (Schwartz, 1994, p. 24)

Of note were the descriptors of the two-dimensional field: **Self-transcendence vs. Self-enhancement** and **Openness to Change vs. Conservation**. The author went on and plotted the 56 values (of which 30, the nouns, were deemed to be terminal, and the remaining 26 (adjectives), were instrumental), within this framework. This produced the insightful value representation in Figure 5 combining the insights of more than 25 000 respondents over 19 countries.

These interpretations yielded a much more complex view of human value systems suggesting values to manifest in a continuum in the two-dimensional space, rather than as a discrete, hierarchical list. Also, values seemed to be positioned in groupings of value sets indicating more complex orientations. Pertinent to the argument to be presented later, one of the countries analysed in a separate study was South Africa, the setting of this study (albeit only a sample of the white population) (Schwartz, 1994). Schwartz did not ponder on the differences in value orientations for the various nations as it was not the focus of his study. He did note that the values were universal, but their relative importance to different cultural groupings would vary (Schwartz, 1992).

Figure 5. Value Structure Prototype: Small Scale Analysis



Source: (Schwartz, 1994, p. 31)

The author concluded that the use of value sets rather than single values improved the repeatability of the instrument and thus showed an improvement of the original Rokeach Value Survey (Schwartz, 1994).

The matter of cross-cultural value comparisons, hinted at by Schwartz (1994), was explored two years later. Bigoness and Blakely (1996) immersed themselves in the question whether value systems vary across cultural and national divides. Surprisingly, given the volume of work conducted by leading authors on the topic of values (Schwartz, 1994; Braithwaite & Law, 1985; Kamakura & Novak, 1992; Schwartz, 1992) the authors chose to employ the original Rokeach Values Survey (Rokeach, 1973) to conduct their data gathering. Although not expressly

mentioned, it is surmised that this was done to ease the experimental procedure. Also, only the 18 instrumental values were employed in the questionnaire, omitting the 18 terminal values. Closer scrutiny of the references employed by Bigoness and Blakely (1996) revealed the absence of the aforementioned contributors in the field. The strong presence of Hofstede's work (1986) on cultural differences, suggests that the authors perhaps approached the field from a fresh angle.

This view resulted in a number of significant insights. Factor analysis of the 18 instrumental values across the 1056 respondents from 12 countries (Australia, Brazil, Denmark, France, Great Britain, Germany, Italy, Japan, the Netherlands, Norway, Sweden, and the United States) revealed four groupings of values or "*value dimensions*". The value dimensions were ranked and produced the following sets of values in order of diminishing importance: *broadminded, capable and courageous*, followed by *imaginative, independent and intellectual*, then *clean, obedient, responsible, polite and self-control* and lastly concluding with the least important values of *cheerful, forgiving, helpful and loving* (Bigoness & Blakely, 1996, p. 748).

The authors concluded that although the different nationals tended to arrange the value groups in the same order of importance, individual cultures exhibited specific value preferences. The notion of a universal value set was rejected in favour of **specific culturally driven value systems**. It would have been valuable if the authors had expanded their questionnaire to include more of the emerging market cultures in the survey (eight of the 12 countries were from Europe). Also, the insights brought by the Schwartz (1994) value framework, would have given much more depth to the study.

Further concerns with regards to the Rokeach Values Survey (Rokeach, 1973) concerned the **social desirability** of the value sets and how they might bias the analysis (Goldsmith, Stith, & White, 1987). The authors proposed that social desirability influences might detract from the effectiveness of the Rokeach Value Survey. Their results showed however, that social desirability influences made very little impact on the instrument and that very weak correlations existed between the social desirability affect ratings and the value lists.

The literature review on value systems included a search into the latest publications in this field. This yielded an update of the Schwartz Portrait Value Questionnaire (Schwartz et al., 2012) that expanded the value motivators from ten to 19 and resulted in an update of the human value survey. Chapter 3 that deals with the research design and discussion of the research instruments relates the detail of this new questionnaire.

2.2.3.2 Value-driven Decision-making

With the value system framework established, an investigation was next made into the importance of value considerations during decision-making. Value-influenced decision-making was traced back as far as the 1959 Harvard Business Review contribution of Learned, Dooley and Katz. Their view: "*man, imperfect in his comprehension and perspective, and burdened with sins and short-sightedness of his own making, is inevitably unable to sense the full reality*" (1959, p. 113) reflected Simon's position on bounded rationality, but applied a personal value component to the view. They believed that every business situation was influenced by value conflicts between men, and that a deeper understanding of the values people held dear and the decisions they made, was required.

A number of authors weighed in on the topic. Oliver (1999) answered the call in part with his longitudinal comparison of managerial value orientations over a period of nearly 30 years. He found surprising little difference between the value orientations of the two sample sets and concluded that these values were enduring, and prone to influence American business life for times to come. Nonis and Swift (2001) in turn investigated the role played by personality types in ethical decision-making and showed that internally driven individuals were less prone to unethical decision-making whereas externally driven individuals were more susceptible to its onslaught. The concluded that value profiles could be used as a predictor of unethical decision-making. Hall and Paradice (2007) later evaluated decision support systems and recognised the importance of considering the influence of value-biased decision-making in the workplace. Their recommendation was to design information systems in such a way as to control for the bias.

Fritzsche and Oz (2007) employed the Schwartz (1994) value scale to determine whether personal value orientations could act as predictors of unethical behaviour. The study employed ethical dilemmas in the form of short stories or vignettes and concluded that ethical behaviour was negatively related to people with self-enhancing and openness to change orientations, and positively related to people with self-transcending and conservative orientations. This study was of particular interest to the author of this thesis as it largely mirrored the experimental design (through the use of the Schwartz Value Survey and the decision-making vignettes) but differed in the targeted outcome variable. It would therefore be significant to see whether ethical decisions also constitute good quality decisions. Furthering the ethical decision-making field Watson, Berkley & Papamarcos (2009) studied ambiguous allure and the value-pragmatics model. Their starting point was the Cognitive Moral Development paradigm, a 4-step model suggesting the following process taking place during ethical decision-making:

- Becoming aware of a moral issue
- Making a conscious and deliberate judgement about the issue
- Experiencing moral intention and motivation
- Carrying out morally related action.

This approach spoke of deliberateness and intent – assuredly System II behaviour which correlated comfortably with the tenets of integrative complexity. Watson et al. (2009) also employed the Schwartz Value Survey (Schwartz, 1994), but furthered the research by relating specific values with moral or amoral behaviour. Their findings suggested therefore that the values of hedonism and power would predict non-ethical behaviour, whereas universalism and benevolence were antecedents of ethical behaviour. Grebitus, Steiner and Veeman (2013) investigated a relationship between personal value sets and environmentally sustainable behaviour. The paper showed that people favouring intrapersonal values, were less sensitive to environmental behaviour, and that people with a societal conscience were probe to environmentally positive behaviour. Though valuable to one of the decision-making scenarios applied for this thesis, the study fell short of contributing to the debate by using the outdated Rokeach Value Survey instead of the Schwartz Value Survey. The latter approach would have made the study comparable to the work of Watson et al. (2009) and Fritzsche and Oz (2007), and would have shown which values specifically predicted environmentally sustainable behaviour. Ariail, Aronson, Aukerman and Khayati (2015) contributed to the work by Hall and Paradice (2007) on the importance of personal value systems to decision-making systems. Their literature review revealed that intuition, cultural differences, problem solving modes, cognitive styles, human factors and personality types all played a role in the decision-making process. An important contribution to this space was the following argument: "*choice involves judgement, and judgement implies values*" (Ariail et al., 2015, p. 137). With the importance of personal values to the decision-making behaviour of managers established, it seems logical to argue that this relationship will extent to show a correlation between the personal value systems and exhibited decision-making quality of managers. The research question, probing just this relationship, seems more pertinent now.

With the three-pronged investigation into decision-making literature concluded, one aspect of the research question remained unaddressed. The author of this report proposed that both individual value orientations and risk preferences would play a role in shaping decision-making behaviour. Thus, before the proposal for a new decision-making framework can be finalised, the role of risk propensity in decision-making had to be discussed.

2.3 Setting of the Research in the Risk Perception/Risk Preference Paradigm

Some of the authors quoted (Kahneman & Lovallo, 1993; Slovic et al., 1984; Slovic & Västfjäll, 2010), suggested that in addition to value orientations, personal risk propensities should also be considered as an important part of the psychological (values/emotions/motivations) perspective on decision-making behaviour of individuals. However, risk preference stems from a different field of literature and has developed separately from the psychological (values/emotions/motivations) perspective on decision-making. A discussion of the evolution of behavioural risk management was thus warranted to show the overlap with and importance of risk propensity to the decision-making literature. The overview of the risk perception/risk preference paradigm included background on the gradual move of the body of knowledge around risk management into the behavioural decision-making world, as well as specific discussions of the literature on risk perception and risk preference. This section concluded with an instrument available to measure risk preference in varying situations.

2.3.1 A Move Toward Behavioural Risk Management

The risk management study field, originating in the hinterland between the strategic management and financial domains, has gone through a number of evolutionary and revolutionary iterations. Miller (1992) proposed the concept of integrated risk management (IRM) in the early 1990's. This signalled a move away from the orthodox "*emphasis on particular uncertainties*" towards a multidimensional perspective of risk. Miller reasoned that an integrated risk management perspective would improve risk management through simultaneous consideration of the numerous uncertainties plaguing international businesses. In an attempt to explore the landscape further, he proposed classification of uncertainties in three main categories: **general environmental**, **industry specific** and **firm specific**. This framework highlighted the complexity and interrelatedness of the uncertainties in the market and was the first step towards an integrated approach to risk management.

The debate was advanced through a seminal overview of risk measures in the domain of strategic management (Ruefli, Collins, and Lacugna, 1999). The authors made a distinction between the ***ex-post* analysis** conducted by financial analysts and the ***ex-ante* requirements** of strategically focused managers. Their research revealed the dominance of both the CAPM risk prediction measure (Beta) and the variance related measure in the 15 years preceding their study. They expressed dissatisfaction with the two methods and showed their ineffectiveness at predicting securities risk-return relationships since 1960. They proposed a plethora of alternative risk assessment measures such as variance of forecasts of earnings, debt-to-equity ratios, capital intensity, research and development intensity and unsystematic

risk, furnishing the financial managers with an abundance of tools to combat the short comings of the two methods discussed above. Unfortunately, they neglected to incorporate the human or behavioural element in the discussion.

A more recent contribution along an integrated risk management philosophy was presented by Ward (2003) through his work on a multi-dimensional framework for risk management. He proposed six dimensions along which organisational activities could be classified. These dimensions were: interpretation of risk as threat, opportunity or uncertainty; decisions to which risk management is applied; purpose of risk management activity; nature of the process employed; parties involved; and resources applied. This showed progress for the integrative nature of risk management, and presented a practical (what, when, why, which way, who, wherewithal) tool to conduct effective risk management assessments with.

The contribution by Arena, Arnaboldi and Azonne (2010) on organisational dynamics of enterprise risk management was indicative of a new perspective in the literature. Their focus on the behavioural aspect of risk management acknowledged the **role played by people** in the **risk management process**. No longer was it simply a cognitive exercise, but the affective component also received cognisance. They introduced a clear definition for ERM where the saw "*Enterprise Risk Management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of the entity's objectives*" (Arena et al., 2010, p. 659) and called for "*real ERM*" in the wake of the financial crisis of 2007-2009. They proposed the adoption of three elements to "*cover broader meaning systems, but also the activities of actors who are embedded in these logics*". These elements were risk rationalities, uncertainty experts and risk technologies and showed clear consideration of the actors involved in the process.

Enter Michael Power. His provocatively titled study, "*The risk management of nothing*" (2009) claimed that an "*intellectual failure*" occurred through "***an impoverished conception of 'risk appetite'***". Power (2009) showed through his work that the ERM approach presented limited risk management effectiveness and was employed as a prescriptive, regulation adhering, boundary preserving practice, rather than an enriching, boundary challenging process. Risk appetite was shown to focus on capital issues alone, neglecting the human component. He proposed the adoption of business continuity management (BCM) as alternative to the status quo on the strength of the embeddedness it would lend to future risk management programs.

The need for behavioural considerations was supported by Anette Mikes (2009) when she introduced the concept of "***calculative cultures***". Mikes proposed that two different logics

existed within the ERM culture: one was very much numbers driven and targeted shareholder value, whereas the other was more holistic and emphasis risk-based control culture. This, she held, gave rise to two distinct views on ERM, producing the "*calculative cultures*" mentioned above. This novel view of risk management was a further indication of the complexities the human element brings to the matter at hand. Developments in the behavioural interpretation of core business disciplines (economics, finance, and lately strategy), present a suitable academic framework against which to study the phenomenon of taboo scenarios and their impact on decision-making in the business world.

Thus with the attention of the risk management world shifted to include behavioural considerations, the way in which risk was perceived by people and how this affected their decision-making skills, needed to be understood.

2.3.2 Risk Perception/Risk Attitude

Moving closer to the core research question of this study is the contribution by Slovic et al. (1984) on the role played by behavioural decision theory to the study area of **risk management**. Slovic et al. (1984) produced a study that was structured around three core ideas: to investigate how people are informed about risk, to understand how risk is perceived and to determine what constitutes acceptable risk. Seeing as the study originated in the behavioural decision-making framework, the authors took specific care to include consideration of heuristics and biases for their research.

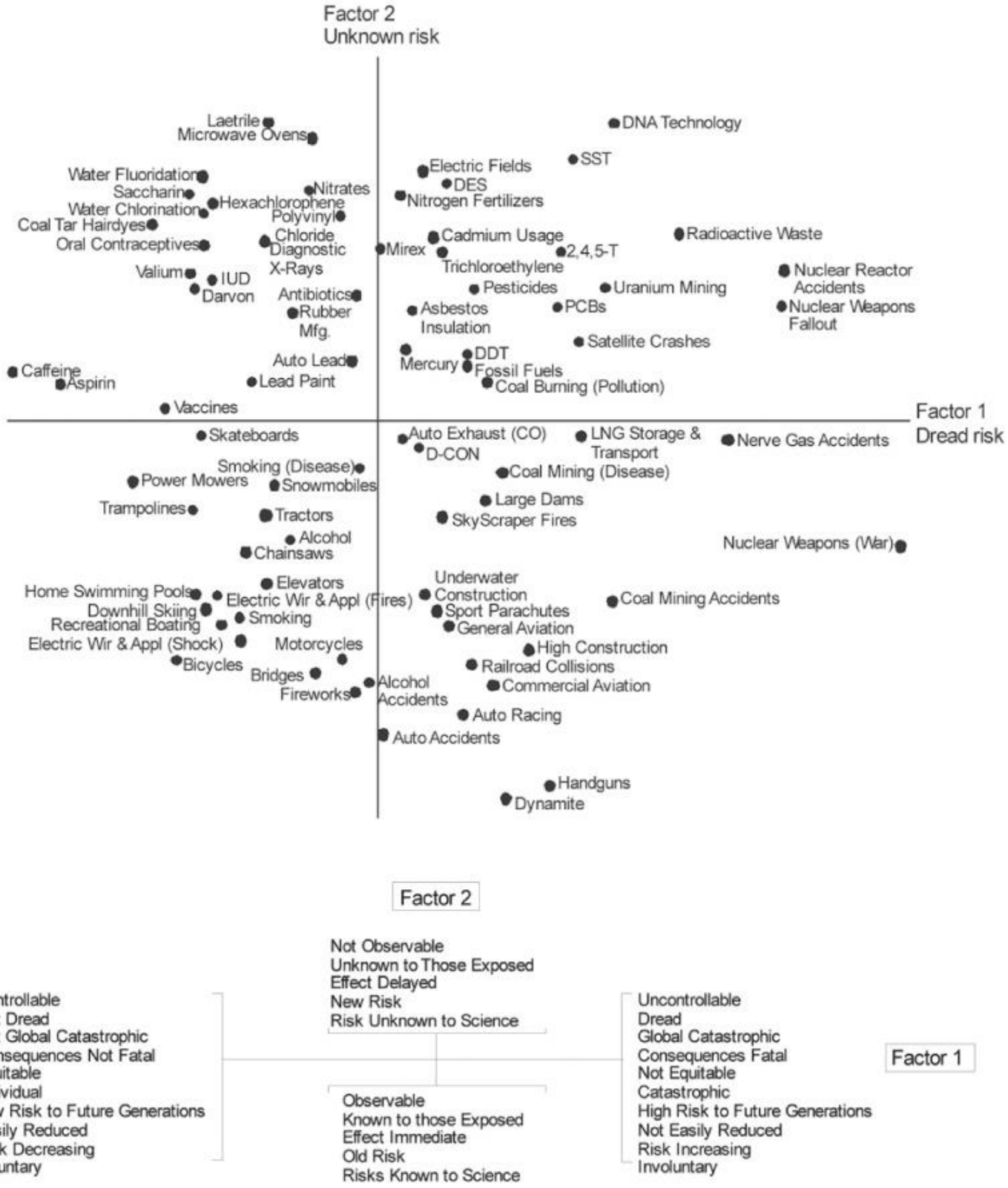
Where **risk communication** was discussed, (Slovic et al., 1984) indicated that a number of challenges existed hindering the effective relation of specific risks. They found, having set the study in the severe risk environment of nuclear power plants, that communicating risks of that particular industry were complicated by the technicality of the subject matter. Lay persons simply did not understand the technical detail of all the risks associated with the industry and hence could not form fully informed opinions. They also showed that pre-formed opinions, even when faulty, tended to dominate further information sessions to the extent where communication sessions aimed at eradicating possible misconceptions, often failed. Conversely, when people lacked pre-formed opinions on a matter, then their perceptions were malleable through specific framing of the risks. Slovic et al. (1984) showed for instance through medical study that focussing subjects' attention on fatality rather than survival rates of terminal illnesses, significantly impacted on the patients' perception of said maladies. The same, the authors inferred, would be true for risk scenarios.

Their second study topic was around **risk perception**, and how behavioural decision theory could enrich it. They conducted a fascinating study to establish what they called a

"*psychometric paradigm*" of risk perception (Slovic et al., 1984). This was achieved through factor-analytic representation of qualitative risk characteristics and yielded an updated interpretation of how people perceive large risks. The research was presented graphically on a Cartesian grid with the two axes representing variance in severity and familiarity respectively (see Figure 6). The placement of the various risks in the grid gave an indication of the extent to which they were perceived with regards to the two factors. The two factors were presented as follows: vertical axis comprising terms dealing with **uncertainty** such as observability, risks known to science, whether the effect was delayed and whether the effects of the risk was known to those exposed. The second factor, positioned on the horizontal, contained terms regarding the risk's **dread factor** and reflected terms such as controllability, whether it would affect future generations, its tendency to cause catastrophes and to what effect it impacted on the individual. This graph was developed further by gauging the respondents' attitude towards regulation. This revealed a clear relation between the top right-hand corner (high dread, high uncertainty) and the need for intervention in terms of regulation.

This contribution progressed the academic world's understanding of risk perception and opened the way for more complex risk assessment measures. No longer was the one-dimensional fatality probability measure the only method available to try and predict how people would perceive serious risks. It had bearing on this study as well, as it indicated risk to be a multi-faceted, multi-dimensional concept. This became evident in the selection of a suitable risk measuring instrument, as discussed in paragraph 2.3.4.

Figure 6. Hazard Locations Derived from Interrelationships Amongst 16 Risk Characteristics



Source: (Slovic et al., 1984, p. 189)

The research was concluded with a very specific search for absolute risk levels. As the study zoomed in on the requirements of the nuclear industry, its relevance to this study waned. However, one valuable contribution was produced through this section of the study. The authors, searching to answer the questions: “How safe is safe enough”, produced a number of guidelines along which to design their safety standards. Taking specific heed of social and behavioural issues, they concluded that **specific consideration of social value** issues needed to form part of any safety program. This echoed the value driven decision-making approach contributed by Rokeach (1973) and proved to be supportive of the Value Pluralism Model (Tetlock, 1986) discussed earlier. More needs to be said on decision-making in uncertain and risky situations, though.

2.3.3 Risky Decision-making

Decision-making during situations of uncertainty or risk is a well-researched field. Edwards (1959) commented on it in stating that a risky decision required three conditions: a decision-maker had to choose between two alternatives, at least one alternative must present the possibility of loss and the scenario must be presented in such a way as that the outcome cannot be known to the participant prior to making the decision. Kahneman weighed in on the matter by extending the cognitive limitations perspective on decision-making to risky choices, and showing that seemingly illogical risk aversion and risk seeking behaviour could occur, depending on how choices were presented (Kahneman & Tversky, 1979; Kahneman & Lovallo, 1993).

However, the behavioural decision-making giant Paul Slovic made decisions under risk and uncertainty a core focus of his work. Writing on environmental health risks with Branden Johnson it was shown that the presentation and communication of environmental risk exposures to lay persons, presented a serious challenge and required a fine balance between informing, confusing and outraging communities (Johnson & Slovic, 1998). In the financial domain, risk perception was shown to be a multidimensional construct dependent on the context, parties involved (be it professionals or lay persons), the level of communication between the people involved and the technical considerations of the matter (MacGregor, Slovic, Berry, & Evensky, 1999). It was clear that additional research was required.

Perhaps Slovic’s most valuable contribution to this argument, was his piece on Affect, Moral Intuition and Risk (Slovic & Västfjäll, 2010). This study investigated whether specific interventions could be introduced to counter a failure in moral intuition in risk-laden decision-making. Building on the work of Jonathan Haidt on intuitive decision-making, Slovic reiterates that “*intuition* comes first” (Haidt, 2001). Slovic and Västfjäll (2010) found that people tended to be morally disassociated with disasters when the number of people involved become too

large suffering what they call a “collapse of compassion”. The authors suggested personalising the events by including the names and narratives of the victims involved, as a possible remedy. They also proposed the use of framing the scenario in a different light, to prompt a System II (deliberate) rather than a System I (intuitive) response. This intervention is exactly the core basis of this thesis, but with a slight difference. For the Slovic and Västfjäll (2010) case, the intervention was supposed to improve the level of moral judgement of the participants. For this research, scenario reframing is anticipated to improve the quality of the decision-making.

Burns and Slovic (2012) finally revisited public risk perceptions, linking up with his earlier work with Johnson (Johnson & Slovic, 1998) on the public opinion of disasters and called for a better understanding of how emotions dictated risk perception and risk-related behaviour during a crisis. Pertinent to this study, the authors again called for a process or intervention whereby the decision-makers could be moved from System I (emotional response) to System II (deliberation response) modes of decision-making. This need highlights the importance of this study, focused on determining a relationship between personal values, risk propensities and decision-making behaviour, as well as investigating a process to improve the quality of decision-making specifically by eliciting a System II response.

However, before we can proceed with the research, more information is firstly required on the instruments available to us for the assessment of risk perception and individual risk-taking attitudes.

2.3.4 Assessing Risk Attitude

An abundance of instruments exists with which to determine the risk attitude or risk propensity of individuals. The Society for Judgement and Decision Making, hosted by the University of Columbia in the city of New York and supported by Centre for Research on Environmental Decisions (also from the University of Columbia), has compiled a Decision Making Individual Differences Inventory (DMIDI) (Appelt, Milch, Handgraaf, & Weber, 2011). This database hosts 170 commonly applied individual difference measures of the judgement and decision-making research space and as such presented the ideal stomping ground for an applicable research instrument.

The work led by Weber stands out as far as domain specific risk attitude is concerned (Weber et al., 2002). The authors presented the DoSpeRT (Domain Specific Risk-Taking) Scale (Weber et al., 2002) with which they illustrated the assessment of risk attitudes of individuals in various settings, in line with the Slovic et al. (1984) position on the multi-dimensionality of risk. This work built forward on the epic contribution of Sitkin and Weingart (1995) that showed

that both **risk propensity and risk perception acted to mediate between problem framing and risky decision-making behaviour**. Weber et al. (2002) suggested a research programme into five specific domains typical of the decision-making environment (Financial, Health & Safety, Recreation, Ethics and Social) and gathered sufficient evidence to support their hypothesis that "***risk taking is domain-specific"*** (Weber et al., 2002). This contribution was fleshed out four years later with a revised version of the DoSpeRT Scale (Blais & Weber, 2006) which was shorter and applicable to a wider audience. As this study hopes to show the impact of framing on value-based decision-making scenarios, and Weber et al. (2002) clearly showed the ethical domain dependence of risk attitudes, this instrument was deemed most suitable to produce the analysis required.

Having concluded the discussion of risk propensity to the decision-making behaviour of individuals, the psychological (values/emotions/motivations) perspective needed to be analysed further to establish the positioning and importance of value systems to the framework. As the title indicated, this research deals with the hypothesised relationships of both risk propensities and value orientations with decision-making quality **during value clashes**. A fundamental understanding of the relevance of the research setting, value clashes, and how they develop from individual variances in both value systems and risk propensities, was thus of core importance.

2.4 Individual Value Systems and Value Clashes

Section 2.4 follows the development of the argument towards the convergence of the three perspectives through a more detailed discussion of value clashes. As proposed in Figure 2 and motivated in the subsequent discussion, a need for a consolidated decision-making framework has arisen to address the requirements posed by a very complex management landscape. The first step toward proposing such a framework is to understand where value clashes originate and how they fit into the current discussion.

2.4.1 Value Pluralism Model and the Origin of Value Clashes

The construct of integrative complexity was introduced in section 2.2.1.3 of the literature review as a measure of the quality of the decision-making process employed to solve taboo trade-offs. This formed part of Tetlock's telling research in support of a value pluralism model of ideological reasoning (1986), discussed in this section. Tetlock conducted a multiphase investigation in the political arena applying a mixed methodology of proven research instruments. This was done to gain support for the core principle of the Value Pluralism Model, which states that "*people respond to value conflict by engaging in more complex trade-off style*

of reasoning" (Tetlock, 1986, p. 819). The author of this study took the view that value pluralism is the cause for the complication of the decision-making process during value clashes.

Through his research, Tetlock (1986) showed that specific circumstances such as where values high on the Rokeach Value Survey are in conflict or even where values of similar ratings were forced to clash, that complication of the decision-making process would occur. He reasoned that the expected response of bolstering one value over another would not occur when the respondent could not argue the superiority of one value over another. Further, the option of decision avoidance was also not available, as the respondents were not willing to distance themselves from such telling and provocative issues.

Among Tetlock's (1986) core conclusions was the rejection of the cognitive miser assumption. This theory holds that people tend to simplify the reasoning process when faced with difficult decisions. Tetlock's view is the opposite in that an increase in value clashes would lead to an increase in the complexity of the decision-making behaviour, evident in his use of the integrative complexity variable, discussed in section 2.2.1.3.

Also of importance was his view on the stark contrast previously held concerning **structure** and **content** of decision-making behaviour. Whereas previous models indicated that these two considerations could be treated separately, Tetlock (1986) showed that the issues were **interlinked** and that what people thought (through their value systems) was influenced by **how they thought** (complexity of the thought process) about a complex value conflict.

The complexity associated with the decision-making process was shown to be exhibited along two distinct lines: conceptual differentiation and integration. **Conceptual differentiation** spoke to the measure to which respondents were willing to consider alternative ways of looking at the value conflict. **Integration** meant the measure to which respondents were willing to "*develop complex rules to compare, contrast and synthesise*" (Tetlock, 1986, p. 819) these multitude of perspectives on the value conflict. One wonders, though, given the individual focus of the study, how interpersonal interactions might influence the decision-making process. A deeper understanding of the drivers behind interpersonal interactions is required. Although it has been established that decision-making is multi-faceted and influenced by a plethora of drivers, that personal values and risk propensities are likely to influence decision-making behaviour, and that a shift from System I to System II thinking could be beneficial to the process, the impact of differing value sets and risk orientations on interpersonal interactions have not been discussed though. Nor has this study yet considered how a shift from System I to System II thinking could be engineered.

The interaction between individual value systems and set forms of social relations was studied by Fiske (1992) and formed one of the building blocks leading to McGraw and Tetlock's (2005) work on taboo exchanges (called value clashes in thus study). These two papers, amongst other contributions, explains what occurs when people of differing value sets clash, and how these clashes, and positioning of them, can be implemented to impact the decision-making behaviour of the individuals involved.

2.4.2 Relational Forms of Sociality

In a bold move away from the academic consensus, Fiske (1992) introduced a revolutionary new take on social relations. He rejected the notion that people are asocial individualists and presented a new model through which to explain social interactions. Supported by contemporary research results, Fiske introduces a hierarchy of four elementary relational models to represent the most common ways people use to "*construct and construe*" relationships. These four relational models, discussed below are "*communal sharing*", "*authority ranking*", "*equality matching*" and "*market pricing*".

The **communal sharing** (CS) relationship is based on associations between individuals and groups of people that are by their nature, undifferentiated and equavalent. These are communal associations that focus on the characteristics of the group rather than the individual. As these relationships are often based on a shared common characteristic, they often occur amongst members of the same kin, such as family or ethnic groups.

An **authority ranking** (AR) relationship utilises linear ordered relationships to form a type of hierarchical, asymetrical association. This is a very common relational model given its wide application.The hierarchical relationhips of military ranks exhibits this perfectly with a multitude of "people above" and "people below" as specific position. The language used to describe these relationships typically assigns higher value to senior positions and lower value to junior positions, using references such as "higher-up", "greater" and "senior" to the top positions.

An **equality matching** (EM) relationship is an egalitarian association based on reciprocity. The tit-for-tat approach to interactions dominate this model where the equality of the relationship is stressed. It differs from communal sharing in the sense that exists a very specific "score keeping" to maintain the balance of the relationship. These interactions are very common amongst arrangements such as car-pooling, where the aim of the arrangements is to attain an equal and fair dsitribution of the load/rewards.

Market pricing (MP) relationships usually simplifies to a single expression of a utility measure, such as time or money. For these relationships every interaction is governed by the core proportionality of the primary association. A good example of this is the percentage of share

an investor might have in a company that dictates his share of the profits, share of the responsibilities and access to peripheral rewards.

Fiske's (1992) interpretation of the results lead him to believe that the relationships were ordered, i.e. CS-AR-EM-MP. This meant that relationships matured through these ranks. The best illustration of this observation can be seen in relationships of children. Younger people tend to fully grasp cummonal relationships and authority ranking, but take time to develop true turn-based social exchanges. This is then only later followed by understanding of the marketing pricing principle. Similarly, newly formed relationships also tend to mature through these steps to attain the more structured and formalised level of MP.

Implications for this research are telling in that it introduced a fundamental understanding of social relationships and helped us understand what embodies a value clash. In Fiske's introduction of the argument, he positioned the research along a number of directive questions. He asked whether people applied specific "*social schemata*" (Fiske, 1992, p. 716) for making decisions as collectives, and whether morally motivated decisions were devoid of conflict and agression? The social relational models gave new meaning to these questions and facilitated a structure through which difficult exchanges and value clashes could be better understood.

However, it was not clear how individual behaviour scaled up to group and organisational phenomena. For this, it was necessary to turn to Stanley Harris.

2.4.3 Individual Sense-Making and Schema Theory

Harris (1994) launched a thought provoking study into the possibility of up-scaling the individual experience to better explain corporate cultures. He employed the mechanism of schema formation, following on where Fiske (1992) left off, to fill the gap in the extant literature explaining how individual sense-making translated into collective and shared organisational cultures.

Harris dug into literature on social cognition and defined schemas as "*the dynamic, cognitive knowledge structures regarding specific concepts, entities, and events used by individuals to encode and represent incoming information efficiently*" (Harris, 1994, p. 309). He also explained as being the "*mental maps*" containing individuals' perception of the organisations. He further defined organisational culture as "*the shared beliefs, values, and assumptions that guide sense-making and action in organizations*"(Harris, 1994, p. 309).

Harris' (1994) research curiosity emerged from the lack of a suitable mechanism to explain individual experiences within the collective. This he addressed by taking specific cognisance

of the various forms of schemas present in the organisational environment. Harris identified the schema of **self-in-the-organisation**, which referred to the individual's perception of his/her role in the organisation. Secondly, he showed the existence of the **personal schema**, referring to the roles given on other participants in the organisations. The third schema was that of **organisational perspective**, illustrating the person's perspective of what is acceptable conduct within the boundaries of the firm. Next Harris proposed the **object/concept** schema that showed the expected behaviour in terms of non-social objects such as the "big corner office" or the water cooler area. Lastly the author identified the **event specific** schema and this frame of thinking referred to special considerations applicable to specific events or occurrences.

Harris' (1994) contribution to the literature came through his incorporation of "*mental dialogues*" conducted using the various organisational schemas. He proposed that taking the multitude of perspectives (schemas) for conversing around a specifically challenging topic, will facilitate broader and deeper shared experiences which in turn would lead to the formation of organisational culture.

Of note to the current argument, are the implications of this process to a situation of conflicting values. As Harris pointed out: "*Sometimes, however, information is confronted which conflicts with the knowledge in a person's schemas. Information conflicting with a schema will either be* ***ignored*** *as an aberration, be* ***cognitively recast*** *to fit current schemas, or generate either* ***schema modification*** *or the addition of a* ***schema subcategory****"* (Harris, 1994, p. 311)*.*

Situations where individuals are placed in a position where core values conflict will experience specific difficulty in maintaining their schemas leading most probably to the individual ignoring the matter and not dealing with the conflict (Harris, 1994). It is proposed that this situation would expose the organisation to undue risk and that measures need to be examined to minimise the impact of these situations on the organisation. It is therefore suggested that a process or intervention (part two of the research question) be found that forces people to engage with difficult value cashes to ensure these matters get the attention they deserve in the workplace.

2.4.4 Protected Values and the Omission Bias

Investigating difficult decision and peoples tendency to shy away from such matters, Ritov and Barron (1999) conducted a number of experiments to test the observation of an omission bias. Defined by the authors as values that people "*think of as absolute, not to be traded off for anything else*" (Ritov & Baron, 1999, p. 79), they proposed that the presence of **protected values** during a decision-making process would produce the occurrence of the omission bias.

The omission bias refers to is the "*tendency to be less concerned with harms caused by omission than with identical harms caused by action*" (Ritov & Baron, 1999, p. 80). This supports the leading argument reiterating that the presence of difficult value clashes could result in sub-optimal decisions.

This research yielded very insightful methodological contributions. The four experiments employed to conduct the research yielded useful experimental scenarios testing specific value clashes. They study's most noteworthy contribution was to show that the **existence of protected values** did produce **incidences of the omission** bias to occur. This guided the researcher of this study to ponder the impact on decision-making attributes such as integrative complexity of such occurrences. Should the omission bias be present in some value clash decisions, then it stands to reason that all such decisions be less than optimal. The contributions of the work by Ritov and Barron (1999) will thus be given careful consideration, specifically during the design of the experiments intended for the study.

2.4.5 Ethical Judgement in the Workplace

Through a search for a deeper understanding of value clashes in the workplace, Finegan (1994) investigated the impact of personal values on ethical judgements. She showed, also applying the Rokeach Value Survey, that people with varying value sets tended to perceive the acceptability of morally challenging scenarios differently. This meant that individuals with higher regard for honesty as a core value, would more readily identify behaviour as immoral, than people not favouring this value.

This work confirmed the applicability of value set research in the workplace setting and paved the way for scenario-based experiments. Although this research will test slightly different variables, some of the research design can be attributed to Finegan's (1994) approach. This dabbling with moral and ethical issues in the workplace, also provided the ideal lead-in for a discussion on taboo trade-offs.

2.4.6 Taboo Trade-offs Brought About by Value Clashes

Fiske and Tetlock (1997) ventured into the challenging world of taboo trade-offs in an attempt to expand the existing literature. They investigation revealed that due to the ever-present **problem of resource scarcity**, that managers are often put in the position of having to perform uncomfortable and difficult decision. Building on the Value Pluralism Model (Tetlock, 1986) and the Relational Theory (Fiske, 1992), the two authors looked for a solution for this unfortunate reality.

The authors proposed that certain decisions and trade-offs were not simple economic or even managerial decisions. Some situations, where fundamental and unequal values collided, often

resulted in serious discomfort and confusion. The authors even went so far as to say the mere consideration of the matter warrants shunning and rejection.

The authors defined **taboo trade-offs** as "*any explicit mental comparison or social transaction that violates deeply held normative intuitions about the integrity, even sanctity of certain forms of relationships and of the moral political values that derive from these relationships*" (Fiske & Tetlock, 1997). Their investigation was designed to determine when trade-offs are seen as taboo, how observers would respond to these taboo trade-offs, how decision-makers forced to execute such decisions could avoid social censure and finally how policymakers should approach these sticky situations.

Drawing from Fiske's (1992) work on relational theory, Fiske and Tetlock (1997) made a few pertinent observations. Trade-offs occurring **within** one of the relational modes (communal sharing, authority ranking, equality matching, market pricing), though often uncomfortable and difficult, were possible without censure. They showed for instance that market pricing considerations such as changing jobs had numerous difficult implications, but yielded no moral objections or even social limitations. However, when the trade-off implied by the decision **spanned the boundaries** of the relational modes, then the difficulty and level of discomfort with it increased. Here the authors used as example the matter of organ donor scarcity. When seen in the realm of communal sharing, communities are generally comfortable with the approach that transplant organs should be made available on a voluntary basis and that the collective "use" of the organs should be to benefit of any individual. However, it the organs are made available in the author ranking realm, many people would object to legislation making the post-mortem donation of organs obligatory. Continuing on this trend is the doubtful practice of an "eye for an eye", as outlined by the equality matching principle. Surely many people would balk at the idea of having to trade organs as only measure of receiving life-saving transplants? Finally, testing the boundaries of moral outrage is the marketing pricing principle dictating that the organ goes to the highest bidder.

From the above examples, we observe two things. Firstly, that cross-boundary trade-off presents very difficult decisions. Secondly, we get a clear impression that the further apart the two relational modes are, the more difficult the trade-off would be. From this observation, the authors postulated that **taboo trade-offs typically occurred at the extreme point**, **where considerations in the communal sharing arena were exposed to the ravages of normal market pricing instruments**. This is a critical observation for this research as it formed the impetus for the scenario design and reframing intervention employed in the research design.

It would thus be a wonderful solution to the problems to advise managers to simply avoid such matters entirely and simply occupy them with "easier" decision. This is a short-sighted and

naïve approach, as such an option simply does not exist. Although most people would not be comfortable to admit it, taboo trade-offs occur as part of regular day-to-day life. People use automobiles for transportation and somehow fail to realise the impact it has on the environment. They place a monetary cap on the measures they are willing to ensure the health and safety of their families and somehow fail to consider the communal sharing obligations placed on them by family and friends when accepting a new job paying twice as much as the previous one but requiring relocation.

Companies face the same conundrums on a daily basis, but as they operate in the public eye, are not exempt from judgement. It is the view of the author that the limitations placed on companies due to **resource scarcity,** have exacerbated their exposure to taboo trade-off situations. The recent venture of an international energy company into obtaining natural gas supply from the pristine Karoo is a typical example of this effect. The organisations involved faced a public outcry when they publicised their plans to explore fracking ventures in the area (Devon, 2012). What made this matter even more dubious was the state of the energy production industry in South Africa at the time (De Wit, 2011). With most of its energy hailing from coal, South Africa has arguable one of the poorest track records as far as environmentally sound practices are concerned. Yet with growing energy demand and dwindling resource availability forcing companies to consider new alternatives, the public seemed oblivious of the complexity of the situation and chose to judge and shame.

Fiske and Tetlock (1997) considered such difficult situations and proposed a new mechanism for taboo trade-offs. They proposed the following four-step process:

1.) acknowledge the legitimacy of the value conflict and the resultant outcry and affective outpouring,

2.) establish a communal sharing decision-making body trained to consider the various relational mode implications of the decision,

3.) instruct the members of the collective to each investigate and defend the various implications of their choice of relations mode,

4.) reflect critically on the implications of the various options with the aim of identifying solutions to the problem least likely to elicit outrage and judgement.

Although this four-step program perhaps provided stronger practitioner than academic value, the Fiske and Tetlock (1997) contribution for the first time shed a harsh light on the uncomfortable reality that taboo trade-offs exist in the workplace. Their relational framing perspective yielded a position of great importance to the leading argument in this text, that

different people with different value sets and risk orientations will react differently to value clashing scenarios. Furthermore, relational framing presented a framework whereby an intervention technique capable of impacting decision-behaviour, could be proposed.

2.4.7 The Acceptability of Exchanges

The next order of business was to investigate the complexities of the relational framing model through research conducted on the acceptability of social and monetary exchanges (McGraw & Tetlock, 2005). Through four carefully crafted **exchange experiments**, the authors managed to detract from the support of a purely capitalist, individualist consumer, as touted by the supporters of the *Homo economicus* school of thought.

The four experiments managed to test the boundaries of cross relational exchanges and furthered the contributions of Fiske (1992) in this field. Fiske's proposal that only four basic relationships existed through which social relationships could be crafted, maintained and evaluated was employed to gauge the acceptability of exchanges that traversed these pre-set models. Fiske's relational models, in order of their importance to people, were identified as communal sharing, authority ranking, equality matching and market pricing. The crux of this study was thus to determine whether exchanges normally committed to the higher ranked relationships (CS, AR, EM) could be "contaminated" through basic monetary driven market pricing exchanges.

The research yielded support for the opposition of the pure *Homo economicus* model through clear evidence that **relational positioning of exchanges (or framing)** played a large role in the **acceptability of the monetary exchange**. The first experiment showed that an arbitrary action such as selling a pen could be complicated when placed in a relational framing perspective. Through this it was acceptable to sell a pen obtained through the normal MP channel (a pen bought by the test subject him/herself), but is frowned upon to sell a pen obtained through one of the other relational models. The higher in the hierarchy the pen originated, the more difficult it was to argue for an acceptable exchange.

In the reverse experiment, it was also shown that the monetary benefit acceptable for the sale of the pen was largely influenced by the relationship model within which this exchange occurred. Whilst respondents were very willing to achieve monetary gains from articles obtained through the market pricing model, the gains dropped significantly as the relationship model progressed towards the communal sharing model.

The research also indicated that more transparent exchanges caused greater levels of outrage. This was achieved by either disclosing or hiding the knowledge of the exchange origin during the experiments. A further observation indicated the moderating impact of both culture

and time, with both impacting the acceptability of exchanges. A practice that was once a socially acceptable exchange, such as slavery, is repugnant today. Cultural acceptability of specific exchanges, such as the exchange of money for grazing rights, is acceptable in the Western world, but rejected in parts of Africa.

The work by McGraw and Tetlock (2005) introduced a new framework for evaluating **extraordinary social exchanges**. An oversimplification of the economic model of exchanges would propose that all exchanges are acceptable and that price would simply have to be adjusted to the situation to address its scarcity level. The results presented by McGraw and Tetlock (2005) rejected this and posited the existence of much more complex sets of social exchange "rules". With access to resources dwindling, one can argue that future trade-offs over relational boundaries will occur more often and become more complex. For this reason, the research question into value clashes is pertinent as it paves the way towards improved techniques to deal with these difficult but necessary exchanges.

2.4.8 Interpretive Perspective

Employing an interpretive perspective (person as centre an part of the research process), Belk (2005) adds to the richness of the relational framing/value clash debate. He positioned a number of constructs hailing from both the sociological and anthropological research domains, against the four relational models proposed by the work of Tetlock (1986), McGraw and Tetlock (2005) and Fiske (1992). This approach yielded richer interpretations of the **nature of value clashes** and deepened our understanding of the relational models.

Belk (2005) firstly investigated the area of gift giving with the Fiske relational models and found it akin to a number of relational framing schemes in the extant literature. He introduced the concept of reciprocity to position the models better. An exchange with **positive reciprocity** resulted in in the altruistic scenario better known through the work of Fiske (1992) as communal sharing. **Neutral reciprocity** exchanges naturally resembled equality matching relations and exchanges with **negative reciprocity** were the same as market pricing model relations. Placing these exchanges in the gift giving space added the deeper context of the social rules and traditions associated with this area and helped to highlight the occurrence and implications of uncouth gifts.

In his investigation of romantic love, communal sharing exchanges were looked at more closely. The author found that taboos surrounding this emotion were specifically heinous and explained this through the sharp contrast between the altruistic and selfless irrationality of love and the realism and heartless nature of the marketing environment (Belk, 2005).

His view on the transcendence of boundaries contrasted with previous preoccupations with specific social-relational compartments. Although he accepted the role of the clear-cut relational models proposed by Fiske (1992), he called for a less discrete model allowing for overlaps between the relationships.

Most telling of Belk's (2005) contribution however was his opinion of the gravity of taboo exchanges, and how they were bound to be treated. Belk proposed that very grave value clashes were bound to be **rejected** by the sheer absurdity of the comparison they implied. However, the **grey areas** were where the intrigue lie, he thought and that more ambiguous cases made for more difficult trade-offs.

Belk (2005) concluded his contribution by stating that society appeared to be in a constant **state of moral flux** and that the **tipping point** between morally acceptable and unacceptable will forever change. With boundaries becoming more permeable and morals more relative, the need for investigating decisions in a value-clashing setting, the context for this research, has never been more profound. Tetlock, Visser, Singh, Polifroni, Scott, Elson, Mazzocco, and Rescober, (2007) furthered this line of thought by investigating people's reactions to perceived boundary transgressions.

2.4.9 Intuitive Prosecutors

Straying from his normal research interests, Tetlock lead a study into the applicability of the fair-but-biased-yet-correctible (FBC) model (Tetlock, 2002) in order to better understand the **punitive reactions** of people towards norm violators (Tetlock et al., 2007). Although this study steered strongly towards the legal arena, Tetlock's earlier work (1986) and contributions with Slovic (1997) illustrated his involvement in biased decision-making research, making the FCB model relevant to the research proposed in this document.

In essence, the investigation probed the applicability of the FBC model that holds three assumptions dear:

1.) most people consider themselves to be fair and adherent to specific norms,

2.) people accept bounded rationality and the probability of judgemental errors occurring due to personal biases, and

3.) the tendency of people to self-correct their actions when they transgress personal norms.

Tetlock et al. (2007) designed a number of experiments aimed at testing the FBC model, allowing for both situational and dispositional "triggers" impacting on the mind-sets of the

respondents. The results proved useful in that it illustrated the influence of situational considerations on the punitive harshness of the test subjects. They showed that **reframing** or **repositioning** the cases with either extenuating or exacerbating circumstances clearly **influenced the severity of the judgements** as well as the **anger** with which it was made. This work paves the route towards the application of **framing to address value clashes** as it predicts the applicability of scenario manipulations as tool to appease the judgements of norm violations.

An addition, and very useful contribution, was the careful descriptions of the various **experiments** applied during the investigation. The experimental design, variable selection and control measures applied to the tests shed some light on what approach to take to address the research questions of this study. These contributions all came together though when Schoemaker and Tetlock finally collaborated on value-driven decision-making.

2.4.10 Taboo Scenarios, an Illustration of Value Clashes

Schoemaker and Tetlock (2012) introduced the topic of taboo scenarios in a comment piece for the California Management Review. They pondered the extent to which the existence of unthinkable, almost unmentionable topics in the organisational setting (taboo scenarios) caused blind spots for management teams. Their argument followed that the firm could be exposed to undue risk, should key strategic issues, due to the sensitivity of their nature, not receive the attention they require.

Schoemaker and Tetlock (2012) proposed this list of sources for these sticky issues, called sacred values – areas in business and society where we rarely traverse and commonly accepted to be too sensitive to violate: human life, God and country, mother earth, workplace asexuality, equality norm, hierarchy deference, and mutual respect.

Seeing as this text targeted a practitioner audience. Schoemaker and Tetlock (2012) proposed three specific steps through which to defuse taboo scenarios: knowing what is really sacred, reframing taboo scenarios as tragic trade-offs and incorporate defensible choices. It is specifically the second step that is of interest to this study.

Schoemaker and Tetlock (2012) proposed reframing value clashing situations (taboo scenarios) as tragic trade-offs rather than taboo choices. Taboo choices in their view present unacceptable exchanges between secular and sacred values, whereas tragic trade-off occurred when two sacred values clashed. In the language of Fiske (1992) the reframing was achieved by repositioning the situation in terms of the social-relational form governing the exchange. Schoemaker and Tetlock's (2012) suggestion therefore entailed framing the situation in such a way as to present the decision as a trade-off between two sacred values

(tragic trade-off) rather than a decision between a sacred and a secular value (taboo trade-off). Put differently, the exchange was reframed as a choice between two communal sharing issues, rather than a choice between a communal sharing and monetary pricing issue. Incidentally, these categories will be used as guiding principles when the appropriate taboo scenarios are designed for the field work.

One of the perceived shortfalls in the literature lies in the relationship personal risk propensity might have with the individual's perception of the scenario and that might influence their decision-making. Although Schoemaker and Tetlock (2012) postulated a linkage between risk, value clashes and the framing effect, their work have not progressed to include this aspect yet. Given this contribution, the author if this report indicated the need to consolidate these three considerations, personal value orientation, risk preference and scenario reframing, in single study. The aim of this was to gather supporting evidence of their interdependence and to expand our understanding of the psychological architecture of the firm in a small way.

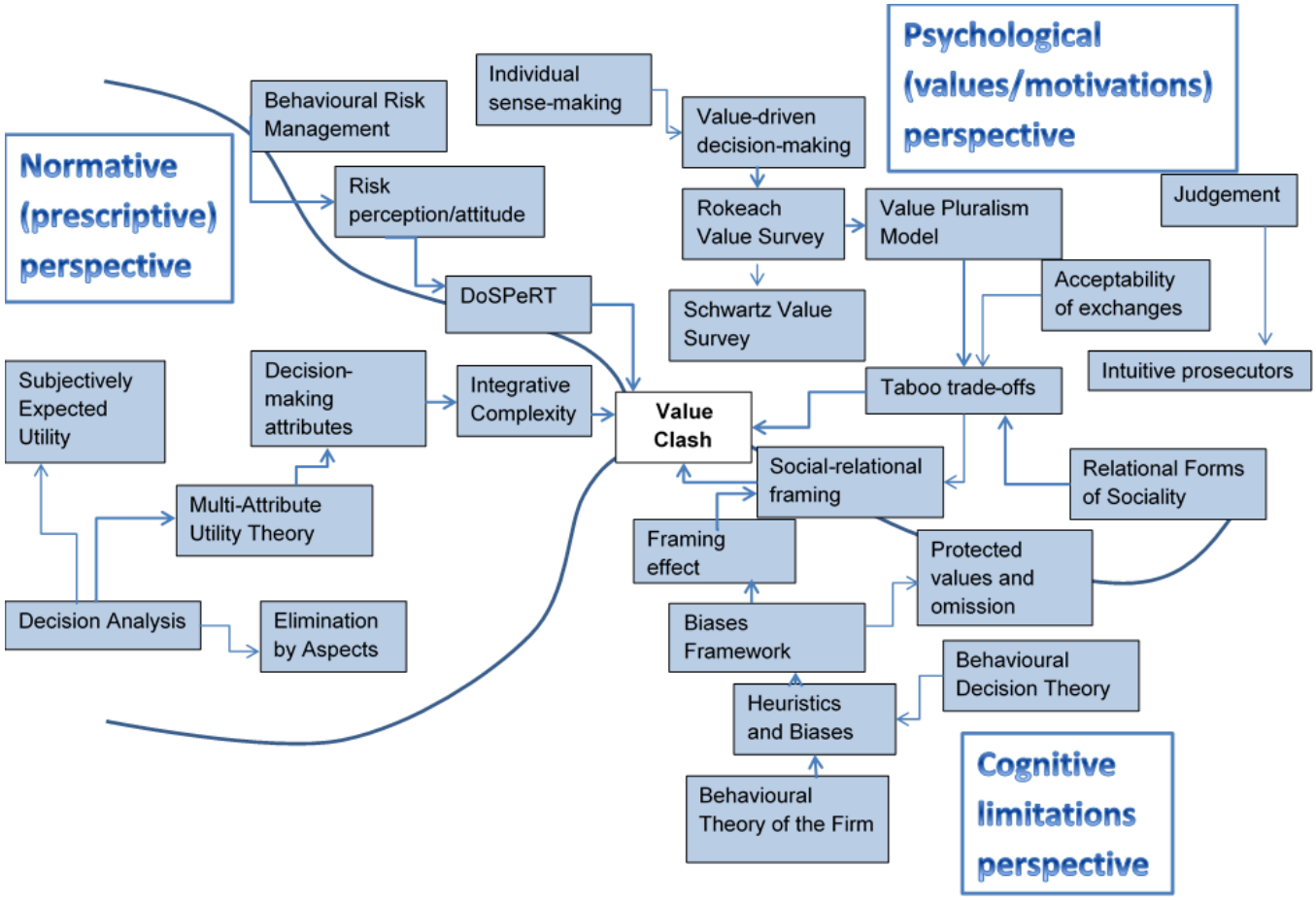
2.5 Integrated Discussion of Literature Review and Research Problem

This study investigated the proposed relationship between personal value orientations, risk propensities, scenario reframing and decision-making quality. Given the complexity and the multiple angles on the research problem, it was thought important to illuminate the most pertinent theoretical contributions through and integrated discussion. This paragraph captures a depiction of the research problem contextualised in the extant literature (Figure 7), presented a consolidated research framework for the field of decision-making (Figure 8), illustrated the evolution of the research questions (paragraph 2.5.3) and made mention of a number of recent developments in this research space (2.5.4).

2.5.1 Contextualising the Research Problem within Literature

The graphic displays the development of the literature from the three fundamental perspectives to merge within the phenomenon of value clashes. The thinner connecting lines show relationships between concepts, whereas the bold connections indicate the flow of logic and the development of the argument over time. For instance, the origin of social-relational framing can be seen as the product of the work by Fiske (1992) on relational forms of sociality, the value pluralism model of Tetlock (1986) and the framing effect (Stanovich & West, 1998; Tetlock & McGraw, 2005). The framing effect in turn came from the biases framework, which resulted from the work by Tversky and Kahneman (1975) on heuristics and biases.

Figure 7. Consolidated Literature Landscape and its Bearing on the Research Problem



This consolidation deepened the author's understanding of the literature and served to present an integrative view of the most telling perspectives on the decision-making literature. Figure 7 shows how the perspectives interrelate, but also clearly illustrate the development of the various arguments. Centred on the phenomenon of value clashes and how value orientations and risk propensities relate to it, this holistic view of the literature led to the proposal of a new framework for our understanding of decision-making behaviour.

2.5.2 Updated Framework for the Field of Decision-making

As mentioned in the introduction to the literature, a need exists to consolidate the various views on decision-making into a single model or cognitive framework through which to study the multitude of phenomena in the decision-making field. Figure 8 presents such an attempt. Although the model represents a distilled version of the literature on the subject, it focused on contributions and schools of thought nascent to the research question. The aim was thus not only to illustrate what we know, but what we would like to know. It therefore presents an attempt to illustrate a gap in the literature and resultant motivation for this study.

Figure 8. Integrative Model: Decision-making Literature

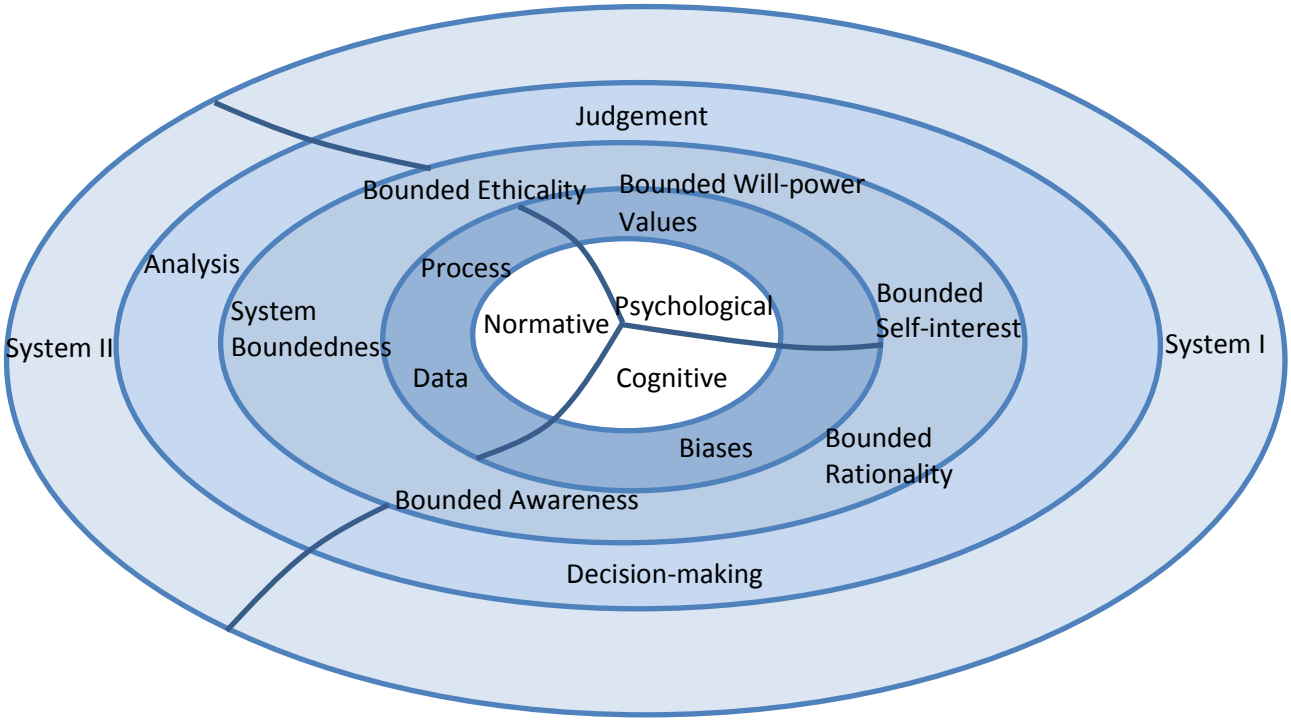


Figure 8 illustrates the literature on decision-making as a collection of concentric ellipsoids, radiating out from a common core. This core, subdivided in three segments, forms the focus of the discussion. A telling contribution by Kahneman and Tversky (1984), titled "*Choices, Values and Frames*", suggests that decision-making is approached from three distinct viewpoints: the normative (prescriptive), cognitive limitations and psychological (values/emotions/motivations). The normative (prescriptive) perspective hails from the System II (Stanovich & West, 1998) thinking and refers to ordered, logical thought and analysis. With the constraints of the human condition as well as the overwhelming deluge of data and information available to the decision-making process, this approach has very specific limitations.

The theory behind bounded rationality (Simon, 1955) holds that people simply cannot consider all aspects of a problem and that the application of satisficing need be implemented in order to cope. The cognitive limitations perspective introduces a coping mechanism for dealing with overly complicated decision-making scenarios by introducing the use of heuristics as countermeasure (Tversky and Kahneman, 1975). Heuristics thus presents a cognitive tool through which to simplify the "noise" in the decision-making space by limiting options to those of concern to the matter at hand.

Logically, with human processing involved, this approached proved to be less than optimal. Heuristics, though meant to assist in the decision-making process, can also harm it. The

excessive and inappropriate application of heuristics can lead to the formation of decision biases (Ariely, 2008; Tversky & Kahneman, 1975). This pattern of behaviour manifests over a number of areas (Availability, representativeness, positive hypothesis testing and affect biases) and has been shown to negatively impact on the decision-making process.

Thaler (2000; 1980) introduced a distinction between judgement and decision-making. Incorporating the sentiment of judgement, one finds support for the Kahneman and Tversky (1984) view of decision-making also influenced by psychological factors. Judgement, having a distinct root in the value-based assessment of the decision-making process, echoes the original perspective (Learned et al., 1959) that decision-making was not only comprised of cognitive limitations and normative (prescriptive) aspects, but also contained psychological considerations (Kahneman, 2003a).

Pertinently, Thaler (2000) added to the discussion on human boundedness, but introduced a psychologically motivated bias to the framework suggested by Kahneman and Tversky (1984). His view is that people, through honest limitations, exhibit "bounded ethicality" that limit their ability to make correct decisions and judgements. Taking this concept further, Bazerman and Moore (2013) identified seven specific instances where bounded ethicality might occur: credit over-claim, in-group favouritism, discounting the future, implicit attitudes, conflict of interest, indirect unethical behaviour and sacred value clashes.

It is the view of the author that neither the normative (prescriptive) nor cognitive limitations perspectives can describe the decision-making landscape completely. With evidence in existence in support of value-driven decision-making, the psychological (values/emotions/motivations) perspective will form part of a holistic view of the literature on the decision-making process. The matter at hand now is the formulation of a practical research design from the gap identified in the extant literature.

2.5.3 Evolution of the research question

The updated framework of the decision-making space (shown in Figure 8) hints at several thought-provoking questions. Have we fully investigated the contributions offered by a psychological (values/emotions/motivations) lens on decision-making? A lot of work has been done on the ethical implications of value-driven decision-making (Ametrano, 2014; Ariail et al., 2015; Fritzsche & Oz, 2007; Grebitus et al., 2013; Nonis & Swift, 2001; Watson et al., 2009), but not so much on its influence on decision-making quality. One wonders to what extent will a person's psychological (values/emotions/motivations) profile, as exhibited by both their value system, influence their decision-making ability? Or more specifically this leads us to this research question:

What is the extent of the relationship between personal value system orientations and the decision-making quality exhibited by individuals during value clashing scenarios?

One wonders though, whether the fact that individuals would be confronted with conflicting values during taboo scenarios, might not also elicit a risk response. The work of Sitkin and Weingart (1995) and Weber et al. (2002) on risk preferences therefore becomes pertinent. It expands the focus on the psychological (values/emotions/motivations) perspective to add personal risk preferences in the mix. Given the migration of risk management into the behavioural management field and the importance of risk perception in the decision-making process, risk preferences seemed specifically relevant to the study. This prompted the following research question:

What is the extent of the relationship between personal risk propensities and the decision-making quality exhibited by individuals during value clashing scenarios?

A fleshed-out interpretation of the psychological (values/emotions/motivations) perspective should thus allow for combinations of these personalistic attributes. By combining the work of Schwartz (1994) and Weber et al. (2002) an opportunity has presented itself whereby the decision-making behaviour of individuals can be portrayed through a new framework. If we simplify Schwartz's value classification model into two basic axes **(**Self-transcendence vs. Self-enhancement and Openness to Change vs. Conservation), we are left with four specific quadrants of human value groupings: Self-transcendent and Open to change, self-transcendent and opposed to change, self-enhancing and open to change; and lastly self-enhancing and opposed to change.

Through this the opportunity arose to expand on the psychological decision-making model. Table 4 illustrates the addition of risk preference to the Schwartz model, resulting in eight personality types, instead of four. For ease of reference in the discussion section, the eight personalities were given unique labels aimed at capturing the nature of the individuals. The following question thus ensued:

Will decision-making groups, produced by a combination of the value- and risk traits, produce decision-making responses of varying quality?

Table 4. Eight Decision-making Personality Types

Self-orientation	Position towards change	Social risk	Combinations	Name
Self-trancendant	Open to change	Risk-taking	ST O RT	Self-transcendent, open-minded risk taking
Self-trancendant	Open to change	Risk-averse	ST O RA	Self-transcendent, open-minded risk averse
Self-trancendant	Conserving	Risk-taking	ST C RT	Self-transcendent, conserving risk taking
Self-trancendant	Conserving	Risk-averse	ST C RA	Self-transcendent, conserving risk averse
Self-enhancing	Open to change	Risk-taking	SE O RT	Self-enhancing, open-minded risk taking
Self-enhancing	Open to change	Risk-averse	SE O RA	Self-enhancing, open-minded risk averse
Self-enhancing	Conserving	Risk-taking	SE C RT	Self-enhancing, conserving risk taking
Self-enhancing	Conserving	Risk-averse	SE C RA	Self-enhancing, conserving risk averse

SE	Self-enhancing
ST	Self-transcendent
O	Open to change
C	Conservative
RT	Risk-taking
RA	Risk-averse

The first aim of the study will therefore be to determine how these eight personality types differ with regards to the quality of their respective decision-making.

However, identifying the problem will only address one half of the problem. This theoretical model needs practical grounding and verification. An intervention designed to alleviate the stresses brought about by value clashes thus needs to be investigated. Schoemaker and Tetlock (2012) introduced the concept of Taboo Scenarios, stating that resource scarcity seemed to place managers in difficult positions where value-clashing decisions are unavoidable. The Schoemaker and Tetlock (2012) contribution suggested the application of

social-relational framing to these value clashes to reframe them as tragic trade-offs rather than taboo trade-offs. It is the researcher's view that any form of framing will complicate the cognitive processes during decisions, hence eliciting higher levels of differentiation and integration of thinking on the matter. We can therefore ask:

> *To what extent will the introduction of social-relational framing impact the decision-making quality exhibited by the individuals?*

The aim of this process was to shift the decision-making from the System I arena, to the System II arena, thus ensuring more time is taken and more thought goes into the decision-making - thinking slow, rather than thinking fast to quote Kahneman (2011). This approach has not been investigated and needs to be verified through a scientifically rigorous process. A full description of the research model, research questions and conceptual theoretical models was shown in paragraph 3.5, from page 78 onwards.

2.5.4 Recent Contributions to the Decision-making Landscape

Given that the core thesis of this work rests on the contribution of Tetlock's value pluralism theory (1986), it seems prudent to verify the applicability and relevance of this contribution to literature. Although the topic of decision-making is an established field and much has been done to examine various aspects of the process, much remains to be discovered.

Recent contributions in the decision-making space seem to still revolve around the limitations of cognitive processing, illustrated by the continued work of Tetlock and others on biases and heuristics (Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2013; Schoemaker & Tetlock, 2012; Tetlock, Vieider, Patil, & Grant, 2013; Trotman, Tan, & Ang, 2011). Decision-making processes is also still a popular topic with ongoing work on decision systems still featuring in the Harvard Business Review (Clarke, Lovallo, & Clarke, 2013; Kahneman, 2011).

Closer to this topic is the field of ethics and ethical decision-making. A large number of authors have contributed to address the question of making the right decision, and personal value sets played a large role in these discussions (Ametrano, 2014; Ariail et al., 2015; Grebitus et al., 2013; Kocet and Herlihy, 2014; Ruedy & Schweitzer, 2010; Wattegama & Ping, 2015). These authors all applied personal value and/or risk evaluations in their work, but focussed on the ethical implications of decision-making (discussed in paragraph 2.2.3.2 in full). No authors expanded the debate to include the quality of decision-making in these contributions. So, although the Tetlock model has a distant origin, it has by no means been made irrelevant by recent contributions. This new focus on the impact of personal attributes on decision-making quality is novel and has the potential of adding richness to the debate on what constitutes and ensures quality decision-making.

2.6 Conclusion

This chapter showed a meticulous examination of the literature surrounding the topic of decision-making. The study entertained three distinct views on decision-making (normative /prescriptive, cognitive limitations and psychological (values/emotions/motivations) perspectives), and produced four core research questions through which to focus the research design. To this end, the study will target a design aimed at finding support for the hypothesised relationship between value orientations, risk propensities and decision-making quality, as well as to show evidence for the applicability of social-relational framing as possible intervention strategy. The next chapter shows the detail research design, and how these constructs were operationalised towards answering the research questions.

Chapter 3

Research Design and Methodology

This chapter details the research design adopted to answer the research question.

3.1 Introduction

As stated before, the purpose of this study was to determine whether a relationship exists between personal attributes, such as value orientations and risk propensities, and decision-making quality, and whether the later can be improved through social-relational reframing of the decision. Chapter 3 details the research philosophy, research design and methodology employed to answer this research question. This chapter gave an overview of the instruments employed to gather the data, but also brought the literature in connection with the research design through a careful description of the evolution of the three hypotheses. The development of the decision scenarios, specifically created for this study, was also discussed.

3.2 Research Paradigm

The first section discusses the philosophy, approach and positioning of the research within the framework of current accepted research practices. The popular three world's model (Babbie & Mouton, 2001; Myers, 2013) was used as a framework through which to discuss this study's positioning. Babbie and Mouton (2001) specifically presented a number of schemas and frameworks through which research questions in the social sciences realm could be positioned. Section 3.2 critically assesses this research endeavour with the aid of these different structures.

The three-world model, depicted in Figure 9, shows the positioning of the research within the three areas of metascience, science and everyday knowledge.

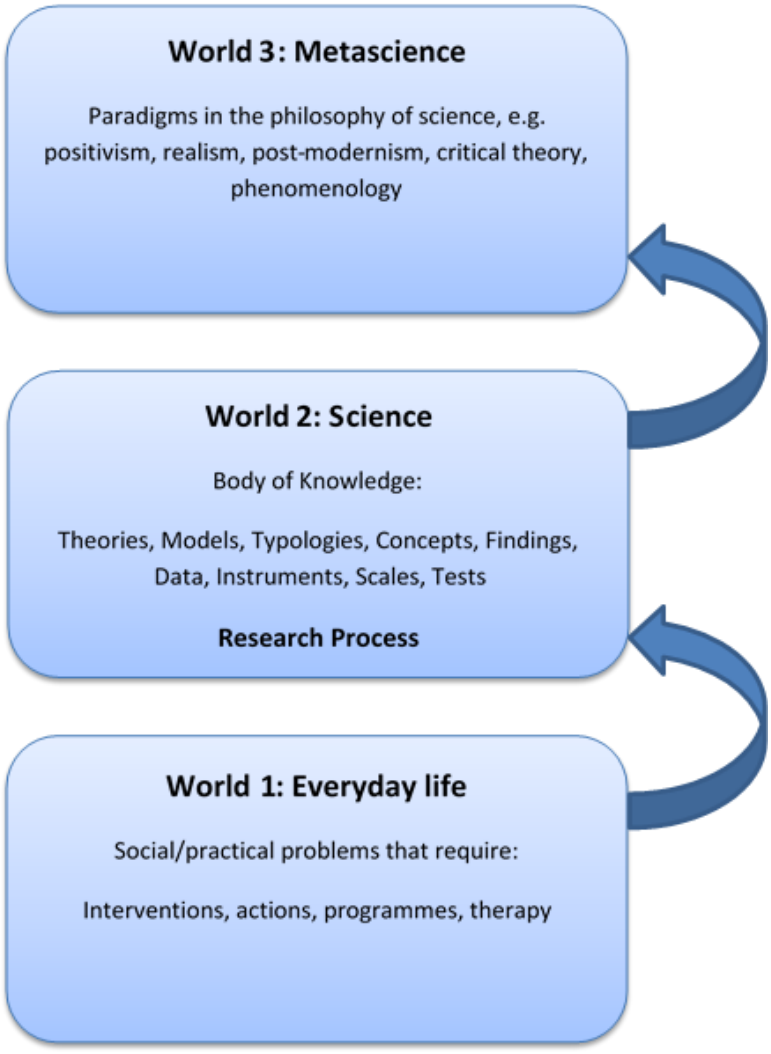
Starting at **World 1**, the level of everyday problems, one finds the phenomenon of value clashes as well as its proposed impact on the decision-making process. Observations from routine decision-making activities would suggest that value clashes could and most probably do occur, and it seems probable that these clashes will complicate the process followed by managers to decide on what actions to take. However, trying to find a solution within this realm will most probably result in a symptomatic approach, rather than one addressed at the core of the problem.

A jump to **World 2** reveals a world consisting of formalised academic knowledge. This arena consists of theories, models, typologies and such developed to make sense of everyday

occurrences. Whereas everyday observations tend to be anecdotal, context bound and subjective, the evidence needed to support theoretical models requires objectivity and empirical, replicable data (Myers, 2013). It is in World 2 that the research process takes place, but it is in World 1 that the data is collected, and very often where the research question originates (Myers, 2013).

To tie this perspective to the current study, the World 2 theoretical perspective entails consideration of the specific theories applied, such as the value pluralism model (Tetlock, 1986), relational forms of sociality (Fiske, 1992) and human value system (Schwartz, 1994).

Figure 9: The Relationship Between Metascience, Science and Everyday Life Knowledge



Source: Babbie and Mouton (2001, p. 15)

World 3 represents the overarching organisation of knowledge in the area known as meta-science (*meta* from the Greek word for “beyond”). This world contains the broader scientific

paradigms and speaks towards the philosophy behind a specific research approach. Within this realm the basic direction and approach of the research is established which in turn will dictate what processes and approaches will be followed through the investigation. Core orientations such as a positivist rather than a naturalist approach to the research reside here. To quote Myers, "*It is thus in the world of the meta-science that the discussions occur on the advancement of knowledge*…" (Myers, 2013, p. 299)

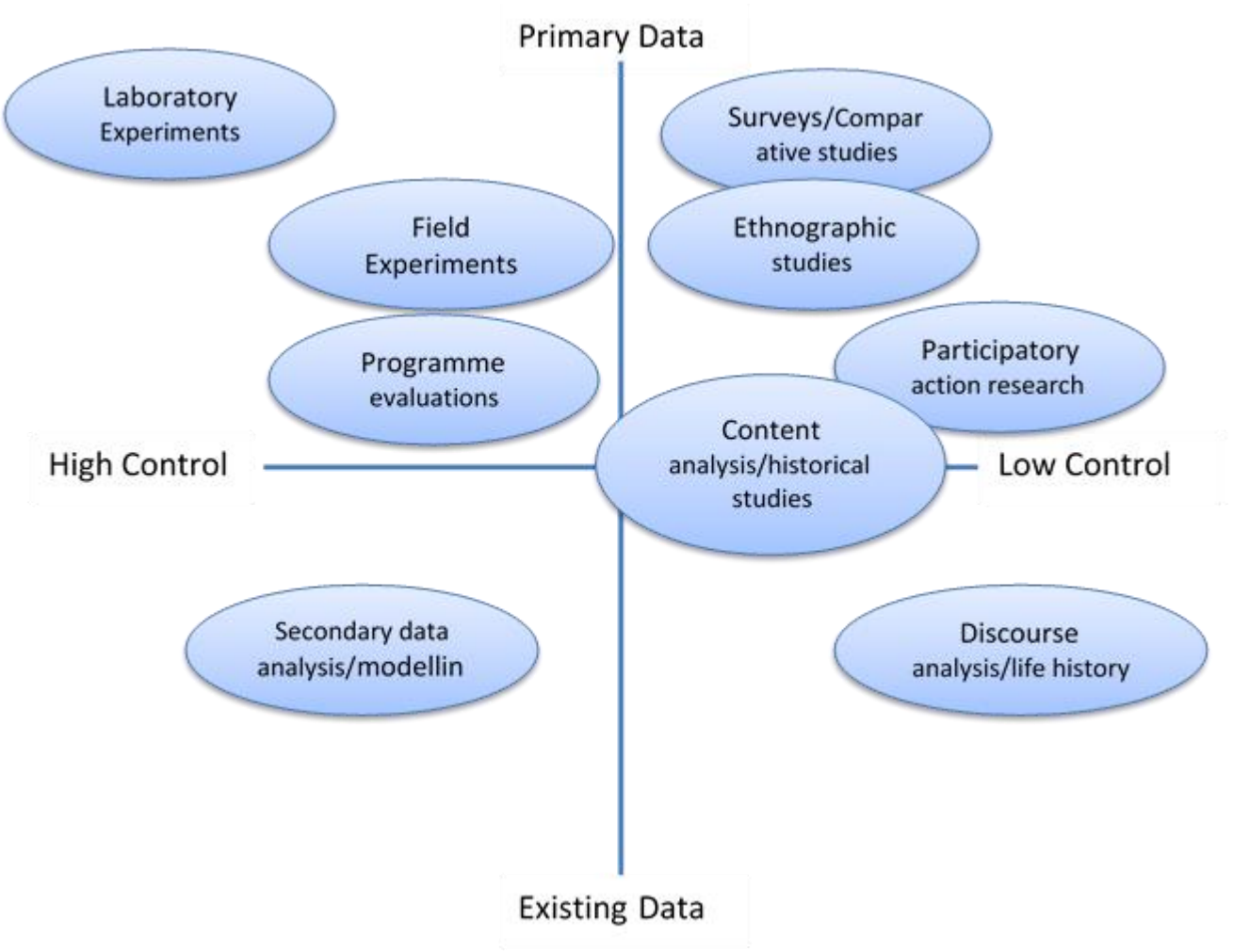
The origin of the study has already been positioned in World 1 through the observations around personal value systems, risk propensities, value clashes and decision-making quality. In World 2 though an appropriate theoretical framework had to found to support the World 1 observations. The literature review placed the phenomenon at the intersection of the three perspectives (psychological (values/emotions/motivations), cognitive limitations and normative (prescriptive)) on decision-making and showed the support of a number of complex theories. The World 3 perspective was thus required to decide on a specific focus for the study. Given the complexity of the theoretical field and the multi-faceted nature of the phenomenon, it was decided to draw from multiple philosophies in the meta-science world. This invariable lead to a suggestion of a mixed method approach, combining both qualitative and quantitative research methodologies.

As far as the positivist approach and empirically orientated portion of the research design was concerned, careful consideration of the data was required to specify the research approach to be used. Figure 10, adopted from Babbie and Mouton (2001) sheds some light on this problem.

The literature suggested a number of research instruments to be used for this study. They consisted of a field experiment, personalistic surveys as well as a content analysis technique. From the graphical presentation in Figure 10, the nature of the data required is shown. The focus for this study was on the collection of primary data and access to secondary data was not required. However, as far as control goes, the different instruments yielded varying degrees of control over the research process.

Where the influence of a mediating variable (social-relational framing) tested, a higher level of control was required. The application of a **field experiment** for this approach was thus sound. Where the personalistic characteristics of the individuals were assessed, control was not as important as the literature supporting value-driven decision-making is sound and well documented. A **survey** thus sufficed.

Figure 10: Mapping Empirical Research Design



Source: Babbie and Mouton (2001, p. 79)

The use of the **content analysis** technique, as discussed in section 3.6, reflected the qualitative side of the study. Its positioning within Figure 10 reveals a lower measure of control over the instrument and the process of coding of the data gathered raised some concerns. The precise methodology followed to do the coding was discussed in paragraph 4.2.2.1. Next, the research process needed to be discussed.

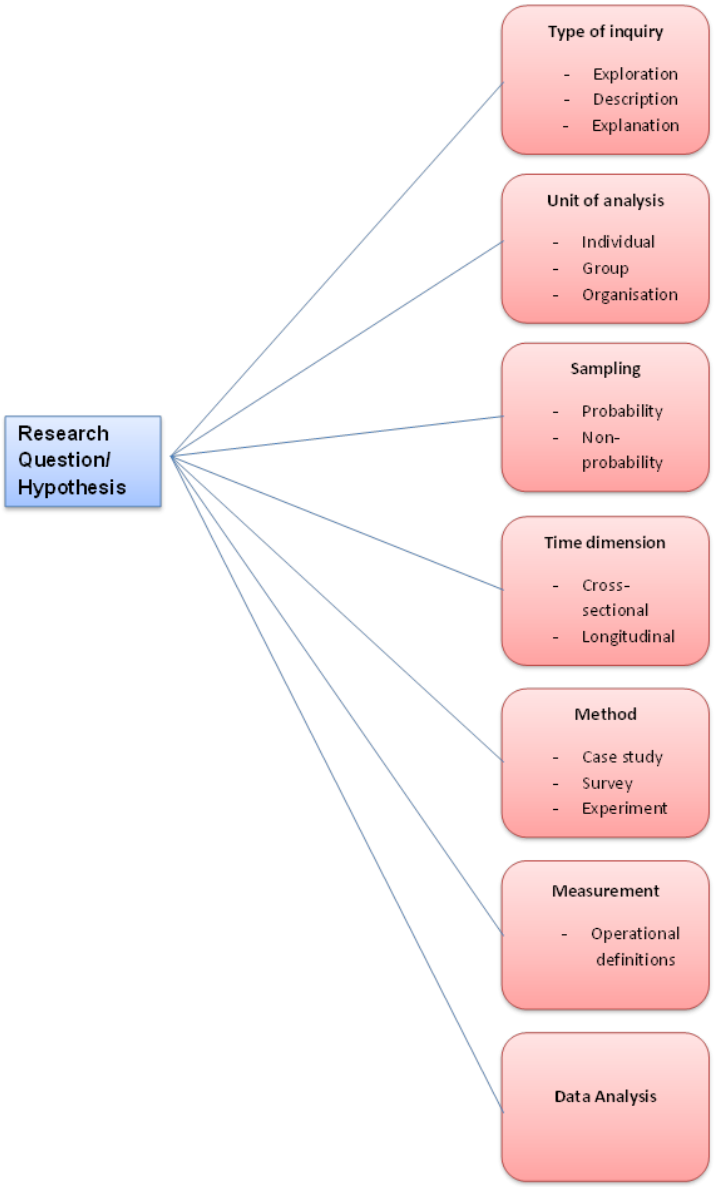
3.3 Detail Design of the Research

The aid of another figure (Figure 11) was employed to describe the detail of the research design and to ensure an exhaustive process was followed in considering all aspects of the project.

3.3.1 Type of Inquiry

Research projects are typically oriented as either a descriptive, exploratory or explanatory study. The focus of this project fell within more than one category. Firstly, the study hoped to **replicate** the findings proposed by McGraw and Tetlock (2005) that social-relational framing would be related to the decision-making process (descriptive). However, new insights were also pursued and as such the study also had an **exploratory** nature. The study specifically hoped to contribute to the body of knowledge by investigating the relationship between risk attitude and decision-making quality, as well as to produce a novel typology for decision-making personality types.

Figure 11: Research Design Checklist



Source: Balnaves and Caputi (2001, p. 66)

3.3.2 Unit of Analysis

The unit of analysis for this investigation was that of the **individual**. As the focus was on establishing relationships between personalistic attributes such as value systems and risk attitudes, the focus has to be on individual.

3.3.3 Sampling Philosophy

The decision scenarios (described in section 3.6.4) were not designed with a specific demographic in mind, but rather targeted issues important to all members of society. Since this research was conducted in the business science realm, and because of the focus on managerial decision-making, a purposeful sampling approach was adopted to gather responses from all levels of management. The sample also had to reside in the emerging market (as per the delimitation set in Chapter 1) and be of a single company large enough to support a statistically sound sample.

The sample was therefore obtained from a company operating in the South African fast-moving consumer goods sector. All members of the organisation's management staff were requested to complete the questionnaire, making this group a sub-sample of the South African management population. The description of the sample was done in section 4.3, and the discussion of its representativeness was done in paragraph 5.2.1.

3.3.4 Time Dimension

The study had a cross-sectional time dimension instead of a longitudinal time dimension. It was believed that a large enough sample would provide ample support for the influence of the framing intervention, negating the need for a longitudinal approach.

3.3.5 Methodology

The research methodology was discussed in section 3.5 in great detail.

3.3.6 Measurement Instruments

The measurement instruments applied were the **Schwartz Portrait Value Questionnaire** (Schwartz et al., 2012)**, the Domain-Specific Risk-Taking Scale** (Blais & Weber, 2006) and the **integrative complexity measure** (Conway et al., 2014; Houck et al., 2014; Suedfeld & Tetlock, 2014; Tetlock, 1986). They were discussed in section 3.6 in greater detail.

3.3.7 Data Analysis

The data analysis considerations and statistical instruments employed to add value and illumination to the data, was discussed in Chapter 4.

3.4 Research Question(s)

With the research paradigm set and the orientation of the research project established, a detailed research question had to be formulated. The core question this study hoped to answer thus was:

> *What are the influences of individual value systems and risk propensities on decision-making quality in value clashing circumstances, and how can it be addressed?*

The research problem called for a more detailed description of the question at hand, requiring the formulation of sub-questions. These sub-questions focussed the research question on three specific aspects of the inquiry: the relationship between value-orientations and decision-making quality, the relationship between risk propensities and decision-making quality, and the impact of the proposed framing intervention on decision-making quality. This produced four sub-questions:

1. *What is the extent of the relationship between personal value system orientations and the decision-making quality exhibited by individuals during value clashing scenarios?*
2. *What is the extent of the relationship between personal risk propensities and the decision-making quality exhibited by individuals during value clashing scenarios?*
3. *Will decision-making groups, produced by a combination of the value- and risk traits, produce decision-making responses of varying quality?*
4. *To what extent will the introduction of social-relational framing impact the decision-making quality exhibited by the individuals?*

3.5 Research Model

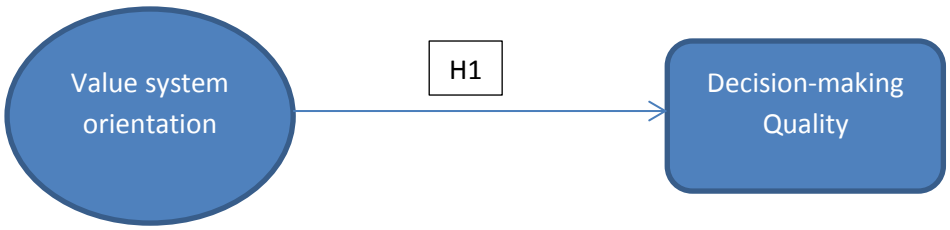
The research model was developed from a critical interpretation of the extant literature as well as perceived gaps in the body of knowledge. The research was designed around the core organisation of the literature shown in Figures 2 and 8 with specific consideration to the overlaps of the three perspectives. The research models depicted in Figures 12-15 give an overview of the process proposed to answer the central research question and related sub-questions. Each model was positioned within a concise restatement of the key theoretical support, to assist in building the core argument.

3.5.1 Value System Orientation and Decision-making Quality

Whereas personal value systems have been shown to impact individual decision-making (Braithwaite & Law, 1985; Rokeach, 1973; Schwartz, 1994) and the presence of value clashes such as those presented by taboo trade-offs will complicate the decision-making process

(Fiske & Tetlock, 1997; Tetlock, 1986), it is postulated that a relationship exists between individual value orientations and attributes of the decision-making process when a value clash arises. With the popular use of integrative complexity (consisting of indicators of both contextual differentiation and integration) in decision-making literature (Conway et al., 2014; Houck et al., 2014; Suedfeld & Tetlock, 1977, 2014; Tetlock et al., 2014), it was decided to incorporate this construct into the research design. As this measure has been shown to be a dependable indicator of the complexity of thought entertained in the assessment of value-clashing scenarios (Tetlock, 1986; Tetlock et al., 2014), a relationship is proposed between individual value orientations (such as measured by the Schwartz Portrait Value Questionnaire (Schwartz et al., 2012) and a new construct, the quality of the decision-making (see the introduction and description of this construct in paragraph 2.3.4). We can therefore present the following hypothesis, illustrated in Figure 12.

Figure 12. Proposed Research Model for Hypothesis 1



Null hypothesis: During a value clash, no relationship exists between an individual's value orientation and the decision-making quality exhibited.

Hypothesis 1: During a value clash, a distinct relationship exists between an individual's value orientation and the decision-making quality exhibited.

The researcher expects specifically to find a strong positive relationship between individuals located high on the "openness-to-change" axis and their decision-making quality score for a scenario. The inverse is also expected, meaning a negative relationship between individuals in the "conservatism" segment, and their decision-making quality score. This presents the first opportunity for a contribution to the extant literature. Although the Schwartz Human Value System has been in existence since 1994, no work has been done to link decision-making quality to specific value orientations. This will further our understanding of decision-making

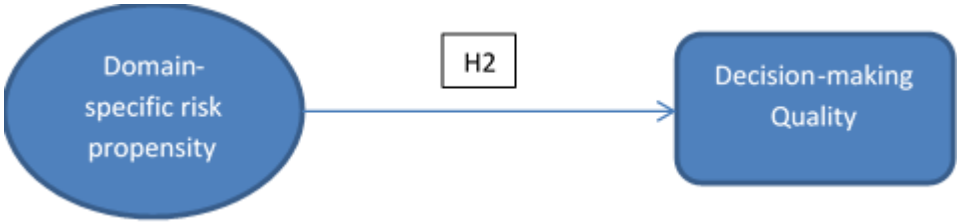
behaviour during testing value clashes and hopefully lead the way towards an effective intervention technique.

3.5.2 Risk Attitude and Decision-making Quality

Whereas risk attitude has been shown to be contributory factor in the decision-making process (Burns & Slovic, 2012; Lovallo & Kahneman, 2000; Sitkin & Weingart, 1995; Slovic et al., 1984), and, as stated before, the attributes of the decision-making process can be measured by the decision-making quality variable, it is proposed that a relationship exists between the domain-specific risk attitude as measured by the Domain-Specific Risk-Taking Scale (Weber et al., 2002) and the decision-making quality of the route adopted to resolve the value clash. The domain-specific risk attitude scale was specifically selected as this was deemed the most appropriate tool with which to gauge the attitudes of the respondents to value conflicts as perceived in various settings. Says Weber et al.: "*Risk attitude, a person's standing on the continuum from risk aversion to risk seeking is commonly considered to be a personality trait, and greater risk taking is sometimes found to be associated with greater personal and corporate success*." (2002, p. 264)

We can therefore present the following hypotheses, illustrated in Figure 13:

Figure 13. Proposed Research Model for Hypothesis 2



Null hypothesis: During a value clash, no relationship exists between an individual's risk propensity and the decision-making quality exhibited.

Hypothesis 2: During a value clash, a clear relationship exists between an individual's risk propensity and the decision-making quality exhibited.

The literature (Sitkin & Weingart, 1995) suggests that individuals with higher risk attitude scores (i.e. more likely to take risks) would be more likely to exhibit risky decision-making behaviour. From the literature background presented, as well as consideration of the System I/System II decision-making model (Stanovich & West, 1998), it is postulated that these decisions will be of lower quality. Risk-taking individuals would be less likely to consider the

implications of their actions and resultantly be more likely to engage a System I decision-making response.

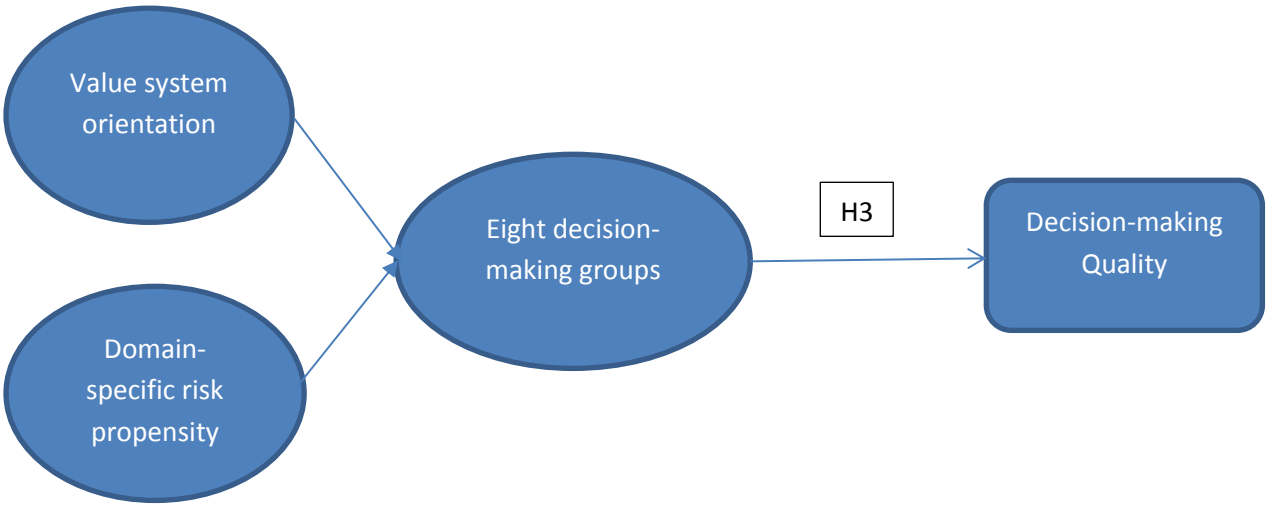
Seeing as the questionnaire is domain-specific, a specifically weak relationship was therefore expected between high risk scores from the **ethical domain** and the respective integrative complexity scores. However, as risk-taking in the **social domain** could be indicative of self-directed thought and action (both values in the openness to change value block), a positive relationship could be established between decision-making quality and social risk taking proclivity, as it would be a corroboration on the anticipated decision-making quality/openness to change relationship from hypothesis 1.

3.5.3 Forming of Decision-making Groups

The hypotheses above suggest that combining the risk- and value orientations into eight different decision-making types (defined in Table 4) should produce a deeper insight into their respective decision-making behaviour. It is suspected that the decision-making groupings defined by the eight possible combinations of the four value orientations (self-transcendent, self-enhancing, open to change or conservative) and two risk propensities (risk-taking or risk averse) will exhibit varying degrees of decision-making quality over the three scenarios.

It is therefore suggested that the following hypothesis be presented, illustrated in Figure 14:

Figure 14. Proposed Research Model for Hypothesis 3



Null hypothesis: In response to a value clashing decision-making scenario, the eight decision-making groups will not produce decision-making responses of varying quality.

Hypothesis 3:

In response to a value clashing decision-making scenario, the eight decision-making groups will produce decision-making responses of varying quality.

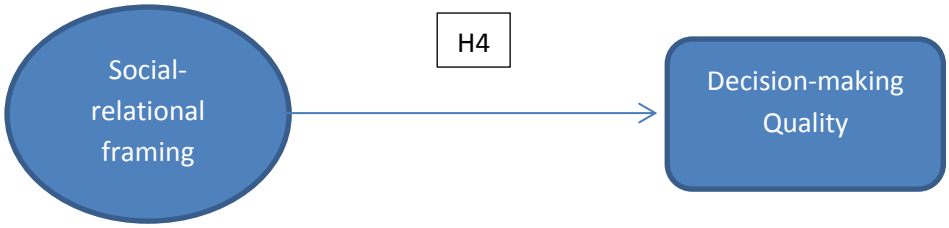
At this point no clear indication exist in literature as to which groups would produce the highest quality decisions. Taking guidance from the hypotheses introduced above, it is expected though that individuals with a combination of high openness to change scores and high risk-taking scores in either the ethical or social domains, should produce higher decision-making scores on the three scenarios.

3.5.4 Social-relational Framing and Decision-making Quality

Whereas social-relational forms such as proposed by Fiske (1992) have been shown to impact the perceived moral acceptability of a social exchange conducted during a value-clashing situation (Fiske & Tetlock, 1997), it is proposed that social-relational framing of a value clashes (that is, the framing of a difficult value-clashing exchange within a different relational framework and with different value attributes) will have an impact on the quality of the decision-making exhibited by the individuals. As the authors on the pioneering work on this topic put it: "*This research suggests that the rhetorical framing of trade-offs—as either taboo or tragic, will be a critical determinant of public reactions to decision makers*." (Schoemaker and Tetlock, 2012, p. 14)

We can therefore present the following hypothesis, illustrated in Figure 15:

Figure 15. Proposed Research Model for Hypothesis 4



Null hypothesis: The application of social-relational framing to value-clashing scenarios will have no impact on decision-making quality scores recorded.

Hypothesis 4: The application of social-relational framing to value-clashing scenarios will have an impact on decision-making quality scores recorded.

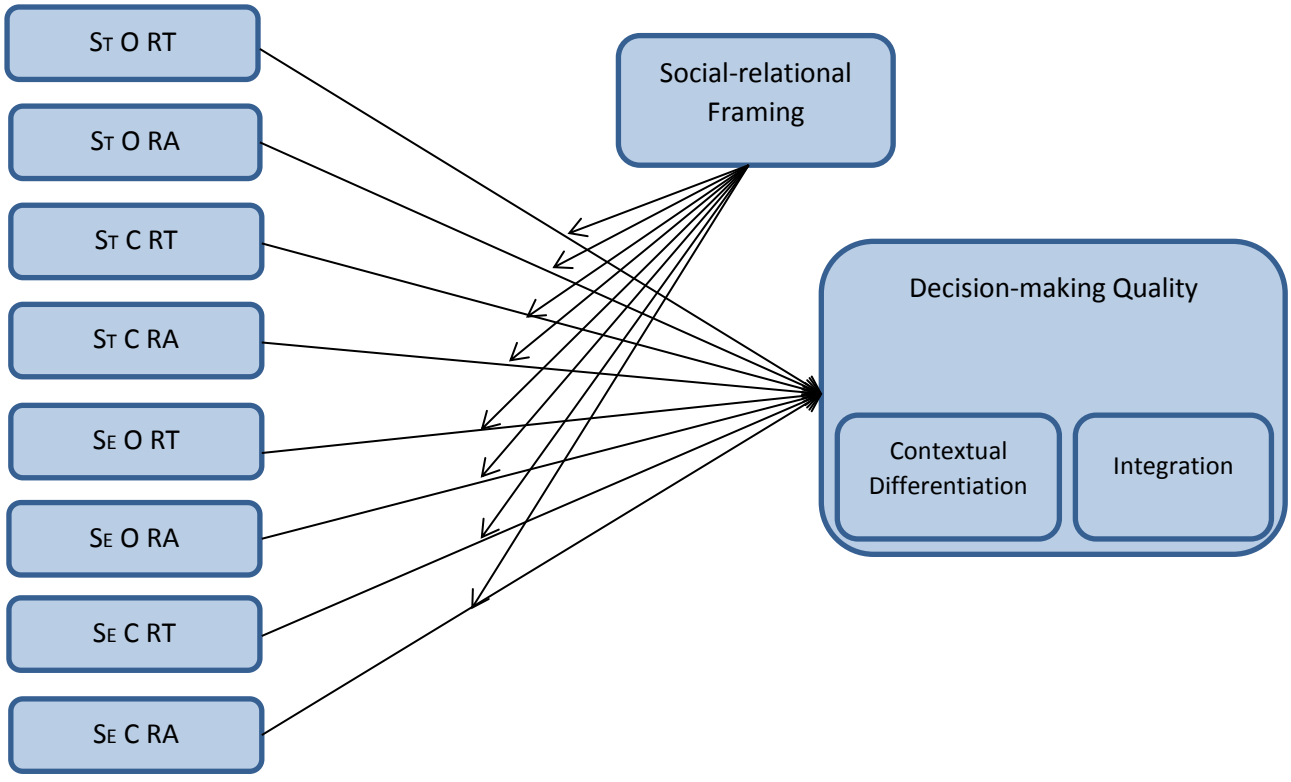
There is no guidance from the work of Tetlock (1986) and Schwartz (1994) on how the relationships proposed for Hypothesis 1 and 2 will be impacted by the introduction of the framing intervention. Tetlock (1986) suggests that framing will highlight the value clashes and

probably influence the decision-making behaviour of the individuals. It is therefore likely that the framing intervention would have a positive impact on the decision-making responses of the individuals, regardless of their value- or risk orientations. Distinguishing between the sensitivity of the eight groups to social-relational framing fell beyond the score of this investigation, but could present an significant avenue of research for future work in this area.

Figure 16 combines the four hypotheses to illustrate the proposed interaction between the eight decision-making groups and their respective decision-making quality scores, as moderated by social-relational framing.

As per Table 4, page 63, the eight risk-taking groupings were abbreviated to ensure a legible diagram. The eight groups, in order of their appearance in Figure 16, are: Self-transcendent, open-minded risk taking, self-transcendent, open-minded risk averse, self-transcendent, conserving risk taking, self-transcendent, conserving risk averse, self-enhancing, open-minded risk taking, self-enhancing, open-minded risk averse, self-enhancing, conserving risk taking and self-enhancing, conserving risk averse.

Figure 16. Eight Decision-making Groups as Influenced by Framing



3.5.5 Decision-making Quality

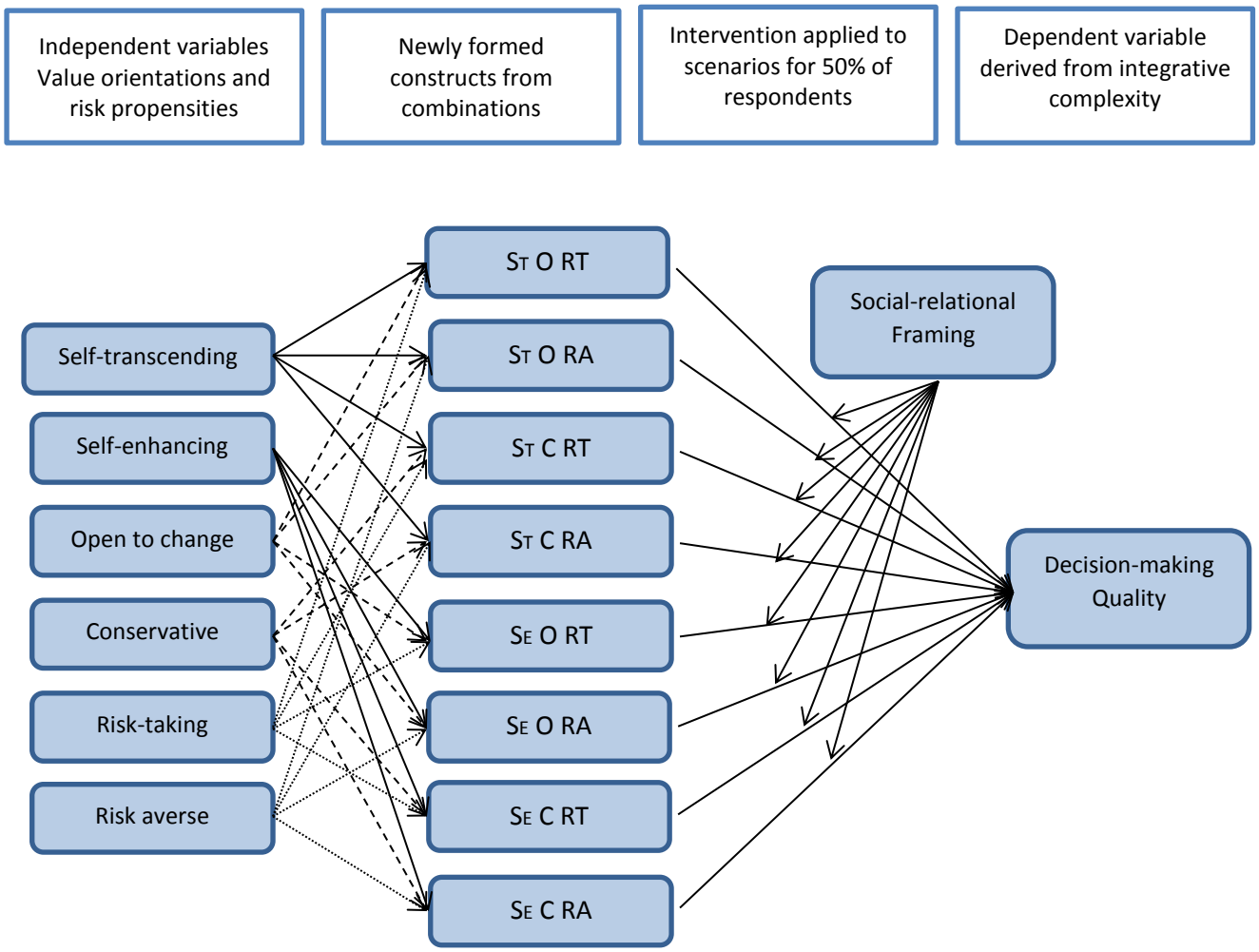
With decision-making quality at the core of the research model, it was deemed necessary to discuss this construct in more detail before the consolidated research model could be

presented. Hailing from the Tetlock (1986) paper that introduced the value pluralism model, the integrative complexity coding was adapted to form the decision-making quality construct. This construct is discussed in detail in section 3.6.5, but it is of importance now to note the duality of the variable. Integrative complexity, and by extension decision-making quality, consists of two sub-variables: contextual differentiation and integration. Together the variables gauge the "involvedness" of the participant in the decision-making by providing more information of the extent to which he/she differentiated (considered alternative options or solutions) and integrated (looked for solutions by contrasting and comparing the various options). For this reason, the decision-making quality construct depicted in Figure 16, shows the sub-constructs of differentiation and integration.

3.5.6 Consolidated Research Model

To clarify and consolidate the research model, the following graphic was presented. Figure 17 shows the anticipated and hypothesised relationships between the decision-making groupings resulting from the two personalistic characteristics, the decision-making quality and the introduction of social-relational framing to the scenarios. Due to the already intricate nature of Figure 17, it was decided to show the decision-making quality construct as a single variable. The truth of course is that it still bears the dual nature reflected in the original construct (integrative complexity) consisting of both contextual differentiation and integration. These sub-variables were simply omitted to present a cleaner, more elegant figure.

Figure 17. Consolidated Research Model



3.6 Data Gathering Instruments

The discussion on the data gathering instruments required a careful discussion of the nature of the variables prior to a detail discussion of the instruments used.

3.6.1 Variable Exposition

The first point to discuss was the type of the variables, which meant it needed to be determined what variables were dependent, independent, moderating or mediating. From the models above it is clear that the dependent variable for all hypotheses was the decision-making quality construct. The independent variables, in turn, were the individual value-system orientation (Hypothesis 1), the ethical domain risk attitude (Hypothesis 2) and of course the various demographic variables (gender, cultural group, management level and age).

No mediating variable was present, and the moderating variable for the research model was the presence (or not) of social-relational framing. (Hypothesis 4).

As far as the nature of the variables was concerned, they were classified as follows:

- Individual value orientation – interval
- Ethical domain risk attitude – interval
- Decision-making grouping - nominal
- Decision-making quality - interval

A multivariate relationship was expected between the various constructs. The literature proposed the following instruments through which the response of the variables could be measured through the research process. The detail descriptions of the instruments were dealt with during the literature study, and this section focusses on the operationalization of the instruments.

3.6.2 Schwartz Portrait Value Questionnaire

The revised Schwartz Value Survey, or **Portrait Value Questionnaire** (Schwartz et al., 2012), version RR was used to assess the value orientation of the individuals participating in the study. This survey used 57 portrait descriptions of an individual's value orientation, grouped to test the 19 core value sets identified by Schwartz. (The survey was made available in both male and female format.) Respondents were required to answer the following question, for each of the 57 statements: "*How much like you is he/she*?" using the following scale: very much like me, like me, somewhat like me, a little like me, not like me and not like me at all. A copy of the survey was placed in the appendix for easy reference. The updated questionnaire, a refinement of the original (1986) ten value framework, consist of the following 19 value-sets: self-direction thought, tradition, self-direction action, stimulation, hedonism, achievement, power dominance, power resources, face, security personal, conformity-rules, conformity-interpersonal, humility, universalism-nature, universalism-concern, universalism-tolerance, benevolence–care, benevolence-dependability, security societal. This was an expansion of the original ten values of benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, security, conformity and tradition. Table 5 gives an overview of the value sets with definitions as well as their relationship to the now outdated value framework, quoted directly from the Schwartz et al. (2012) paper.

Table 5. Refined Basic Individual Value Framework

Value	Definition	Old framework
Self-direction – thought	Freedom to cultivate one's own ideas and abilities	Self-direction
Self-direction – action	Freedom to determine one's own actions	
Stimulation	Excitement, novelty, and change	Stimulation
Hedonism	Pleasure and sensuous gratification	Hedonism
Achievement	Success according to social standards	Achievement
Power-dominance	Power through exercising control over people	Power
Power-resources	Power through control of material and social resources	
Face	Security and power through maintaining one's public image and avoiding humiliation	
Security-personal	Safety in one's immediate environment	Security
Security-societal	Safety and stability in the wider society	
Tradition	Maintaining and preserving cultural, family, or religious traditions	
Conformity-rules	Compliance with rules, laws, and formal obligations	Conformity
Conformity-interpersonal	Avoidance of upsetting or harming other people	
Humility	Recognizing one's insignificance in the larger scheme of things	Benevolence
Benevolence-dependability	Being a reliable and trustworthy member of the in-group	
Benevolence-caring	Devotion to the welfare of in-group members	
Universalism-concern	Commitment to equality, justice, and protection for all people	Universalism
Universalism-nature	Preservation of the natural environment	
Universalism-tolerance	Acceptance and understanding of those who are different from oneself	

(Source: Schwartz et al., 2012)

3.6.3 Domain-Specific Risk-Taking Scale

The risk attitude of the individuals was assessed using the adult **Domain-Specific Risk-Taking Scale** developed, as mentioned before by Weber et al. (2002). The questionnaire consisted of 30 risk-related statements split up amongst five domains: financial, social, recreation, health & safety and ethical. Weber et al. (2002) adopted the domain classification from earlier work (Byrnes, Miller, & Schafer, 1999) and refined to show statistical support for these five domains. This helped to further the researcher's understanding of domain-specific

risk propensities. The domain definitions listed in Table 6, were derived from these contributions

Table 6. Risk-Taking Domains

Risk-taking Domain	Definition
Financial	The arena of personal finance, investment and gambling
Social	The arena of personal exposure in social interactions
Recreation	The arena of risky recreational activities, such as extreme sports
Health and Safety	The workplace setting and associate labour risks
Ethical	The moral arena dealing with ethically challenging situations

(Source: Weber et al., 2002.)

Respondents were required to indicate the likelihood that they would participate in the activity on a 7 point Likert scale. (Extremely unlikely, moderately unlikely, somewhat unlikely, unsure, somewhat likely, moderately likely and extremely likely). As Weber et al. (2002) reported sufficiently high Cronbach-Alpha scores of the different domain questions (ranging between 0.71 for social and 0.84 for ethical), it was decided to include all of the domains listed in the DoSpeRT Scale in the survey. This was a fortunate decision, as the results in Chapter 4 would later show. Initial expectations proposed a relationship between either financial or ethical risk-taking and decision-making quality. These relationships proved to be non-significant, and a significant relationship was established between decision-making quality and social risk-taking instead. The discussion chapter investigated possible causes of these relationships.

3.6.4 Value Clashing Scenarios

The next aspect of the research methodology was the implementation of **experimental design** through the crafting of a value clashing scenarios. First off, a discussion on the selection of experimental design as research methodology is warranted. Literature distinguishes between experimental design and quasi-experimental design (Gliner & Morgan, 2000). The main difference according to Gliner and Morgan (2000) is that pure experimental design requires randomisation of the experimental manipulation intended for the test subjects, whereas in quasi-experimental design, no randomisation is incorporated in the design. Given that the research design applied for this study allows for randomisation of the test conditions, a pure experimental design was opted for.

In addition to this consideration, it was also deemed important to establish a design best positioned to address concerns on both internal and external validity. The work of Aguinis and

Bradley (2014) proved to be extremely valuable not only in addressing these concerns, but also in setting up a carefully considered experiment.

3.6.4.1 Experimental Vignette Methodology

Aguinis and Bradley (2014) investigated a technique called Experimental Vignette Methodology (EVM), a process consisting of crafted scenarios or vignettes aimed at manipulating the behaviours, feelings and attitudes of respondents towards a dependent variable. Elsewhere EVM is defined as "*a short, carefully constructed description of a person, object or situation, representing a systematic combination of characteristics*" (Atzmüller & Steiner, 2010, p. 128).

Aguinis and Bradley (2014) produced a telling contribution on the tension between internal validity and external validity when constructing experimental designs. This tension stems from the fact that a balance between the replicability of the study (external validity) and appropriateness to the intended test (internal validity) needs to be established for all experiments. Should a design overemphasis the vignette detail and positioning, then it would be hard to replicate. Alternatively, should a design be too vague and inclusive, it might fail in testing what it was designed to do. With this tension in mind, Aguinis and Bradley (2014) produced a ten-step framework for crafting an EMV adherent to both internal and external validity concerns.

The framework consists of ten decision considerations. The authors firstly suggest determining whether EVM is applicable for the experiment at hand. EVM works particularly well in instances where causation needs to be established. It also has specific application for instances where sensitive topics such as ethical dilemmas are being investigated. The vignette assists the researcher in creating a sensitive experiment without having to physically play out the difficult scenario (such as infidelity, or inappropriate romantic relations in the workplace). EVM is thus the ideal methodology for the testing of value clashes.

The second consideration refers to the choice of EVM: paper people studies or policy capturing and conjoint analysis studies. The first refers to explicit interaction with people whereas the second refers to implicit testing and consideration of multiple inputs. Since the study is not concerned with the decision-making of an individual, and will aim to contact a large group of people, the paper policy study approach is favoured.

The third decision concerns the between-person and within-person research design paradigm. Between-person designs incorporate a single scenario and compare the responses of the various individuals to each other. Within-person designs utilise multiple scenarios and has the ability to compare scenario response of a single person to **multiple scenarios**. Aguinis and

Bradley (2104) specifically cautioned against between-case designs. Thus, because a fairly large respondent sample was achieved, and since pre-testing of the scenarios indicated their individual sensitivities to different value sets, a design incorporating both between-person and within-person aspects was chosen. So, even though the decision-making quality instrument can only be linked to a single scenario at a time, it was felt that the findings and relationships would be much richer should they occur for multiple scenarios and multiple persons.

The fourth consideration concerns the level of immersion. This factor plays right into the internal/external validity tension as it has to do with the generalizability and realism of the scenario. The authors suggest higher levels of immersion in the scenario to aid the realism and experience of the participants. They suggest technological interventions such as pictures, video or sound clips to heighten the participants experience of the vignette.

The last six decision points are related to the implementation of the research design. The authors suggest increasing the test population to improve the external validity of the experiment. They make a case for additional vignettes to improve the internal validity of the findings and suggest the experiment be conducted in an environment closest to the staged scenario. The latter consideration was of course made to improve the realism of the experiment. Lastly the authors made comments on the data analysis techniques to be used and the transparency to be employed when presenting the data. The data analysis techniques used was discussed in section 4.2 and the transparency consideration under section 3.11.

3.6.4.2 Crafting a Value Clash Scenario

With the many considerations listed above duly regarded and incorporated, and additional consideration had to be addressed before the scenarios could be formulated. A setting or context had to be established for the vignette. Taking lead from the work on taboo scenarios by Schoemaker and Tetlock (2012), a number of sacred, untouchable subjects were presented as grounds for such a scenario. The four topics highlighted below were taken from the Schoemaker and Tetlock (2012) list and were deemed to present the best opportunity for a believable scenario.

> **Mother Earth**: A value clash setting the sacred value of our natural heritage and associated communal sharing level of exchange and against a secular, market-priced, commercial endeavour.
>
> **Equality Norm**: A scenario that violates the sacred, communal shared belief that discrimination on grounds of race, gender or religious orientation is taboo, against a secular, commercial gain.

Sanctity of Human Life: A scenario that illustrate a serious value clash when the sacred value of human life is confused as being in the same relational sphere as a market pricing venture, thus shockingly giving it a secular value.

Hierarchy Deference: A scenario that violates the societal respect for authority ranking interactions by again presenting the exchange as a commercial interaction.

Three Value Clashing Scenarios were presented as short stories or vignettes illustrating a particular value clash to the respondent. The base-case scenario was crafted in such a way as to present a decision choice between a sacred and a secular value with the intention of sparking a strong, emotionally laden *System I* response. The framed scenario, which was offered to half of the respondents (randomly selected), was positioned as a tragic trade-off. This was achieved by reframing the context of this scenario so as to present a decision choice between two sacred values, as opposed to a choice between a sacred and secular value.

As mentioned above, the scenarios were presented in either the framed or unframed format. This means they were presented to the respondent with either the harsh value clash "as is" as it were, or framed in such a way as to alleviate the unacceptability of the clash and presenting the scenario as an unfortunate or tragic trade-off. The instrument was concluded with a **yes/no** question to gauge the respondents' support of the scenario as well as quantitative assessment of the **level of certainty** and **discomfort** experienced in coming to a decision. This is of course in line with the procedure followed by Tetlock (1986) when he introduced the Value Pluralism Model. The following three paragraphs describe the process followed to craft the respective scenarios.

3.6.4.3 Scenario 1 - Affirmative Action and the Equality Norm

Direction for the crafting of suitable and valid scenarios was taken from literature. The topic of affirmative action appears to be very topical in the business ethics arena with a number of leading authors contributing to the debate (DesJardins & McCall, 2005; McEwan, 2001; Rossouw, 2002). McEwan (2001) describes discrimination as unethical as it "*violates human dignity and autonomy and often leads to the withdrawal of right that should be available to all members of society*". He also typifies discrimination as having multiple facets with its roots in one or more of the following demographic descriptors: race, gender, disability, sexual orientation and age.

South Africa has a very chequered past where racial and gender discrimination is concerned. Rossouw (2002, p. 94) states that years' of Apartheid legislation prior to the 1994 democratisation of South Africa, have left Africans disenfranchised and excluded from society. Affirmative action, he states, is a possible remedy to address the unfairness of the past. The

American perspective (DesJardins & McCall, 2005) recommends three actions through which to address discrimination: equal opportunities, affirmative action and preferential treatment. Equal opportunity legislation is usually the first step in rectifying inequalities and results in "passive non-discrimination". Examples of this include allowing woman to vote and disallowing slavery. However, as a policy of non-discrimination does little to correct established inequalities, and since rectifying these inequalities often take very long, additional measures are often required and indeed implemented.

DesJardins and McCall distinguish between affirmative action and preferential treatment in the following way (2005, p. 442). Whereas affirmative action offers "*positive support for members of previously disadvantaged groups that they do not offer for other groups*" preferential treatment amounts to "*actively preferring women or member of minority groups in hiring or promotion decision*." Preferential treatment thus extends the limits of affirmative action in cases where candidates of minority groups are favoured for positions and promotions even if less qualified. An ethical dilemma therefore results in that non-selection of the more qualified individual from the previously advantaged group could constitute unfair treatment. Rossouw echoes this sentiment by stating that "*a clear choice for affirmative action does not mean its implementation presents no moral dilemmas*" (2002, p. 98).

The South African case is very significant and unique in a number of ways. Rossouw defines affirmative action as "*a temporary intervention to rectify the consequences of discrimination in order to enable people to compete as equals for opportunities*" (2002, p. 96-97). However, as 20 years have passed since the 1994 elections, one wonders about the governing party's interpretation of the word "*temporary*". At what point thus does the governments mandate to "*rectify the consequences of discrimination*" expire? And when does the so-called "fair discrimination" turn into unfair discrimination?

On the flip side of the argument, South Africa's economic inequality and lack of transformation needs to be considered. Is it fair to do away with affirmative action simply because a specific time period has past, or because the measures introduced to date have been ineffective in addressing the wrongs of the past? The answers to these questions still evade us. Affirmative action is still a very contentious issue in South Africa and such has been the cause of many heated debates (Alexander, 2007). The ambiguous rulings respectively offered by the supreme and constitutional courts on the case of Renate Barnard vs. the South African Police Service, attests to the complexity of the issue (Malan, 2014). This topic thus presents the ideal context from which to craft a value clash scenario.

I keeping with the design proposed by Schoemaker and Tetlock (2012), a value clashing scenario (or taboo, as they referred to it) should present a circumstance where a sacred and

secular consideration is put in direct conflict. Such a scenario should ultimately present the respondent with a decision between an attractive, but purely monetary gain against a morally challenging alternative.

Schoemaker and Tetlock (2012) suggested that a gross disregard of the equality norm principle could be one of the conditions prone to elicit such a scenario. This of course refers to the popularly held belief that any form of discrimination, be it on grounds of race, gender, sexual orientation, age or disability, is fundamentally unfair. Should such discrimination then be exercised to gain a monetary advantage, it is very likely to cause significant protest and very strong feelings.

However, the South African context presents a much more complex reality. As seen from the literature contributions by Rossouw (2002) and Alexander (2007), affirmative action is not a simple problem. The debate is fraught with racial tension, political influence and strong emotions. Both sides of the argument have merit and the social context, political history and unique character of the South African case has made for a multi-layered scenario.

The value clash experiment was presented with two alternatives, adhering to the Schoemaker and Tetlock (2012) design. Their work suggested that the repositioning, or reframing of a value clash could be used as a measure to address the difficult nature of the situation. The authors argued that restating a value clash as a tragic trade-off rather than a taboo trade-off, would assist in complicating the thought process during the decision-making process. This then was postulated to increase the quality of the decision-making behaviour exhibited by the respondent as it would force them into a System II decision-making response. During System II decision-making, decision-makers take more time to reflect on the complexities of the situation and typically incorporate both differentiation and integration of alternatives into the process of getting to a decision.

It is a contestable position that increased complexity in the decision-making behaviour of individuals would necessarily result in improved decision outcomes. However, for the purpose of this study, an increase in the complexity of the thought processes concerning the decision was equated to an increase in the decision-making quality. This was done to encourage rational thought in preference to intuitive and emotional responses, given that these value clashes carry such large emotional burdens.

Coming back to the scenario at hand, the base case value clash was subsequently presented by the following decision-making request:

Taboo trade-off – Secular vs Sacred Value (Personal remuneration vs legal requirements)

Imagine you manage a commission-driven sales team that has recently lost its most successful sales representative. You have to fill the vacancy as a matter of urgency and have received a number of applications. After sifting through the candidates, you have, with the time available narrowed the field down to just two candidates. The first candidate, a white male, belongs to a previously advantaged group but is a very skilled salesperson with all the skills required to succeed in the position. The second candidate, a black female, belongs to a previously disadvantaged group, but will have to be undergo lengthy training and coaching to succeed at the position. Since this is a commission-driven unit, you estimate that you stand to forego 30% of your personal remuneration should you choose the second candidate. Do you comply with employment equity guidelines and appoint the black female?

This presented a taboo trade-off as it forced the respondents to risk hierarchical deference by choose his/her personal financial gain over the legal requirements of the country. The alternative scenario had to be positioned to represent a scenario with the same factual content, but with additional circumstantial information (highlighted and printed in red) aimed at complicating the issue. The aim was to present the decision as a devils' alternative, or tragic trade-off, as opposed to a straight taboo by refocussing the decision as a trade-off between the equality norm and legal requirements. This was therefore reformulated to the scenario below:

Tragic trade-off – Sacred vs Sacred Value (Equality norm and fairness vs legal requirements)

Imagine you manage a commission-driven sales team that has recently lost its most successful sales representative. You have to fill the vacancy as a matter of urgency and have received a number of applications. After sifting through the candidates, you have, with the time available narrowed the field down to just two candidates. The first candidate, a white male, belongs to a previously advantaged group but is a very skilled salesperson with all the skills required to succeed in the position. The second candidate, a black female, belongs to a previously disadvantaged group, but will have to undergo lengthy training and coaching to succeed at the position. Since this is a commission-driven unit, you estimate that you stand to forego 30% of your personal remuneration should you choose the second candidate. ***Consider this scenario against the reality that the affirmative action policy is still being implemented almost 20 years after the Apartheid government was deposed and that this practice potentially***

***discriminates against people not involved in the atrocities of the past**. Do you comply with employment equity guidelines and appoint the previously disadvantaged candidate?*

It was proposed in literature (Fisher & Katz, 2000) that a pilot study was incorporated to test the effectiveness of the scenario. This resulted in slight changes to the wording to improve the clarity of the statement and a test of the effectiveness of the framing intervention. The affirmative action vignette (scenario 1) produced a fairly even split between the yes/no answers, indicating that it was properly positioned. Individual discussions with the respondents after the assessments supported this observation and pointed towards the scenario's realism and believability.

3.6.4.4 Scenario 2 – The Local Council and Hierarchy Deference

The idea for this scenario originated in the recent history of social unrest, labour disputes and the state of the South African education system. The last three years have seen large numbers of public demonstrations and protests against poor municipal service deliveries. The Mail and Guardian recently reported 191 protests to have taken place in 2014 and 164 in 2015 (Steyn, 2016). If the current trend in 2016 holds firm, then this year is bound to top 200 protests. The matter of dissatisfaction amongst disenfranchised South Africans due to the quality of municipal service delivery, has also been the topic of a large number of academic studies. Alexander (2010) found that the protests were not only rooted in dissatisfaction with service delivery, put ran deeper towards a sense of unfairness and injustice brought about by uncaring and corrupt public officials. Allan and Heese (2011) supported this point, but stressed that people would be willing to wait for services provided that other communities were not favoured unfairly. For these authors it was thus not a question of dissatisfaction, but one of fairness.

Complicating the South African landscape, is the volatile labour market. Since the Marikana tragedy of 2012, dissatisfaction with low wages, working- and living conditions and the disparity between the remuneration packages of entry level workers and top executives, have come to the fore. Twala (2012) reported a number of causes to the massacre. The uncompromising stance of employers in the mining industry, the poor performance of labour unions in addressing the work force and government's inability to implement the mining charter were listed as the top three contributors to the tragedy. Bond (2013) took a different view and positioned the practice of micro-financing of mineworkers at the core of the problem. Over-indebted miners, perhaps bent on bridging the inequality they face every day, were forced into an uncompromising position by a combination of unrelenting employers, personal needs and the services (and accompanied harsh measures) of the micro lenders. What the root cause might have been is not of importance to this study, though, but the interest in this issue serves

to highlight its importance to the South African community. South Africa is one of the worlds' most unequal and economically volatile countries in the world (Bond, 2013) and a scenario based on it protest-prone nature is certainly topical.

The final piece of the second scenario is the state of South African education. It stands to reason that a society plagued by inequality and poor living conditions (as highlighted by the first two paragraphs) would endeavour to better itself through education. Fedderke, de Kadt and Luiz (2000) showed that the country's inability to deal with the 1910-1993 legacy could be one of the contributing factors to its lack of economic growth and concluded that that it was still heavily hampered by the legacy of the Apartheid years. The recent spate of protests at South African universities highlighted the importance of this matter to the populous, marking it as yet another important facet of the South African landscape.

So, the second scenario was crafted around the tensions brought about by the frustrations of poor service delivery, the sense of discontent and inequality fuelling the local strike culture and the hunger for purposeful education tagged to be the long-term solution. These issues are very prominent in the South African psyche and every South African have strong feelings on the matters. Pitting them against each other is sure to elicit strong emotions and value-driven decision-making. This scenario therefore showed a taboo trade-off by asking respondents to choose between self-interest and political gain, and the interest of a suffering community. Herewith the second scenario.

> ***Taboo trade-off – Secular vs Sacred Value (personal power vs welfare of the community)***
>
> *Imagine you are the mayor of a rural town. The local schools have had a dismal academic record with most pupils failing their matriculation exams. You have investigated the problem and have found that results could be improved dramatically through the appointment of 20 additional teachers. At the same time, you have also received notification from the union that the municipal workforce has issued their wage increase demands. Their offer is quite steep and will have serious financial implications for the municipality. The union has indicated that the workers would strike if you do not agree to their demands.* ***A political analyst has confidentially informed you that the municipal workers have the power to re-elect you.*** *With the local elections looming and only funds for one of the two expenditures, do you appoint the teachers?*

For the second or framed version of the scenario, the researcher opted to leave out a piece of information, rather than add something. The explicit reference to the mayor's political future was excluded for the framed scenario, removing the clash between the sacred needs of the

community and the secular, financial and power needs of the individual. The second version was thus a sacred/sacred clash between the welfare of the striking workers and the educational needs of the community.

> ***Tragic Trade-off – Sacred vs Sacred Value (labour harmony and continued service delivery vs welfare of the community)***
>
> *Imagine you are the mayor of a rural town. The local schools have had a dismal academic record with most pupils failing their matriculation exams. You have investigated the problem and have found that results could be improved dramatically through the appointment of 20 additional teachers. At the same time, you have also received notification from the union that the municipal workforce have issued their wage increase demands. Their offer is quite steep and will have serious financial implications for the municipality. The union has indicated that the workers would strike if you do not agree to their demands. With the local elections looming and only funds for one of the two expenditures, do you appoint the teachers?*

Pilot testing of the second scenario was very useful as the original first version proved to be ill conceived. The first draft of the scenario dealt with water supply issues and produced a completely lopsided response (100% in favour of supplying the community with water, no matter what the striking municipal workforce asked for). The scenario was re-written and retested where a more acceptable 70/30 split between the “yes” and “no” votes resulted.

3.6.4.5 Scenario 3 – Pollution in Africa and Mother Earth

Schoemaker and Tetlock (2012) predicted that matters concerning the well-being of our planet were likely to illicit strong feelings. Paul Slovic was instrumental in producing a number of significant studies on decision-making in the environmental setting (Irwin, Slovic, Lichtenstein, & McClelland, 1993; Johnson & Slovic, 1998). These contributions showed the complexities of human decision-making on environmental matters and showing evidence of preference reversals occurring when scenarios are reframed. Outside of the decision-making literature we find numerous contribution on environmentalism with quite a number targeting the emerging market setting (as proposed for this scenario).

Hart (1995) proposed a natural-resourced-based view of the firm to address the lack of attention the environment has received in management theory. Bullard, Johnson and Torres (2002) harnessed this position and added to the debate by showing that specifically people of colour and of low-income groups have had to endure the brunt of industrial expansion. This, they said, paved the way for increased sensitivity to pollution and the resultant grassroots activism towards improved environmental laws. Mittelman (2001) took this view further, but

focussed on environmental resistance groups in emerging market economies. His work showed that emerging economies had wised up to the impact of globalisation on their natural resources, and that environmental resistance politics was on the rise. Clearly, environmentalism has become very topical in the emerging market setting. The citizens of African and Asian countries are no longer ignorant of the impact of foreign activity in their own backyards and pushback on these matters can be expected. However, this matter, like most others in the emerging milieu, is far from simple. Foreign investment in emerging economies lead to economic growth and job creation. How will people react when the needs of the environment are placed in conflict with the needs of the local communities? Scenario 3 explore this conundrum by presenting respondents with choice between the secular need for personal wealth, against the sacred need for a protected environment (Mother earth sacred value).

> ***Taboo trade-off – Secular vs Sacred Value (Personal remuneration vs Environmental protection)***
>
> *Imagine you own a manufacturing company with a very poor environmental record, operating in a smallish and poor African country. Local legislation is unclear on the legality of your operation and you will probably be allowed to maintain the status quo due to the job creation and tax contributions your company makes. To rectify the pollution problem will require a substantial investment in a new production technology and will certainly result in severe losses to the company* ***as well as a disruption of your personal income.*** *Do you acquire the new technology?*

The framed version of scenario three omits the explicit personal remuneration statement (although it remains part of the decision framework, albeit implicitly) and introduces a human angle. A company experiencing severe financial losses and an uncertain future obviously need to address it by all means possible, including possible staff reduction measures. This is explicitly stated in the framed version of scenario 3 with the expressed intention of focussing the respondents' attention on the sacred/sacred clash of mother nature vs community welfare. Again, the aim of this reframing was to move the respondents from a System I response to a System II response, bypassing the value-based gut response and eliciting a better considered and higher quality decision.

> ***Tragic trade-off – Sacred vs Sacred Value (Staff and Community welfare vs Environmental protection)***
>
> *Imagine you own a manufacturing company with a very poor environmental record, operating in a smallish and poor African country. Local legislation is unclear on the legality of your operation and you will probably be allowed to maintain the status due to*

the job creation and tax contributions your company makes. To rectify the pollution problem will require a substantial investment in a new production technology and will certainly result in severe losses to the company. ***This places the future of the manufacturing enterprise as well as the hundreds of jobs associated with your company, at risk.*** *Do you acquire the new technology?*

The scenarios were not only written to test different arenas of decision-making and different value pluralism clashes, but were also positioned to increase in their explicitness. The first scenario merely reminded the respondents of the context and time-lapse of the South African affirmative action initiative. The second scenario touched on the selfish needs of the mayor (in the unframed version) but still positioned the needs of the workers against those of the community. The third scenario was different in that it made explicit mention of the financial gains achievable by the owner of the company. The difference in value clashes between the two versions of the third scenario is thus the most extreme of the three stories. This was done to ensure the framing intervention is given the best chance of working, and to determine whether there is a limit to the effectiveness of the framing intervention. The results proved this precaution to be a very fortunate amendment to the research methodology, as scenario 3 produced the only instance where the framing intervention produced a statistically significant variance in the decision-making quality.

This scenario was also subjected to a pilot test. The test revealed the first version of the scenario to be too weakly worded. This resulted in the addition of the highlighted section "*as well as a disruption of your personal income*" to make the secular/sacred clash more explicit. The wording was also amended slightly to make it more understandable for the respondents. The scenario then produced a 70/30 yes/no split.

3.6.5 Decision-Making Quality Assessment

As mentioned before, one of the core aims of the study was to determine what impact the framing intervention had on the quality of the decision-making process. With this in mind, an investigation was launched into what described quality in the decision-making process (discussed at length in section 2.2.1.3 of the literature review). This section deals with the operationalisation of the integrative complexity coding approach as measure of decision-making quality proposed for this research. Seeing as this line of investigation started with the ground-breaking article on the Value Pluralism Model (Tetlock, 1986), it was deemed reasonable to establish how Tetlock addressed the issue.

Integrative complexity coding (Tetlock, 1986) distinguishes between contextual differentiation and integration of the various options considered by the decision-maker during the decision-

making process. This made it a very useful measure through which the involvement of the individual in the decision-making process could be measured. Contextual differentiation refers to the extent to which the subject would be willing and able to incorporate alternative ways of looking at the problem. Low scores typically reflected the existence of rigid decision-making rules, a dichotomous predisposition towards the process and unwillingness to be open to alternative solutions. Higher scores typically reflected a more evolved decision-making skill-set with individuals encouraged to way up alternative interpretations of the fact, as well as less evidence of rigid decision-making rules.

Integration during the decision-making process is a measure of the extent to which individuals tend to apply creative problem-solving skills to the decision-making process. Low scores in integration were typically awarded for individuals that failed to make conceptual connections between alternative options. High integration skills would in turn be evidenced by higher levels of creativity in the decision-making process, and specifically the ability to link, compare, contrast and synthesize alternative solutions from various interpretations of the situation (Tetlock, 1986).

In this interpretation, integration reflects the next level in decision quality building on differentiation. Thus, low differentiation scores would thus necessarily lead to low integration scores. The researcher therefore operationalises decision quality as the extent to which the individual managed to incorporate both contextual differentiation and integration in his/her decision-making behaviour. Therefore, high quality in decision-making will be exhibited by high levels of contextual differentiation and integration, and low-quality decision-making of course by the inverse. In short, the more complex and evolved the decision-making behaviour by the individual, the higher the quality of the decision will be.

The Tetlock (1986) paper proposed a qualitative approach to gathering the data. The description of the instrument called for participants in the research to conclude their assessment of the scenarios with a five-minute description of the decision-making tactics applied to get to an answer. The resulting information would then be coded for evidence on both the conceptual differentiation and integration applied by the participants in the experiments. The resultant text is expected to produce rich and important insights into the decision-making behaviour of the individual.

Concerns about respondent fatigue and possible fall-out from the survey prompted thoughts of splitting the data gathering into two separate phases. Even though the questionnaires on value and risk orientations accompanying this section of the research appear quite long, the simplicity of the questions makes for a very quick assessment. The researcher therefore believes that writing a paragraph in response of each of the three scenarios would not prove

to be too taxing to the respondents or detrimental to the quality of the responses. It was also deemed the most practical course of action to assess the integrative complexity measure at the same time as the risk and value questionnaires. The respondents were ensured of their anonymity, and a two-phased approach requiring a second contact with the respondents, would have negated this promise.

In addition to this, the research design was set up to test the respondents' reaction to scenarios designed to cause outrage and decision-making discomfort. This is expected to yield an emotional response and possibly a System I decision-making response (for the unframed scenarios, if the experimental framing works as the literature predicts). Should the research then be split into two phases, an unintended response might ensue. The time delay associated with a two-phased approach might cause the respondents to consider the scenario in greater depth and possible discussion the scenario with friends and family. This could contaminate the response and will very probably lead to invalid research results.

Appendix C relates the integrative complexity instrument, adopted from the Tetlock (1986) format to serve the aims of this study.

3.6.6 Questionnaire Adaptations to Context

A closing note of the instruments to be employed is warranted. As these instruments were adopted from an American perspective, a number of adjustments had to be made to the questionnaires. The following adjustments were made:

1. One question in the Domain-Specific Risk-Taking (DoSpeRT) Scale referred to the individual's willingness to attempt a challenging ski slope. This question was amended to be more relevant to the South African context by changing it to an extreme mountain biking trail.
2. For another question in the DoSpeRT Scale, the currency for a monetary scenario was changed from US dollar to South African Rand (in accordance to the ruling exchange rate at the time of the survey).

3.6.7 Order of the Instruments

A concern exists that an improperly sequenced research design might contaminate the research process and would produce inconclusive findings. The most pertinent limitation in this regard is that a questionnaire targeting value systems and risk propensities prior to the scenarios, would prime, or frame the respondents to alter their true responses to the value clashes. The following design is therefore suggested to avoid this problem.

1. Value Clashing Scenario with simple, qualitative response
2. Schwartz Portrait Value Questionnaire

3. Domain Specific Risk-Taking Scale
4. Decision-Making Quality Assessment

3.7 Sample Description

As structured equation modelling (SEM) was initially anticipated as the preferred data analysis technique, direction on the preferred sample size was taken from the work of Lei and Wu (2007). This contribution indicated that a sample size of six times the questionnaire length (of the longest instrument) would be adequate to present sufficient rigour in the data analysis. With the longest instruments (Schwartz Portrait Value Questionnaire) totalling 57 questions, a sample size of 342 would thus suffice this requirement. This figure corresponds to similar research projects in the realm of decision-making, with sample sizes of 150 to 300 typically reported. (Ariail et al., 2015; MacGregor et al., 1999)

The sample employed during this research was obtained from a leading South African company in the fast-moving consumer goods (FMCG) sector. Of a total target pool of 600 respondents, 461 respondents participated in the survey. Of these respondents, 284 (at a response rate of 61%) completed the questionnaires to at least the first scenario. The sample exhibited the demographic traits presented in Table 7.

Table 7: Sample Description

Age	18-30	31-40	41-50	51-60	+60
	42 (15%)	99 (35%)	93 (33%)	44 (15.5%)	4 (1.5%)
Gender	Male	Female			
	206 (73%)	78 (27%)			
Language preference	Afrikaans	English	Indigenous languages	English (Indian)	Afrikaans (Coloured)
	120 (42%)	58 (20%)	75 (28%)	20 (7%)	10 (3.5%)
Management Level	Senior managers	Middle managers	Junior managers		
	48 (17%)	110 (39%)	113 (40%)		

As it was possible that some respondents might have been uncomfortable with English as the only choice of interaction, a measure had to be put into place to guard against language deficiencies. The text responses produced by the integrative complexity measure were scrutinised for language shortcomings, and respondents that failed to answer these questions effectively, were removed from the dataset.

The respondents were given the opportunity to decline answering any of the demographics questions. This resulted in the figures in Table 8, and consequently explains any incidents where the summed percentages did not accumulate to 100%.

Table 8: Respondents Declining to Answer

Age	2
Gender	0
Language preference	1
Management Level	12

3.8 Data Sources

As mentioned above, the core data sample was obtained from a large South African company operating in the fast-moving consumer goods sector. Additional smaller samples were obtained from a target group of 12 PhD/DBA students for the purpose of piloting the decision-making scenarios, as well as follow-up pilot events from an insurance company (29 participant) and an aluminium production organisation (16 respondents). The last two pilot runs were used to confirm the changes made after the first pilot run, and to test the data analysis techniques (especially the qualitative integrative complexity coding process) before entering into the large data set.

3.9 Practicality of the Data Gathering Process

It was deemed wise to give an exposition of the "nuts-and-bolts" of the research procedure, to explain the practicality of the experimental design mentioned above. The research process was very simple and required only one interaction with the sample group. The data gathering effort was structured as a single, online questionnaire, using the Qualtrics platform. This included the perfunctory demographical questions (five questions), followed by the Value Clashing Scenarios, the Schwartz Portrait Value Questionnaire (Schwartz et al., 2012) (57 questions) and then the DoSpeRT Scale (Weber et al., 2002) (25 questions). The data gathering was timed at taking between 15 and 45 minutes during the pilot runs. Screen shots of the questionnaire have been included as an Appendix.

A pure experimental design requires that the two versions of each value clash scenario (framed or unframed) be randomly assigned to the participants. This was done through Qualtrics by assigning groups of associated questions (the two versions of a scenario, in this case) to separate blocks and then randomly selecting amongst these for each participant. This facilitated random distribution of the scenarios to the pool of respondents.

3.10 Social Desirability Bias

As the research design consisted of self-reported questionnaires and since these questionnaires deal with personal attributes such as risk propensity and value orientations, a concern for the emergence of the social desirability bias was identified. Research on the social desirability bias is widely published resulting in a number of insightful definitions for the term. Chung and Monroe produced an overview of the subject and thus supplied a very workable definition, positioning it as "*the tendency of individuals to underestimate (overestimate) the likelihood they would perform an undesirable (desirable) action*" (2003, p. 291).

Closer examination of the phenomenon shows it to be the product of two influences: self-deception positivity (the pure but overly flattering belief that a person has admirable qualities) and impression management (the overt overstating of personal attributes so as to appear socially acceptable) (Fisher & Katz, 2000). With self-reporting multi-item scale questionnaires an ever-present occurrence in social science research these day (King & Bruner, 2000), it stands to reason that the phenomenon of social desirability has become a significant threat to research validity.

The various authors offer a number of remedies to the scourge of social desirability bias on research validity, of which the following were investigated for this research design. The application of **pre-testing** was encouraged to determine the exposure of the questionnaires to social desirability bias (Chung & Monroe, 2003). The introduction of a pilot phase served this purpose in the current design considerations. Additional measures included increasing (or assuring) respondent anonymity to take away the need for social conformity, adjusting the wording of some of the questions (as a form of amending the questionnaire after the pre-test), trying to avoid similarities between the interviewer and interviewee (shown to not applicable to this design), and finally addressing the influence of social desirability bias after the fact during data analysis (Fisher & Katz, 2000).

In addition to these considerations, guidance was also taken from the authors of the two instruments employed. To this end, the papers on the Portrait Value Questionnaire (Schwartz et al., 2012) and the Domain-Specific Risk-Taking Scale (Weber et al., 2002) were studied to determine what measures were used by the authors. Schwartz et al. (2012) mentioned the influence of social desirability bias on similar studies in the past and opted for a correction of the results during the data analysis phase. This was done by including a common factor (loaded 1) to the confirmatory factor analysis to guard against systematic social desirability preferences.

Weber et al. (2002) on the other hand incorporated a much more elaborate measure. The authors included the use of the Balanced Inventory of Desirable Responding (BIDR) version 6 (Paulhus, 1991) to determine whether social desirability affected the respondents during the development of the Domain-specific Risk-attitude Scale. The authors found that this BIDR score varied depending on the domain tested. The social desirability bias reflected in the risk-attitude scores for the Ethics and Health and Safety arenas were slightly higher than those for the recreational, social and financial arenas. With these findings documented, the author of this report thus will have sufficient grounds to correct for the occurrence of social desirability bias in the final results.

In closing, the following design considerations have been incorporated into the research design. There was no contact between the interviewer and interviewee, as the questionnaires were distributed electronically and completed anonymously. This helped to decrease the need for social desirable test scores amongst the respondents. The questions were tested during the trial phase of the research but no significant distortion of the assessments were detected. The data analysis was conducted with full cognisance of the possibility of social desirability bias occurring but the prescribed data calculating procedures prescribed by the authors accounted for skew results. Also, in the pre-amble to the questionnaire, the respondents were urged to give honest and forthright responses and were assured of their anonymity during the process.

3.11 Ethical Concerns

The ethical consideration for the research design was built around the prescriptions set by Babbie and Mouton (2001) in their South African edition of The Practice of Social Research. A number of core principles were established by the authors and they are discussed below.

3.11.1 Voluntary Participation

The very personal and intrusive nature of this study requires specific mention of the voluntary participation principle. Although the study runs the risk of depleting the respondent pool and through that, possibly impacting the quality of the study, the rights of the individual test subjects takes precedence (Babbie & Mouton, 2001). Participation in the study therefore was on a voluntary basis to ensure the protection of the individuals as well as to guarantee the findings of the data. Should people have been forced to participate in the study it is very likely that they would have approached the scenarios with a negative disposition. This could very easily have had a negative influence on the repeatability of the experimental process.

3.11.2 No Harm Principle

The no harm principle is closely related to the principle stated above, but speaks also towards the intentions of the researcher during the process. The study ran the risk of causing emotional distress, or at the least emotional discomfort. The subjects were informed of this possibility prior to consenting to participate in the study (Babbie & Mouton, 2001). Participants were also be given the option to opt out of the study should they feel intolerable discomfort during the investigation.

3.11.3 Anonymity and Confidentiality

Thirdly, and as a natural product of the first two principles, is the principle of anonymity and confidentiality. Babbie and Mouton (2001) proposed that the data from a study with such an intimate and personal focus should be treated with the utmost respect and care. For this reason, all interactions with the test subjects were treated anonymously.

The confidentiality of the data also had to be ensured. The data was collected carefully so as to protect the identity of the respondents. Also, once collected, the data set was secured in a locked storage facility, to ensure the long-term confidentiality of the test subjects.

3.11.4 Deceiving of Subjects

The core intervention mechanism proposed for this study is social-relational framing. This presents a challenge as this process entails manipulation of the decision-making thoughts of the individuals participating in the study. Subjects will obviously not be deceived with unsavoury intent, but as the foundation of the study is the application of framing, some misdirection might occur. This is a difficult point but has been resolved through consultation with the University of Pretoria ethics committee. The committee suggested sending a debriefing email to all respondents on completion of the date collection phase of the study. This will serve to inform them of the deception and to explain the purpose of the research design. A copy of this letter was included in Appendix L of this report.

3.11.5 Analysis and Reporting

All measures will be introduced to ensure the accurate and ethical treatment of the data sets (Babbie & Mouton, 2001). To this end the researcher has employed the highest standards when processing and analysing the data. Furthermore, the researcher was careful to indicate the limitations of the study and ensured that any deductions from the data set and analysis were responsible and supported by the extant literature. Under no circumstances was researcher allowed to change, falsify or misrepresent data points to support his hypotheses.

3.12 Data Analysis Techniques

This section discusses the analytical procedures applied for the analysis of the data and gives specific reference to the statistical instruments employed. The study employed both qualitative and quantitative data analysis techniques as prescribed by the nature of the research design. The quantitative analysis was discussed first.

3.12.1 Quantitative Data Analysis

The first order of business for the quantitative data analysis was the descriptive statistics.

3.12.1.1 Descriptive Statistics

The descriptive statistics tabulated the initial observations of the data and contained summary statistics illustrating some of the core findings. The core value and risk assessments as well as the overarching effect of the framing intervention was illustrated here. The first responses to the scenarios through the yes/no choices, comfort and sureness scores were included in these tables and were aimed to give an introduction of the detail results to come.

3.12.1.2 Graphical Representation of the Data

The next step in the data analysis was the graphical analysis of the data. This section contained radar graphs (also called spider web plots) for both the value system scores and risk propensity scores of the respondents. To add value to the discussion, these plots were subdivided to reflect the impact of the various demographic groups on the value and risk plots.

A number of scatter plots were also employed to illustrate some of the fundamental relationships between the outcome variable (decision-making quality) and the most important independent variables, value orientations and risk propensities. These plots were used to determine whether decision-making quality was sensitive to any of these variables, and to steer the investigation into possible relationships between the variables.

3.12.1.3 Multiple Regression Analysis

A number of regression analyses were conducted to determine whether sufficient and statistically meaningful evidence could be gathered to support the relationships between value-orientations, risk propensities and decision-making quality hypothesised earlier. The analyses were conducted along the guidelines suggested by Julie Pallant in her SPSS guidebook (Pallant, 2013).

3.12.1.4 Decision Tree Analysis

The nature of the relationships (be it univariate, bivariate or multivariate) as well as the nature of the variables (category, ordinal or interval) determined the statistical instruments employed. The **decision tree methodology** was used to establish the relationships between the large

number of independent variables and the outcome variable. Because of the large data set, an expected large degree of covariance between the value orientation variables as well as the risk propensity variables, and the presence of a clear target outcome variable in the decision-making quality measurement, literature suggested decision trees as the most effective route of analysis (Song & Lu, 2015). The decision tree method was selected in preference to other data mining techniques due to its flexibility, robustness, ease use and most importantly, ease of interpretation. As the aim of this phase of the analysis was merely to identify which factors played to most important role in influencing decision-making quality towards producing a workable decision-making model later, a simple approach was warranted.

These benefits strongly agree with the requirements set in the literature. In presenting the 19-value system, Schwartz (1994) argued that value-driven decisions were the result of intra-value trade-offs. People tend to hold a number of vales dear, but tend to make decisions by trading values off against each other. This behaviour is best described by the decision tree methodology, as it allows for simultaneous accommodation of all the values, whilst allowing for their inter-dependence.

3.12.1.5 Significance of the Results and Model Fit

The significance of all the findings (that is the categorisation of the eight decision-making groups as well as the impact of the framing intervention and the decision-making quality measure) were tested via the T-test statistic and a measure of 0.05 was used as an indicator of an acceptable level of significance. Literature on this topic suggests a number of additional techniques through which to assess the fit of the model. A good rule of thumb states that a Root Mean Square Error of Approximation (RMSEA) of 0.05 reflects a good fit. The Standardised Root Mean Residual (SRMR) value of 0.8 is a good measure and a Comparative Fit Index of 0.095 would be most agreeable (Hancock & Freeman, 2001).

3.12.1.6 Criteria for Measurement Quality

Internal validity was addressed through the use of multiple questions in the two survey instruments. Both the value positioning questionnaire and the risk attitude scale include multiple questions to test the same concepts. A calculation of the Cronbach Alpha measure for all of the variables produced by these instruments confirmed their internal validity.

3.12.2 Qualitative Data Analysis

As mentioned in the research design section (Chapter 3), the investigation also contains a qualitative element. These data sets were employed firstly to assess the quality of the decision-making exhibited by the participants, but also to gain deeper insight into the core motivations behind these decisions.

3.12.2.1 Integrative Complexity Measure

The measure applied to determine the decision-making quality has been adopted from the integrative complexity coding system and is a qualitative instrument. This methodology was incorporated to produce an open-ended measure of the individuals' experience of the value clash presented by the scenario. The question delivered a short text renditions of the thoughts of the individuals on the scenario and the motivation behind their decision-making.

For this analysis, the coding of the data was done in accordance to the methodology outlined by Tetlock (1986), incorporating both of the sub-constructs of the original integrative complexity variable (conceptual differentiation and integration). In this approach, called "*Analyzing thought protocols*". Tetlock (1986, p. 822) called for assessing the levels of differentiation and integration separately. This approach called for individual scores of 1-5 for both differentiation and integration assessed individually, and then combined towards an IC score. The specific guidelines were:

- Differentiation score of 1: insensitivity to alternatives, rule-guided decision-making
- Differentiation score of 3: recognition of at least two contributing factors
- Differentiation score of 5: recognition of multiple viewpoints and factors
- Integration score of 1: failure to see linkages between alternatives
- Integration score of 3: allowing for trade-off between some alternatives
- Integration score of 5: comparing and contrasting alternatives towards a high-quality, creative response

A detailed coding procedure was later produced (Baker-Brown, Ballard, Bluck, De Vries, Suefeld & Tetlock, 1990) which suggested the following coding scale:

- IC Score of 1: Only one variable identified in making a decision,
- IC Score of 3: The presence of two causal and independent variables in the response statement,
- IC Score of 5: The respondent exhibited an understanding of the interaction between independent causal variables,
- IC Score of 7: And the respondent exhibited a clear understanding of the complexity of the scenario, being dependent on a multitude of independent causal variables, as well as their inter-dependence and linked nature.

The paper suggested adding scores of 2, 4 and 6 for responses where the analysis spanned the explicit boundaries of the four scoring guidelines above. Coding procedure adopted for this study was a combination of the two approaches. The differentiation and integration coding was done separately (as per the Tetlock guideline), but these scores were then considered in combination towards achieving the IC score (out of 7) as per the Baker-Brown et al. (1990)

guidelines. These scores resulted in the outcome variable labelled IC1, the hand-coded integrative complexity score.

However, integrative complexity, recognised as a very powerful tool for content analysis over the 40 years since its inception, was also perceived as a laborious and time-consuming process (Suedfeld & Tetlock, 2014). This view motivated the need to ease and speed up this valuable analysis tool through attempts at automation. Much have been achieved since the days of Tetlock, Baker-Brown and associates with the most important development occurring through the work of Lucian Conway and the University of Montana team. The authors produced two papers (Conway et al., 2014; Houck et al., 2014) on the effectiveness and accuracy of an automated coding system for integrative complexity measure. This technique, run from an Excel macro, produced the best automation yet and provided content analysis researchers with a powerful and time-effective assessment tool. The coding manual included in Appendix N of the report, takes the researcher through a step-by-step process of downloading, preparing, scoring and even interpreting the data. These instructions were followed to the letter, and all the text responses from the three scenarios were thus analysed. The scores produced by this process were labelled as IC2.

The Conway et al. (2014) paper concluded with a sobering thought. They hailed the strengths of human coding, stating explicitly that no form of automation can replace the strength of the intelligence and discretion of trained, experienced coders. However, given the lack of access to such individuals, alternatives have had to be invented. The authors therefore proposed a type of “super-system”, incorporating the best of both world: the accuracy and intelligence of a human system combined with the speed repetitiveness of an automated system. To give cognisance of this sentiment, the researcher of this thesis implemented a hybrid system, incorporating both techniques. The scores produced by human scoring (IC1) and computer scoring (IC2) were combined (added and averaged) towards a new score, IC3. Pertinently, the IC3 score produced the soundest results, from a statistical significance point of view. Table 23, to follow in section 4.4.5, shows statistically significant T-test results for 11 of 12 hypothesis tests incorporating the IC3 outcome variable, compared with ten and seven significant results for the IC1 and IC2 variables respectively.

3.12.2.2 Coding of the Text Responses

The key to unlocking the value of the qualitative data produced by the test responses lies in the coding process. The coding of the content analysis data done with cognisance of the eight-point checklist recommended by Babbie and Mouton (2001), shown below.

1. Decide on the level of analysis
2. Decide on how many concepts to code for

3. Decide on whether to code for existence or frequency
4. Decide on how to distinguish between concepts
5. Develop rules for coding text
6. Decide what to do with irrelevant information
7. Perform the coding process
8. Analyse results

The coding of the text elements was done along the two core directions of the investigation, namely personal value orientations and domain-specific risk propensities. The software package ATLAS.ti (Friese, 2013) was used to facilitate the coding process. Coding of the value orientations was done through the framework established by Schwartz (1994) portrayed in Figure 5 in Chapter 2. This value plot described multiple sub-descriptors of the 19 Schwartz personal values, allowing for a more rigorous coding system. The coding was thus done by reading the text responses and assigning the sub-descriptors as codes. Code families were established from these sub-descriptors in ATLAS.ti and used to produce consolidated codes reflecting the 19 personal values. The coding was done blind with no knowledge of the respondents' demographics, value or risk orientations. A second coder was incorporated to conduct a number of periodic checks.

The text elements were also considered for risk coding, using the five risk domains (social, ethical, financial, recreational and health and safety) as possible motivators during the decision. Open coding was also allowed for. It became clear during the coding process that the motivation behind some of the decisions could not be described by either a value or a risk propensity. For such instances, an "open code" was created and assigned to the text unit. The extent of this coding practice is also discussed in section 4.5. In total, 45 codes emerged from this process.

3.12.3 Data Analysis Overview

The data analysis section can be summarised in Table 9. The statistical instruments specified below were selected from literature as the ones best suited to extract value from the data set. Chapter 4 relates the detail findings of the study.

Table 9. Summary of the Data Analysis Instruments and Statistics

Hypothesis	Relationship	Nature	Instrument	Statistics
H1	Value orientation and decision-making quality	Independent, interval	Schwartz Portrait Value Questionnaire	T-test, Decision-tree, multiple regressions
H2	Risk attitude and decision-making quality	Independent, interval	DoSpeRT Scale: Ethical domain	T-test, Decision-tree, multiple regressions
H3	Decision-making groups and decision-making quality	Dependent, interval	Scenario – framed or unframed	T-test, Decision-tree, multiple regressions
H4	Social-relational framing and decision-making quality	Moderating	Decision-making quality instrument	T-test, Decision-tree, multiple regressions

3.13 Conclusion

This then concludes Chapter 3, the methodology section. The chapter described the methodology employed by the researcher to gather sufficient evidence to support the four hypotheses, and extend the extant literature. A thorough exposition was made of how the researcher went about establishing a research methodology able to gather appropriate data on the proposed relationships between decision-making quality and personal values, decision-making quality and risk propensities and the impact of social-relational framing on decision-making behaviour. The design included both qualitative and quantitative research methodologies, and it is expected that the results from these investigations will present enough support for a deeper understanding of individual decision-making behaviour. Chapter 4 relates these results in detail.

Chapter 4

Results

This chapter discusses the research results.

4.1 Introduction

The results chapter includes both the data analysis techniques employed on the data, as well as the results produced by the study. The chapter communicated the core findings of the study and exhibited the evidence supportive of a psychological (values/emotions/motivations) perspective of decision-making behaviour. Analysis of both the quantitative and qualitative data sets showed a clear relationship between some personal values, value-blocks and risk-taking domains, and decision-making quality employed by the participants. This corroborated the relationships hypothesised in Chapter 3, and supported the decision-making model proposed during the conclusion of the literature study.

The results were presented in a scenario by scenario format in favour of a research question driven format to support a flowing narrative, and place emphasis on the multiple instances of support of the four research questions. The instances where the results showed support for a specific research question, were specifically highlighted and a concluding section was writing to tie up the results with the research questions. Evidence supporting Hypothesis 1 (a relationship between personal value systems and decision-making quality) is evident in paragraphs 4.4.1 – 4.4.3 and 4.5.2 – 4.5.4. Hypothesis 2 (the relationship between risk propensities and decision-making quality) can be seen corroborated in paragraphs 4.4.1 – 4.4.3 and 4.5.2 – 4.5.4. whilst Hypothesis 3 (the eight decision-making groups) developed concurrently with the first two hypotheses. Hypothesis 4 results were shown in paragraph 4.4.3 and discussed in 4.4.5.

4.2 Evaluation of Instruments

A number of basic statistical tests were conducted on the raw datasets to confirm the rigour and relevance of the instruments employed.

4.2.1 Schwartz Portrait Value Questionnaire

The Schwartz Portrait Value Questionnaire (Schwartz et al., 2012) has been an established personal value assessment instruments since the mid 1990's. This instrument has enjoyed multiple iterations since and today arguable stands as the most preeminent value assessment tool. To verify its importance to this study, the results produced by the PVQ was submitted to

a Cronbach's Alpha test the internal consistency of the questionnaire. The values assessed during the survey were tested individually, as well as per value-blocks (values associated with each other, as per the Schwartz classification).

Table 10 shows these results.

Table 10. Schwartz PVQ: Reliability Statistics

Value/Value block	**Cronbach's Alpha**	**Number of elements**
Openness to change	**0.767**	**Four values below, 12 elements**
Self-directed thought	0.636	3 elements
Self-directed action	0.554	3 elements
Stimulation	0.564	3 elements
Hedonism	0.718	3 elements
Conservation	**0.855**	**7 values below, 21 elements**
Face	0.617	3 elements
Security-personal	0.458	3 elements
Security-social	0.706	3 elements
Tradition	0.870	3 elements
Conformity-rules	0.782	3 elements
Conformity-personal	0.867	3 elements
Humility	0.369	3 elements
Self-enhancement	**0.727**	**3 values below, 9 elements**
Achievement	0.431	3 elements
Power-dominance	0.614	3 elements
Power-resources	0.720	3 elements
Self-transcendence	**0.790**	**5 values below, 15 elements**
Benevolence-dependence	0.560	3 elements
Benevolence-care	0.369	3 elements
Universalism-tolerance	0.595	3 elements
Universalism-concern	0.593	3 elements
Universalism-nature	0.813	3 elements

Good scores of 0.73-0.86 were produced by the value-blocks for this test indicating the strength and rigour of the Schwartz instrument. However, reliability testing of the individual values resulted in mixed results. The lowest scoring values showed Cronbach's alpha of around 0.37 (humility and benevolence care) whereas the highest scoring values showed sores of around 0.87.

4.2.2 Domain-Specific Risk-Taking Scale (Weber et al., 2002)

A similar test was conducted on the domain specific risk propensity scale. This measure tested slightly lower than the value survey and returned a Cronbach's Alpha of 0.54 – 0.80. Though not unacceptable, the figure will have to be taken into account when discussing the efficacy of the instrument later in the report.

Table 11. DoSpeRT Scale: Reliability Statistics

Risk domain	Cronbach's Alpha	Number of elements
Financial	0.662	6 elements
Recreational	0.808	6 elements
Ethical	0.542	6 elements
Security	0.625	6 elements
Health and Safety	0.672	6 elements

4.2.3 Integrative Complexity Measure

As mentioned in previous sections, decision-making quality was assessed by the integrative complexity (IC) measure. Given that there were two methods (human-coded and computer-coded) to evaluate the IC-score of the decisions made by the respondents, an investigation had to be conducted on the validity and correlation of these two routes.

Conway et al. (2014) made a tremendous contribution towards establishing IC computer-coding methodology, and testing its efficacy against human coding. Their work showed correlations of around 0.4-0.6 between system and human coding, stating that these scores pointed towards an acceptable fit.

The Pearson correlation scores for the two integrative complexity coding methodologies were therefore calculated for the respondent answers to the three scenarios. Scores of **0.47, 0.53 and 0.52** were produced for the three scenarios respectively, echoing the work of Conway et al. (2014). Although the computer scoring was consistently lower than the human scoring, it

also mirrored the results produced by the authors and were therefore found to be meaningful and reliable.t

4.3 Value orientations and Risk Propensities (Descriptive Statistics)

The nature, origin and subgrouping of the sample set was described in section 3.7. A deeper and more meaningful description of the test subjects was however provided by the value and risk assessment results. Although the relationships between the various values and decision-making quality (as proposed by the four research questions and resulting hypotheses) is later reported on, it was deemed pertinent to view the value-orientation and risk propensity results holistically and as reported for the various demographic groupings.

4.3.1 Value Orientation Results

The revised Schwartz Portrait Value Questionnaire (Schwartz et al., 2012) using 19 values organised into four specific value groups, were assessed for the sample. Figure 18 below shows the averaged value orientation for the entire population.

Figure 18. Averaged Schwartz Human Value Orientation Plot

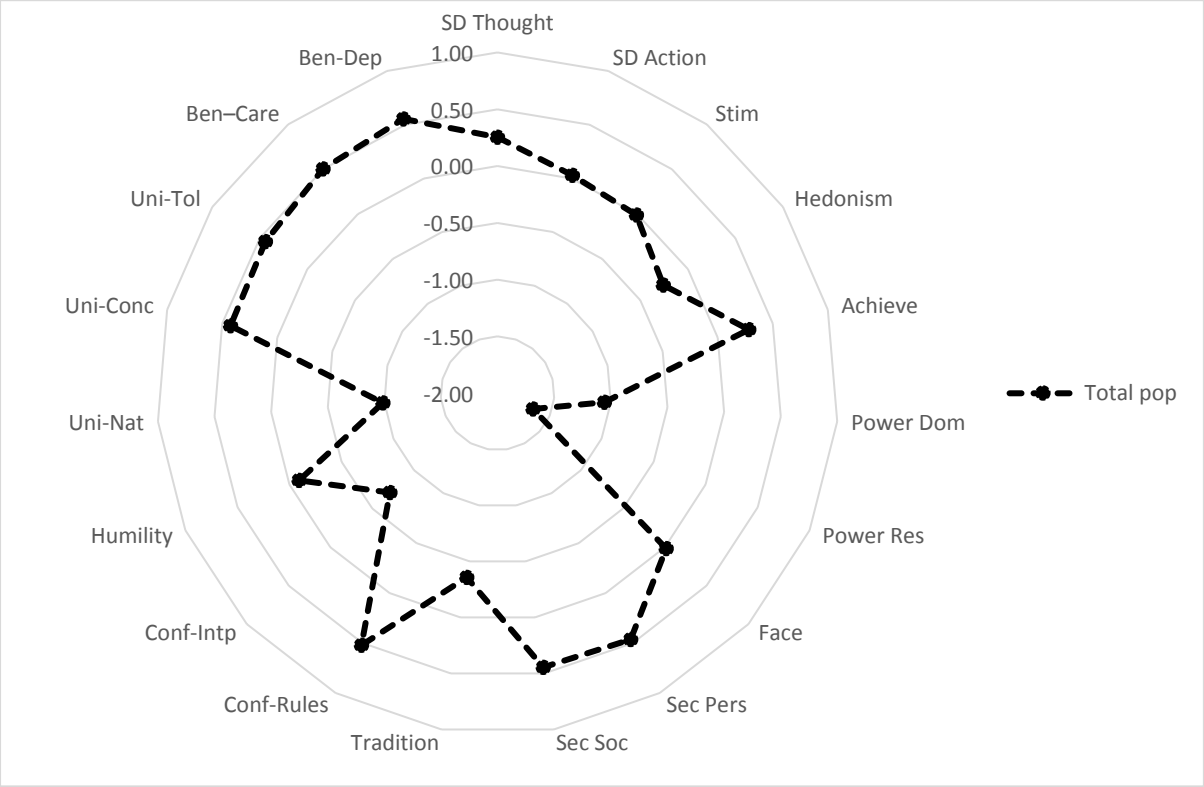


Figure 18 does very little other than illustrate the group's nett value position apart from the fact that specific values tend to be supported more than others. The participants clearly indicated that the value ***power: resources*** (the need to exercise power over the available resources)

scored very low (-1.66) during the questionnaires. The values of ***tradition*** (-0.36) and ***universalism: nature*** (-0.99) exhibited similarly low considerations. Given that the sample consisted of a very diverse group of people, one can safely deduce that these are broader, social orientations spanning individual belief sets. It provides a good background and reference point against which to evaluate individual value sets, but is the product of an aggregated process, and thus has limited statistical meaning. However, when split into the various demographic subsets, a number of insight come to the fore.

Figure 19. Schwartz Human Value Orientation by Age

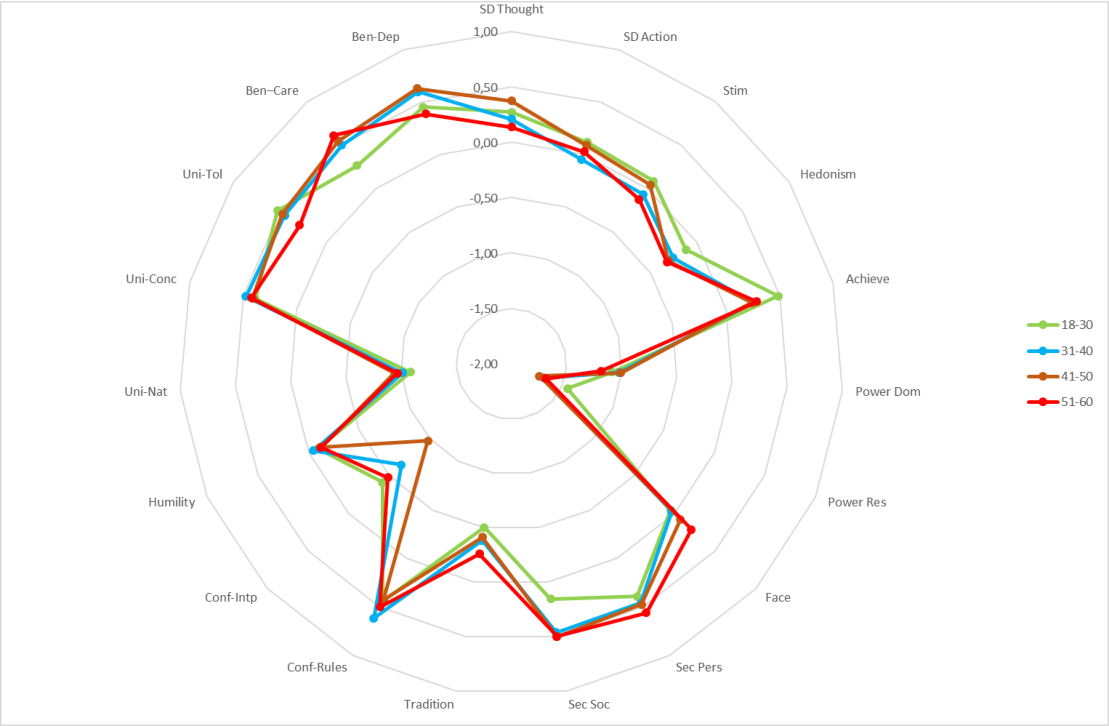


Figure 19 reflects the value-orientations for the sample disseminated over the various age groups. It indicates that the various age groups seem to differ most on their respective valuing of ***interpersonal conformation*** with values ranging between -0.42 (18-30 year olds) and -1.75 (60+ers). The younger people seemed to favour ***achievement*** (0.49) and ***hedonism*** (-0.12) more than the group (0.28 and -0.26 respectively), and seemed to disregard the importance of ***tradition*** (-0.50 vs -0.36) and ***benevolence: care*** (0.27 vs 0.50). These observations were confirmed through a number of t-tests conducted on the various group scores. Statistically significant differences (p-values of < 0.05) were reported for four (***achievement, social security, interpersonal conformity and benevolence: care***) of the values when comparing the 18-30 age group with the 41-50 age group – the two groups exhibiting the biggest differences.

Figure 20. Schwartz Human Value Orientation by Gender

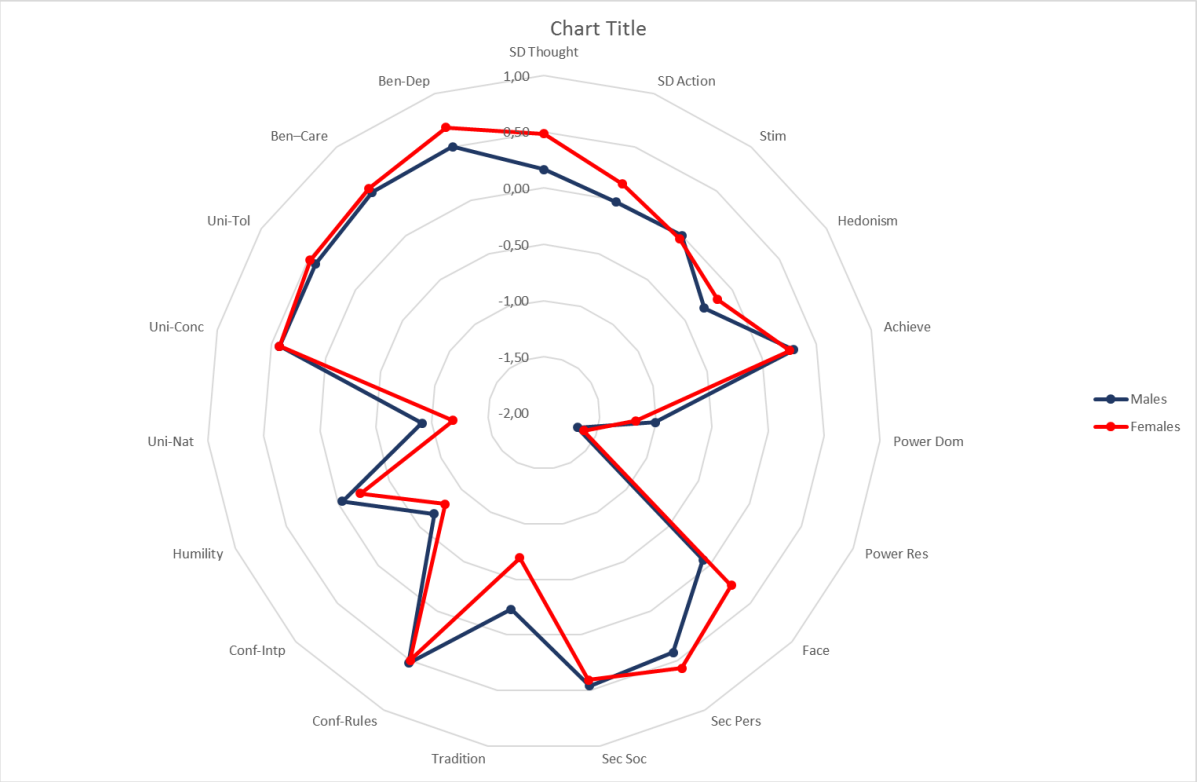


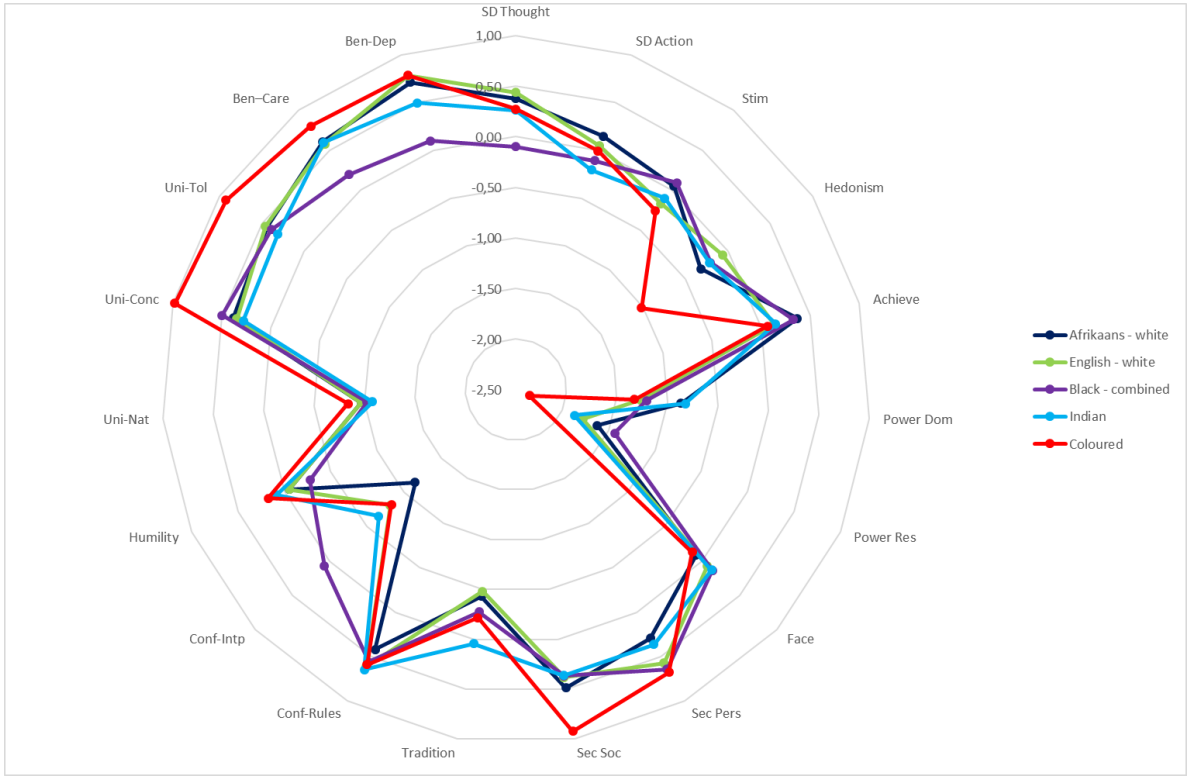
Figure 20 in turn shows the difference in value orientations between the two gender groups. Male respondents seemed to favour ***tradition*** (-0.23) as a value more than females (-0.69), while female participants expressed support for ***personal security*** *(0.58 vs 0.42)*, ***self-directed thought*** (0.48 vs 0.17), ***self-directed action*** (0.15 vs -0.02) as well as ***benevolence: dependence*** *(0.68 vs 0.51)*. T-tests of the various value scores revealed five values significantly different (p-value of < 0.05) between the two sexes: ***self-directed thought, face*** (more important for females) ***tradition, universalism: nature and benevolence: dependence***.

Figure 21 depicts the changes in value orientations over the various language- or cultural groups. South Africa is culturally diverse country reflected in its use of eleven official languages. It is also a country with a legacy of racial discrimination and cultural oppression. Demographic grouping is therefore a very sensitive issue. However, in the post-Apartheid era it has become customary to distinguish between the following cultural groups for the purpose of demographic studies. Caucasian people, identifying with a European heritage, are commonly referred to as whites, or white people. But as this group has two culturally significant sub-groups best reflected by their choice of first language, the white population was further split between Afrikaans-white, and English-white. This distinguishes between white people with a Dutch/French/German heritage and people with a British heritage (Giliomee & Mbenga, 2007, p. 70).

The Black-combined group represents the indigenous people of South Africa, but is made up of a large number of cultural groups, such as Zulu's, Xhosa's, Sotho's, Tswanna's, Venda's, Pedi's, Swazi's, Ndebele's and more. The South African society still opt to refer to these cultural groups collectively as blacks, or black people. For this reason, and for statistical purposes (sub-dividing the black-combined group into its various subsets would have yielded statistically meaningless sample sets), the indigenous people were lumped together (Giliomee & Mbenga, 2007, pp. 124-138).

The Indian community in South Africa can trace its roots back to South Africa's British Empire days, where the forced relocation of 150 000 Indian people in the period 1860-1911 produced a thriving South-African Indian community. Today, the country boasts around 1.3 million people of Indian decent (StatsSA, 2010), and they too have inherited a post-Apartheid moniker, that of Indians (Giliomee & Mbenga, 2007, pp. 149-150, 269-270).

Figure 21. Schwartz Human Value Orientation by Cultural Group

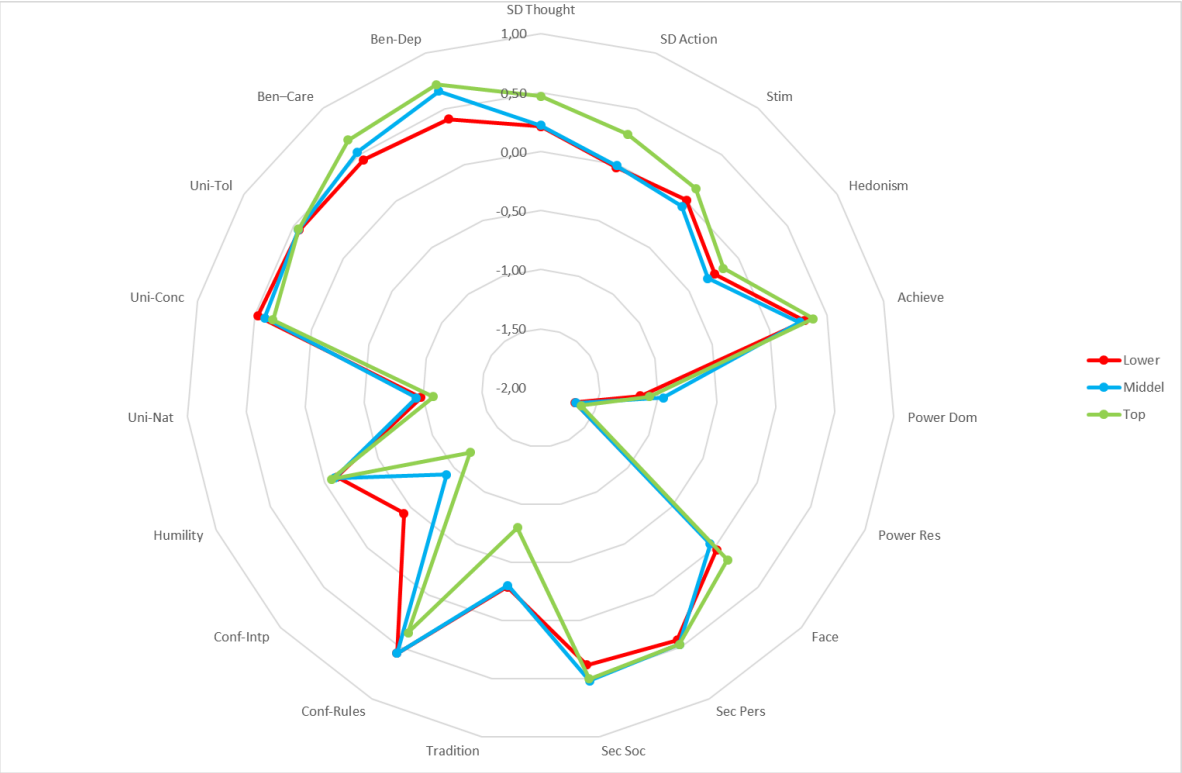


The group referred to as Coloured, is a community of people of mixed decent (African and European). The community originated shortly after the European colonisation of South Africa, but has grown, partly through isolation during the Apartheid years, into a sizable (2.4 million people) and culturally distinct demographic (StatsSA, 2010). It should be noted though that the number of coloured participants in the study were very low and that the value orientations

reported here were therefore not necessarily representative of this sector of society (Giliomee & Mbenga, 2007, p. 68).

A very clear and statistically meaningful difference can be seen in the value of ***interpersonal conformation***. Afrikaans speaking individuals seem to favour it the least (-1.14), whereas the people reporting to favour an indigenous language, seemed to favour it the most (0.08). A t-test on this variance produced a p-value much smaller than 0.05, clearly indicating the significance of this difference. Other notable differences occurred with the values of ***benevolence: care*** and ***benevolence: dependence***, ***personal security***, as well as ***self-directed thought***, all reporting very p-values, 0.05 in a 2-tailed T-test

Figure 22. Schwartz Human Value Orientation by Management Level



The final graph, Figure 22 in this series shows the changes in value orientations we can expect from different positions in the company. These managerial groupings were produced through self-reported selections, with the respondents given a choice between top, middle and junior management. From this display, top-level managers seem to have a relative disregard for both ***tradition*** and ***interpersonal conformity*** but favoured ***self-directed thought*** and -***action***. Statistically speaking, the top and lower management groups differed significantly (p-value of 0.05) on six of the 19 values: ***self-direction: thought, self-direction: action, tradition, interpersonal conformity, benevolence: care and benevolence: dependence*** – with the

highest point for disagreement occurring for the value of ***interpersonal conformity*** (top management measured -1.19 against a lower level measurement of -0.43).

4.3.2 Risk Propensity Results

In addition to the value assessment, a measure for risk propensity was also employed. The participants were asked to complete the DoSpeRT Scale developed by Weber et al. (2002). This measure measures the willingness of people to take risk in different domains. Weber's team proposed five areas each with a distinct risk characteristic. The domains tested were the areas of financial, social, ethical recreational and health and safety risks. The various demographic groupings were again tested to determine if the sub-groups exhibited specific risk-taking characteristics.

Figure 23. Domain Specific Risk-Taking Scale by Age

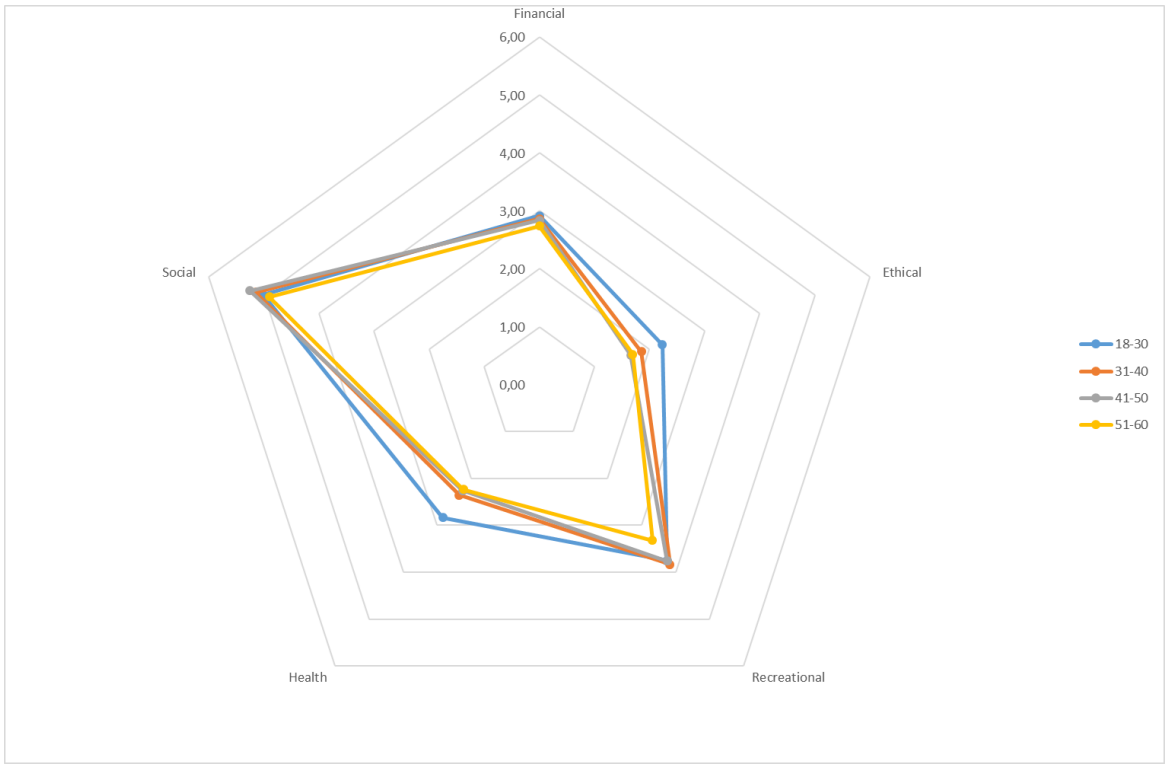


Figure 23 shows the DoSpeRT Scale plot for the respondents organised around the various age groups. The 18-30 group appears to exhibit different risk-taking behaviour than the rest of the respondents. T-tests conducted on these scores revealed that the 18-30-year-old differed significantly from both the 41-50 and 51-60 age brackets for the health and ethical domains. (The younger respondents were willing to take more risk in both instances.) Pertinently, two popular beliefs, that the youth take unnecessary risk with money, and partake in unnecessarily dangerous sports, were waylaid by the results seeing as the younger generation's scores of 3 and 4 respectively for these two domains were not significantly

different to those of the older groups. The financial risk-taking scores varied between 2.91 (18-30 year olds) and 2.74 (50-60) for the age groups, and the recreational risk-taking ranged between 3.75 and 3.32 respectively for the same age groups (18-30 listed first).

Figure 24. Domain Specific Risk-Taking Scale by Gender

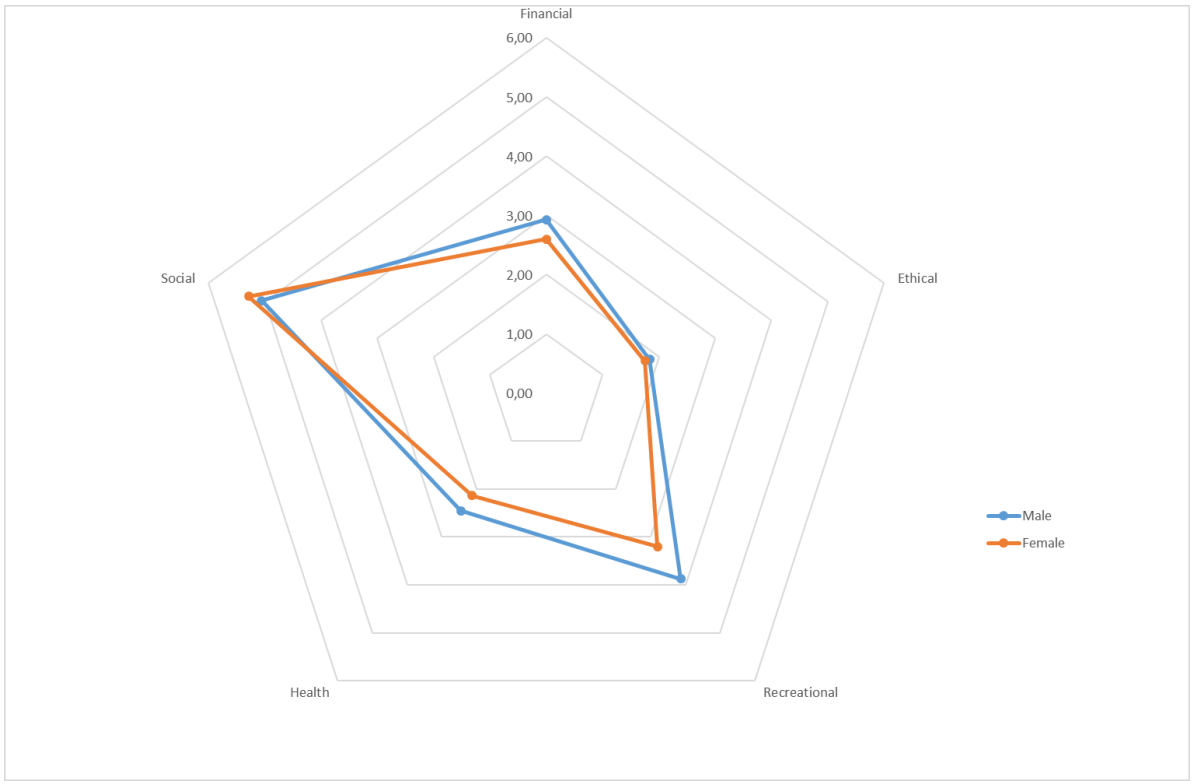
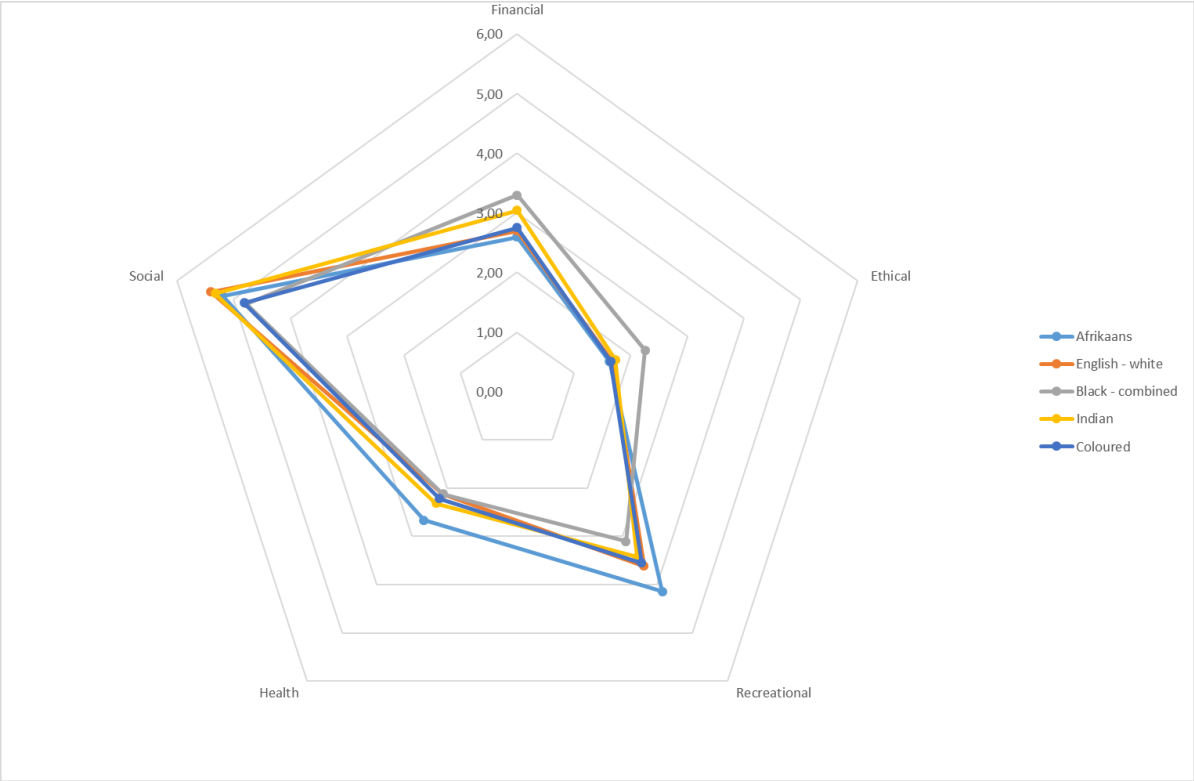


Figure 24 reflects the risk-taking propensities for the two genders. A visual inspection of the graph shows male respondents prone to more risk-taking in all but one of the five domains (Females gravitate towards social risk, according to the results.) The statistical analysis supports this observation with T-tests reporting p values of < 0.05 for three of the domains: financial, recreational and health. The following scores were reported for the various domains (male, female): ***financial*** (2.93 vs 2.60), ***ethical*** (1.84 vs 1.75), ***recreational*** (3.87 vs 3.20), ***health*** (2.45 vs 2.14) and ***social*** (5.06 vs 5.29).

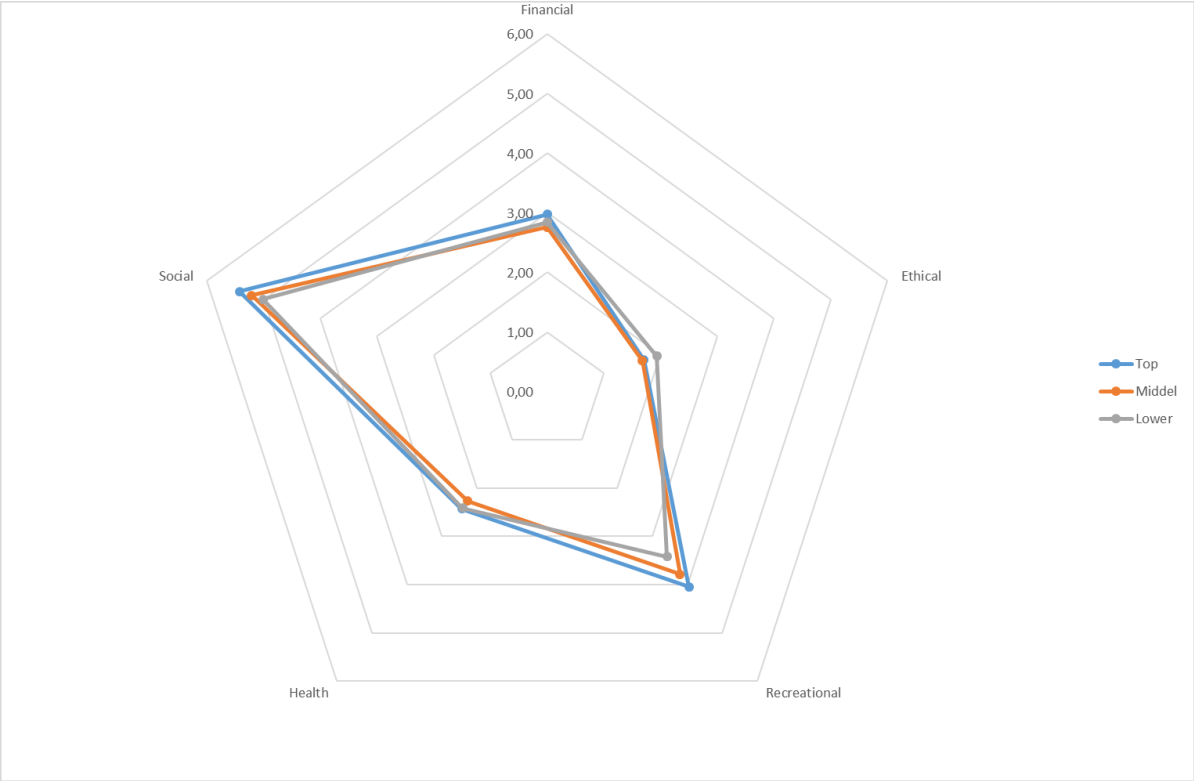
Figure 25. Domain Specific Risk-Taking Scale Cultural Group



Ordering the data by cultural- or language group offered a very significant graph (Figure 25). The black people seemed to be more prone to taking ethical- and financial risks, whereas the Afrikaans speaking white people exhibited a greater likelihood for health- and environmental risk taking.

Statistical analysis of the observations revealed these conclusions to hold. T-tests conducted on the differences between the risk-taking scores of Afrikaners and indigenous people (the combined group of people speaking isiZulu, Xhosa, Sotho, Pedi, Tswanna, Venda, Shona etc.) revealed statistically meaningful results for all these comparisons. The relative scores compared as follows, with Afrikaans scores reported first: ***financial*** (2.59 vs 3.30), ***ethical*** (1.63 vs 2.26), ***recreational*** (4.14 vs 3.10), ***health*** (2.66 vs 2.12) and ***social*** (5.19 vs 4.78). From a cultural perspective, it was significant to note that South African white people when segregated on language differed only in the ***health*** domain, with Afrikaans speaking respondents willing to take larger risks in this domain than their English-speaking compatriots (2.66 vs 2.13).

Figure 26. Domain Specific Risk-Taking Scale by Management Level



Observations on the managerial segregation of the sample, revealed less distinct risk-taking behaviour as the plots appear to be very close in Figure 26, above. Although, when comparing the risk-taking propensities of the lower level of management to that of the top level, we find significant differences for two areas: ***recreational and social***. Top-level staff seem to be happier to take risks in both areas when compared to junior staff, scoring 4.04 vs 3.42 and 5.43 vs 5.01 for ***recreation*** and ***social*** respectively (top managers reported first).

The complete DoSpeRT Scale scores for the various demographic groups were presented in a summarised format for easy reference, shown in Table 12. The boldface figures represented the highest score in each domain, not necessarily statistically significantly so, though.

Table 12. DoSpeRT Scale Results for the Different Demographic Groups

Domain	Financial	Ethical	Recreational	Health	Social
Age					
18-30	**2.91**	**2.23**	3.75	**2.83**	5.01
31-40	2.86	1.85	**3.84**	2.35	5.15
41-50	2.84	1.66	3.76	2.25	**5.25**
51-60	2.74	1.69	3.32	2.24	4.90
61+	2.42	1.42	1.83	1.83	5.00

Gender					
Male	**2.93**	**1.84**	**3.87**	**2.45**	5.06
Female	2.60	1.75	3.20	2.14	**5.29**
Culture					
Afrikaans	2.59	1.63	**4.14**	**2.66**	5.19
English	2.70	1.67	3.61	2.13	**5.40**
Black	**3.30**	**2.26**	3.10	2.12	4.78
Indian	3.04	1.73	3.43	2.31	5.32
Man. Level*					
Top	**2.97**	1.71	**4.04**	**2.43**	**5.43**
Middle	2.75	1.68	3.79	2.26	5.21
Low	2.84	**1.94**	3.42	2.41	5.01

* - Management Level

4.4 Decision-making Results

As discussed in the research design chapter, the core investigation hinged on three decision-making scenarios. For the purpose of structure and flow of argument, the three scenarios were discussed in turn, highlighting touch points with the relevant research questions.

4.4.1 Scenario 1 Results

Scenario 1 (available in Section 3.6.4) dealt with an employment equity placement. Respondent had to indicate whether they, as head of a commission driven sales team, would support either the employment of a previously disadvantage individual (in this case a black female) or a previously advantage candidate (a white male). The scenario was complicated by stating that the white male was more skilled and that appointing the black female would most probably lead to a significant loss of revenue. It is important to note that the scenario intended the description of “black” to refer to people from indigenous origin and not the coloured or Indian groups.

4.4.1.1 Scenario 1: Yes/no Decision

The Yes/No decision reported the following results by demographic group, against a total population split of Yes-137, No-144 (49%/51%). Viewed by demographic group, we find a number of significant relationships. Cultural division showed the black people (61%) to be must supportive of appointing the affirmative action candidate, whereas the English-speaking folks (30%) seemed most against the notion. The gender split was not significant with 51% of males supporting the notion versus 43% of the females. The age groups were aligned with the population figures of a 50/50 split, except for the 41-50 group, who were 66% against

employing the candidate, and the 50+ group, of whom 62% supported her appointment. The lower management levels were proportionally more favourable of her appointment (59% yes) whereas a large proportion of the top-level candidates were against it (62% no).

The detail figures of the demographically organised yes/no decisions for scenario 1, are shown in Table 13.

Table 13. Scenario 1 Consolidated Decision-making Results

Cultural group	**Afrikaans**	**English**	**Black**	**Indian**
Yes	57 (48%)	17 (30%)	**46 (61%)**	9 (45%)
No	61 (52%)	**40 (70%)**	29 (39%)	11 (55%)
Gender	**Male**	**Female**		
Yes	104 (51%)	33 (43%)		
No	100 (49%)	44 (57%)		
Age	**18-30**	**31-40**	**41-50**	**51+**
Yes	22 (52%)	53 (54%)	31 (34%)	**26 (62%)**
No	20 (48%)	45 (46%)	**61 (66%)**	16 (38%)
Management level	**Lower**	**Middle**	**Top**	
Yes	**66 (59%)**	49 (45%)	18 (38%)	
No	46 (41%)	60 (55%)	**29 (62%)**	

The sureness and comfort measures produced the following results. The bulk of the respondents (263/284: 93%) indicated being either "***very sure***" or "***fairly sure***" about the decision they made, whilst 242 (85%) respondents opted for being either "***very comfortable***" or "***fairly comfortable***" with the decision made. This trend was perpetuated through all demographic categorisations and was thus not reported on in detail.

4.4.1.2 Scenario 1: Decision-making Quality (Integrative Complexity)

The measure employed to test for decision-making quality, integrative complexity (IC3), constitutes the heart of the research. All three scenarios were crafted with this outcome variable in mind as its relationship to the many variables investigated in this project was hypothesised to answer the core research question. The results were therefore reported in a fashion to either include or eliminate a specific variable due to the strength of its relationship with the decision-making quality measure.

In answering the scenario 1 question, the **decision-making quality** measured for the total population came to an average score of **2.47** with a standard deviation of **1.13.** This is a fairly

low score seeing as fully differentiated and integrated decision-making typically reflecting a score of around 3.5 - 4.0. Closer scrutiny of this figure reveals that the framing intervention crafted for the decision, failed to have an impact on the decision-making quality of the respondents (thus not providing support for research question 4). The unframed response related an IC3-score of 2.46 whereas the framed decisions an IC-score of 2.49. A p-value of 0.41 during a T-test showed that this difference was not significant.

A number of alternative variables had to be investigated. This prompted the use of scatter plots, to illuminate some of the leading relationships. Figure 27 shows a plot of decision-making quality exhibited for scenario 1, as influenced by the four quadrants of value orientations.

Figure 27. Decision-making Quality/Personal Value Scatter Plot – Scenario 1

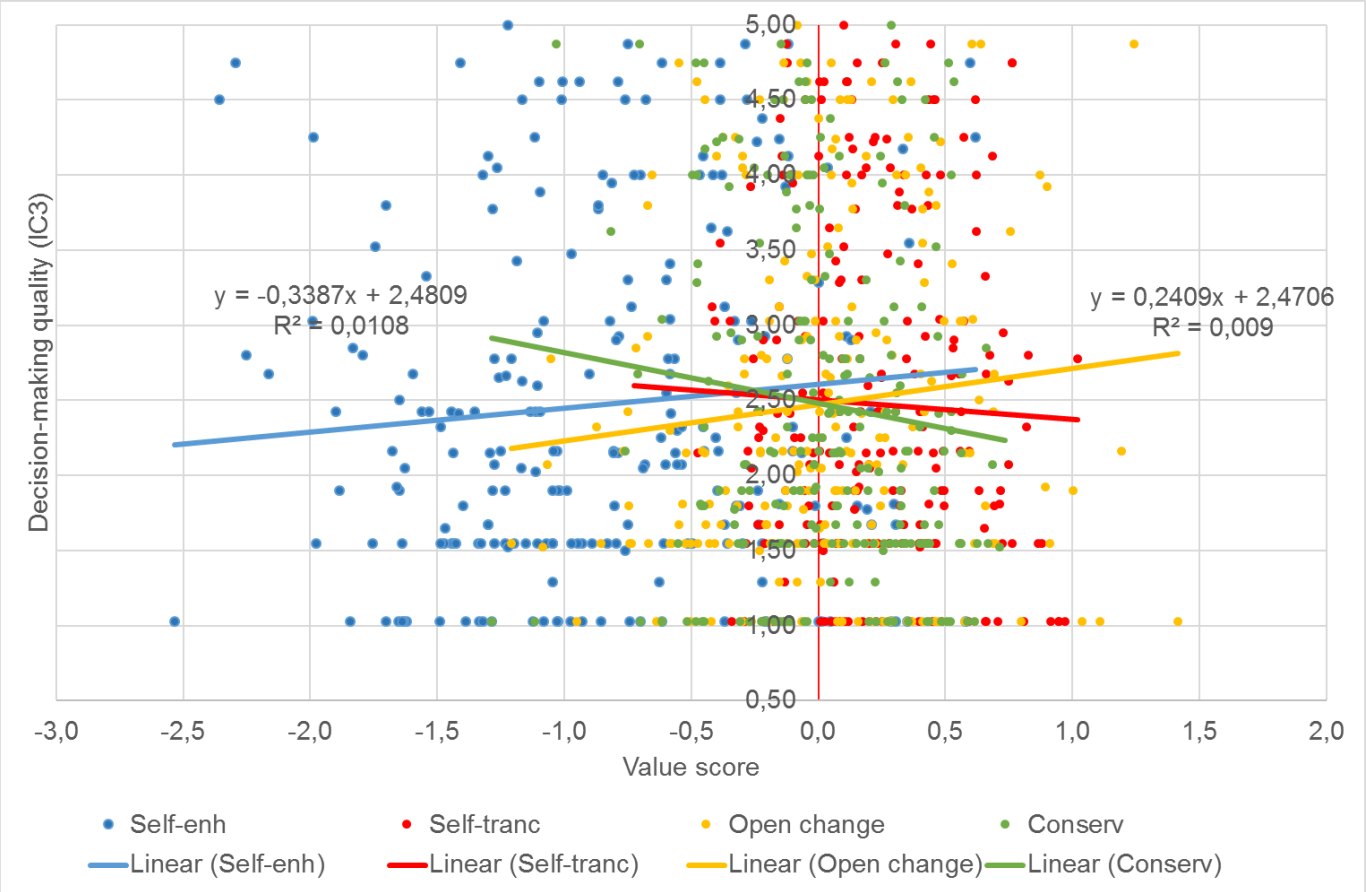


Figure 28 revealed a negative relationship between decision-making quality and values associated with conserving the status quo (green line), and a positive relationship between decision-making quality and the self-enhancement value block (blue line). These results hinted a support for research question 1, but the curve fit statistic, presented by the r-squared number on the graph, suggest a poor fit, though.

The proposed relationship with risk-taking propensity was also investigated, and a scatter plot to this effect is shown in Figure 28.

Figure 28. Decision-making Quality/Risk Propensity Scatter Plot – Scenario 1

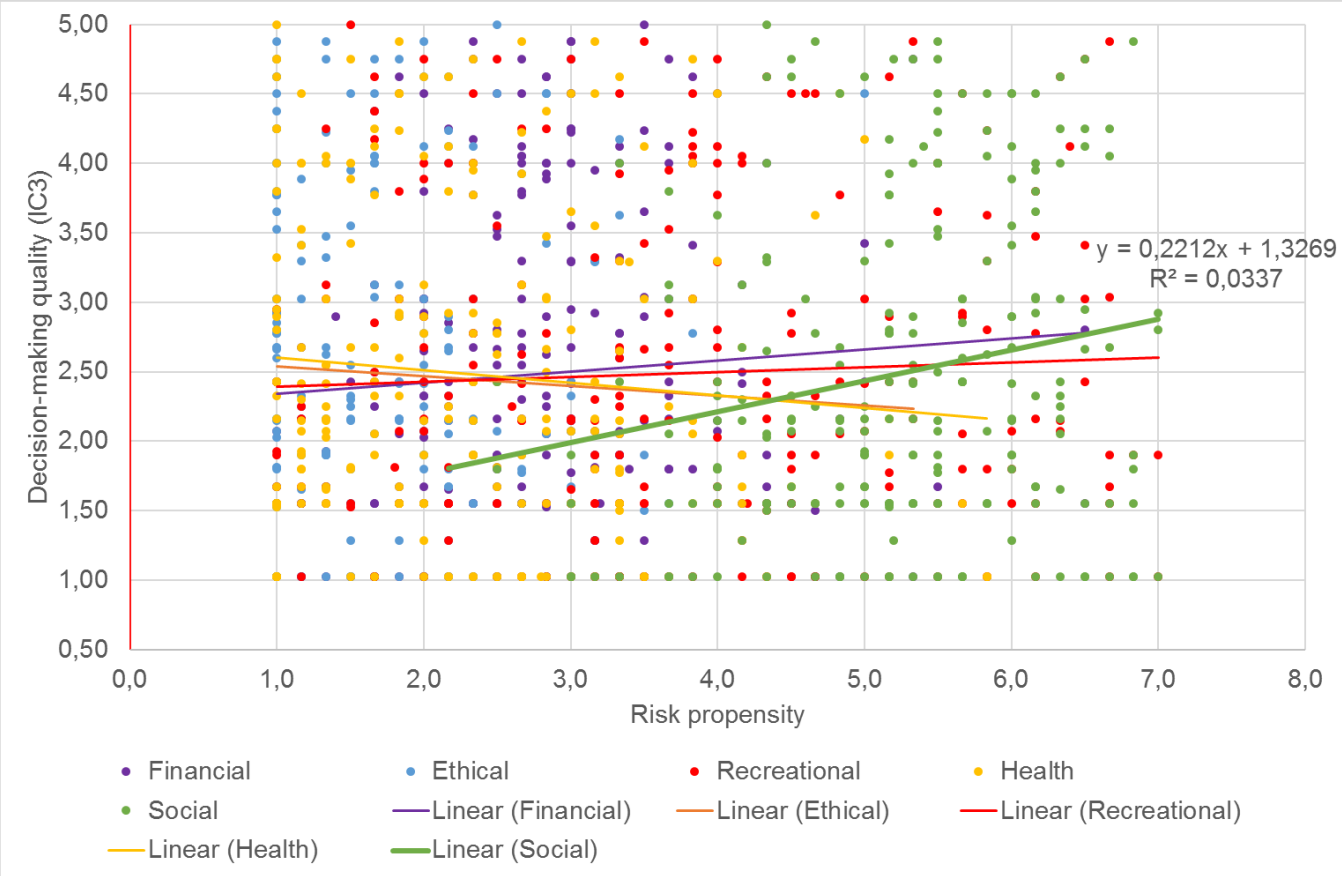


Figure 28 shows the trend line plot of social risk-taking to have the strongest positive relationship with decision-making quality, supporting research question 2. We see this domain dominating the various relationships plotted above, but that the R-squared value of 0.034 suggests a very poor fit. Though suggestive of a relationship, additional factors or relationships need to be investigated to find the true driver of decision-making quality.

Taking direction from the demographic findings mentioned in section 4.3, one should obviously also consider the possible impact of a variable such a cultural group on the IC3 measure. Comparing the Afrikaans respondents to the Black respondents, we find the decision-making quality for the latter group to be higher than the first group (2.43 vs 2.58). Similarly, the English-speaking respondents exhibited lower IC scores for this scenario (2.51 vs 2.58). However, the p-values of T-tests conducted on the two combinations revealed these findings to lack statistical significance (shown in Table 14).

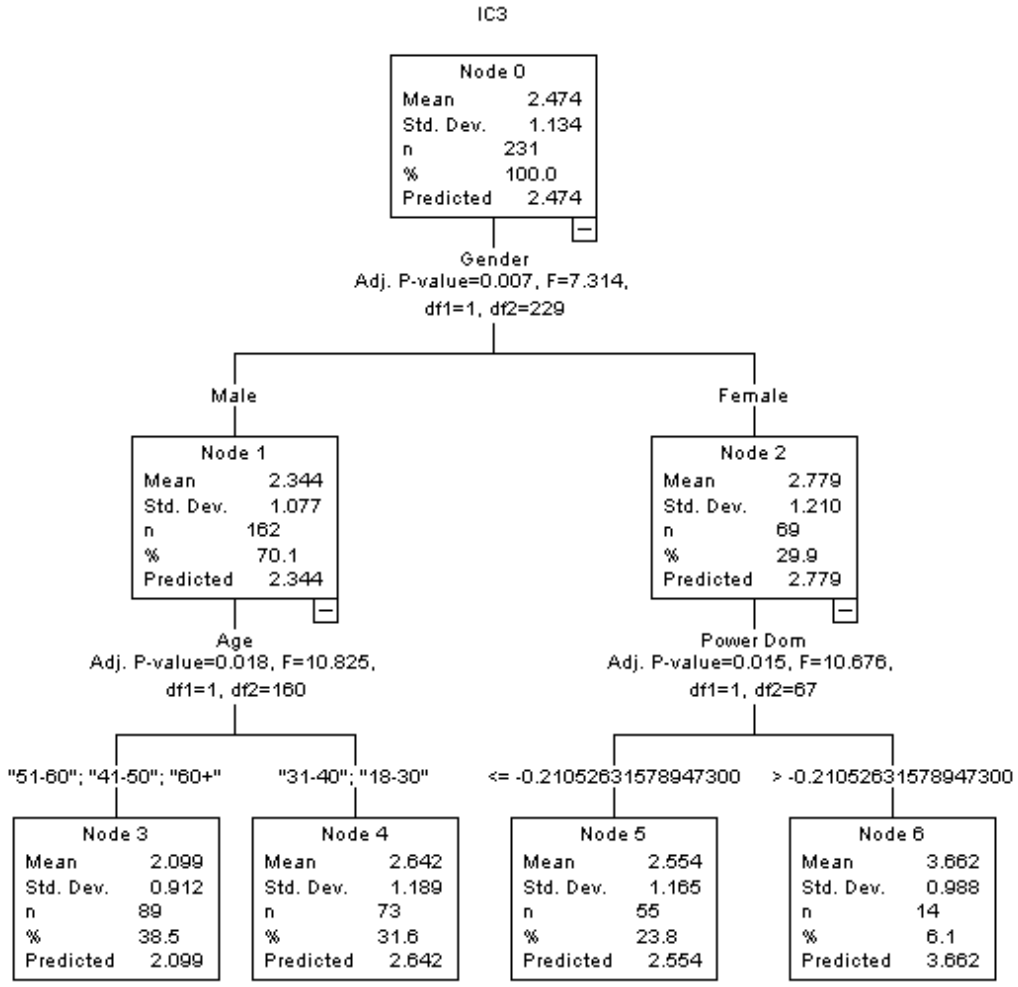
Table 14. Decision-making Quality – Scenario 1

Cultural group	Afrikaans	English	Black
IC score	2.43	2.51	2.58
T-test P value*	0.24	0.38	

** – single tailed t-test, equal variance assumed*

Since these findings were indicative of **cultural heritage** as a driver in the decision-making quality exhibited for scenario 1, but not a conclusive finding, it was deemed prudent to delve further for an explanation for differences for this measure between individuals. A decision-tree analysis was conducted on all the variables assessed. This analysis allowed for any of the 19 value orientations, five risk domains or demographic measures to be considered as related to the IC construct. Figure 29 shows this diagram.

Figure 29. Scenario 1 Decision-tree Diagram



A number of notable observations emerge from this analysis. The first discriminator for decision-making quality for scenario 1 is **gender**. Although the group average decision-making score (IC3) came to 2.47, male respondents showed an IC3 of 2.34 versus an IC3 of 2.78 for their female counterparts (at a p value of 0.007). These subsets totalled 162 and 69 for male and female respectively with a p-value of 0.007, indicative of a highly significant finding.

Secondly, and as a subset of the male group, **age** comes to the fore as a decision-making quality discriminator. The younger respondents (18-30 and 31-40) reported higher IC3 scores at 2.64, nearing that of the female average. The older respondents (40+) showed significantly (p value of 0.018) lower IC3 scores averaging only 2.10.

A third consideration, with which to segregate the IC scores and detailing the female group, was the value of ***power: resources***. Splitting on a power: resources assessment of -0.21 (producing a p-value of 0.015), female respondents more prone to favouring this power value exhibited higher levels of decision-making quality (IC3 of 3.66) and contributed in part to an answer to our first research question. However, those females not valuing power over resources reflected lower IC3 scores (2.55), albeit still higher than the average male scores.

We can summarise the findings as shown in Table 15.

Table 15. Scenario 1, Summarised Decision-tree Results

Groups	Female respondents valuing power	Young males	Female respondents not valuing power	Older males
IC3 score	3.66	2.64	2.55	2.10

4.4.2 Scenario 2 Results

Scenario 2 (section 3.6.4) introduced a decision-making scenario outside of the working environment. The respondents were asked to choose between improving the local education results by employing 20 additional teachers, or to adhere to the demands of the striking municipal workers (local government or county employees) and give them their wage increase.

4.4.2.1 Scenario 2: Yes/no Decision

The nominal yes/no decision was split 215 for the appointment of the teachers, against 68 for adhering to the striker demands, which gave a **77/23%** split of the 283 respondents. A deeper analysis of the demographically organised results did not reveal any startling relationships. The cultural groupings had very similar distributions between the yes/no splits, ranging only

between 75% for Indian people and 79% for English speaking people. The gender split was a bit more prominent with 73% of males favouring the yes (appointment of teachers) option against 85% of the females. The various age groups showed the 31-40 year olds to be most supportive of the "yes" decision at 83% and 51 and over the least supportive at 65%. Support by management level varied between 75% for middle managers and 81% for top managers. The demographically segregated results are shown in Table 16.

Table 16. Scenario 2 Consolidated Decision-making Results

Cultural group	**Afrikaans**	**English**	**Black**	**Indian**
Yes	92 (77%)	46 (79%)	57 (76%)	15 (75%)
No	28 (23%)	12 (21%)	18 (24%)	5 (25%)
Gender	**Male**	**Female**		
Yes	151 (73%)	**64 (83%)**		
No	55 (27%)	13 (17%)		
Age	**18-30**	**31-40**	**41-50**	**51+**
Yes	29 (69%)	82 (83%)	72 (77%)	**28 (65%)**
No	13 (31%)	17 (17%)	21 (23%)	15 (35%)
Management level	**Lower**	**Middle**	**Top**	
Yes	85 (76%)	82 (75%)	39 (81%)	
No	27 (24%)	28 (25%)	9 (19%)	

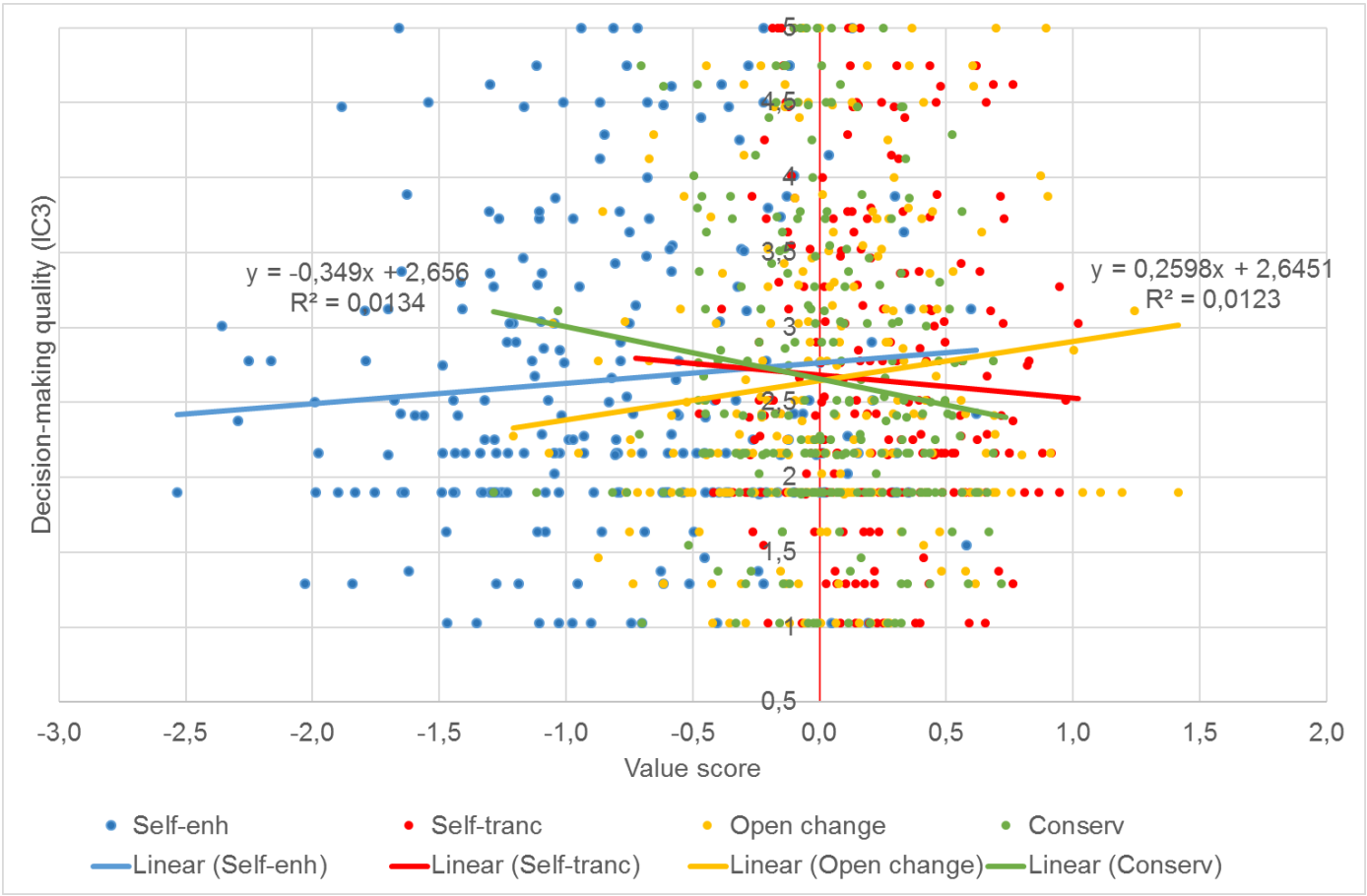
As with the first scenario, the measures for sureness and comfort did not add much to the discussion. The bulk of the population (97%) relayed being either "very sure" or "fairly sure" with the decision, and a similar figure (88%) reported to be either very comfortable" or "fairly comfortable" with the decision.

4.4.2.2 Scenario 2: Decision-making Quality (Integrative Complexity)

As with scenario 2, the focus of this sections analysis fell on the assessment of decision-making quality exhibited by the respondents in answering the open-ended question. An analysis of the entire population's response to scenario 2, produced an integrative complexity (IC3) score of **2.65**. The **framed versus unframed** split revealed a slight variance with the quality of decision-making lowering to **2.61** for the unframed version, and increasing to **2.68** for the framed version. These findings proved to be statistically non-significant as the T-Test p-value came to 0.29 and a lack of support for research question 4. These findings naturally prompted a deeper investigation into the relationships of the variables of values, risk and demographics to find out what drove individual decision-making.

To facilitate these investigations, scatter plots were produced for the proposed relationships between value orientations and risk propensities to decision-making quality. Figure 30 shows the first of two plots, this one relating the four value quadrants to the IC3 score.

Figure 30. Decision-making Quality/Personal Value Scatter Plot – Scenario 2

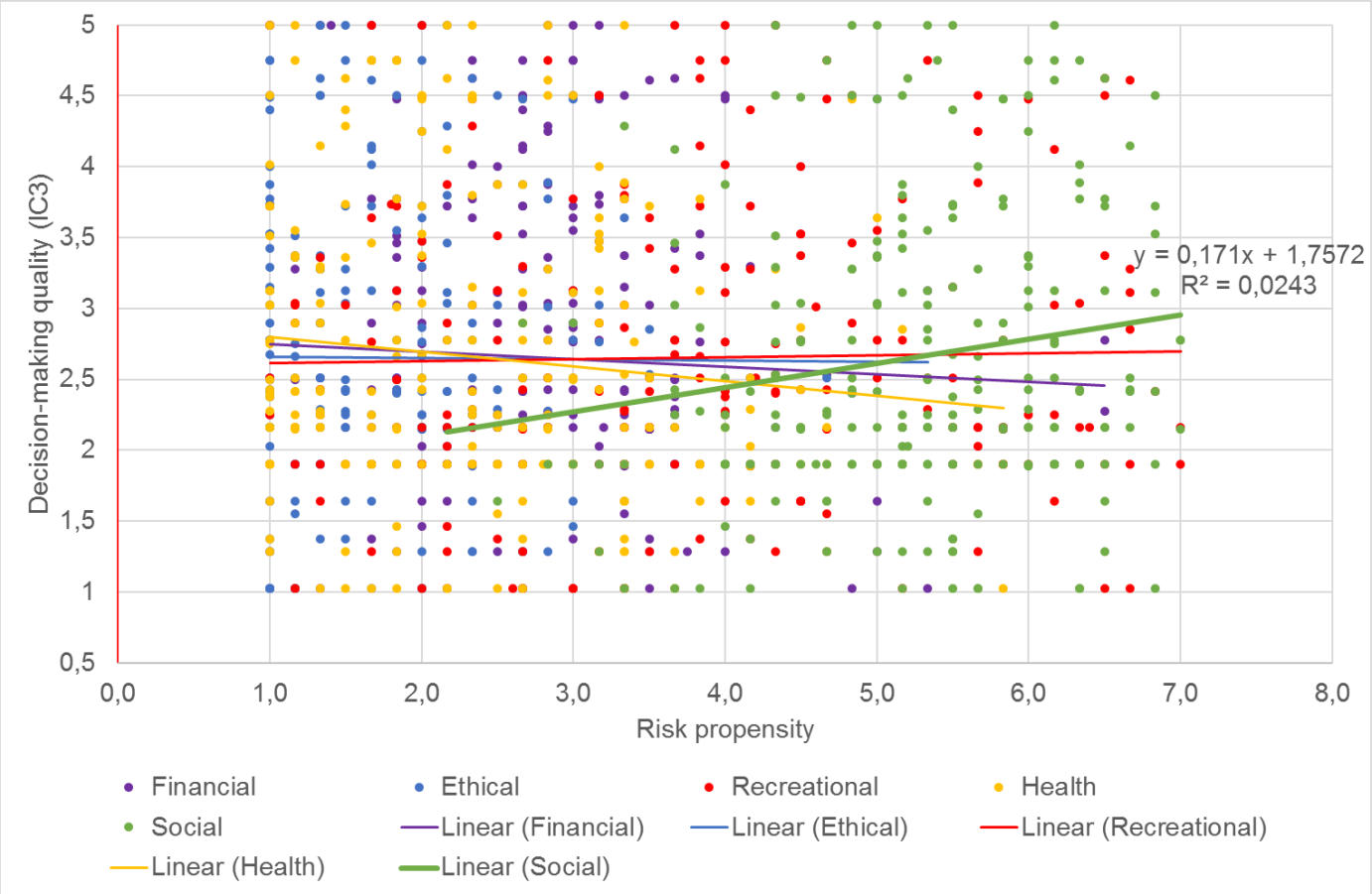


From Figure 30 above it is again suggestive that specific value orientations have an impact on decision-making quality (research question 1). The strongest positive relationship (yellow trend line) is indicative of openness to change as an antecedent to higher quality decisions. Also, self-transcending respondents seem more likely to make decisions of a lower quality, given its negative relationship with the IC3 measure. Low R-squared values were again reported for these plots and did not provide the final answer to what drives decision-making quality.

A risk-domain plot was next created (Figure 31), plotting the risk propensities of the respondents in five different domains. Pertinently, the social risk domain relationship to the IC3 score dominated again, supported hypothesis 2 by showing a strong relationship to decision-making quality. Poor R-squared values were reported again, though, prompting a

deeper analysis into specific values and demographic groupings, as well as their interrelated nature.

Figure 31. Decision-making Quality/Risk Propensity Scatter Plot – Scenario 2



Given the success of the scenario 1 decision-tree analysis, the process was repeated for the scenario 2 results in the hope of finding similarly significant results. Figure 32 relates these findings.

From it we find the first descriptor for increased decision-making in the value of ***tradition*** (being resistant to change and supportive of the status quo). People favouring this value showed decreased IC3 scores of 2.42 against a group average of 2.65, whereas people dismissing this value showed higher IC3 scores (2.88), addressing research question 1.

Gender came into the mix again, with female respondents of the more traditional subset reporting higher decision-making scores (IC3 of 2.80) versus scores of 2.32 for male respondents.

Sub-dividing the male respondents with traditional value, was the “comfort” measure, assessing the level of comfort experienced by the respondents after completing the scenario

feedback. It was reported that people most comfortable with their decisions (1), were more likely to make lower quality decision (IC3 of 2.08), whereas people with reservations on their comfort (scores of 2 and 3) were likely to make better decisions (IC3 of 2.58).

Figure 32. Scenario 2 Decision-tree Diagram

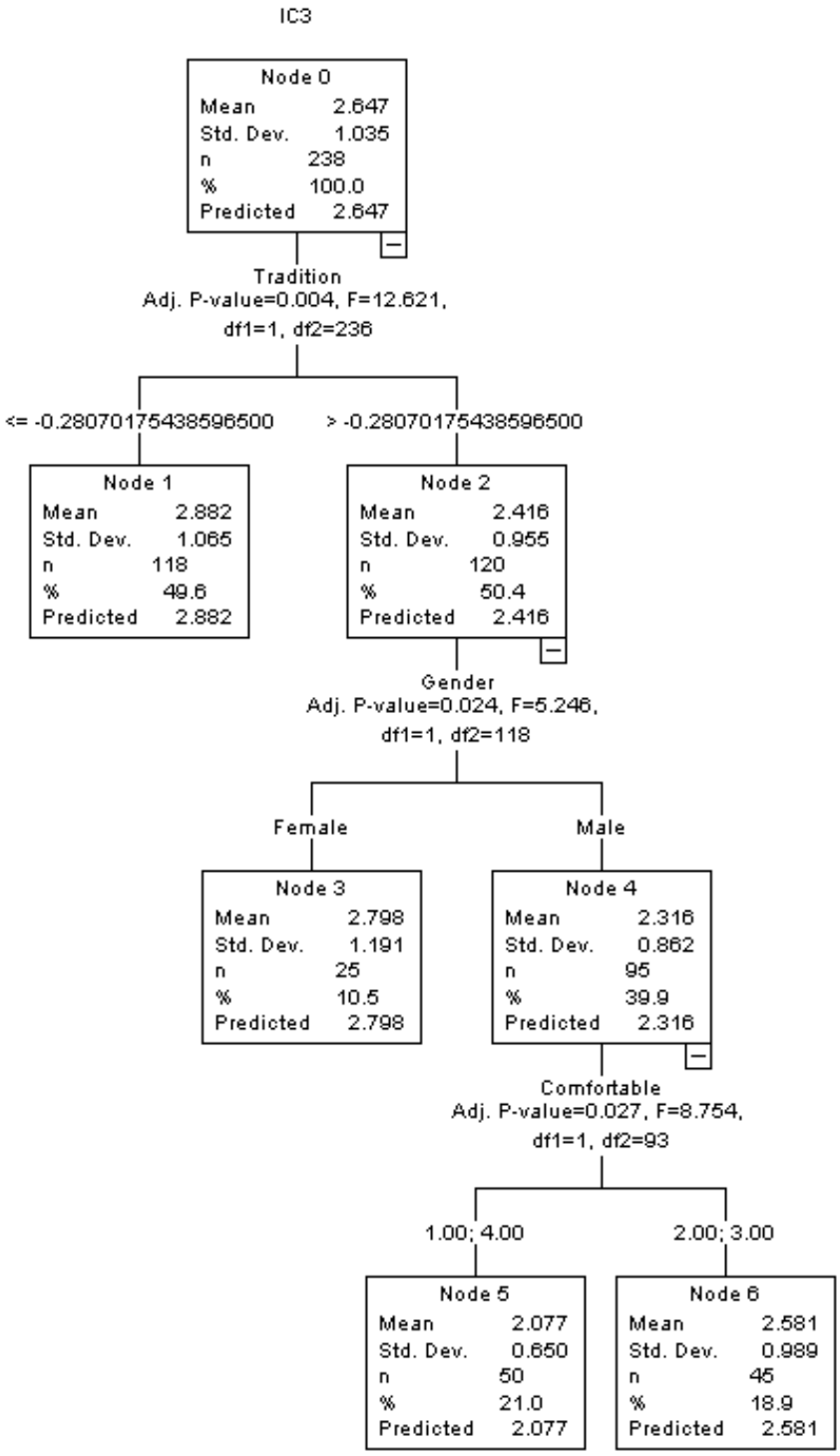


Table 17 summarises the most important findings for scenario two.

Table 17. Scenario 2, Summarised Decision Tree Results

Groups	Non-traditional	Traditional females	Traditional males, uncomfortable with the scenario	Traditional males, comfortable with the scenario
IC score	2.88	2.80	2.58	2.08

4.4.3 Scenario 3 Results

The final scenario (detailed in section 3.6.4) concerned an environmental question, where respondents were given the instruction to choose between curbing an organisations environmental impact by acquiring new technology, versus postponing the upgrade and looking after the financial interests of the organisation.

4.4.3.1 Scenario 3: Yes/no Decision

The total population yes/no split came to 211 versus 73 in favour; a split of 74% vs 26%. Further investigation into the results revealed a number demographic relationships.

Table 18. Scenario 3 Consolidated Decision-making Results

Cultural group	**Afrikaans**	**English**	**Black**	**Indian**
Yes	94 (78%)	46 (79%)	49 (65%)	14 (70%)
No	26 (22%)	12 (21%)	26 (35%)	9 (30%)
Gender	**Male**	**Female**		
Yes	158 (74%)	53 (77%)		
No	48 (26%)	25 (23%)		
Age	**18-30**	**31-40**	**41-50**	**51+**
Yes	28 (67%)	75 (76%)	70 (75%)	32 (74%)
No	14 (33%)	24 (24%)	23 (25%)	11 (26%)
Management level	**Lower**	**Middle**	**Top**	
Yes	87 (77%)	83 (75%)	33 (69%)	
No	26 (23%)	27 (25%)	15 (31%)	

Black people seemed slightly less likely to support the environmentally friendly equipment (65% yes) when compared to English speaking people (79%). Female respondents were more sympathetic towards the environment (77% vs 74%), but not by much. Of the various age

groups, the 31-40 year olds were most supportive of the option (76%), whilst the youngest bracket (18-30) valued it the least (67%). As the levels in management increased, so did support for the environmentally friendly drop. 77% of junior managers supported the option, whilst only 69% of top managers did the same (Table 18).

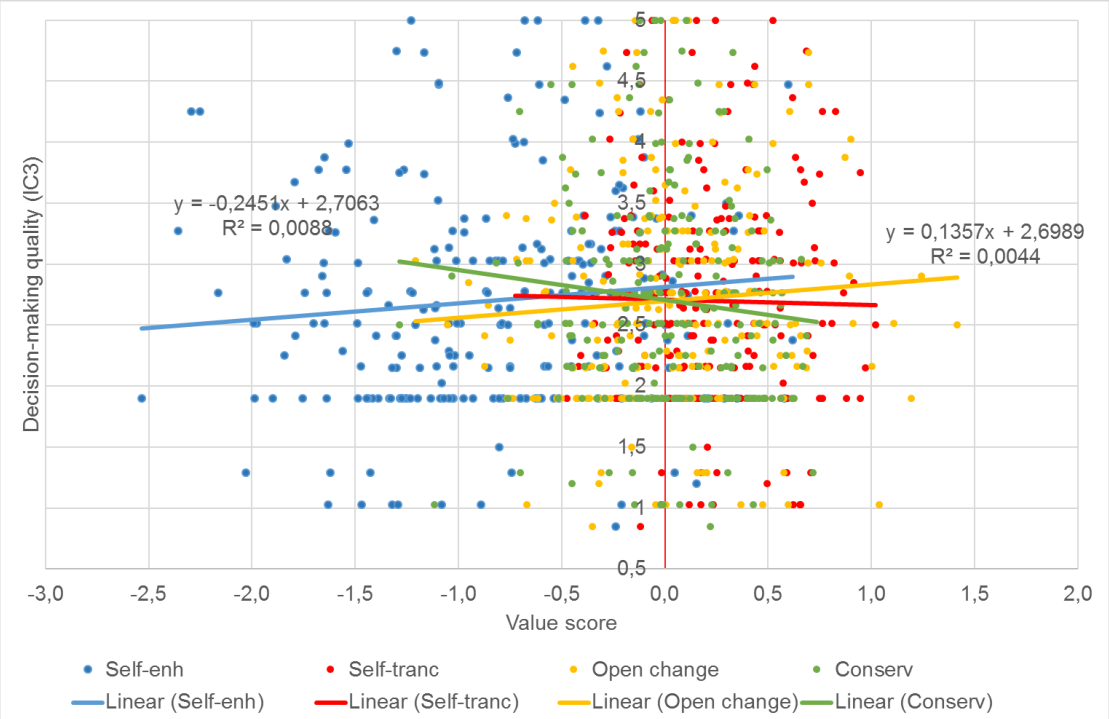
The sureness and decision comfort measures again did not really produce varied results with the balance of the population (93%) relayed being either “very sure” or “fairly sure” with the decision, and a similar figure (92%) reported to be either very comfortable” or “fairly comfortable” with the decision.

4.4.3.2 Scenario 3: Decision-making Quality (Integrative Complexity)

The decision-quality employed by the participants during scenario 3, was again measured using the integrative complexity measure. The total population scored an IC3 of **2.70**, but differed from the other scenarios but responding to the framing intervention. The unframed version of the scenario produced a decision-making quality score of **2.58** whereas the framed version produced a score of **2.81**. A T-test comparing these two scenarios revealed an acceptable p-value (0.04), indicative of a statistically meaningful finding, and providing support for the fourth hypothesis (impact of framing on decision-making quality).

As with the first two scenarios, evaluating the findings in more detail was found to be of great value as this brought depth to the multitude of variables in the research, and helped to determine possible interrelatedness of the variables.

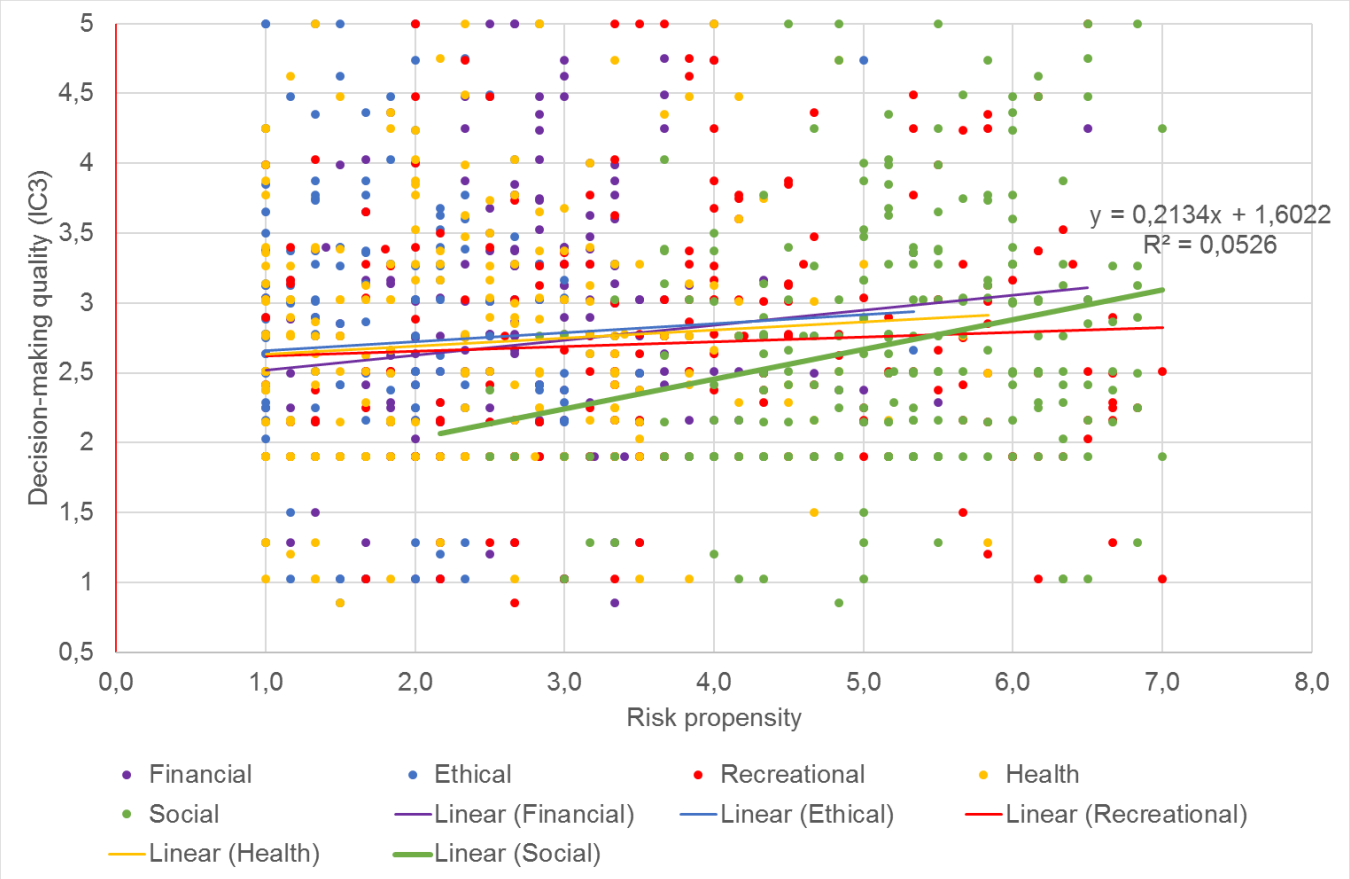
Figure 33. Decision-making Quality/Personal Value Scatter Plot – Scenario 3



To this end, the scatter plots of the relationships between value orientations and risk propensities with decision-making quality were again done for this scenario. Figure 33 shows the value-block/decision-making quality plot and it clearly mirrors the relationships hinted at in scenario 1 and 2. Respondents with a tendency to be self-enhancing seem to make better decisions (as portrayed by the positive slope of the blue line, showing the relationship between these values and the IC3 score), and respondents with strong traditional views, seemed to make decisions of lower quality (green line). Both observations supported hypothesis 1.

A risk-domain/decision quality plot was also produced. The importance of risk propensity in the social domain was again stressed with this relationship exhibiting the steepest trend line graph. However, as with the first two scenarios, the low R-squared values indicated that additional investigations into the drivers behind decision-making quality had to be done.

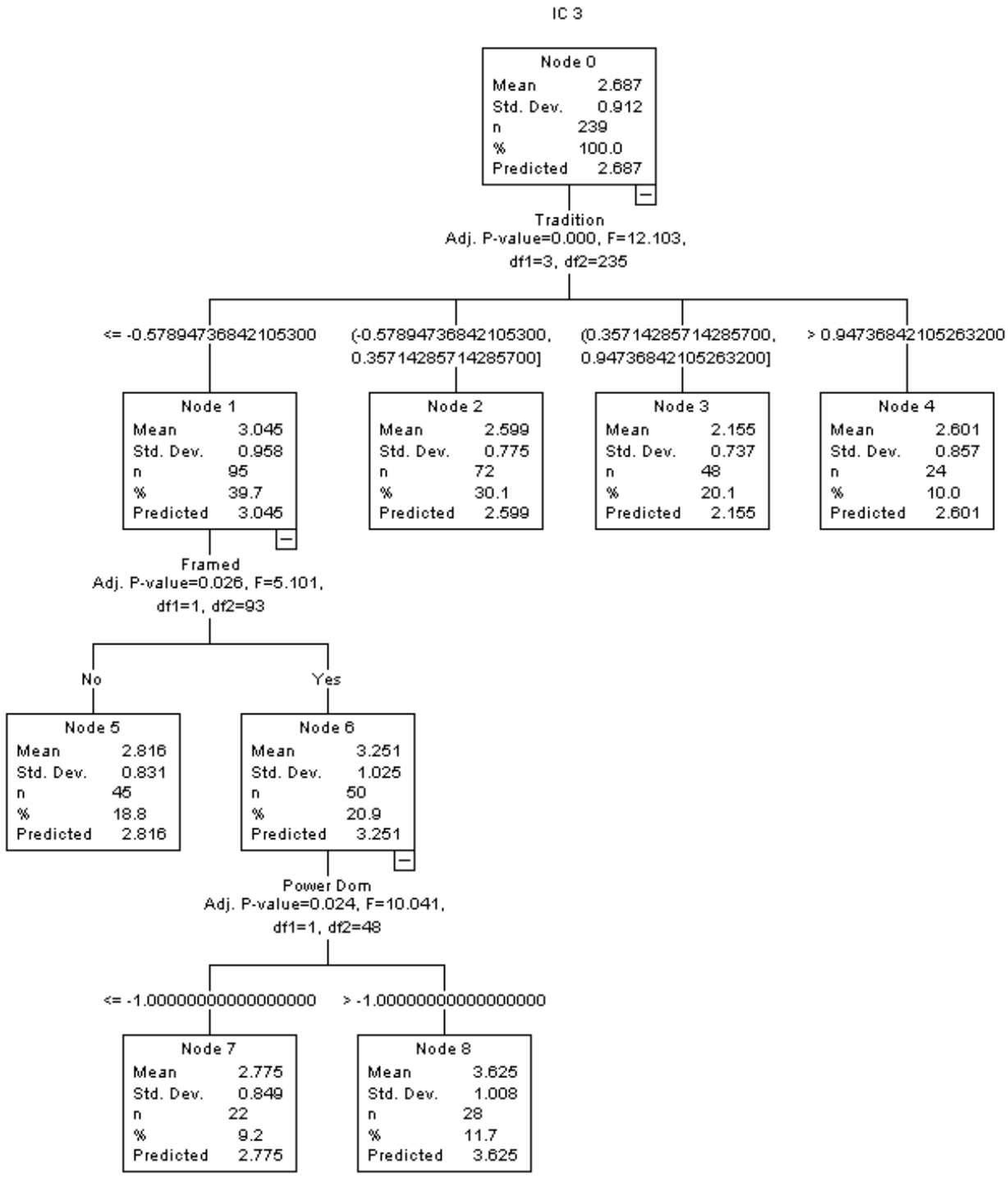
Figure 34. Decision-making Quality/Risk Propensity Sscatter Plot – Scenario 3



Once again, a decision tree analysis was used for the demographic groupings, risk domains, value orientations and framing to investigate whether meaningful differences in integrative complexity could be unearthed.

Figure 35 shows a summary of this analysis.

Figure 35. Scenario 3 Decision-tree Diagram



The first descriptor for integrative complexity proved to be the value of ***tradition*** (hypothesis 1). For less traditional respondents (a tradition value score of <-0.6), it was found that the highest scores of integrative complexity occurred (3.05 vs the average of 2.69). However, for the respondents reporting to be moderate to slightly more traditional (with a tradition score of

> -0.6, but < 0.95), it was found that lower levels of decision-making quality transpired (2.60 and 2.16 for the two sub-sets). Pertinently, and counter to the trend reported to date, a slight increase in decision-making quality was reported for the very traditional respondents (an IC3 of 2.60). The sub-sample thus produced totalled only 24 and it is conceivable, given the complexity of the variables active in these scenarios, that this was due to an as yet unidentified variable.

The second tier of determinants was produced by the framing intervention (hypothesis 4). For the very traditional respondents, framing of the intervention showed their decision-making quality improve significantly from an IC3 score of 3.05 to 3.25. The unframed respondents showed a decrease in IC3 scores from the 3.05 average to 2.82 for the non-traditional group.

Finally, the measure of power: dominance (also relating to hypothesis 1) came into play with less dominant respondents scoring lower (IC3 of 2.78) and more dominant respondents scoring higher (IC3 of 3.63). This was of course done to evaluate the non-traditional framed subset a bit further. Table 19 shows the results in brief.

Table 19. Scenario 3, Summarised Decision Tree Results

Groups	Non-traditional, power dominating, framed respondents	Non-traditional, framed respondents	Non-traditional. Unframed respondents	Traditional respondents
IC score	3.63	3.25	2.82	2.15

4.4.4 Multiple Regression Analysis

As mentioned in Chapter 3, a number of regression analysis were done to see whether additional support could be gathered for hypotheses 1 and 2, i.e. that a relationship exists between value orientations, risk propensities and decision-making quality.

The analyses were conducted separately for each scenario and presented to reflect the regression fit statistics between the various value and risk variables, and the decision-making quality outcome variable (IC3, as per all other analysis). Table 20-22 details the findings of these analysis.

Table 20. Scenario 1 Regression Results

Value	**Parameters**		**Risk**	**Parameters**	
	Significance	*Fit*		*Significance*	*Fit*
Tradition	0.025	0.024	Social, Health	0.005	0.041

Table 20 shows that the value of tradition and the risk-taking in the social and health domains were the closest related to decision-making quality in the first scenario.

Table 21. Scenario 2 Regression Results

Value	**Parameters**		**Risk**	**Parameters**	
	Significance	Fit		Significance	Fit
Tradition	0.013	0.028	Social, Health, Financial	0.013	0.051

Table 21 is indicative of the value of tradition, and risk-taking in the social, health and financial domains pointing towards decision-making quality in scenario 2.

Table 22. Scenario 3 Regression Results

Value	Parameters		Risk	Parameters	
	Significance	Fit		Significance	Fit
Tradition, Universalism-Nature	0.000	0.099	Social	0.006	0.035

Table 22 reflects that the values of tradition as well as universalisms-nature, and risk-taking in the social domain played the largest role in predicting decision-making quality in scenario 3.

The results seem to indicate consistent support for the notion that specific values and risk propensities were related to decision-making quality. Although the regression fit statistics were poor, the significance of each regression indicated a statistically meaningful result. From the three scenarios, it seems that both social risk-taking and the value of tradition seem to be

predictive of decision-making quality. However, these results were not conclusive and additional tests would have to be conducted to gain support for the hypotheses.

4.4.5 Summary of Quantitative Results

The results presented above suggest a number of notable relationships. It is specifically noteworthy that different scenarios elicited the incorporation of different values and risk propensities. However, a general observation cannot be made at this point. An additional analysis of the data set was thus required.

The scatter plots of value blocks against the IC3 measure (Figures 27, 30 and 33) as well as the risk domain plots against the IC3 measure (Figures 28, 31 and 34), hinted at a consistent relationship between specific value orientations, risk propensities and decision-making quality over all three scenarios, providing initial support for hypotheses 1 and 2. The graphs showed repeatedly that the value block of conformism was negatively related to decision-making quality, that self-enhancement was positively related to decision-making quality, and that a propensity to take social risk was also positively related to decision-making quality. This observation prompted an investigation into a decision-making behavioural pattern present across scenarios. With the failure of the R-squared measures of the linear trend line plots, an alternative approach was taken to determine a relationship that had statistical significance.

With the success of the framing intervention of the third scenario and the accompanied use of the T-test statistic to show its relevance, a similar approach was taken to establish the relationships between these variables. Table 23 shows the result of the investigation. The three decision-making measures (hand-coded IC, computer-coded IC2 and combined measure IC3) were recorded for contrasting subsets of the value block and risk domain measures. This was done by sorting the data from low to high for a particular measure (say conformism), splitting the sample in two subsets (so as to split the sample in two, generally along the “0” point of the value or risk scale), and then conducting a T-test on the decision-making quality measures for each of the three IC scores. This was done to determine whether a statistically meaningful relationship could be established between decision-making quality and these variables.

Due to the bulk text produced by this analysis, a summary of the results was presented below. The detail of this exercise, complete with Levene’s test scores measuring the homoscedasticy of the sample sets, F-scores, variances, means, standard deviations and degree of freedom information, is available in Appendix M.

Table 23. Consolidated Quantitative Results

Scenario	Scenario 1			Scenario 2			Scenario 3			Scenario 3 framed		
DMQ measure	IC	IC2	IC3	IC	IC2	IC3	IC	IC2	IC3	IC	IC2	IC3
Not conserving	3.83	1.46	2.65	4.08	1.52	2.81	4.05	1.58	2.82	4.32	1.76	3.06
Very conserving	3.16	1.41	2.27	3.56	1.38	2.46	3.67	1.45	2.53	3.67	1.50	2.57
T-test	**0.01**	0.52	**0.01**	**0.01**	**0.05**	**0.01**	**0.03**	0.15	**0.02**	**0.02**	**0.01**	**0.00**
Self-enhancing	3.80	1.51	2.64	3.94	1.57	2.76	4.08	1.63	2.85	4.22	1.81	2.58
Not self-enhancing	3.28	1.38	2.32	3.73	1.37	2.54	3.70	1.42	2.54	3.73	1.42	3.02
T-test	**0.04**	0.08	**0.04**	0.28	**0.04**	0.11	**0.03**	**0.02**	**0.01**	0.06	**0.01**	**0.02**
Risk taking	3.68	1.48	2.59	3.94	1.47	2.70	4.10	1.66	2.89	4.20	1.81	3.01
Risk averse	3.37	1.40	2.39	3.73	1.44	2.59	3.67	1.38	2.52	3.85	1.46	2.65
T-test	0.12	0.14	0.17	0.31	0.80	0.41	**0.01**	**0.00**	**0.00**	0.20	**0.01**	0.06
Social risk raking	3.94	1.47	2.71	4.05	1.53	2.79	4.17	1.59	2.86	4.42	1.72	3.06
Social risk averse	3.11	1.40	2.24	3.67	1.39	2.54	3.62	1.46	2.53	3.69	1.56	2.63
T-test	**0.00**	0.33	**0.00**	0.07	0.16	0.07	**0.00**	0.14	**0.01**	**0.01**	0.25	**0.02**

Table 23 thus relates an uncanny strong support for the notion that decision-making quality is related to specific value-blocks and risk-taking propensity in one specific domain. Comparing the subset ordered by **conserving** (the value block containing the values of humility, conformity-rules, conformity-interpersonal, security-societal, security-personal and face), we see that non-conserving respondents related higher decision-making quality scores for each of the three scenarios (as well as the framed version of scenario 3) across all three IC measures, when compared to conserving respondents. Ten of these 12 (three IC measures for four scenarios) findings were shown to statistically significant, seeing as the T-tests of these ten comparisons produced p-values less than the required 0.05.

The value-block of **self-enhancement** (containing values such as achievement, power-resources and power-dominance) exhibited a similarly strong trend, with high scores in this block strongly related to high scores in decision-making quality. Eight of the 12 T-tests passed the p-value requirement, two came very close (0.06-0.08) and two instances proved to be not-significant. These findings supported the proposed research question (hypothesis 1) into whether a relationship existed between value orientations and decision-making quality.

The risk propensity measure was similarly significant with strong evidence of an overall risk seeking attitude related to higher decision-making quality scores for the third scenario. However, when focusing on the propensity of respondents to take risks on the **social domain**, we find that higher social risk-taking behaviour was strongly related to higher decision-making scores for all three scenarios, providing significant support for hypothesis 2. Six of the twelve T-tests returned p-values smaller than 0.05 and the combined measure (IC3) returning statistically significant results for each of the scenarios, bar one.

These results give ample support for the notion that broad value orientations (such as presented by a combination of related values) as well as specific risk orientations have an influence on the decision-making quality exhibited by respondents. We can therefore safely reject both null hypotheses 1 and 2 and conclude that:

- during a value clash, a distinct relationship exists between an individual's value orientation and the decision-making quality exhibited, and
- that during a value clash, a clear relationship exists between an individual's risk propensity and the decision-making quality exhibited.

These results viewed together, and considered on the strength of the simultaneous occurrence of both risk and value terms in relation to decision-making quality during the decision tree analysis, we can infer that combinations of risk-and value attributes are likely to shape decision-making quality. We move therefore to reject the null hypothesis 3, and conclude that:

- during a value clashing decision-making scenario, the eight decision-making groups (proposed in Table 4) will produce decision-making responses of varying quality.

As far as the framing intervention is concerned, partial rejection of the null hypothesis seems warranted, on the strength of the scenario three results. However, it has to be a qualified rejection, as the nature, or rather severity of the scenario framing needs to be considered. With regards to hypothesis four, the following conclusion:

- The application of social-relational framing to value-clashing scenarios will have a moderating influence on the relationship between the decision-making groupings and their respective decision-making quality scores, ***provided that the framing is worded explicitly enough.***

4.5 Qualitative Results

The qualitative results were presented in section 4.5. These results were produced by deeper analysis of the text elements produced by the three decision scenario responses.

4.5.1 Decision-making Quality Relationships

A second round of analysis was conducted on the survey data. Even though this study was heavily grounded in the quantitative research idiom, the nature of the research design presented an opportunity to include a qualitative component to the study. The integrative complexity measurement, consisting of an open-ended question, provided the ideal situation through which a more detailed and textured view of the analysis could be gained.

The responses of the participants were analysed with the aid of the ATLAS.ti software package. The data consisted of 278, 265 and 252 text responses respectively, answering the

following question for each of the three scenarios: *Please take 5 minutes to describe how you came to your decision on the scenario.* The text items were read and coded for any of the 19 value orientations, five risk propensities, or open-coded to capture any themes not described in the values or risk categories. This process yielded a total of 45 codes; 19 value orientations, 15 risk propensities (5 domains and three levels for each) and 11 open codes.

The aim of this process was firstly to see whether the findings of the quantitative results could be ratified by the open-ended question. Although the statistics revealed clear relationships between value orientations and/or risk propensities, it would make a stronger case that these motivations played a role in the decision-making behaviour of the respondents if they were to volunteer them without being prompted. (It is important to note here that the research design was set up to avoid contamination of this phase of the process. The respondents were given the scenarios before they were evaluated on their value and risk orientations. The motivations stated in the response to the open-ended question could therefore not have come from the value and risk questionnaires, as they occurred after the fact).

The coded text elements were grouped into broader themes searching for common motivational threads for each of the scenarios. This was done by grouping sets of values together and interpreting the combination of risk propensities as well as the emergent themes in the context of the scenario setting. The following core results were produced by the ATLAS.ti coding and theming analysis.

4.5.2 Scenario 1 Results

Scenario 1 dealt with a racially laden, politically sensitive employment equity consideration. The scenario was designed to tap into South Africa's racial divide, current political landscape and peoples need for and perception of fairness. It was anticipated that cultural differences between the ethnic groups (extensively postulated by the work of Hofstede (1983) would come into play and that the gender of the hypothetical candidate might come into consideration. A trade-off between the self-enhancing quadrant of values and the self-transcending values was expected to occur along the decision motivators, and risk propensities, such as the financial risk exposure of the decision-maker, was expected to be mentioned.

Table 24 presents a summary of the code occurrences recorded for the scenario organised by code family and frequency of occurrence, as produced by the ATLAS.ti codes co-occurrence table. Note that the codes were recorded for either a high, medium or low IC score (integrative complexity) to add an additional dimension to the analysis. For ease of interpretation and ensuring a balanced picture, the scores were normalised in terms of the number of responses in each of the three quality categories (high, medium and low). This was

done to present a balanced view of the results and to protect against over-valuing codes from high-frequency decision-making quality categories. Seeing as high-quality responses were prone to produce numerous codes per text item, (and low-quality answers few codes) but that the low quality codes were more numerous, this adjustment had to be made.

For instance, for scenario 1, the split between high, medium and low-quality decision-making for the 231 text responses was split 54 (23%), 54 (23%) and 123 (53%) respectively. A straight summation of the codes would overvalue the occurrence of low decision-making quality codes, as there were simply more responses in this group. Therefore, the original count for self-directed thought (the first code in Table 24), was adjusted from the original count of 6, 7, 9 to 11.1, 14.8 and 8.1 to allow for skew representations between the high, medium and low decision-making sets.

Table 24. Scenario 1. Integrative Complexity and Value Orientations

Values	**Sc1-High**	**Sc1-Med**	**Sc1-Low**
Self-direction-Thought	11.1	14.8	8.1
Self-direction-Action	1.9	5.6	0.8
Stimulation	0.0	0.0	0.0
Hedonism	0.0	0.0	0.0
Achieve	**75.9**	**42.6**	**50.4**
Power-Dominance	**29.6**	**37.0**	**45.5**
Power-Resources	0.0	0.0	0.0
Face	3.7	7.4	3.3
Security-Personal	0.0	0.0	0.0
Security-Social	9.3	5.6	7.3
Tradition	**20.4**	**33.3**	**25.2**
Conformity-Rules	**22.2**	**16.7**	**21.1**
Conformity-Interpersonal	0.0	0.0	0.0
Humility	1.9	0.0	1.6
Benevolence-Dependence	5.6	1.9	4.1
Benevolence-Care	1.8	11.1	5.7
Universalism-Concern	**27.8**	14.8	9.8
Universalism-Nature	0.0	0.0	0.0
Universalism-Tolerance	13.0	13.0	8.1

In keeping with research question 1, the scenario 1 responses were clearly motivated by the value of ***achievement*****,** ***power-dominance, tradition and conformity-rules***. Higher quality decision-making seemed to go with higher levels of valuing ***achievement***, whereas people with *the* ***power-dominance*** value seemed to favour lower quality decisions. ***Universalism-concern*** peaked for high-quality decisions, but did not really feature for the lower variants.

Table 25. Scenario 1. Integrative Complexity and Risk Propensities

Risks	**Sc1-High**	**Sc1-Med**	**Sc1-Low**
Ethical Risk	3.7	3.7	0.0
Financial Risk	**27.8**	**22.2**	**18.7**
Health Risk	0.0	0.0	0.0
Recreational Risk	0.0	0.0	0.0
Social Risk	1.9	0.0	0.8

In terms of research question 2, the only risk that seemed to play a role in motivating the decision made by the respondents, was financial risk (Table 25). The broad trend appeared to be associated with the quality of decision-making, with high occurrence of financial risk as a decision-making motivator aligning with high IC scores.

Table 26. Scenario 1. Integrative Complexity and Emerging Themes

Emergent themes	**Sc1-High**	**Sc1-Med**	**Sc1-Low**
Balanced	**14.8**	**7.4**	**4.9**
Compromise	5.6	1.9	4.9
Conflicted	7.4	9.3	8.1
Do the right thing	3.7	1.9	7.3
Education is a priority	0.0	0.0	0.0
Fairness	0.0	11.1	6.5
Fatalistic	0.0	0.0	0.0
Immediate	**18.5**	**16.7**	**10.6**
Long-term view	**14.8**	**3.7**	**4.1**
Pragmatic	5.6	0.0	7.3
Self-preservation	3.7	0.0	2.4
Self-sacrificing	1.9	0.0	0.0
Sexist	1.9	1.9	4.9
Sustainability	0.0	1.9	0.0

As mentioned in the introduction to this section, a number of codes emerged from outside of the value-and-risk framework. Fifteen emergent codes were produced during the analysis process and the terms “balanced”, “immediate”, “long-term view” proving to be the most common motivators. The discussion chapter will evaluate the relevance and possible interrelatedness of these term amongst each other, as well their relationship to the risks and values tabled before. Figure 36 shows a wordcloud analysis, positioning the various codes in terms of the frequency of their occurrence with the larger fonts depicting the more important terms.

Figure 36. Wordcloud for Scenario 1 Coding

From wordcloud it is evident that financial risk, tradition and confirmation to rules dominated the thoughts and motivations of the respondents during their decision-making.

4.5.3 Scenario 2 Results

The scenario 2 results were analysed exactly the same, and produced the results in Tables 27-29. The motivating values for scenario 2, though different when compared to scenario 1, showed additional support for research question 1 (Table 27). The values of ***self-direction – thought, power-resources, social security*** and ***universalism-tolerance*** were pushed to the fore. The higher quality decisions were driven by each of the four values as they were more prominent for the decisions with high IC scores. The values of ***power-dominance*** and ***tradition*** seemed to play a role in the making of lower quality decisions.

Table 27. Scenario 2. Integrative Complexity and Value Orientations

Values	Sc2-High	Sc2-Med	Sc2-Low
Self-direction-Thought	**27.8**	6.7	**10.9**
Self-direction-Action	0.0	0.0	2.2
Stimulation	3.7	0.0	0.0
Hedonism	0.0	0.0	0.0
Achieve	5.6	13.3	8.0
Power-Dominance	11.1	13.3	**14.5**
Power-Resources	**16.7**	2.2	2.9
Face	9.3	4.4	4.3
Security-Personal	9.3	2.2	2.2
Security-Social	**46.3**	**46.7**	**34.1**
Tradition	5.6	**17.8**	**12.3**
Conformity-Rules	1.9	0.0	0.0
Conformity-Interpersonal	0.0	0.0	0.0
Humility	0.0	2.2	1.4
Benevolence-Dependence	1.9	11.1	2.9
Benevolence-Care	11.1	13.3	6.5
Universalism-Concern	9.3	6.7	2.9
Universalism-Nature	0.0	2.2	0.0
Universalism-Tolerance	**16.7**	**15.6**	5.8

Table 28. Scenario 2. Integrative Complexity and Risk Propensities

Risks	Sc2-High	Sc2-Med	Sc2-Low
Ethical Risk	0.0	0.0	1.4
Financial Risk	**9.3**	**11.1**	2.2
Health Risk	0.0	0.0	0.0
Recreational Risk	0.0	0.0	0.0
Social Risk	9.3	0.0	2.2

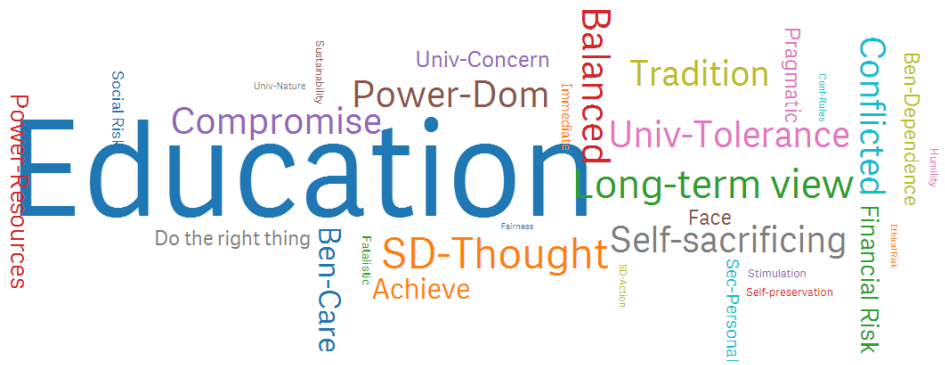
Table 28 shows that the risk codes were less prominent for this scenario, albeit with financial risk again favoured as a motivational factor. However, it seemed that this scenario did not plague the respondents' risk propensities, but was rather driven by other considerations.

Table 29. Scenario 2. Integrative Complexity and Emerging Themes

Emergent themes	Sc2-High	Sc2-Med	Sc2-Low
Balanced	**20.4**	**15.6**	**5.1**
Compromise	**16.7**	**15.6**	**5.8**
Conflicted	**16.7**	**11.1**	**2.2**
Do the right thing	5.6	6.7	8.7
Education is a priority	**53.7**	**53.3**	**59.4**
Fairness	0.0	0.0	1.4
Fatalistic	3.7	0.0	2.2
Immediate	5.6	0.0	2.2
Long-term view	**14.8**	**11.1**	**17.4**
Pragmatic	9.3	2.2	5.1
Self-preservation	3.7	0.0	0.7
Self-sacrificing	13.0	17.8	6.5
Sexist	0.0	0.0	0.0
Sustainability	0.0	2.2	0.7
Work pressure	0.0	0.0	0.0

The emerged themes proved to be very significant for this scenario (Table 29). ***The importance of education*** dominated these results with around 50 occurrences in the decision motivation. The importance of a ***long-term view*** as well as a ***balanced*** outlook, emerged from some of the participants, whereas a number of people indicated being ***conflicted*** by the question. A second wordcloud was produced, this time for the scenario 2 codes. Figure 37 shows clear prominence for the "Education is a priority" code, with Self-directed thought emerging as a distant second consideration.

Figure 37. Wordcloud for Scenario 2 Coding



4.5.4 Scenario 3 Results

The scenario 3 results were presented in Tables 30-32.

Table 30. Scenario 3. Integrative Complexity and Value Orientations

Values	Sc3-High	Sc3-Med	Sc3-Low
Self-direction-Thought	**29.3**	11.3	5.6
Self-direction-Action	1.7	1.4	0.0
Stimulation	0.0	1.4	0.9
Hedonism	0.0	0.0	0.8
Achieve	**22.4**	**25.4**	**34.3**
Power-Dominance	12.1	15.5	11.1
Power-Resources	3.4	2.8	0.0
Face	**12.1**	14.1	5.6
Security-Personal	3.4	4.2	5.6
Security-Social	**15.5**	8.5	8.3
Tradition	**13.8**	5.6	7.4
Conformity-Rules	12.1	8.5	8.3
Conformity-Interpersonal	0.0	0.0	0.9
Humility	0.0	0.0	0.9
Benevolence-Dependence	6.9	9.9	8.3
Benevelonce-Care	5.2	0.0	3.7
Universalism-Concern	6.9	4.2	2.8
Universalism-Nature	**43.1**	**35.2**	**29.6**
Universalism-Tolerance	6.9	2.8	2.8

The last scenario dealt with a trade-off between the environment and personal enrichment (unframed) or the environment and the wellbeing of the workers (framed). The decision motivation seemed to be strongly linked with concerns about nature (***universalism-nature***), as one can expect, but a number of other drivers also surfaced. Supporting research question 1, the values of ***self-directed thought, achievement, face, social security*** and ***tradition*** all came into play, but it seems that the higher quality decisions (high IC scores) featured more of these values.

Table 31. Scenario 3. Integrative Complexity and Risk Propensities

Risks	Sc3-High	Sc3-Med	Sc3-Low
Ethical Risk	8.6	8.5	3.7
Financial Risk	**39.7**	**45.1**	**22.2**
Health Risk	**13.8**	12.7	**14.8**
Recreational Risk	0.0	0.0	0.0
Social Risk	3.4	1.4	1.9

Table 31 shows that decision-making quality was also influenced by risk drivers (hypothesis 2), again dominated by the ***financial*** concerns positioned by the scenario, though the ***health risk*** considerations came into play through the nature of the risks presented to the communities around the manufacturing plant in the scenario.

Table 32. Scenario 3. Integrative Complexity and Emerging Themes

Emergent themes	Sc3-High	Sc3-Med	Sc3-Low
Balanced	**22.4**	5.6	3.7
Compromise	5.2	2.8	1.9
Conflicted	**15.5**	2.8	3.7
Do the right thing	8.6	15.5	9.3
Education is a priority	0.0	0.0	0.9
Fairness	0.0	0.0	0.0
Fatalistic	0.0	0.0	0.0
Immediate	1.7	7.0	0.0
Long-term view	**44.8**	**35.2**	**29.6**
Pragmatic	6.9	1.4	6.5
Self-preservation	1.7	1.4	1.9
Self-sacrificing	3.4	2.8	2.8
Sexist	0.0	0.0	0.0
Sustainability	6.9	7.0	9.3
Work pressure	0.0	0.0	0.0

The last batch of decision-making influencers came in the form of the emergent themes (Table 32). Most of the respondents showed that a consideration of the ***long-term effects*** of the

pollution could come into influencing the decision. High quality decisions complicated the discussion by adding that the matter presented ***conflicting*** ideas and that a ***balanced*** approach would most likely have to be followed.

The coding of the responses for the third scenario were also presented in wordcloud format in Figure 38. Here it was evident that a long-term perspective as well as the financial risk associated with the decision were on the minds of the respondents.

Figure 38. Wordcloud for Scenario 3 Coding

4.5.5 Summary of Text Response Coding and Theming

As with the quantitative results, true value can be found in generalised findings across the three scenarios.

As far as personal values were concerned, it seemed evident that the need to appear successful, capable, intelligent and influential, all sub-descriptors of the **achievement value**, was very important to the respondents, given the prominence of this code in both scenarios 1 and 3. Self-directed thought featured heavily in scenario 2 and 3, highlighting people's needs for independence and original ideas. Tradition features in scenarios 1 and 3, and societal security in scenario 2 and 3. These findings underlined those presented in section 4.4 and provided additional support for hypothesis 1.

As far as risk coding was concerned, **financial risks** dominated each of the scenarios, with health and safety risk only featuring in scenario 3. These codes, though not echoing the quantitative results around social risk-taking, suggested support for hypothesis 2 in that is illustrated a relationship between risk preferences and decision-making quality. The emergent themes tended to reflect the specific attributes of each scenario (such as the importance of education for scenario 2), but it would appear that the two temporal codes enjoyed some

prominence. Long-term view as code emerged for all three scenarios and immediate action, for scenario 1.

Lastly, the need for a **balanced view** and mentions of personal **conflicted** were quite common but seemed to gravitate towards the higher decision-making groups. This presents and relevant talking point for the discussion, as it supports the tenets of the dual processing theory of decision-making (System I/ System2) proposed by, amongst others, Stanovich and West (1998).

Figure 39, below, shows wordcloud (produced by the datamining software Qlik Sense) to reflect a consolidated view of the decision-making motivators, as reflected by the various codes.

Figure 39. Wordcloud of Decision-making Motivators

With the three families of codes presented on even keel, it is clear that achievement, financial risk, education and tradition preoccupied the respondents.

Form the results produced by the qualitative analysis of the decision responses on the three scenarios, it is thus clear that a number of personal values, risk considerations and contextual factors play a role in decision-making behaviour. These findings link to those produced by the quantitative analysis through the fact that the same decision motivators (values and risk propensities) were volunteered by the respondents. This supports the core hypotheses of this research in as much as it shows evidence of both personal values (hypothesis 1) and risk orientations (hypothesis 2) playing a role in decision-making.

4.6 Conclusion

Linking back to the four research questions, we found support for the following hypothesis:

> Hypothesis 1: During a value clash, a distinct relationship exists between an individual's value orientation and the decision-making quality exhibited.

T-Tests conducted on the proposed association between decision-making quality and the value blocks of openness to change and self-enhancement, indicated the existence of a significant relationship.

> Hypothesis 2: During a value clash, a clear relationship exists between an individual's risk propensity and the decision-making quality exhibited.

T-Tests conducted on the proposed association between decision-making quality and social risk-taking, also indicated the existence of a significant relationship.

> Hypothesis 3: In response to a value clashing decision-making scenario, the eight decision-making groups will produce decision-making responses of varying quality.

A combination of the results above, as well as the concurrent appearance of both value and risk variables in the decision tree analyses, led the researcher to infer the existence of eight distinct decision-making groups, made up from the four quadrants of the Schwartz value orientation plots and the Domain Specific Risk-Taking Scale.

> Hypothesis 4: The application of social-relational framing to value-clashing scenarios will have an impact on decision-making quality scores recorded.

T-tests conducted on the decision-making responses of the final scenario, supported the claim that a framing intervention could influence the decision quality of a value clash.

The results from the qualitative analysis of the decision responses underlined these findings, but suggested that even more factors, such as the respondents time perception and their emotional link to the context of the specific scenario, might influence decisions-making quality. The importance of these findings, as well as the relationship between the qualitative and quantitative findings, were dealt with in the discussion chapter (Chapter 5).

Chapter 5

Discussion

This chapter related a detailed discussion of the results.

5.1 Introduction

The discussion focused on interpreting the research results and was written to illustrate a link between the decision-making model, the hypothesised relationships between personalistic attributes and decision-making quality and the gap in our current understanding of decision-making behaviour. Three mini case studies were employed to illustrate the importance of individuality in decision-making behaviour, where the research results were discussed per hypothesis from paragraph 5.4 onwards. The decision-making framework proposed in Chapter 2 was revisited to illustrate the relevance of the findings and tie the discussion together.

5.2 Discussion of the Sample, Research Design, Instruments and Experimental Design

The four instruments employed during the research were assessed for internal reliability and applicability for achieving the goals set by the research design. The results from these investigations and their implications for the design were discussed below. But first, closer scrutiny of the sample obtained for the research project, was required.

5.2.1 Validity of the Sample – Size, Make-up and Sector

It was deemed necessary to discuss the appropriateness and validity of the sample in greater detail. In total, 461 respondents participated in the survey. Of these respondents, 384 completed at least the demographics, 278 completed value survey, 281 the risk survey, 276 the first scenario 264 the second and 253 the last survey. Compared to similar studies in the field of decision-making (Ariail et al., 2015; MacGregor et al., 1999), these figures bode well. As shown in section 3.7, studies by leading authors in this space employed sample sizes between 150 and 300, giving this study the academic rigour required in the field as far a sample size is concerned.

The sample originated in the FMCG (fast-moving consumer goods) sector and was drawn from a single company. Although it can be argued that a single-source sample could hamper the generalisability of the findings, a case can also be made to support the opposite view. Since the sample was purposefully selected to represent a single company context, external influences such as company culture have been controlled for. The research has been

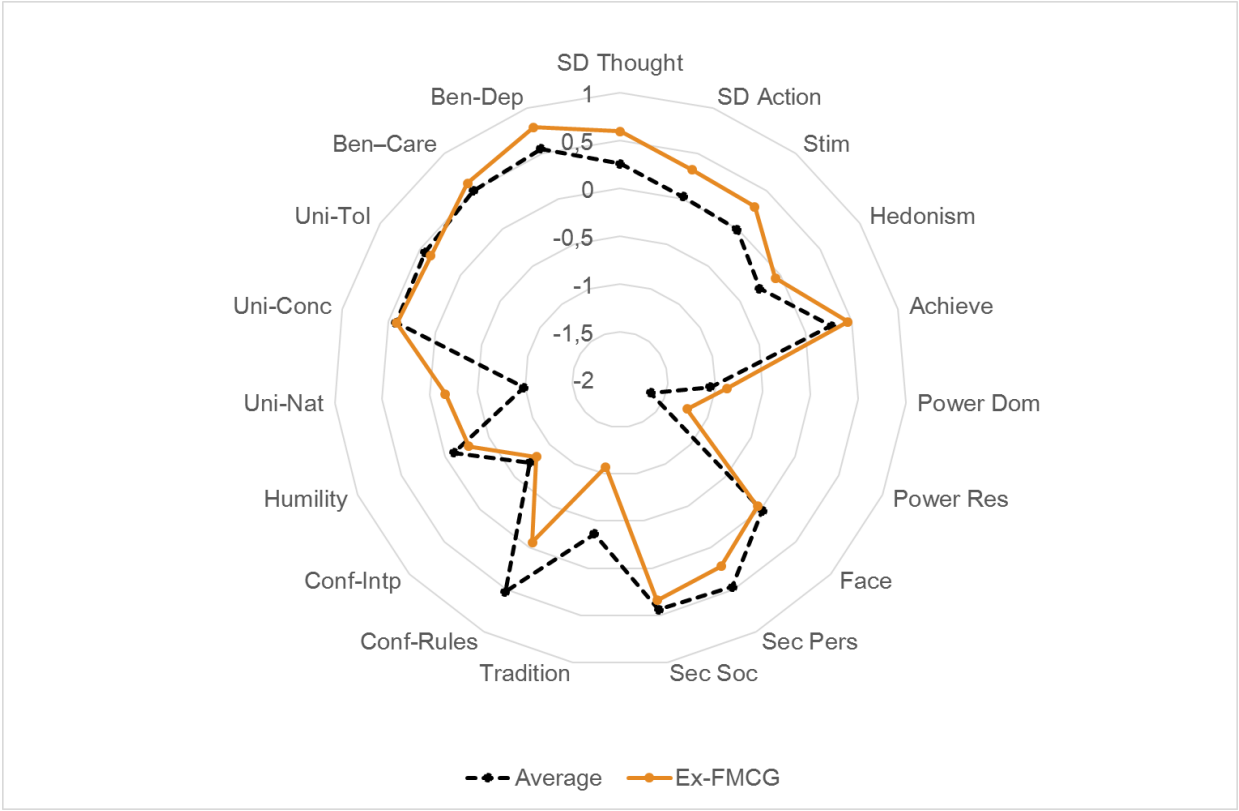
conducted within the boundary of a single firm's "value set" and risk culture, thus negating its possible influence on the findings. The matter whether the findings of this specific sample can be generalised across other contexts, needs to be addressed though.

As mentioned in the research design section, a number of pilot runs were conducted prior to the bulk research drive. These mini data collections, though aimed at testing the decision-making scenarios, provide the added benefit of a sample benchmark. Figure 40 compares the value sets of three populations against the core sample set collected from the FMCG. These samples present the averaged value orientations of a group of 14 PhD students, a group of 29 middle managers from the insurance industry and a sample of 16 managers from the metal manufacturing industry (shown as the orange line) with the core sample (black dashed line).

From Figure 40, the basic format of the human value set becomes apparent. The two lines form similar peaks and troughs, with the exception of universalism-nature and tradition. It is proposed that these differences reflect the internal culture of the target company, whereas the points of overlap represent commonly held human values.

So, for the purpose of this research and addressing the question of generalisability, the value plots seem to suggest that similar findings would be gathered should the study be repeated in different industries.

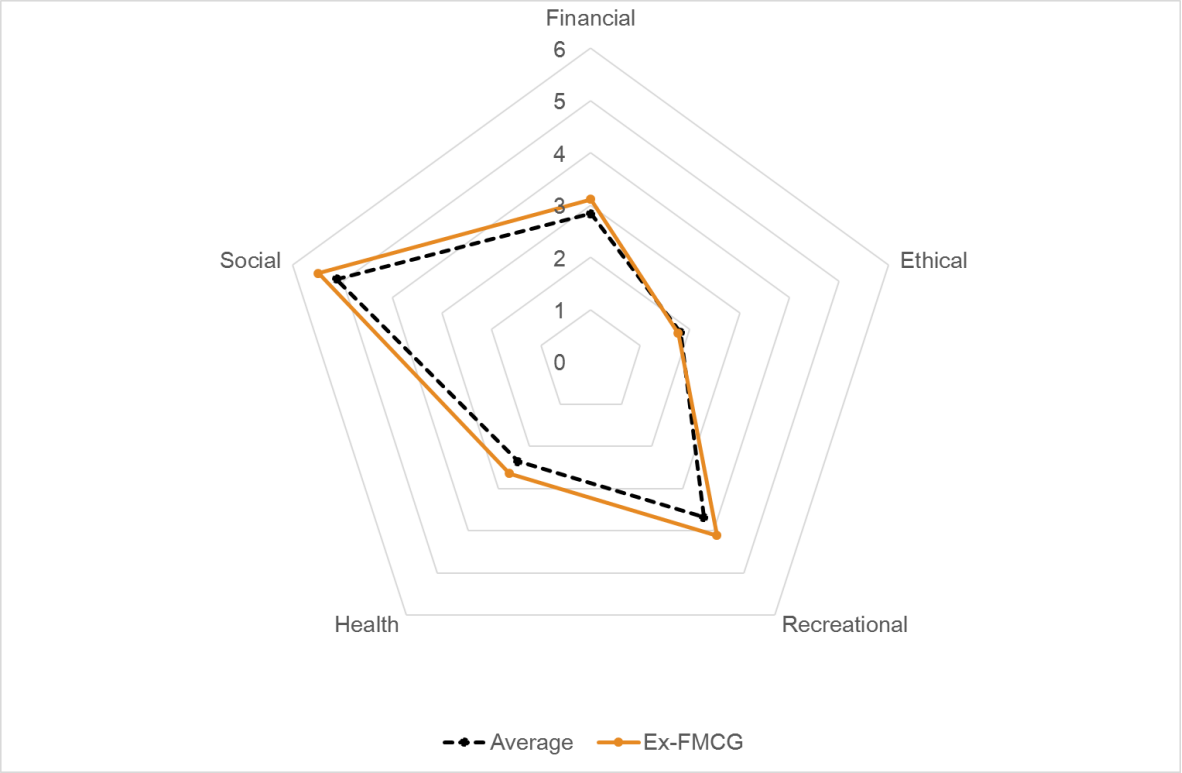
Figure 40. Value-sets Compared Across Industries



It should also be noted that the ex-FMCG sample was still fairly small at 59 and possibly not representative of the broader management population.

Figure 41 shows a similar comparison as far as the risk plots are concerned. The basic shape of the spider graph is maintained for the ex-FMCG sample, showing perhaps a slight propensity to higher risk-taking for this group. These differences appear to be insignificant and indicative of broader human risk-taking tendencies. It is therefore also proposed that these differences on their own should not produce significantly different findings, should the study be repeated in another industry.

Figure 41. Risk plots Compared Across Industries



However, as each instruments required different analysis techniques, and had a different literature origin, the instruments were treated separately.

5.2.2 Schwartz Portrait Value Questionnaire

The Schwartz Portrait Value Questionnaire produced test results with a high degree of internal validity as far as the value blocks were concerned. (see the Cronbach's Alpha measurement in Chapter 4). However, some individual value assessment (humility and benevolence-care most notably) failed to produce reliable scores. Although the sample size employed for this instrument (278) corresponded well with similar investigations in the literature, it seemed that perhaps the instrument was not perfectly fitted to the cultural setting of this study. A multi-test,

multi-nation program lead by Shalom Swartz using sample sets varying between 200 and 500, did however not include a South African sub-sample. In fact, no African countries were included in their work (Schwartz et al., 2012).

The wide use of the Schwartz Portrait Value Questionnaire in psychology (Schwartz et al., 2012) as well as ethical decision-making (Watson et al., 2009) puts in it good standing with academic researchers and confirms its position as measure of good rigour and repeatability. With the above information taken into consideration, it seems prudent to conclude that the use of the Schwartz Portrait Value Questionnaire when assessing value blocks succeeded for this context.

5.2.3 DoSpeRT Scale

The DoSpeRT Scale produce comfortable Cronbach's Alpha scores (0.62-0.81) for most of the risk domains, producing a marginal reliability score only for the Ethical domain (at a score of 0.54). The original findings by the authors of the DoSpeRT Scale (Weber et al., 2002) produced Cronbach Alpha's of around 0.69 - 0.83 from sample sizes around 540 respondents (Study 1). So, though the instrument seems grounded and strong, perhaps the cultural setting of this study was not perfectly fitted to this instrument. However, given that the core findings around domain-specific risk-taking showed a strong correlation between increased decision-making quality and higher risk-taking in the social domain, and that this domain resulted in a comfortable Cronbach's alpha score of 0.63, the findings are deemed to be sound and statistically meaningful.

Alternative risk-taking measures could be considered for future research programmes. The DMIDI (Decision Making Individual Differences Inventory) maintained by the Columbia University of New York, contains a number of decision-making assessment tools and instruments. The risk-taking surveys are presented in accordance to the framework proposed by Weber and associates (Weber et al., 2002) and consists of personality trait risk measures (11 scales), behavioural risk measures (15 scales), measures of risk attitude (13 scales) and ambiguity measures (5 scales). Perhaps the more business oriented Business Risk Propensity Scale (BRPS) (Sitkin & Weingart, 1995) could be implemented in the design, or the newer Passive Risk Taking Scale (PRT) (Keinan & Bereby-Meyer, 2012) that has a stronger ethical focus, and delves deeper into risk avoidance behaviour.

5.2.4 Integrative Complexity Measure as a Measure of Decision-making Quality

The application of the integrative complexity measure to assess decision-making quality is presumed to be a novel addition to the decision-making space. The measure is typically used to assess leader personality, conflict resolution, quality of communication, information

processing styles and complexity of decision-making (Suedfeld & Tetlock, 2014), but it has not to the knowledge of this researcher ever explicitly been used as a measure of decision-making quality.

With this new direction comes a multitude of questions. Was this an appropriate tool to measure decision-making quality by? Was the application of the tool successful? Can the findings be repeated? Has this amendment contributed to the extant literature?

The results produced in this research program showed that significant relationships existed between decision-making quality (as measured by integrative complexity) and the values blocks of openness to change and self-enhancement as well as to risk-propensity in social settings. It is perhaps important to remember at this stage that integrative complexity was selected as a measure of decision-making quality because its subsets, differentiation and integration, were argued to be the building blocks of thoroughly considered, System II decisions. With this in mind, a case can be made that the instrument worked as it managed to differentiate the decision responses to the three scenarios along established personal values and risk propensity frameworks.

However, the contribution of the integrative complexity measure to this research was of much more value than a simple outcome variable. In addition to providing a measure whereby decision-quality could be assessed, the instrument also provided a wealth of qualitative data. In-depth coding of the integrative complexity text elements revealed not only the quality of the decisions, but also the deeper motivations behind them. This additional level of analysis helped gather additional support for the quantitative results that showed that decision-making quality was influenced by personal value orientations and risk propensities. It also revealed a number of alternative decision motivations not supported by either value or risk framework, deepening the quality of the findings.

Therefore, it can be concluded that incorporating integrative complexity as measure of decision-making quality was warranted. It assisted the researcher in showing clear relationships between value and risk orientations and decision-making quality, but was also instrumental in suggesting alternative motivations behind value-clash decisions.

5.2.5 Design of Value-clashing Decision Scenarios to Test Value-driven Decision-making

The last instrument used during the research and that also warrants a discussion, is the value-clashing decision-making scenarios. The scenarios were crafted from scratch, taking guidance only from the frameworks proposed by Fiske's social-relational framing (1992), Tetlock's value pluralism model (1986) and of course Schoemaker and Tetlock's taboo scenarios (2012).

The testing of the scenarios during the pilot phase revealed that rewording and re-balancing of the scenarios led to improved instruments, better positioned to test the value-driven decision-making of the target audience. This process of homing and improvement will undoubtedly be required in the future as better scenarios can still be produced.

The scenarios used for this study had a very specific South Africa flavour and were purposefully written in this way to unearth the depth and complexity of the local socio-economic landscape. Repeating this study in a different country would naturally require these scenarios to be reframed to fit the local context.

Lastly, seeing as the reframing of the scenarios was presented in order of increasing severity, guidance on the extent of reframing required in a scenario, can be taken from the results. Two of the three framings failed to have a significant impact on the decision-making quality. Future researches might want to revisit the extent of framing used in the scenarios, so as to induce a greater influence on the decision-making quality. One particularly relevant finding of this study was that only one scenario reframing produced a decision-quality increase. This suggests that a framing intervention alone is not sufficient for causing an increase in decision-making quality, but that the extent to which framing is introduced also plays a role.

These scenarios present a good starting point though, and can be improved in future investigations. It is suggested that the reframed scenario be presented with a much more explicit difference (value clash vs value trade-off), or that three versions of the same scenario is tested (unframed, mildly framed, explicitly framed) to determine the point where the intervention affects the decision-making quality.

A number of case studies were introduced to illustrate the variance in decision-making behaviour between respondents of varying value- and risk orientations across the three scenarios.

5.3 Mini Case Studies

Given the uniqueness of each of the three scenarios, and the emerging results suggesting varying degrees of decision-making quality for respondents with differing demographic, value and risk attributes, a case study type discussion was introduced to explicate the data further and to delve deeper into the decision-making behaviour by group hypothesis (hypothesis 3) suggested in Chapter 3.Since limited direct evidence was shown to support Hypothesis 3, the case studies were incorporated to show selections of value and risk attributes work together to show a relationship on decision-making quality.

5.3.1 Case Study Design and Selection

Three mini case studies were therefore selected to illustrate the variance exhibited between individuals' handling of the different decision-making scenarios. The decision-tree results from each of the scenarios as well as the ATLAS.ti text coding, were used to produce decision-making characters of opposing traits, as indicated by their decision-making quality scores (IC3 scores). The following determinants and personal characteristics were considered when selecting the different cases.

Demographics – gender, age, culture, management level
Value sets – tradition & benevolence-dependence
Risk propensities – financial risk taking
Decision-making attributes – IC-score and comfort
Emerged drivers – Time focus (immediate vs long-term)

The three sections below attempted to illustrate the antecedents to the differences in decision-making quality exhibited by the participants during the survey. Each case starts off with a description of the individual's key traits as well as the relevant value, risk or decision-making attribute used to discriminate with. The quote following is the motivation presented respectively by each of the respondents on why and how they made that particular decision. Note that for the first two cases, the scenarios were chosen to reflect the exact same conditions, so as to negate the effect of the framing intervention. However, for the third scenario a closer look at the impact of the framing intervention was made.

Also included in the case studies were the individual value orientations and risk propensities in graphical form, to further illustrate the variance between the candidates in these areas. The two individuals' assessment were presented on the same graph, with the respondent exhibiting a higher quality decision shown in a solid line, and the respondent exhibiting a lower quality decision, with a dotted line.

5.3.2 Scenario 1 Case Study

5.3.2.1 High Quality Decision

Tables 33 gives the details of the first respondent to scenario 1 – high quality decision.

Table 33. Respondent Giving a High-quality Response to Scenario 1

Respondent number	**Gender**	**Culture**	**Age**	**Management level**	**IC score**
R_2Bh2OteDGQXVtf7	Male	Afrikaans	31-40	Junior	High
Value orientation: Tradition < -1.67					
Scenario framing - unframed					

"In the end I do not feel very comfortable with my decision due to the fact that it is stated that I will not comply with the BEE legislation [South African legislation targeting Black Economic Empowerment]*. My decision revolves around the following motivation. I need to look after the company's best interest by employing the experienced candidate. I will put my company in the best possible position to not loose sales and market share. I believe the best candidate should be appointed no matter of the race of that person. If the better suited candidate was the black female my decision would have been to employ her."*

Figure 42. Value Systems for Scenario 1 Case Study

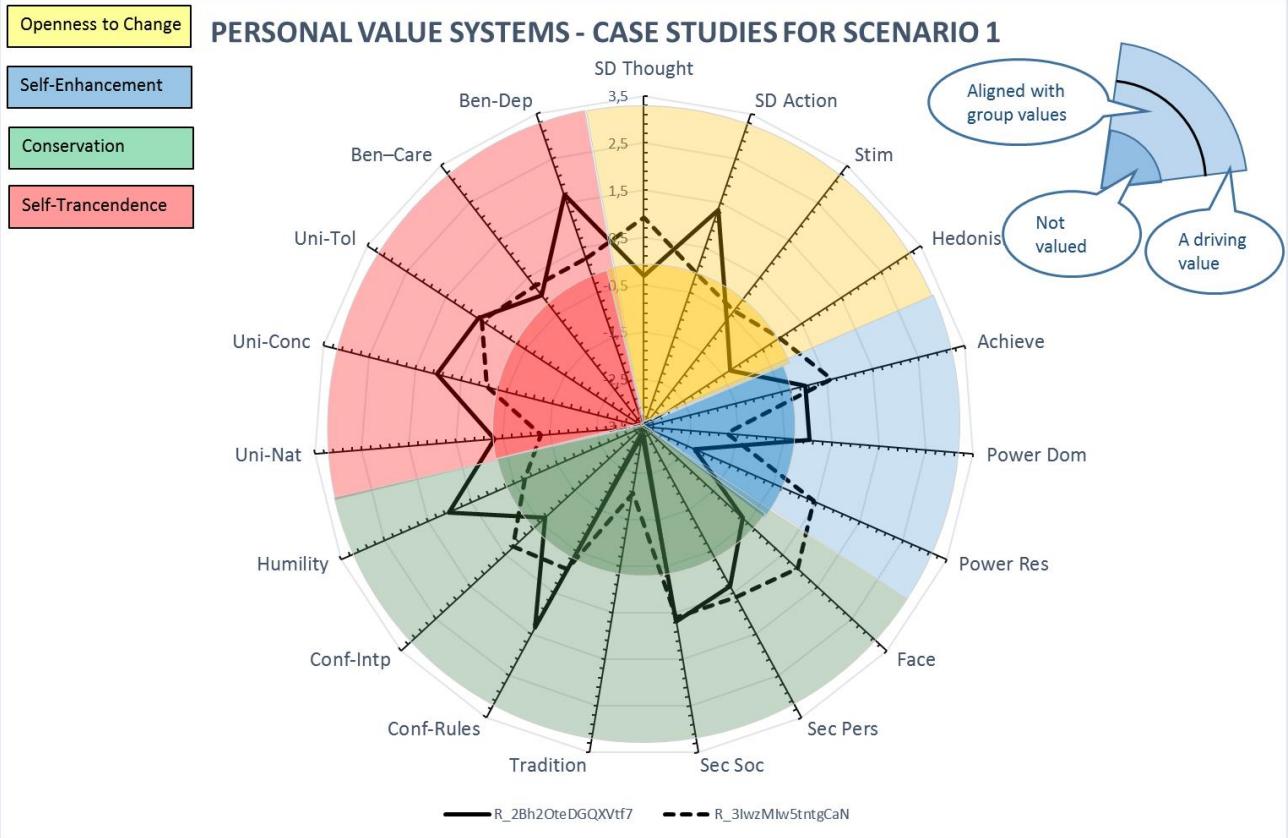
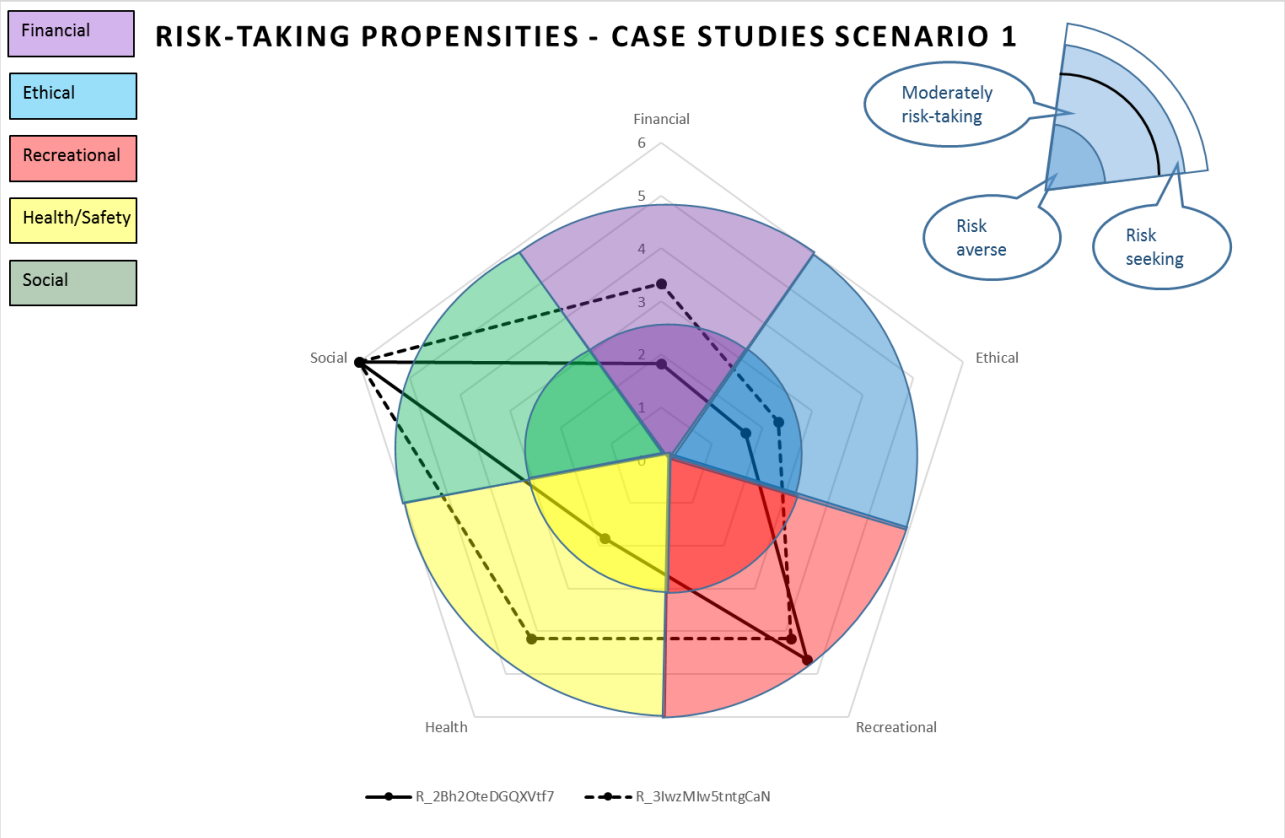


Figure 43. Risk-taking Profiles for Scenario 1 Case Study



5.3.2.2 Low Quality Decision

Table 34 shows the detail of the second respondent to scenario1 – being the candidate that provided the low-quality decision.

Table 34. Respondent Giving a Low-quality Response to Scenario 1

Respondent number	**Gender**	**Culture**	**Age**	**Management level**	**IC score**
R_3IwzMIw5tntgCaN	Female	Black	18-30	Middle	Low
Value orientation: Tradition > -1.67					
Risk Propensity: Financial < 2.4					
Scenario framing - unframed					

"I believe the white man was a better candidate for the job and it's only fair that the vacancy is filled in on merit basis not favouritism."

5.3.2.3 Discussion

The two cases presented above illustrate the acute differences present in two of the respondents, reacting to the same scenario. From Tables 33 and 34 listing their personal traits, the respondents differ in gender, culture, age and management level. From the values and risk charts (Figures 42 and 43) we also see significant differences; especially

around the tradition and power-resources values, as well as the health- and financial risk proclivities.

The motivational text sections depict even further differences. The first candidate discussed the decision at great length and took care to motivate his thinking around the eventual conclusion. The second candidate was much more succinct and opted for a one-dimensional motivation.

It is significant to note that the two people came to the same conclusion (employing the white male candidate), but that the quality of the decisions differed markedly. From these texts, it is also evident that the motivation for the decision came from different roots. The first respondent exhibited feelings of discomfort and uncertainty (note his high regard for conformity to rules) but opted to appoint the male candidate on ground that it would be to the benefit of the company. His tendency to avoid financial risk-taking, coupled with his need for self-directed action and need for social security (and by extension, his need for a secure work environment) probably assisted his decision.

The second respondent only showed regard for fairness during her motivation. It is not clear what she meant by this statement, seeing as her score for universalism-concern was fairly low. She exhibited a higher score on achievement though, which could have prompted her to act in a way that would ensure the success of the firm.

5.3.3 Scenario 2 Case Study

5.3.3.1 High Quality Decision

Tables 35 and 36, as well as Figures 44 and 45 give the details of the scenario 2 case.

Table 35. Respondent giving a high-quality response to scenario 2

Respondent number	**Gender**	**Culture**	**Age**	**Management level**	**IC score**
R_2zeH39qY8vL2u9c	Female	Afrikaans	31-40	Middle	Very high
Value orientation: Benevolence, dependence > 1.54					
Decision-making: Comfort > 2.5					
Scenario framing - unframed					

"Appointment of 20 teachers will spread workload and address failing standards in school, critical for better quality schooling. However current teacher demands will not be met and there will be work needed to ensure integration and acceptance. Politically, I would rather be voted out for doing what is right than bending to pressure from the union."

Figure 44. Value Systems for Scenario 2 Case Study

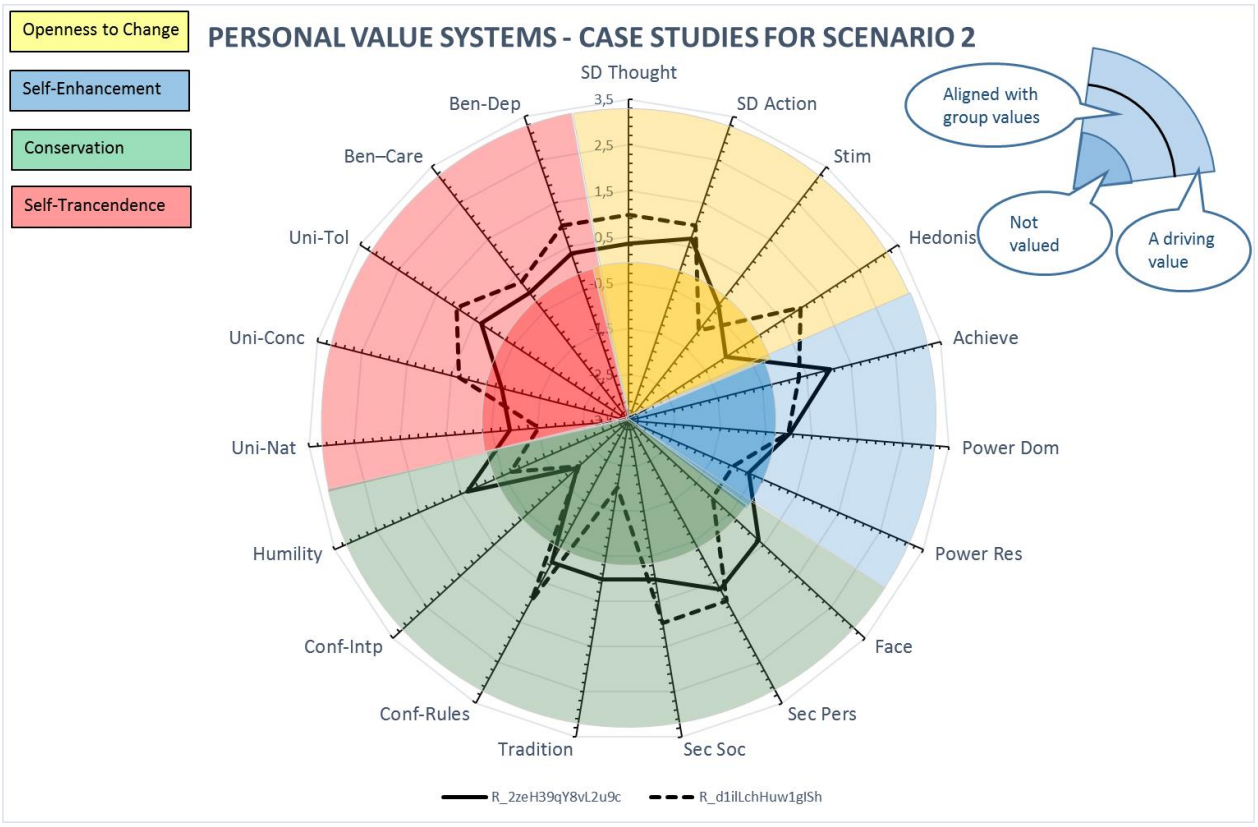
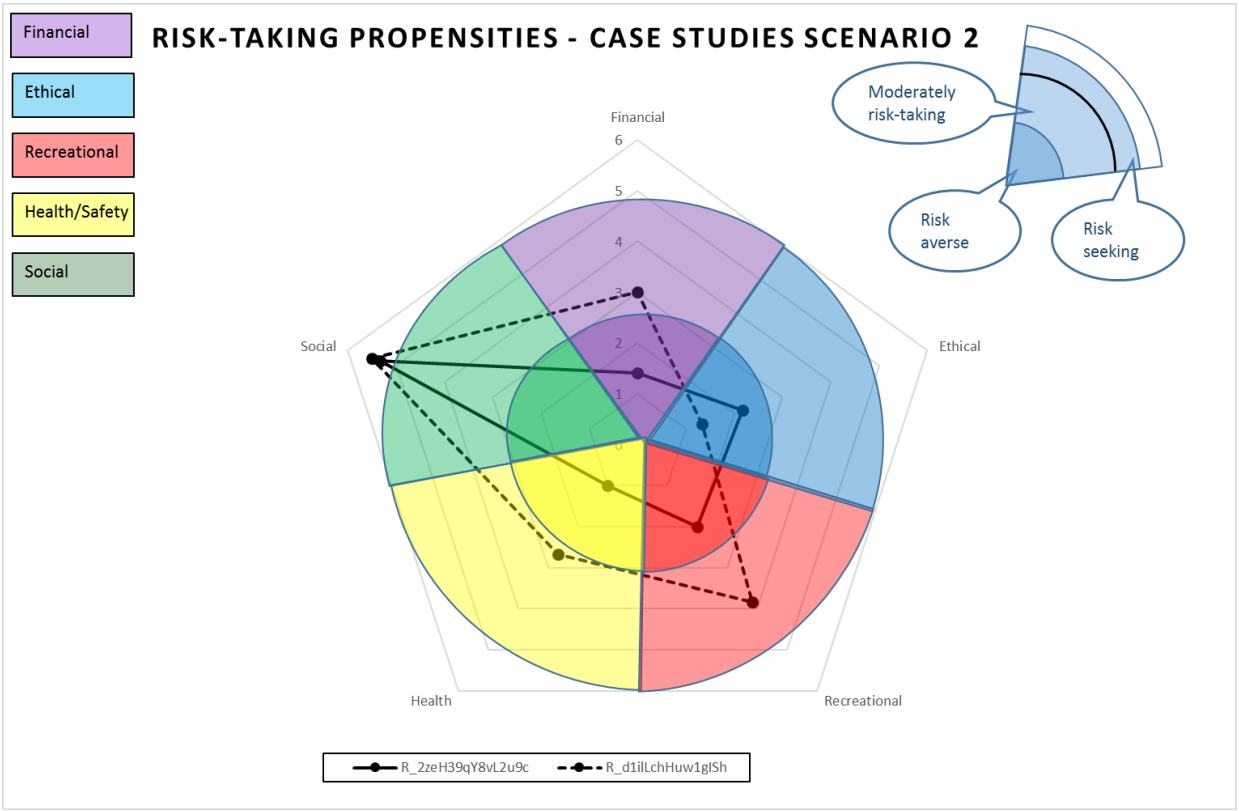


Figure 45. Risk Profile for Scenario 2 Case Study



5.3.3.2 Low Quality Decision

Table 36. Respondent giving a low-quality response to scenario 2

Respondent number	**Gender**	**Culture**	**Age**	**Management level**	**IC score**
R_d1ilLchHuw1gISh	Female	English	31-40	Middle	Low
Value orientation: Benevolence, dependence < 1.54					
Decision-making: Comfort < 2.5					
Scenario framing - unframed					

"The youth are tomorrow's leaders."

5.3.3.3 Discussion

As with the first scenario, two very contrasting cases were presented. However, for this instance, the two respondents were remarkably alike. Both candidates were females, aged between 31 and 40 and in middle management. The only differed with regards to their cultural background with one speaking Afrikaans and the other English (Tables 35 and 36).

A look at the value systems (Figure 44) reveal only tradition as a clear difference between the two candidates, but this value did not surface in the motivations. The risk assessments (Figure 45) make for thought provoking reading with the two women exhibiting clear difference. The first respondent exhibited very low risk-taking tendencies, underscoring to the other candidate in almost all of the domains. She would therefore be a very cautious person and not very comfortable in difficult decisions. This analysis was supported by the comfort she exhibited during the decision. She was uncomfortable with the situation and went to lengths to justify her position. The other candidate exhibited a tendency towards risk-taking and was much more comfortable in her decision. It is possible that this trait influenced her make a relatively one-dimensional decision.

5.3.4 Scenario 3 Case Study

5.3.4.1 High Quality Decision

Tables 37 and 38 show the details of the scenario three case study.

Table 37. Respondent Giving a High-quality Response to Scenario 3

Respondent number	**Gender**	**Culture**	**Age**	**Management level**	**IC score**
R_1po5gWxToyxOZ5f	Male	English	41-50	Middle	High
Value orientation: Tradition -1.2					
Scenario framing - framed					

"In the interest of profits and job creations many companies make this mistake. We only have one planet and we are currently killing it at a fast pace. I firmly believe that if we make the investment it will in the beginning hurt the bottom line and place strain on employment, but ultimately if we as management team sit down and strategize through improvement initiatives, we could not only help to prevent job losses but in fact possibly end up creating more jobs."

5.3.4.2 Low Quality Decision

Table 38. Respondent Giving a Low-quality Response to Scenario 3

Respondent number	**Gender**	**Culture**	**Age**	**Management level**	**IC score**
R_1MlDHznBgD6LoXv	Male	English	41-50	Middle	Low
Value orientation: Tradition -0.4					
Scenario framing - unframed					

"If I'm going to run at a loss then it does not make sense."

Figures 46 and 47 show the value- and risk profiles of the two respondents chosen for the third case study.

Figure 46. Value Systems for Scenario 3 Case Study

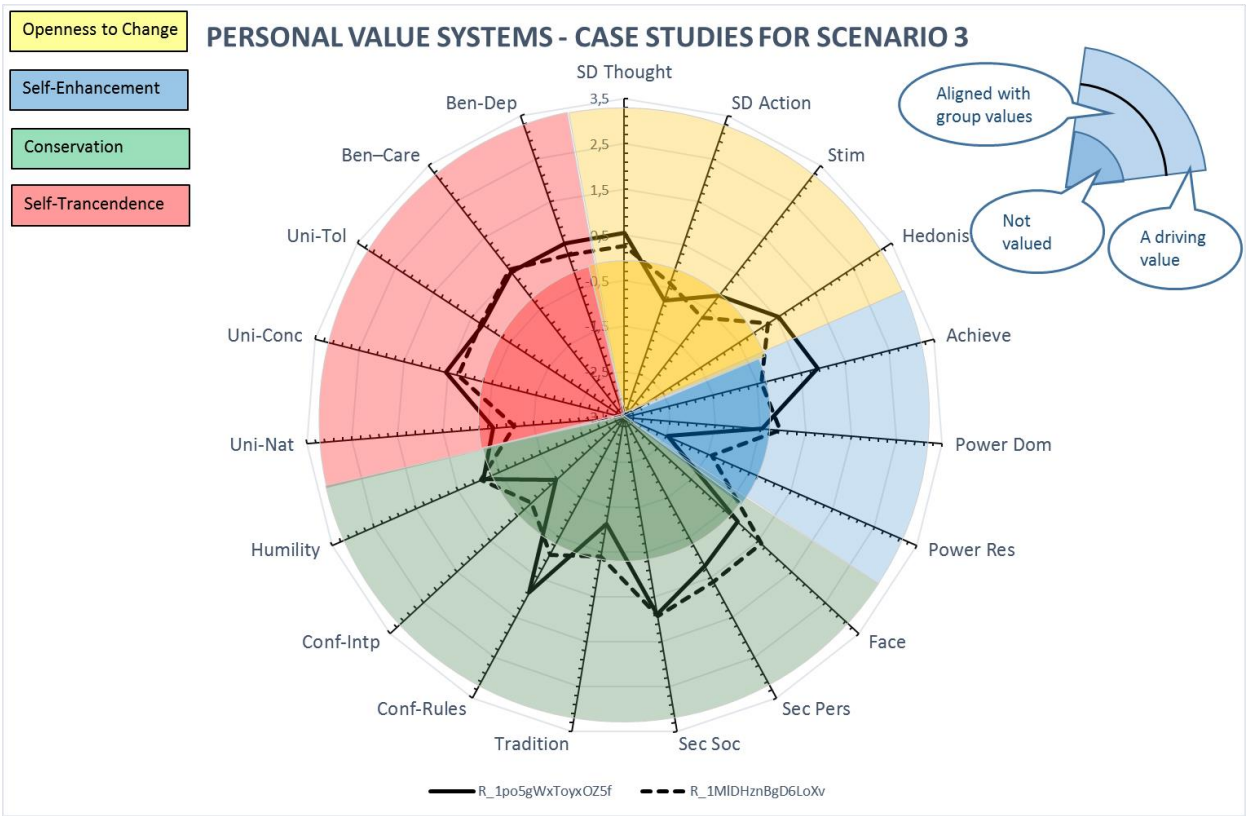
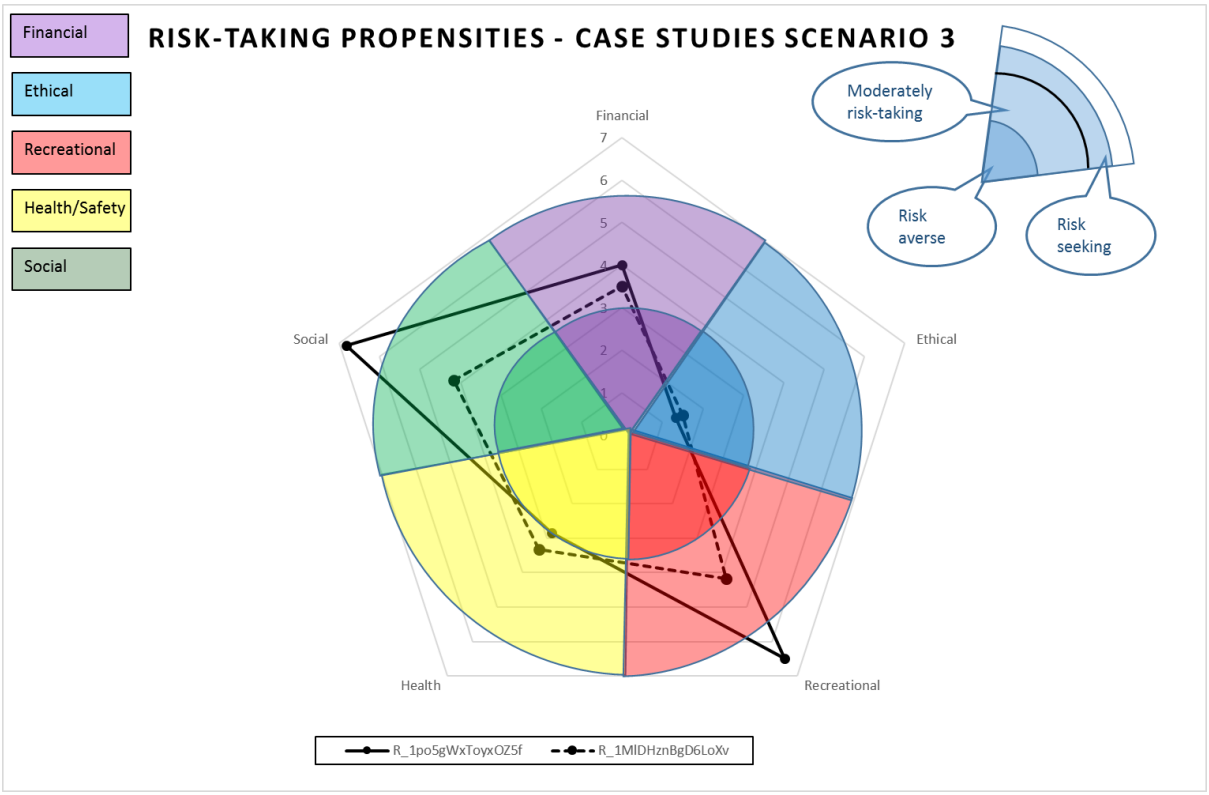


Figure 47. Risk Profile for Scenario 3 Case Study



5.3.4.3 Discussion

For this scenario, the aim of the investigation was to determine what effect framing had on the scenario. To achieve this, it was decided to remove as many of the variables from the discussion, and focus on the effect of the intervention. The two tables (Tables 37 and 38) above show two very similar respondents with both being English males from middle management, aged between 41 and 50. Both respondents scored relatively low for the tradition score (-0.4 and -1.2), an important determinant for this scenario. The main difference between them thus was the framing of the scenario.

As indicated in the results section, the framing intervention produced a statistically significant impact on the decision-making quality of the large population. The two cases presented here, it seems to support hypothesis 4, that stated that the introduction of social-relational framing would increase the decision-making quality exhibited by the respondents. The first respondent replied to the framed scenario and showed great detail in motivating his decision. He made an emotional plea against short-term profit taking and urged for a more sustainable solution. The second candidate, presented with a simpler choice, opted for a one-line response focussed purely on profit. Given the similarity of the two respondents in their value and risk assessments, it is possible that the presentation of the scenario produced these varying result.

5.4 Interpretation of Results

The results shown in Chapter 4 was discussed in the section below an interpreted against the extant literature. The results were discussed using the framework presented and the hypotheses proposed in Chapter 3.

5.4.1 The Role of Personal Values in Predicting Decision-making Quality

Hypothesis 1, page 78 proposed that during a value clash, a distinct relationship exists between an individual's value orientation and the decision-making quality exhibited. Although different values were shown to play a role in the different scenarios, it would appear that generalised findings emerged around groups or blocks of values. From the consolidated results presented in Table 23, it seems evident that higher quality decisions were associated with the openness to change and self-enhancement value sets.

The openness to change block consists of the values self-directed thought, self-directed action, stimulation and to an extent, hedonism. These values speak to people who value new experiences, creativity and freedom of thought and action. Intuitively it makes sense that participants valuing these orientations would produce higher quality decisions (reflected in higher scores of conceptual differentiation and integration), as they favoured novelty and complexity.

The self-enhancing individuals typically favour personal achievement and power over people and resources. The value of face (the need to maintain a specific public image) borders this block and can be seen as a contributory orientation. At first glance, it seems that this finding presents a contradiction. Surely self-centred individuals, only concerned with their personal advancement and power spheres will not consider decision attributes beyond their personal needs precluding them from high-quality decisions? The reverse was in fact shown by the results and requires a deeper analysis.

The reason for this observation is not clear. It could be that self-enhancing individuals are aware of the self-centred nature of their position, and resultantly go to greater lengths to explain the decision they've made, causing a higher quality decision. It could also be that self-enhancement comes with seniority. The data in Chapter 4 seemed to suggest that senior managers produced higher quality decisions. Perhaps seniority, with its requirements of leadership, self-drive, ambition and self-believe instils a sense of self-enhancement. This might mean that measuring self-enhancement might not be measuring self-centredness, but rather self-belief and power of personal conviction. It could also be, should seniority be the driver behind higher quality decisions, that the experience and communication skills

associated with successful managers caused higher quality decisions to be made, and not their value orientations.

The closest study in the literature is the work by Fritzsche and Oz on the role of personal values in making ethical decisions (2007). The authors established support for specific value orientations and ethical decision-making. Using the Schwartz Value Survey (Schwartz, 1994), Fritzsche and Oz showed a strong relationship between altruistic (self-transcending) values and ethical decision-making, but negative relationship between ethical decision-making and the value blocks of openness to change, tradition and self-enhancement.

At first glance, these findings seem to suggest the opposite of the findings in this report, where self-enhancement and openness to change came up trumps. But different outcome variables were used. Ethical decision-making and quality decision-making are not the same thing. Both attributes are desirable in decision-making, but hail from very differing origins. The ethical dimension prescribes a judgement, stating whether a specific decision was either right or wrong, ethical or unethical, acceptable or unacceptable. Quality decision-making on the other hand requires no judgement, but seek rather to evaluate the complexity of the thought involved.

From this perspective, the outcomes are in fact opposites. Ethical decision-making deals with matters of the heart, with feelings and personal dispositions (Fritzsche & Oz, 2007). It calls for a judgement call based on a first-instinct value perception of the matter at hand. In this, it resembles a System I response with limited discussion, thought or process. Quality decision-making, described by integrative complexity, is in fact the exact opposite. Quality decision-making calls for considered thought, deliberate consideration, differentiation of all aspects of the question, integration of related matters and the formulation of a deep and textured response. Quality decision-making is detached from value-drivers and looks beyond one's personal belief system.

With this important distinction in mind, it seems plausible that these findings build on the work of Fritzsche and Oz (2007). If ethical decision-making and quality decision-making have opposite drivers, then we can naturally expect them to have opposite value drivers. Seeing as this is exactly what the data suggests, can conclude that this work extends upon the core position of Fritzsche and Oz (2007), which was that varying value sets will result in varying decision-making behaviour. The two studies just chose different (and fundamentally opposite) outcome variables.

5.4.2 The Role of Risk Propensities in Predicting Decision-making Quality

Hypothesis 2, page 79 proposed that during a value clash, a distinct relationship exists between an individual's risk propensity and the decision-making quality exhibited. The findings suggested that four of the five domains (financial, ethical, recreational and health & safety) played very small roles in influencing decision-making, but that proclivity to social risk-taking dominated the scenario responses.

At first glance, this finding seems arbitrary and perhaps unconnected. However, if we position this against the findings of personal value systems, a case can be made that it fit a larger decision-making model. People prone to risk-taking in the social domain are those individuals comfortable with scoffing the status quo and rebelling against tradition and perceptions. From this perspective, there seems to be an overlap in social risk-taking and openness to change as those individuals comfortable with rebelling against social conventions, would typically be the same individuals who would be open to new things, would value original thought and be likely to follow their own head in decision-making. The orientations complement each other.

And when considering the social risk-taking against self-enhancement, perhaps a case can be made that the self-confidence required for social rebellion is the same personality trait allowing individuals the conviction of thought to act in their own interests, and to assume power over resources and other people. This lines up beautifully with the argument in the previous paragraph that senior managers produced higher quality decisions because their experience have entrusted emboldened their decision-making behaviour, allowing them to take greater social-domain risks.

If a proclivity for taking risk in social settings thus supports the value orientations of self-enhancement and openness to change, then the findings that social risk-taking promotes higher quality decision-making makes sense and supports the core tenet of this research: that specific value orientations and risk proclivities are related to higher quality decision-making behaviour.

5.4.3 Inter-instrument Confirmation of Results – Qualitative vs Quantitative Datasets

Now if the assertions above were a true reflection of the decision-making behaviour exhibited by the participants in the research, similar themes would have emerged from the qualitative data. As mentioned before in Chapters 3 and 4, the text elements produced by responding to each of the three decision-making scenarios were not only coded towards establishing the integrative complexity measures for the decisions, but were also coded to determine the deeper motivations driving the choices of the respondents. In responding to the request:

"*Please take 5 minutes to describe how you came to your decision on the scenario*" the respondents had carte blanche to list any reason (or none at all, it they so preferred) to support their decision. It therefore stands to reason that these motivational statements were made from a place of true conviction and honest motivation in answering the scenario questions.

Analysing the qualitative responses aggregated across the entire population and all three scenarios, is thus of great importance, as it gives us an indication of the general values and orientations driving decision-makers. Figure 39 (repeated here as Figure 48), shows a wordcloud depicting the most prominent drivers behind the scenario responses.

Clearly the values of achievement, conformity-rules, tradition and power-dominance and the risk in the financial domain dominate the graphic. (Education is ignored for the time being, as it was seen as a response to very specific scenario, and only occurred for this scenario.)

However, this picture above shows responses of all quality (high, medium and low) and from all the respondents. Selecting for high-quality decision-making, the picture changes somewhat. Achievement remains as a core driver, but self-directed thought appears more prominent. Financial risk and education diminishes and the graphic appears to be very crowded and well-populated.

Figure 48. Aggregated Scenario Responses Shown in Wordcloud Format

When this high-quality wordcloud is compared with the low quality one, we see a marked difference. The low-quality depiction is clearly less populated and contains much less terms. This is to be expected, given the nature of the quality assessment mechanism (integrative complexity) that awards multiple terms with high scores. Achievement remains a key driver for

these results, but self-directed thought, power-dominance and a long-term view wane in favour of financial risk, education and tradition. With the limitations of this method of analysis in mind, we find supporting evidence that specific value sets, broadly aligned with self-enhancement (such as achievement and power-dominance) and openness to change (Self-directed thought) contributed to higher decision-making quality. Lower quality decision-making seems to have favoured values associated with self-transcendence (universalism-nature, universalism-concern, benevolence-dependence) and conservation (conformity rules and tradition).

Figure 49. Aggregated Wordcloud – High Quality Responses

Figure 50. Aggregated Wordcloud – Low Quality Responses

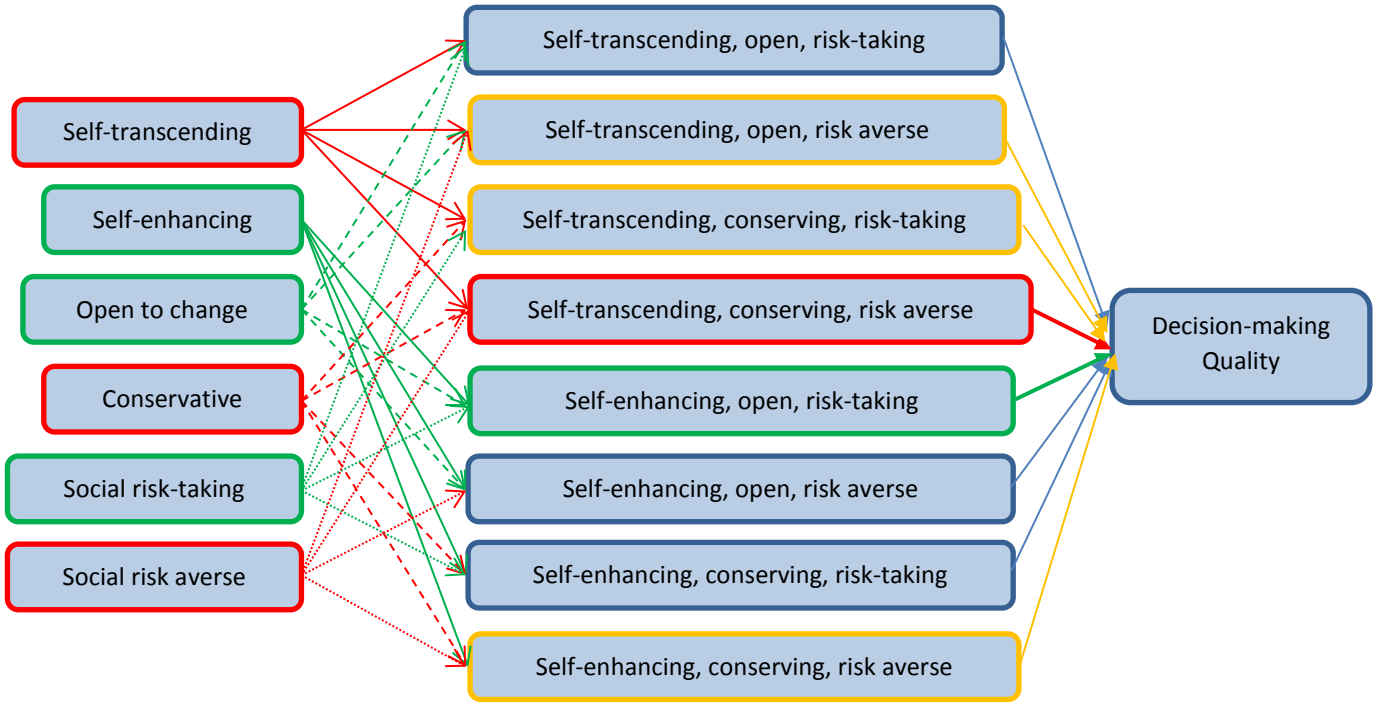
5.4.4 Decision-making Characters/Personalities as Predicted by the Value and Risk Results

The study set out to gather evidence in support of the broad decision-making framework depicted in Figure 17. Sufficient evidence has now been presented to support **Hypothesis 3**, that the combinations of specific value orientations and risk propensities into groups of

decision-makers can be used as a predictor of higher quality decision-making behaviour. Figure 51 shows the various value and risk attributes in combination to form eight decision-making characters or personalities.

Taking direction form the overview of the findings (Table 23), as well as the insights presented by the mini case-studies, we can revisit Figure 17 to produce an illustrated depiction of the findings. The personal attributes predicted to produce higher quality decisions were coloured green and the attributes responsible for lower quality decisions, red. Following the lines and logic of Figure 17, the resulting personalities can now be coloured in accordance to the expected decision quality, Hence, a personality receiving three green arrows (Self-enhancing, open, risk-taking) is also coloured green to reflect the high-quality decision expected from these individuals. Similarly, the Self-transcending, conserving, risk averse group, created from three red arrows, is coloured red. Blue edges were used for the characters created from two green inputs and one red one, and yellow for characters created from two red arrows and one green one.

Figure 51. Decision-making Framework



Predicting of the expected decision-quality delivered by the various personalities should therefore follow the following order, arranged from highest decision-making quality to lowest:

Self-enhancing, open, risk-taking **>** Self-transcending, open, risk-taking, Self-enhancing, open, risk averse and Self-enhancing, conserving, risk-taking **>** Self-transcending, open, risk

averse, Self-transcending, conserving, risk-taking and Self-enhancing, conserving, risk averse **>** Self-transcending, conserving, risk averse.

Knowing the personal characteristics of the various personalities would add value to the management environment. People prone to low quality decision-making can be identified and made cognisant of a possible flaw in their decision-making behaviour. People of whom higher quality decisions are expected can be used as decision advisors and be paired with low quality decision-makers. And lastly, should interventions be required in the form of scenario reframing, managers would know who to target their actions on. The next section discusses one such intervention.

5.4.5 The Efficacy of Social-relational Framing as Intervention to Impact Decision-making Quality

The **fourth hypothesis** investigated the role social-relational framing might play in causing higher decision-making quality to occur. This hypothesis, introduced on page 74 proposed that the application of social-relational framing to value-clashing scenarios will have a moderating influence on the relationship between the decision-making groupings and their respective decision-making quality scores. The results showed limited support for this notion, as only one of the three scenarios reacted positively to the intervention. However, initial indications suggest that the level (or severity) of the reframing might have an impact on its effectiveness. It is therefore suggested that reframing of the first two scenarios failed to impact the decision-making quality as the wording of these repositioned statements were too slight or vague.

Literature suggested that reframing the scenarios should have an impact on the decision-making behaviour of the participants. Tetlock and Schoemaker (2012) proposed that reframing taboo decisions as tragic trade-offs would prevent decision-makers from making an emotional, purely value-driven choice. Instead, careful positioning of the scenarios would provide a balanced picture, illustrating the complexity of the scenario and pushing respondents towards a more considered response.

The researcher believes that the reframing enacted upon scenario 3 achieved just this. Although the facts of the scenario were repositioned and alternative aspects highlighted, the nature of the choice was not altered fundamentally. In the unframed scenario, it is clear that the personal financial position of the respondent was pushed to the front, whilst done-toning the larger impact of the decision. In the framed version, the personal financial impact is not stated explicitly (though it could be deducted from the entry conditions), but the social aspect of job losses is positioned in contrast to the potential damage to the environment.

This created a tragic trade-off rather than a taboo scenario in the language of Schoemaker and Tetlock (2012), thus causing a more complex decision consideration. It is suggested that this shift towards a more complex scenario was indicative of a shift between System I and System II thinking (Stanovich & West, 1995) and a more deliberate thought process on the matter. This move one would think would lead to an increase in decision-making quality (as measured by the integrative complexity instrument) as it would lead to more thinking points (or talking points, were this a group decisions). Hence, the reframing led to a repositioning of the considerations on which the scenario was to be considered, which lead to more matters to consider, which lead to a more complex and intricate choice, which upped the quality of the decision-making.

5.5 Contributions

The academic and practitioner contributions were listed separately.

5.5.1 Academic Contributions

A number of contributions have been put forward in this thesis. It is the humble opinion of the researcher that the literature framework presented in the review (Figure 8) is novel and gives a fresh perspective on decision-making literature. It is by no means completely original work, but incorporating the three perspectives in one, visually consistent model is considered to be a contribution to the field. This approach showed the interaction between decision-making and judgement as a continuum influenced by ether cognitive limitations or psychological (values/emotions/motivations) considerations, and highlighted the logical need for additional research on ethically bounded (or value-driven) decision-making.

The second contribution was the operationalisation of the integrative complexity measure as an effective instrument for measuring decision-making quality. To the knowledge of the researcher, the explicit use of this measure as an indicator of decision-making complexity is a contribution to the field that will assist future researchers in the design of more rigorous research models, now that a practical outcome variable has been established.

The latest Schwartz Portrait Value Questionnaire been applied in the decision-making context. Although this has been done before, the application of the instruments in the space assessing decision-making quality is novel, giving this powerful instrument broader scope and meaning.

Application of the DoSpeRT Scale in the decision-making context was a novel contribution (again as far as the researcher could determine) and thus provides a new context for the use of this powerful tool.

And lastly, evidence was gathered supporting the proposed relationship between decision-making behaviour and scenario framing. Schoemaker and Tetlock's (2012) position stated that a possible interaction tactic for the treatment of taboo scenarios in the workplace could be an intervention of scenario reframing. Their approach was adopted in this research program and shown to be effective, provided that the framing be explicitly enough.

5.5.2 Practitioner Contributions

These contributions naturally extent to the realm of the practitioner, with a number of them with the potential of increasing the decision-making behaviour of managers in the workplace. A deeper understanding of the influence of personal value systems and risk propensities on decision-making quality, will certainly aid managers in improving the quality of the decisions they make. This research could be applied to the assist managers in analysing the personality traits of their employees with the aim of identifying candidates for decision-making training. The managers could also employ the findings to ensure improved decision-making is achieved by introducing social-relational framing when positioning decision scenarios to the decision-makers for the first time. Presenting difficult decisions as tragic trade-off rather than taboo value clashes will highlight the value-sensitive nature of these decisions and should lead to improved decision-making. The selection of decision-making teams could also be improved to ensure the inclusion of participants from varying value- and risk-profiles. Should the teams be mature enough to value the diversity of viewpoints this practice will introduce to the discussion, it is sure to have a positive impact on the decision-making quality produced by the team.

5.6 Future Research

Several concepts, themes, instruments and practices were highlighted in the discussion, with a number of them tagged for future research. This section lists the most important areas for future research.

5.6.1 Refining the Decision-making Scenarios

As stated before, the reframing intervention requires a rethink. Although one of the interventions worked perfectly (scenario 3), the other two did not bring about the desired impact on decision-making quality. It is suspected that the degree of reframing introduced to the scenarios impact the effectiveness of the reframing. Therefore, additional research work establishing the "tipping point" for scenario reframing could be of value. Additional test work, using the integrative complexity measure as outcome variable, is required to determine exactly how extensive a reframing intervention should be for it to produce an increase in the decision-making scenarios. Perhaps a scenario with two alternatives (severely reframed and moderately reframed) might be considered to test this assertion.

5.6.2 Confirmation of the Literature Framework

The literature framework suggested in Chapter 2 is complex and perhaps a bit all-encompassing. A solid meta-review of the decision-making space would be a benefit to the literature. The space is complex, influenced by multiple disciplines, and with a number of different targeted outcomes. Research in decision-making is either descriptive or prescriptive. Authors target decision-making process, decision-making ethicality or decision-making quality. A consolidated framework would assist future research in this field, and would assist authors in distinguishing their contributions from that of their colleagues.

5.6.3 Repeating the Study for Alternative Sectors and Countries

The discussion section highlighted both the limitations and benefits of completing a value-driven decision-making study in one sector and in one country. Though this approach limited the impact of unknowable extraneous variables, it limited the applicability of the study to alternative settings and contexts. Comparisons of the aggregated population value and risk assessments revealed slight differences when compared to the data sets used for the pilot runs. This could be indicative of variance in value sets across organisations (expected, as we would expect variance between organisational cultures).

To investigate possible differences between organisations and cultures, it is suggested that the study be repeated in different settings. A wealth of knowledge could be acquired should opportunities be established to study organisations in other countries and sectors. For instance, one can only ponder the importance of a similar study in a multi-national organisation targeting variance in decision-making quality between host and parent companies.

5.6.4 Investigating the Impact of Temporal Variable on DMQ

One of the strongest indicators of a missed extraneous variable seems to reside in the temporal dimension. Several decision-makers indicted that their decision was influenced by considering the impact it would have over time. Some respondents favoured immediate action and seemed to make the decision to save time and hasten action. Other though seemed to embolden a long-term view considering the impact of their decision long beyond their own needs or wants. Perhaps the personality assessments need to be expanded to gauge this aspect of decision-making. It could very well by that fast responders, those with a short decision horizon, are more prone to System I thinking and resultantly low quality decision-making. The inverse might also be observed, in that people with a long decision horizon exhibited System II thinking, and higher quality decision-making.

5.6.5 Themes Emergent – Further Investigations of the Qualitative Results and Wordcloud Plots

Several other themes emerged from the qualitative analysis and wordcloud plots. It appeared that the scenario settings prompted very specific decision considerations. The second scenario, steeped in the education idiom, predictably produced “education is a priority” as the most common decision-making motivator. The third scenario in turn showed that “sustainability” should be considered when making decisions. Though telling and perhaps statistically significant, care should be taken that these context-specific descriptors do not contaminate the findings with incidental decision motivators, not applicable to other settings.

And lastly, before a future scenario is considered, it would also probably be wise to read through the common themes identified for each of the scenarios. It could very possible be that the terms “conflicted”, “compromise” and “balanced” represent a yet uninvestigated phenomenon(s) in decision-making, and decision-making quality.

5.7 Conclusion

This chapter discussed the applicability of the research instruments, examined the research findings through mini-case studies and positioned the core findings against the initial research questions and literature framework.

The showed support for the applicability of the Schwartz Portrait Value Questionnaire to determine value profiles of people, the domain-specific risk-taking scale to describe variations in personal risk preferences and the integrative complexity measure to determine the decision-making quality exhibited in response to value clashes.

The discussion exhibited the sensitivity of decision-making quality to various factors through carefully designed mini case-studies. Instances of high and low decision-making quality were examined and it was shown that demographic detail, value orientations, risk proclivities and the application of framing could all play a role in shaping the quality of our decisions.

The first research question, regarding a relationship between personal value systems and decision-making quality, was addressed in the discussion as it was shown that a strong relationship existed between high scores in the value blocks of both openness to change and self-enhancement, and improved decision-making quality. The inverse was also shown to be true.

A discussion of the risk propensity results showed a relationship between social risk-taking and increased decision-making quality, underlining the hypothesis presented by the second research question suggesting just such a relationship. It was noteworthy that this was the only

domain of the five examined (financial, ethical, recreational, health and social) to show a significant relationship to decision-making quality, and perhaps presents a line of further investigation.

Together, the results from the value orientations assessments and the risk propensity assessments, were used to produce typical eight decision-making profiles. This addressed research question 3, by illustrating clear differences in decision-making quality between the various groups.

The final research question, pertaining to framing, was also discussed and it was shown that social-relational framing can have an impact on the decision-making quality of respondents, provided that the framing intervention was done harshly enough. Further research on this topic might reveal the sensitivity of decision-making quality to reframing interventions.

Chapter 6

Conclusion

This chapter concludes the report and contextualised the results within the extant literature.

6.1 Introduction

This study furthered the psychological (values/emotions/motivations) perspective on the field of decision-making behaviour, by illustrating relationships between certain personalistic characteristics and attributes of decision-making. The investigation specifically showed evidence for a framework of decision-making personalities formed by a combination of personal value systems and domain-specific risk-taking proclivities. This was achieved by illustrating that the quality of decisions made during specific value-clashing scenarios varied for the participating managers from the different groups. Merely knowing who made high- or low-quality decisions was not enough though, and subsequent work revealed the use of social-relational reframing to be workable intervention for low-quality decision-making.

6.2 Significance of the study

The significance of the research may be found primarily in that it explored an as yet untested notion that personal preferences, value-orientations and risk appetites could influence the quality of decision-making produced by managers. Although literature describes a theoretical landscape encompassing various perspectives and viewpoints (Bazerman & Moore, 2013; Simon et al., 1987; Slovic et al., 1984), to date not much attention has been given to the quality of decision-making produced when situations become complex and value-laden (Schoemaker & Tetlock, 2012). Thus, with a hyper-linked, ever-shrinking, ever-evolving, complex and dynamic business landscape set to describe the playing field for modern decision-makers, it has become important to fully understand how people of varying backgrounds react to value-clashing decisions.

Secondly, and with variance in decision-making behaviour for managers of differing value- and risk profiles established, it was also vital that some form of remedy be suggested to aid practitioners in coping with value-laden decision-making. Social-relational framing (Fiske, 1992; McGraw & Tetlock, 2005) was shown to be a suitable intervention technique as it managed to highlight the inherent value-clashes in scenarios. This allowed even those naturally predisposed to a specific value-insensitivity, to recognise and deal with the true nature of the decision at hand, leading to a deeper cognisance of the facts at hand, a realisation of the values at play and a more considered decision-making response. It is

anticipated that this approach to decision-making will assist practitioners in predicting managers prone to low-quality decision-making and empower them to intervene timeously by reframing decision-scenarios for improved decision responses.

6.3 The literature foundation

The literature review produced a decision-making landscape consisting of three core perspectives: normative (prescriptive), cognitive limitations and psychological (values/emotions/motivations) (Figure 7, p.59). A thorough investigation of each of these views led to the proposition of an integrated decision-making framework presented in Figure 8 (p.60). The framework presented a holistic view of the decision-making literature and related the implications of each of the three perspectives.

The normative (prescriptive) view, based on the assumption that decision-making is driven by analytical processes, was show to be limited in the extent to which detailed analysis could be achieved and the impact of excessive system complexity on the practicality of this approach (Corner & Kirkwood, 1991; Edwards, 1983; French et al., 1998; Stillwell et al., 1981).

The cognitive limitations perspective emboldened by the limitations of human cognition, assumed decision-makers to have “blind spots” or biases when they practice decision-making and encouraged awareness of limitations as a process of addressing these shortcomings (Kahneman & Tversky, 1984; Lovallo & Kahneman, 2000; Simon, 1991; Slovic et al., 1977).

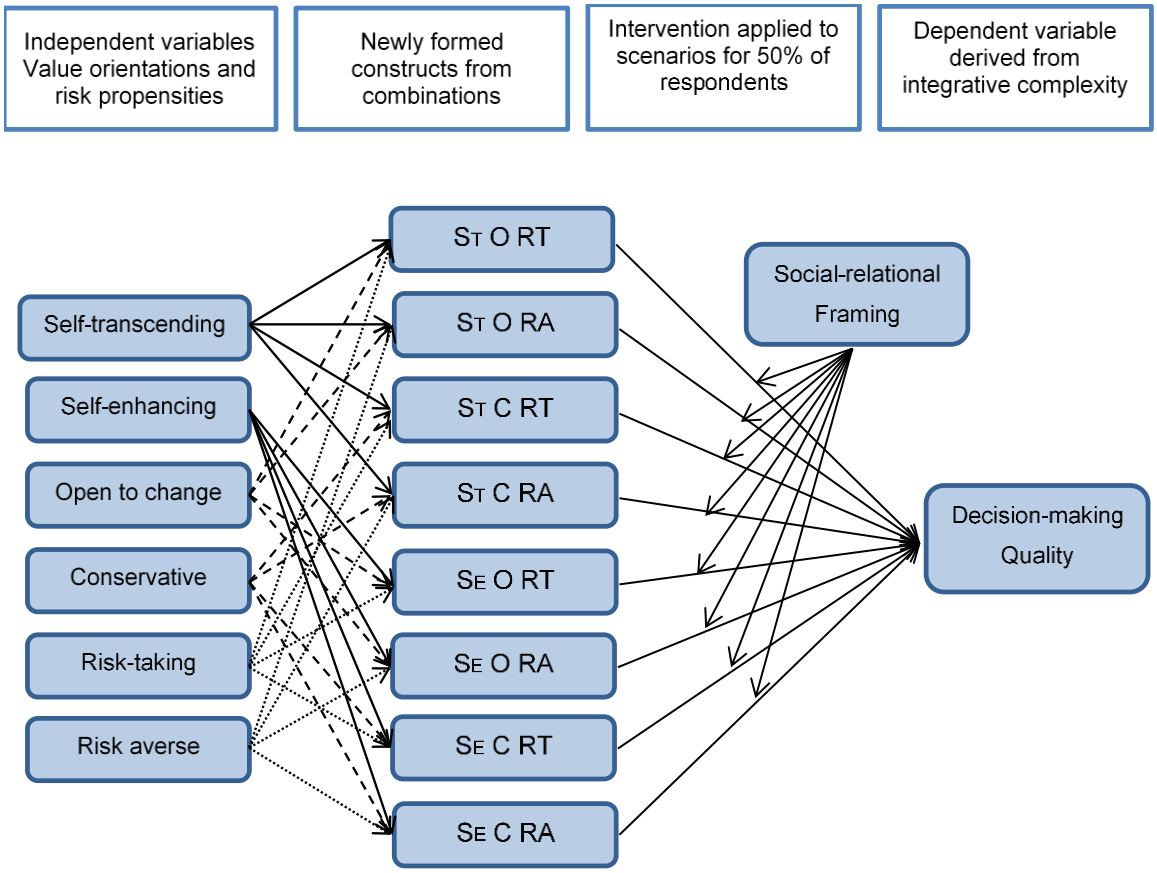
The psychological (values/emotions/motivations) perspective was driven by the assumption that individual differences (in this case personal values and risk propensities) will result in different decision-making behaviours (Connor & Becker, 2003; Finegan, 1994). This view held that decision-making behaviour in individuals was not only limited by their cognitive limitations (presented in the biases framework), but also by their value- and risk profiles (Hanselmann & Tanner, 2008). This expanded the contributions from the cognitive limitations view on bounded awareness and bounded rationality by including the concepts of bounded ethicality and value-bounded decision-making (Bazerman & Moore, 2013). Consequently, it stands to reason that decision-making behaviour could be detrimentally impacted by personal value sets and risk proclivities. But for which combinations of attributes, and by how much?

6.4 Addressing the gap in literature

A deep review of the literature on decision-making behaviour did not reveal much towards decision-making quality and its antecedents (Kahneman, Lovallo & Sibony, 2011). Most studies in the field of decision-making behaviour have taken a prescriptive view and have produced volumes of recommendations on how to improve decision-making (Trotman et al.,

2011). The normative (prescriptive) perspective yielded numerous contributions on improving the multi-attribute decision analysis approach, but was vague on a consistent measure of improved decision-making (Morton & Fasolo, 2009). The cognitive limitations approach produced valuable insights on explaining aberrant decision-making behaviour, but again fell short of identifying what improved decision-making might produce (Slovic et al., 1977). The psychological (values/emotions/motivations) perspective contributed to bettering decision-making, but focused its attention on ethics, rather than decision quality (Finegan, 1994; Hanselmann & Tanner, 2008). This study addressed this gap specifically by determining how decision-making quality in individuals related to their personal attributes.

Figure 52. Consolidated research model



The aim of this study was thus to determine whether decision-making responses (measured of course through the newly operationalised decision-making quality measure of integrative complexity (Tetlock et al., 2014)) varied significantly for individuals of varying personal value and risk orientations. The setting of value-clashes (or taboo scenarios) was selected as a viable research area as it provided the opportunity to study all three perspectives simultaneously. The analytical tools available to the study provided the basis for a normative (prescriptive) view on the study and supplied a useful outcome variable in decision-making

quality. The psychological (values/emotions/motivations) view was provided by the value- and risk defined profiles produced for the study. An extension of the cognitive limitations perspective that of the application of framing interventions (McGraw & Tetlock, 2005; Tetlock & McGraw, 2005), was used to determine whether an intervention could be introduced to impact decision-making quality. These three perspectives, combined with the research instruments available to the study, resulted in the research framework presented in Figure 17, p. 81, and reprinted above as Figure 52.

6.5 Findings

As expected from literature (Bazerman & Moore, 2013; Hanselmann & Tanner, 2008; Tetlock & McGraw, 2005; E. U. Weber et al., 2002), test results revealed a clear relationship between two of the value orientation segments (self-enhancement and openness to change) and one of the risk domains (social risk taking) and increased decision-making quality. This led to the suggestion that the personality group consisting of all three of these traits, the self-enhancing, open-to-change, socially risk-taking, would be expected to produce decisions of a higher quality. Conversely, the self-transcending, conserving, socially risk-averse group, would be expected to produce the lowest quality decisions.

Qualitative evaluation of the decision responses deepened the researcher's understanding of decision-making behaviour. Although the coding and theming of the text elements produced by the respondents for each of the scenarios underlined the fact that respondents with differing value- and risk sets evaluated scenarios differently, several additional insights developed. The motivational texts revealed that decision-making was very context-driven, and that the scenario description clearly played a role in shaping the respondents' answers, as per Finegan's (1994) findings. The temporal sensitivity of the decisions emerged as an important consideration, and the researcher believes that sufficient evidence exists to motivate a study into the relationship between decision-making quality and the perceived time horizon of the decision. And, although sustainability featured as a driver for some decision-makers, not all respondents seem to have embraced the concept yet.

The intervention mechanism introduced to the study, social-relational framing, produced the expected result, an increase in decision-making quality, in one of the three scenarios (Schoemaker & Tetlock, 2012; Tetlock, 1986). It is believed that the extent (or severity) to which the framing is applied would impact the successfulness of the intervention. More work would have to be done to show sufficient support for this assertion, though.

6.6 Literature contribution

Thus, using the original theoretical framework (Figure 8) as a starting point, we can now illustrate the culminating contribution of this study by an altered graphic. Figure 53 revisits the original framework and triangulates the research findings with the extant literature towards addressing the gap discussed in paragraph 6.3.

Figure 53. Integrative Decision-making Model: Revisited

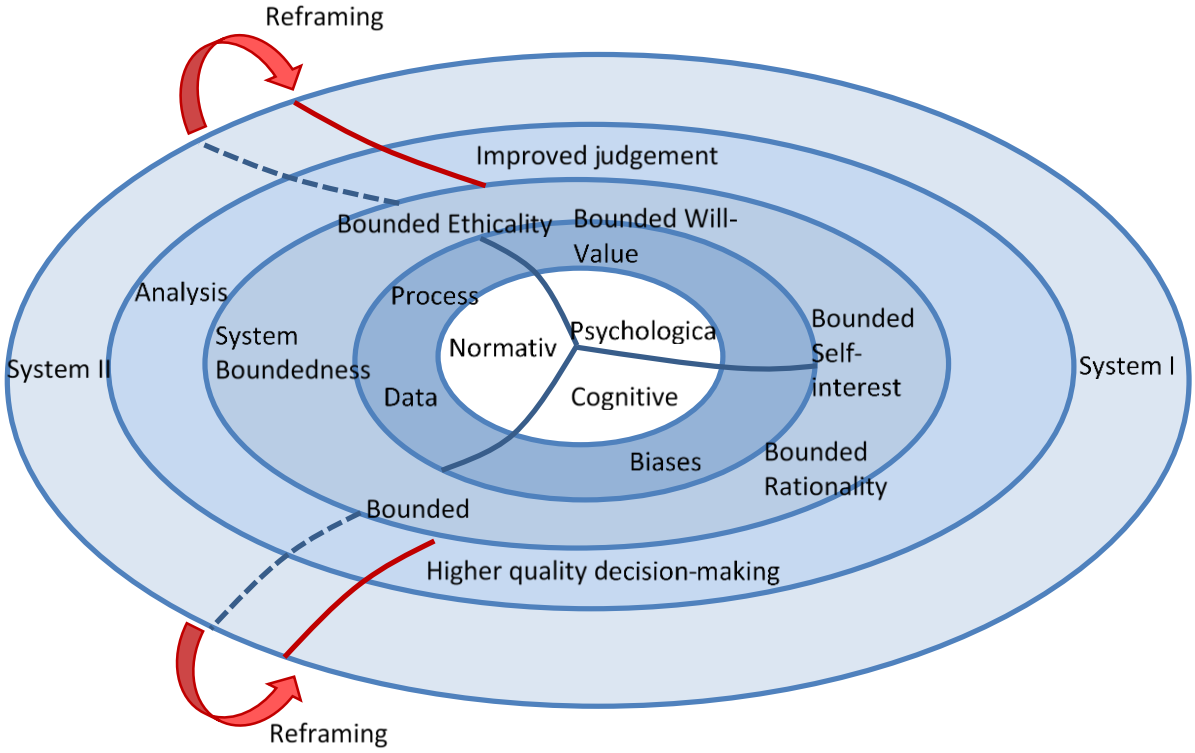


Figure 53 above clearly illustrates the focus of this study. Existing contributions on decision-making behaviour describes a dual process consisting of System I and System II decision-making processes (Stanovich & West, 1998). This schema suggests that typical decision-making response was either intuitive and unfiltered (System I) or deliberate and analytical (System II). Superimposing these systems over the popular perspectives in decision-making literature, we find semblance in the normative (prescriptive) perspective illustrating System I responses and the psychological (values/emotions/motivations) and cognitive limitations perspectives describing occurrences of System II thinking, as illustrated above (Bazerman & Moore, 2013). An expansion of this framework led the author to compete the various levels of the diagram with typical drivers (data and processes for the normative (prescriptive) view, biases and heuristics for the cognitive limitations view, and values and preferences for the

psychological (values/emotions/motivations) view), common limitations or short-comings (reflected in the various areas of boundedness) and expected action of decision process likely to occur (judgement, decision-making or analysis).

It was further proposed in literature that the introduction of social-relational framing would impact the extent to which System I decision-making is employed in value-clashing scenarios (Hanselmann & Tanner, 2008; Schoemaker & Tetlock, 2012; Tetlock & McGraw, 2005). The model above was an attempt at a visual representation of this phenomenon. The dotted blue lines above show the original boundaries between System I and System II decision-making, with deliberate analytical processing reporting to the System II segment, and the more intuitively driven value and biased influenced processing to the System I segment. The updated graphic shows the likely impact of an effective reframing intervention on the model. The System I / System II boundaries should be moved out (red lines) by the reframing interventions (red arrows), increasing the System II area, or stated differently, producing more deliberate, thought-through decisions.

From the literature covered (Hanselmann & Tanner, 2008; McGraw & Tetlock, 2005; Slovic et al., 1977; Tetlock & McGraw, 2005) and the results obtained from this study, it can be inferred that the introduction of a framing intervention to address value-clashing scenarios can be applied to increase the decision-making quality. From the model in Figure 53, is seems thus that this is most likely due to addressing both the aspects of bounded awareness and bounded ethicality during the decision-making process.

The concept of bounded awareness (Simon, 1991; Slovic et al., 1977; Tversky & Kahneman, 1975) is seated in the cognitive limitations view of decision-making. Figure 53 above suggest that scenario reframing could result in an expansion of the System II processing footprint. Reframing value-clashing scenarios as tragic trade-offs is expected to increase the awareness of areas, facts and viewpoints perhaps not considered by the respondent, hence leading to an increase in the decision-making quality (Hanselmann & Tanner, 2008; Tetlock & McGraw, 2005).

Bounded ethicality (Bazerman & Moore, 2013), in turn reports to the psychological (values/emotions/motivations) perspective, and as with bounded awareness, reframing is postulated to have an expansion effect on the System II processing footprint. In this case though, the improved decision-making is postulated to have occurred due to an increase in the awareness of alternative viewpoints and value orientations on the matter at hand (Finegan, 1994; Fritzsche & Oz, 2007). This “enlightened” position is expected to increase the decision-maker’s sensitivity to competing viewpoints, thus increasing the number of issues considered before coming to a final decision.

The core contribution on the front of literature thus, was an expansion of the psychological (values/emotions/motivations) perspective on decision-making behaviour. The findings of the investigation clarified the role played by personal value sets and risk propensities on decision-making behaviour. This contribution fleshed out the model depicted in Figure 53 to some extent, and showed that the Tetlock (1986) premise that integrative complexity can be employed as an effective and veritable instrument through which to measure decision-making quality, rang true.

The study also provided support for the notion (McGraw & Tetlock, 2005) that social-relational framing can be employed to impact decision-making quality in managers, but additional research must be conducted to establish the extent and severity of the wording for the reframing to be effective.

6.7 Methodological contributions

Methodological contributions include the development and testing of a decision-making quality tool and the creation of three decision-making scenarios designed to tests value-conflicting decision-making behaviour. Although the integrative complexity measure has been applied to assess decision-making behaviour in other instances (Suedfeld & Tetlock, 1977; Tetlock et al., 2014), this is the first application of the instrument explicitly positioned to assess decision-making quality. The scenarios were written specifically for this study with the specific aim of creating value-laden decision material. Though effective in principle, it is expected that the scenarios could evolve into more powerful instruments should future researchers decide to reapply them for similar studies.

6.8 The importance to practitioners

For the practitioner, the research yielded two important contributions. Managers now have a toolkit whereby they can assess decision-makers with regard to their value- and risk preferences. This will alert senior staff to decision-makers with a natural inclination to lower quality decision-making in value-clashing circumstances. Secondly, having identified such individuals, decision-making quality could be improved by employing the reframing intervention to value-laden decision scenarios, to make decision-makers aware of the latent value stresses in the decision, and to address their personal value-boundedness. It is expected that such interventions would have a positive impact on decision-making quality in organisations (Kahneman et al., 2011).

6.9 The importance to business

The study has also contributed on a larger platform. Given that the business landscape is constantly evolving to be a more complex, globally connected and culturally saturated environment, having a toolset to deal with complex decision-making scenarios is sure to benefit business practice. The findings from this study can be used to make a strong case for the risks of individualism in decision-making. Business leaders should take cognisance of the fact that that the research showed people to have significantly varying value sets and risk proclivities - even between individuals from similar cultural backgrounds, genders, management levels and age groups. For this reason, any one person will at some point be confronted with a decision-scenario for which they are naturally ethically biased, or bounded to use the Bazerman and Moore (2013) term. The most logical solution to this exposure, barring reframing for a moment as its practicality in all situations is a bit doubtful, is to create diverse decision-making teams. True diversity, based not only on gender and cultural groupings, but on value- and risk orientations should eradicate the risk of ethically bounded decision-making and is sure to increase the quality of decisions made by these managers (Ametrano, 2014; Ariail et al., 2015; Connor & Becker, 2003; Finegan, 1994).

6.10 Future research

Future research could be instrumental in developing the psychological (values/emotions/motivations) perspective of the decision-making framework depicted in Figure 53. To date, the researcher has only considered the roles of personal value orientations and risk proclivities on decision-making quality. As mentioned before, the impact of the individual's time horizon as well as their support for sustainability might be considered in future investigations.

Value and risk-driven decision-making needs to be evaluated in alternative settings (company and country) as the work done for this study specifically focused on a single company case. It would be useful to determine to what extent organisational, cultural and even national sentiments compare to the findings of this investigation.

From a methodological perspective, it could also be beneficial to conduct additional work on the coding procedures used to evaluate the integrative complexity measure (Houck et al., 2014; Tetlock et al., 2014). This study employed a dual coding approach using both a manual and automated response. Though the comparisons between the two systems were favourable, refinement of the process would benefit future researchers and perhaps aid in speeding up decision-making quality assessments.

The value-clashing decision-making scenario technique requires some additional iterations, as the scenarios and reframings employed for this study were not all successful. The researcher believes that a "tipping point" exists whereby reframing interventions become effective. It was clear from the findings of this investigation that reframings worded too subtly, failed to sway the respondents to make higher quality decisions. What was not clear though, was what the extent of the reframing should be to ensure an impact on decision-making behaviour. Additional investigations targeting various degrees of framing of the same scenario should be able to address this matter.

6.11 Conclusion

This report, written to address the gap in the extant literature on decision-making quality in the context of value clashes, addressed four research questions:

1. What is the extent of the relationship between personal value system orientations and the decision-making quality exhibited by individuals during value clashing scenarios?

2. What is the extent of the relationship between personal risk propensities and the decision-making quality exhibited by individuals during value clashing scenarios?

3. Will decision-making groups, produced by a combination of the value- and risk traits, produce decision-making responses of varying quality?

4. To what extent will the introduction of social-relational framing impact the decision-making quality exhibited by the individuals?

The research showed support for a relationship between specific value blocks (openness to change and self-enhancement) and decision-making quality, as well as a relationship between decision-making quality and a proclivity for social risk-taking. It is the position of the researcher that these findings combined to an inferred support of the third research question, namely that decision-making groups comprised of combinations of value- and risk orientations, will produce decisions of varying quality.

The use of social-relational framing was shown to be effective in one of the three scenarios, and it is the view of the researcher that this indicated a sensitivity to the harshness of the framing intervention.

Future research could focus on refining the value-clash scenarios, calibrating the framing intervention to determine its effectiveness point, refining the integrative complexity coding process and follow-up on the additional drivers of decision-making quality hinted at by the qualitative results set.

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Appendices

Appendix A: Schwarz revised Human Value Survey

PVQ-RR Male (10/2013)

Here we briefly describe different people. Please read each description and think about how much that person is or is not like you. Put an X in the box to the right that shows how much the person described is like you.

		HOW MUCH LIKE YOU IS THIS PERSON?					
		Not like me at all	Not like me	A little like me	Moder-ately like me	Like me	Very much like me
1.	It is important to him to form his views independently.	☐	☐	☐	☐	☐	☐
2.	It is important to him that his country is secure and stable.	☐	☐	☐	☐	☐	☐
3.	It is important to him to have a good time.	☐	☐	☐	☐	☐	☐
4.	It is important to him to avoid upsetting other people.	☐	☐	☐	☐	☐	☐
5.	It is important to him that the weak and vulnerable in society be protected.	☐	☐	☐	☐	☐	☐
6.	It is important to him that people do what he says they should.	☐	☐	☐	☐	☐	☐
7.	It is important to him never to think he deserves more than other people.	☐	☐	☐	☐	☐	☐
8.	It is important to him to care for nature.	☐	☐	☐	☐	☐	☐
9.	It is important to him that no one should ever shame him.	☐	☐	☐	☐	☐	☐
10.	It is important to him always to look for different things to do.	☐	☐	☐	☐	☐	☐
11.	It is important to him to take care of people he is close to.	☐	☐	☐	☐	☐	☐
12.	It is important to him to have the power that money can bring.	☐	☐	☐	☐	☐	☐
13.	It is very important to him to avoid disease and protect his health.	☐	☐	☐	☐	☐	☐
14.	It is important to him to be tolerant toward all kinds of people and groups.	☐	☐	☐	☐	☐	☐
15.	It is important to him never to violate rules or regulations.	☐	☐	☐	☐	☐	☐
16.	It is important to him to make his own decisions about his life.	☐	☐	☐	☐	☐	☐
17.	It is important to him to have ambitions in life.	☐	☐	☐	☐	☐	☐
18.	It is important to him to maintain traditional values and ways of thinking.	☐	☐	☐	☐	☐	☐
19.	It is important to him that people he knows have full confidence in him.	☐	☐	☐	☐	☐	☐
20.	It is important to him to be wealthy.	☐	☐	☐	☐	☐	☐
21.	It is important to him to take part in activities to defend nature.	☐	☐	☐	☐	☐	☐

	Not like me at all	Not like me	A little like me	Moder-ately like me	Like me	Very much like me
22. It is important to him never to annoy anyone.	☐	☐	☐	☐	☐	☐
23. It is important to him to develop his own opinions.	☐	☐	☐	☐	☐	☐
24. It is important to him to protect his public image.	☐	☐	☐	☐	☐	☐
25. It is very important to him to help the people dear to him.	☐	☐	☐	☐	☐	☐
26. It is important to him to be personally safe and secure.	☐	☐	☐	☐	☐	☐
27. It is important to him to be a dependable and trustworthy friend.	☐	☐	☐	☐	☐	☐
28. It is important to him to take risks that make life exciting.	☐	☐	☐	☐	☐	☐
29. It is important to him to have the power to make people do what he wants.	☐	☐	☐	☐	☐	☐
30. It is important to him to plan his activities independently.	☐	☐	☐	☐	☐	☐
31. It is important to him to follow rules even when no-one is watching.	☐	☐	☐	☐	☐	☐
32. It is important to him to be very successful.	☐	☐	☐	☐	☐	☐
33. It is important to him to follow his family's customs or the customs of a religion.	☐	☐	☐	☐	☐	☐
34. It is important to him to listen to and understand people who are different from him.	☐	☐	☐	☐	☐	☐
35. It is important to him to have a strong state that can defend its citizens.	☐	☐	☐	☐	☐	☐
36. It is important to him to enjoy life's pleasures.	☐	☐	☐	☐	☐	☐
37. It is important to him that every person in the world have equal opportunities in life.	☐	☐	☐	☐	☐	☐
38. It is important to him to be humble.	☐	☐	☐	☐	☐	☐
39. It is important to him to figure things out himself.	☐	☐	☐	☐	☐	☐
40. It is important to him to honor the traditional practices of his culture.	☐	☐	☐	☐	☐	☐
41. It is important to him to be the one who tells others what to do.	☐	☐	☐	☐	☐	☐
42. It is important to him to obey all the laws.	☐	☐	☐	☐	☐	☐
43. It is important to him to have all sorts of new experiences.	☐	☐	☐	☐	☐	☐
44. It is important to him to own expensive things that show his wealth.	☐	☐	☐	☐	☐	☐
45. It is important to him to protect the natural environment from destruction or pollution.	☐	☐	☐	☐	☐	☐
46. It is important to him to take advantage of every opportunity to have fun.	☐	☐	☐	☐	☐	☐
47. It is important to him to concern himself with every need of his dear ones.	☐	☐	☐	☐	☐	☐
48. It is important to him that people recognize what he achieves.	☐	☐	☐	☐	☐	☐

	Not like me at all	Not like me	A little like me	Moder-ately like me	Like me	Very much like me
49. It is important to him never to be humiliated.	☐	☐	☐	☐	☐	☐
50. It is important to him that his country protect itself against all threats.	☐	☐	☐	☐	☐	☐
51. It is important to him never to make other people angry.	☐	☐	☐	☐	☐	☐
52. It is important to him that everyone be treated justly, even people he doesn't know.	☐	☐	☐	☐	☐	☐
53. It is important to him to avoid anything dangerous.	☐	☐	☐	☐	☐	☐
54. It is important to him to be satisfied with what he has and not ask for more.	☐	☐	☐	☐	☐	☐
55. It is important to him that all his friends and family can rely on him completely.	☐	☐	☐	☐	☐	☐
56. It is important to him to be free to choose what he does by himself.	☐	☐	☐	☐	☐	☐
57. It is important to him to accept people even when he disagrees with them.	☐	☐	☐	☐	☐	☐

PVQ-RR Female (10/2013)

Here we briefly describe different people. Please read each description and think about how much that person is or is not like you. Put an X in the box to the right that shows how much the person described is like you.

	HOW MUCH LIKE YOU IS THIS PERSON?					
	Not like me at all	**Not like me**	**A little like me**	**Moder-ately like me**	**Like me**	**Very much like me**
1. It is important to her to form her views independently.	☐	☐	☐	☐	☐	☐
2. It is important to her that her country is secure and stable.	☐	☐	☐	☐	☐	☐
3. It is important to her to have a good time.	☐	☐	☐	☐	☐	☐
4. It is important to her to avoid upsetting other people.	☐	☐	☐	☐	☐	☐
5. It is important to her that the weak and vulnerable in society be protected.	☐	☐	☐	☐	☐	☐
6. It is important to her that people do what she says they should.	☐	☐	☐	☐	☐	☐
7. It is important to her never to think she deserves more than other people.	☐	☐	☐	☐	☐	☐
8. It is important to her to care for nature.	☐	☐	☐	☐	☐	☐
9. It is important to her that no one should ever shame her.	☐	☐	☐	☐	☐	☐
10. It is important to her always to look for different things to do.	☐	☐	☐	☐	☐	☐
11. It is important to her to take care of people she is close to.	☐	☐	☐	☐	☐	☐
12. It is important to her to have the power that money can bring.	☐	☐	☐	☐	☐	☐
13. It is very important to her to avoid disease and protect her health.	☐	☐	☐	☐	☐	☐
14. It is important to her to be tolerant toward all kinds of people and groups.	☐	☐	☐	☐	☐	☐
15. It is important to her never to violate rules or regulations.	☐	☐	☐	☐	☐	☐
16. It is important to her to make her own decisions about her life.	☐	☐	☐	☐	☐	☐
17. It is important to her to have ambitions in life.	☐	☐	☐	☐	☐	☐
18. It is important to her to maintain traditional values and ways of thinking.	☐	☐	☐	☐	☐	☐
19. It is important to her that people she knows have full confidence in her.	☐	☐	☐	☐	☐	☐
20. It is important to her to be wealthy.	☐	☐	☐	☐	☐	☐
21. It is important to her to take part in activities to defend nature.	☐	☐	☐	☐	☐	☐
22. It is important to her never to annoy anyone.	☐	☐	☐	☐	☐	☐
23. It is important to her to develop her own opinions.	☐	☐	☐	☐	☐	☐

	Not like me at all	Not like me	A little like me	Moder-ately like me	Like me	Very much like me
24. It is important to her to protect her public image.	☐	☐	☐	☐	☐	☐
25. It is very important to her to help the people dear to her.	☐	☐	☐	☐	☐	☐
26. It is important to her to be personally safe and secure.	☐	☐	☐	☐	☐	☐
27. It is important to her to be a dependable and trustworthy friend.	☐	☐	☐	☐	☐	☐
28. It is important to her to take risks that make life exciting.	☐	☐	☐	☐	☐	☐
29. It is important to her to have the power to make people do what she wants.	☐	☐	☐	☐	☐	☐
30. It is important to her to plan her activities independently.	☐	☐	☐	☐	☐	☐
31. It is important to her to follow rules even when no-one is watching.	☐	☐	☐	☐	☐	☐
32. It is important to her to be very successful.	☐	☐	☐	☐	☐	☐
33. It is important to her to follow her family's customs or the customs of a religion.	☐	☐	☐	☐	☐	☐
34. It is important to her to listen to and understand people who are different from her.	☐	☐	☐	☐	☐	☐
35. It is important to her to have a strong state that can defend its citizens.	☐	☐	☐	☐	☐	☐
36. It is important to her to enjoy life's pleasures.	☐	☐	☐	☐	☐	☐
37. It is important to her that every person in the world have equal opportunities in life.	☐	☐	☐	☐	☐	☐
38. It is important to her to be humble.	☐	☐	☐	☐	☐	☐
39. It is important to her to figure things out herself.	☐	☐	☐	☐	☐	☐
40. It is important to her to honor the traditional practices of her culture.	☐	☐	☐	☐	☐	☐
41. It is important to her to be the one who tells others what to do.	☐	☐	☐	☐	☐	☐
42. It is important to her to obey all the laws.	☐	☐	☐	☐	☐	☐
43. It is important to her to have all sorts of new experiences.	☐	☐	☐	☐	☐	☐
44. It is important to her to own expensive things that show her wealth.	☐	☐	☐	☐	☐	☐
45. It is important to her to protect the natural environment from destruction or pollution.	☐	☐	☐	☐	☐	☐
46. It is important to her to take advantage of every opportunity to have fun.	☐	☐	☐	☐	☐	☐
47. It is important to her to concern herself with every need of her dear ones.	☐	☐	☐	☐	☐	☐
48. It is important to her that people recognize what she achieves.	☐	☐	☐	☐	☐	☐
49. It is important to her never to be humiliated.	☐	☐	☐	☐	☐	☐
50. It is important to her that her country protect itself against all threats.	☐	☐	☐	☐	☐	☐

	Not like me at all	Not like me	A little like me	Moder-ately like me	Like me	Very much like me
51. It is important to her never to make other people angry.	☐	☐	☐	☐	☐	☐
52. It is important to her that everyone be treated justly, even people she doesn't know.	☐	☐	☐	☐	☐	☐
53. It is important to her to avoid anything dangerous.	☐	☐	☐	☐	☐	☐
54. It is important to her to be satisfied with what she has and not ask for more.	☐	☐	☐	☐	☐	☐
55. It is important to her that all her friends and family can rely on her completely.	☐	☐	☐	☐	☐	☐
56. It is important to her to be free to choose what she does by herself.	☐	☐	☐	☐	☐	☐
57. It is important to her to accept people even when she disagrees with them.	☐	☐	☐	☐	☐	☐

Appendix B: Domain-Specific Risk-Taking (Adult) Scale – Risk Taking

For each of the following statements, please indicate the likelihood that you would engage in the described activity or behaviour if you were to find yourself in that situation. Provide a rating from Extremely Unlikely to Extremely Likely, using the following scale:

1	2	3	4	5	6	7
Extremely Unlikely	Moderately Unlikely	Somewhat Unlikely	Not Sure	Somewhat Likely	Moderately Likely	Extremely Likely

1. Admitting that your tastes are different from those of a friend. (S)
2. Going camping in the wilderness. (R)
3. Betting a day's income at the horse races. (F)
4. Investing 10% of your annual income in a moderate growth mutual fund. (F)
5. Drinking heavily at a social function. (H/S)
6. Taking some questionable deductions on your income tax return. (E)
7. Disagreeing with an authority figure on a major issue. (S)
8. Betting a day's income at a high-stake poker game. (F)
9. Having an affair with a married man/woman. (E)
10. Passing off somebody else's work as your own. (E)
11. Going down an extreme mountain biking trail that is beyond your ability. (R)
12. Investing 5% of your annual income in a very speculative stock. (F)
13. Going white-water rafting at high water in the spring. (R)
14. Betting a day's income on the outcome of a sporting event. (F)
15. Engaging in unprotected sex. (H/S)
16. Revealing a friend's secret to someone else. (E)
17. Driving a car without wearing a seat belt. (H/S)
18. Investing 10% of your annual income in a new business venture. (F)
19. Taking a skydiving class. (R)
20. Riding a motorcycle without a helmet. (H/S)
21. Choosing a career that you truly enjoy over a more prestigious one. (S)
22. Speaking your mind about an unpopular issue in a meeting at work. (S)
23. Sunbathing without sunscreen. (H/S)
24. Bungee jumping off a tall bridge. (R)
25. Piloting a small plane. (R)
26. Walking home alone at night in an unsafe area of town. (H/S)

27. Moving to a city far away from your extended family. (S)
28. Starting a new career in your mid-thirties. (S)
29. Leaving your young children alone at home while running an errand. (E)
30. Not returning a wallet you found that contains R 2000. (E)

Note. E = Ethical, F = Financial, H/S = Health/Safety, R = Recreational, and S = Social.
Source: (Blaise & Weber: 2006)

Appendix C: Decision-making Quality Instrument

Using five minutes, please share in writing any thoughts you might have on how you came to the decision you made on the scenario. Please reflect on the thought processes you followed and any emotions you might have experience during the question.

Appendix D: Value Clash Scenarios and reframed alternatives

The scenarios were discussed and illustrated in full in the body of the report

Appendix E: Proprietary Instruments – Permission letters

1. Schwartz Portrait Value Questionnaire

Christoff Prinsloo Apr 22

to msshasch

Dear Prof Schwartz

I am in the process of researching individual decision-making in situations brought about by constraint resources. I need to assess the individual's value orientations as part of my research.

How would I go about getting permission to use the Portrait Value Questionnaire (PVQ) in my research?

Kind regards,

shalom schwartz Apr 23

to me

Dear Christoff,

I attach the PVQ-RR which is the version I currently recommend. It is more reliable than the PVQ for measuring the 10 values, takes the same amount of time, and yields scores for 19 more refined values, as discussed in the attached article. Please use the instructions attached. Let me know how it goes. We also have other language translations if needed.

Shalom

Professor Shalom H. Schwartz
Department of Psychology
The Hebrew University of Jerusalem
& The Higher School of Economics, Moscow

------- End of Original Message -------

2. Domain-Specific Risk-Taking Scale – DoSpeRT Scale

Christoff Prinsloo Apr 23

to euw2

Dear professor Weber

I am in the process of researching individual decision-making in situations brought about by constraint resources. I need to assess the individual's risk-taking propensity for various settings, and would like to incorporate the Domain Specific Risk Attitude questionnaire (Weber et al., 2002, 2006) in my research. The instrument is listed on the DMIDI website.

How do I go about to gain permission to use this instrument?

Kind regards,

Christoff Prinsloo

Weber, Elke Apr 23

to me

dear dr. prinsloo:
you have my prermission and all info can be found at dospert.org.
best,
elke weber

Elke U. Weber
Jerome A. Chazen Professor of
International Business
Director, Center for Research
On Environmental Decisions
Director, Center for the
Decision Sciences
Uris Hall 716, 3022 Broadway
New York, NY 10027-6902

Appendix F: Demographic Questionnaire

Consent Statement

The following questionnaire has been designed to investigate a specific phenomenon pertinent to the modern business landscape. Please fill in all the questions to the best of your ability, and in accordance to your decision-making behaviour in the work place.

Your completion of the questionnaires is seen as a statement of consent. This means that you acknowledge that the questionnaire forms part of a PhD study and that your responses will be used in the research. The researcher will treat the responses to these questionnaires with the utmost respect and discretion to ensure both the confidentiality and anonymity of the respondents is guaranteed. Respondents will be issued with a unique participation number to ensure the anonymity of the respondents. The researcher will also be the only person authorised to deal with the raw data set.

As this research deals with potentially contentious issues and matters of an emotional nature, the respondents must be informed that their participation in the research is completely voluntary and that they can chose to exit from the research at any point.

Demographic questionnaire

Please indicate in which of the categories you fall by marking the appropriate box with an “X”. Should you not wish to reveal this information, simply mark “Not Specified”.

Age

18-30	31-40	41-50	51-60	61+	Not Specified
☐	☐	☐	☐	☐	☐

Sex

Male	Female	Not Specified
☐	☐	☐

Race

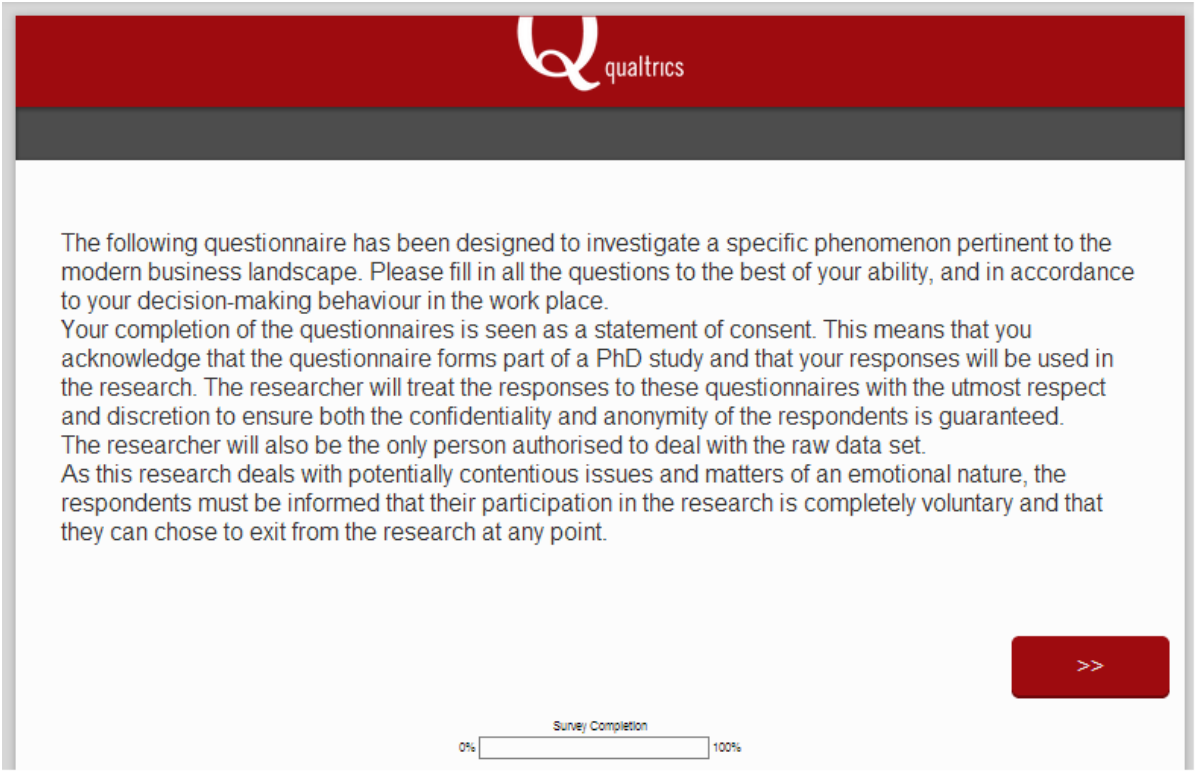
White	Black	Indian	Coloured	Not Specified
☐	☐	☐	☐	☐

Management level

Junior	Middle	Senior	Executive	Not Specified
☐	☐	☐	☐	☐

Appendix G: Qualtrics questionnaire screen shots

The Questionnaire was conducted online using the Qualtrics software package. This picture below illustrates the look-and-feel of the instruments on the Qualtrics platform and show the first page of the instrument.



Appendix H: Pro-forma introductory email to be sent to each respondent

Appendix H contains a copy of the pro-forma email sent to each respondent requesting their participation in the research.

Gordon Institute of Business Science
University of Pretoria

To whom it may concern

Doctoral Research on Decision-making behaviour

Your company has agreed to participate in a PhD study. (See attached confirmation letter). This research is aimed at obtaining a deeper understanding of the decision-making behaviour exhibit by managers in the workplace environment.

Please complete the questionnaire as honest as possible. Please note that you participation in this exercise will be completely anonymous. The individual results will not be forwarded to the company, not will anybody but the researcher have access to the raw data set.

Please note that the questionnaire contains questions of a personal nature and a scenario that could be considered to be sensitive. Participation in the questionnaire is completely voluntary and respondents can exit from the process at any time. A de-briefing email will be forwarded to all participants once the data collection has been completed. This will illustrate the requirement for the questionnaire and elaborate on the purpose of the research.

Your participation in this event is dearly appreciated.

Kind regards,

Christoff Prinsloo

Christoff Prinsloo

Doctoral Candidate

Gordon Institute of Business Science, University of Pretoria

Appendix I: List of companies contacted

The following companies were contacted to assist in the research.

Company	Sector	Name	Position
Company 1	Fast-moving consumer goods	Mr F	Executive: Human Resources
Company 2	Aluminium production	Mr. H	Managing Director
Company 3	Management consulting	Mr F.	Senior Consultant

Appendix J: Standard contact email for target companies

The following email was used to contact the companies.

Gordon Institute of Business Science
University of Pretoria

Dear *NAME OF CONTACT PERSON HERE*

Doctoral Research on Decision-making behaviour

I was given your contact details by my supervisor, Charlene Lew. As you've probably deduced from the title line of the email, I come asking a favour. I have successfully defended my research proposal at GIBS and will soon be ready to proceed with field research. However, before I can proceed with gathering data, the University require me, as part of an ethical clearance process, to show proof of a willing subject. This is of course where you enter the fray.

I plan to conduct research into decision-making behaviour during severe value clashes, and hope to expand the literature to take cognisance of both personal value systems and risk propensities in an updated decision-making framework. To achieve this, I intent to gather feedback on a +- 60 question questionnaire from about 1000 individuals. This is the gist of the research, but I can elaborate ad nauseum, should you require more information.

The research instruments have been designed and can be forwarded. Ideally though, should your schedule permit, I'd like to discuss the research over a coffee to illustrate my passion on the subject and hopefully convince you to allow me access to the rich database that is *COMPANY NAME HERE*.

Thank you for reading this far! Hope to hear from you soon.

Kind regards

Sincerely,

Christoff Prinsloo

Christoff Prinsloo

Doctoral Candidate

Gordon Institute of Business Science, University of Pretoria

Appendix K: Correspondence with target company giving permission to proceed with the research

PhD Navorsing

Christoff Prinsloo - Gmail

10/22/15

to Mr T, Mr F

Beste Mr T en Mr F

Baie dankie weereens vir die geleentheid om my navorsing binne “TARGET COMPANY” te doen. Ek waardeer die moeite wat julle bereid is om te doen en die toewyding wat julle toon om mense te help. Ek glo dit is deel van die “TARGET COMPANY” suksesverhaal.

Hieronder is die bewoording vir die epos, soos bespreek. Laat weet my asseblief of dit in orde is, of verander soos nodig. (Ek is by voorbeeld nie seker van die bewoording rondom “Doing the right thing” nie).

Terloops, as julle die groep sou wou wyer maak en senior bestuurders wou insluit by die monster sou dit natuurlik wonderlik wees, maar as julle voel dat dit te veel van hulle tyd sou vat, verstaan ek dit. Dink aan die waarde wat dit kan inhou vir n senior bestuurder om sy span se belsuitneminggedrag te evalueer, wetend wat sy eie waardestel is.

Vriendelike groete

Christoff

Dear respondent

As part of our ongoing focus on “Doing the right thing”, we have decided to conduct the following survey on values-driven decision-making. We feel a deeper understanding of individual value orientations and risk propensities, as they relate to decision-making, will help us to pave the way towards a better “TARGET COMPANY”.

Please assist us in completing the online survey, by simply clicking on the link below. It consists of a number of decision-making scenarios, followed by two personality questionnaires and should take you between 30 minutes and an hour to complete.

https://pretoria.eu.qualtrics.com/SE/?SID=SV_3QcapGs7yYwgZed

Please note that the survey can be interrupted and resumed at a later stage, should you run out of time or tire.

Thanking you in advance for your support in this endeavour.

Kind regards,

Translate message

Turn off for: English

Hallo Cristoff

Die aanvangsbrief is reg, haal net “”na “TARGET COMPANY” uit. Laat weet asb die demografie verlang in die steekproef. (naam, van, e-pos, vlak van bestuur?)

Groete

Mr F

From: Christoff Prinsloo - Gmail [mailto:

Sent: 22 October 2015 09:13 AM

To: Mr T <Mr T.@”TARGET COMPANY”.com>

Cc: Mr F <Mr F.@”TARGET COMPANY”.com>

Subject: PhD Navorsing

Christoff Prinsloo

10/27/15

to Mr F

Hallo Mr F

Baie dankie vir die epos. Ek sal verander soos verlang en dit more vir jou aanstuur. Ek is betrokke by n entrepreneursdag by UJ vandag maar sal dit eerste ding more oggend doen.

Groete

Christoff

10/28/15

to Mr F

Hallo Mr F.

Aangeheg is die aangepasde epos, soos versoek. Die vraelys sal die nodige inligting self versamel (naam en van, vlak van bestuur, kultuurgroepering, ouderdom, geslag). Ons kan dit nou op twee maniere doen:

1. Julle verpsrei die epos self intern, met die “link” sodat die respondent dit daarvandaan kan volg.

2. Julle IT mense stuur vir my n databasis van eposadresses met name en vanne, sodat ek dit kan inlees en versprei. Dit het die voordeel dat ek die epos persoonlik kan addresseer vanuit die databasis inligiting. Hierdie opsie het egter die nadeel dat die epos miskien in die Junkmail folder kan land, omdat dit van n onbekende address sal kom. Julle kan maar hieroor besluit – vir my is dit omt ewe.

Groete

Christoff

Dear ####

As part of our ongoing focus on “Doing the right thing”, we have decided to conduct the following survey on values-driven decision-making. We feel a deeper understanding of individual value orientations and risk propensities, as they relate to decision-making, will help us to pave the way towards a better “TARGET COMPANY”.

Please assist us in completing the online survey, by simply clicking on the link below. It consists of a number of decision-making scenarios, followed by two personality questionnaires and should take you between 30 minutes and an hour to complete.

https://pretoria.eu.qualtrics.com/SE/?SID=SV_3QcapGs7yYwgZed

Please note that the survey can be interrupted and resumed at a later stage, should you run out of time or tire.

Thanking you in advance for your support in this endeavour.

Kind regards,

From: Mr F [mailto:Mr F.@”TARGET COMPANY”.com]

Sent: 27 October 2015 08:41 AM

To: Christoff Prinsloo - Gmail <

Cc: Mr T <Mr T.@”TARGET COMPANY”.com>

Subject: RE: PhD Navorsing

Hallo Cristoff

Die aanvangsbrief is reg, haal net “”na “TARGET COMPANY” uit. Laat weet asb die demografie verlang in die steekproef. (naam, van, e-pos, vlak van bestuur?)

Groete

Mr F

Mr F <Mr F.@”TARGET COMPANY”.com>

11/3/15

Hallo Christoff

Sal verkies indien jy versprei met Mr T se brief as inleiding. Aangeheg twee lyste met besonderhede van alle bestuur. Neem kennis van “level of work” i.e. individual contributor, manager of others, manager of manager, manager of business. Laat my asb weet in terme van vordering; uitstaande per naam sodat ek opvolg kan doen. Dink jy moet net ook in die inleiding klem plaas op die feit dat die steekproef vertroulik is .

Groete

Mr F

From: Christoff Prinsloo - Gmail [mailto:

Sent: 28 October 2015 09:24 AM

To: Mr F <Mr F.@"TARGET COMPANY".com>

Subject: RE: PhD Navorsing

2 Attachments

Preview attachment TAR Target Population List (Mr F).xlsx

TAR Target Population List (Mr F).xlsx

Preview attachment Lead Team members 27 October 2015.xlsx

Lead Team members 27 October 2015.xlsx

Reply Forward

Hallo Christoff Jy sal sien in die een lys is daar name sonder 'n e-pos adres...

Mr F 11/3/15

Hallo Mr F

Baie dankie hiervoor. Ek gaan die databasis intrek in Qualtrics en die proses so spoedig moontlik begin. Dankie vir jou moeite sover.

Ek hou jou op hoogte.

Groete

Christoff

From: Mr F [mailto:Mr F.@"TARGET COMPANY".com]

Sent: 03 November 2015 11:28 AM

Appendix L: De-briefing email for research participants

The following de-briefing email will be sent to all the respondents once the data collection has been completed.

Christoff Prinsloo

Aug 29

to Mr F

Goeie dag Mr F

Baie dankie vir die epos. Ek's jammer vir die lang stilte – hierdie data analiese was bietjie rowwer as wat ek gedink het. Ek is so-te-sê klaar met die opskrywing en sal graag vir julle 'n binne-kort persoonlike terugrapportering wil doen.

Wanneer sou julle pas?

Vriendelike groete

Christoff

From: Mr F

Sent: Monday, 29 August 2016 10:56 AM

To: Christoff Prinsloo - Gmail

Subject: RE: Decision-making survey

Hallo Christoff

Ek verneem graag hoe jou finale studies afgeloop het en ook die finale bevindings.

Groete

From: Christoff Prinsloo - Gmail [

Sent: 07 December 2015 08:04 AM

To: Mr F <Mr F.@”TARGET COMPANY”.com>

Cc: Mr T <Mr T.@”TARGET COMPANY”.com>

Subject: RE: Decision-making survey

Goeie dag Mr F

Aangeheg, weer n “screenshot” van die Qualtrics voorblad. 456 ingevulde vralyste! Let op die “bump” wat gevolg het op jou herinneringsepos.

Baie dankie weereens vir julle insette en moeite met die navorsing. Ek gaan dit deurwerk in Desember en sal graag, sodra ek iets van waarde het, vir julle terugvoering gee.

Vriendelike groete

Christoff

From: Mr F [mailto:Mr F.@”TARGET COMPANY”.com]

Sent: 04 December 2015 12:21 PM

To: Christoff Prinsloo - Gmail <

Subject: RE: Decision-making survey

Hallo Christoff

Volg net op hoe dit gaan met die steekproef.

Groete

From: Christoff Prinsloo - Gmail [

Sent: 23 November 2015 12:36 PM

To: Mr F <Mr F.@”TARGET COMPANY”.com>

Subject: RE: Decision-making survey

1000 dankies, Mr F. Dit gaan wonderlik werk.

Groete

Christoff

From: Mr F [mailto:Mr F.@”TARGET COMPANY”.com]

Sent: 23 November 2015 11:26 AM

To: Christoff Prinsloo - Gmail <

Subject: FW: Decision-making survey

FYI

Hallo Christoff

Ek kom terug na jou – moet net met Mr T bevestig.

Groete

From: Christoff Prinsloo [mailto:

Hallo Christoff

Hoe lyk die volgende datums en tyd vir jou:

1. 22 September enige tyd vanaf 13h00

2. 9 November tussen 13h00 en 14h00

3. 21 November tussen 13h00 en 16h00

Groete

Mr F

From: Christoff Prinsloo [mailto:

Sent: 29 August 2016 04:55 PM

Hall Mr F

More is bietjie kort kennisgewing – ek het ongelukkig reeds iets aan in daai tydgleuf.

Ek sou die 9e November verkies – 13:00 tot 14:00.

Groete

Christoff

From: Mr F

Sent: Wednesday, 21 September 2016 10:41 AM

To: Christoff Prinsloo

Cc:

Subject: RE: Decision-making survey

Hallo Christoff

Hoe lyk die volgende datums en tyd vir jou:

1. 22 September enige tyd vanaf 13h00

2. 9 November tussen 13h00 en 14h00

3. 21 November tussen 13h00 en 16h00

Groete

Mr F

Dankie Christoff

Ons teken dit so aan

Groete

To whom it may concern

De-briefing - Decision-making behaviour research

Thank you for participating in the research programme. It is requirement of the doctoral research ethics committee of the Gordon Institute of Business Science, that a debriefing email be sent to all respondents that have participated in a research project.

The purpose of the research was to determine whether the application of scenario framing could be employed to manipulate the decision-making quality of the respondents. Secondly, I hoped to determine whether the degree of manipulation differed for people of differing value and risk orientations. To achieve this, respondents were randomly selected to receive either a framed or unframed scenario to respond to. The statistical analysis of the data has not been completed yet, but it is suggested by the extant literature that a more complex, morally ambiguous scenario should lead to more complex (and for the purpose of this study, higher quality) decision-making.

Attached you will find both the scenarios for your own comparison. Should you want to know more about this experiment, or want to discuss this field of research in greater detail, please feel free to contact me at email.co.za.

Thank you again for participating in the research and helping us to advance our understanding of value-driven decision-making behaviour.

Kind regards,

Christoff Prinsloo

Christoff Prinsloo

Doctoral Candidate

Gordon Institute of Business Science, University of Pretoria

Scenario 1 – Unframed

Imagine you manage a commission-driven sales team that has recently lost its most successful sales representative. You have to fill the vacancy as a matter of urgency and have received a number of applications. After sifting through the candidates, you have narrowed the field down to just two candidates. The first candidate, a white male, belongs to a previously advantaged group but is a very skilled salesperson with all the skills required to succeed in the position. The second candidate, a black female, belongs to a previously disadvantaged group, but will have to be undergo lengthy training and coaching to succeed at the position. Since this is a commission-driven unit, you estimate that you stand to forego 30% of your personal remuneration should you choose the second candidate. Do you comply with employment equity legislation and appoint the black female?

Scenario 1 – Framed

Imagine you manage a commission-driven sales team that has recently lost its most successful sales representative. You have to fill the vacancy as a matter of urgency and have received a number of applications. After sifting through the candidates, you have narrowed the field down to just two candidates. The first candidate, a white male, belongs to a previously advantaged group but is a very skilled salesperson with all the skills required to succeed in the position. The second candidate, a black female, belongs to a previously disadvantaged group, but will have to undergo lengthy training and coaching to succeed at the position. Since this is a commission-driven unit, you estimate that you stand to forego 30% of your personal remuneration should you choose the second candidate. Consider this scenario against the reality that the affirmative action policy is still being implemented almost 20 years after the Apartheid government was deposed and that this practice potentially discriminates against people not involved in the atrocities of the past. Do you comply with employment equity legislation and appoint the previously disadvantaged candidate?

Appendix M: Detail Independent T-Test results

Scenario 1

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= .050	106	3.157	1.683	0.163
	< .050	124	3.834	2.072	0.186

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC score	Equal variances assumed	10.909	0.001	-2.693	228	0.008	-0.678	0.252	-1.174	-0.182
	Equal variances not assumed			-2.737	227.436	0.007	-0.678	0.248	-1.166	-0.190

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC2	>= .050	107	1.414	0.596	0.058
	< .050	124	1.464	0.609	0.055

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC2	Equal variances assumed	0.528	0.468	-0.631	229	0.529	-0.050	0.080	-0.207	0.107
	Equal variances not assumed			-0.632	225.374	0.528	-0.050	0.079	-0.207	0.106

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= .050	107	2.270	0.997	0.096
	< .050	124	2.649	1.217	0.109

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC3	Equal variances assumed	12.618	0.000	-2.562	229	0.011	-0.379	0.148	-0.670	-0.087
	Equal variances not assumed			-2.600	228.409	0.010	-0.379	0.146	-0.666	-0.092

Group Statistics

Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= -.80	108	3.801	2.012	0.194
	< -.80	122	3.275	1.824	0.165

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC score	Equal variances assumed	4.036	0.046	2.082	228	0.038	0.527	0.253	0.028	1.025
	Equal variances not assumed			2.069	217.510	0.040	0.527	0.254	0.025	1.028

Group Statistics

Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC2	>= -.80	109	1.514	0.643	0.062
	< -.80	122	1.375	0.558	0.051

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC2	Equal variances assumed	2.566	0.111	1.757	229	0.080	0.139	0.079	-0.017	0.294
	Equal variances not assumed			1.743	215.278	0.083	0.139	0.080	-0.018	0.296

Group Statistics

Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= -.80	109	2.640	1.169	0.112
	< -.80	122	2.325	1.085	0.098

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC3	Equal variances assumed	2.292	0.131	2.126	229	0.035	0.315	0.148	0.023	0.607
	Equal variances not assumed			2.117	221.193	0.035	0.315	0.149	0.022	0.609

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= 5.20	119	3.940	2.036	0.187
	< 5.20	106	3.105	1.730	0.168

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC score	Equal variances assumed	6.327	0.013	3.292	223	0.001	0.834	0.253	0.335	1.334
	Equal variances not assumed			3.322	222.523	0.001	0.834	0.251	0.339	1.329

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC2	>= 5.20	119	1.477	0.597	0.055
	< 5.20	107	1.400	0.604	0.058

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC2	Equal variances assumed	0.029	0.865	0.967	224	0.334	0.077	0.080	-0.080	0.235
	Equal variances not assumed			0.967	220.983	0.335	0.077	0.080	-0.080	0.235

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= 5.20	119	2.708	1.186	0.109
	< 5.20	107	2.238	1.037	0.100

Independent Samples Test

		for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
IC3	Equal variances assumed	5.898	0.016	3.157	224	0.002	0.470	0.149	0.177	0.764
	Equal variances not assumed			3.179	223.835	0.002	0.470	0.148	0.179	0.762

Scenario 2

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= .03	112	3.561	1.382	0.131
	< .03	126	4.076	1.692	0.151

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	8.345	0.004	-2.554	236	0.011	-0.515	0.202	-0.913	-0.118
	Equal variances not assumed			-2.584	234.382	0.010	-0.515	0.199	-0.908	-0.123

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC2	>= .03	112	1.371	0.630	0.060
	< .03	125	1.552	0.798	0.071

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC2	Equal variances assumed	6.235	0.013	-1.927	235	0.055	-0.181	0.094	-0.367	0.004
	Equal variances not assumed			-1.951	231.436	0.052	-0.181	0.093	-0.365	0.002

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= .03	112	2.466	0.897	0.085
	< .03	126	2.808	1.123	0.100

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC3	Equal variances assumed	11.843	0.001	-2.576	236	0.011	-0.342	0.133	-0.604	-0.081
	Equal variances not assumed			-2.610	233.400	0.010	-0.342	0.131	-0.601	-0.084

Group Statistics

Self-tranc		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= .17	121	3.727	1.545	0.140
	< .17	117	3.944	1.599	0.148

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	the Difference Lower	the Difference Upper
IC score	Equal variances assumed	0.266	0.607	-1.066	236	0.288	-0.217	0.204	-0.619	0.184
	Equal variances not assumed			-1.065	234.907	0.288	-0.217	0.204	-0.619	0.185

Group Statistics

Self-tranc		N	Mean	Std. Deviation	Std. Error Mean
IC2	>= .17	120	1.3688	0.62843	0.05737
	< .17	117	1.5662	0.80836	0.07473

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	the Difference Lower	the Difference Upper
IC2	Equal variances assumed	8.921	0.003	-2.103	235	0.037	-0.19749	0.09392	-0.38252	-0.01246
	Equal variances not assumed			-2.096	218.896	0.037	-0.19749	0.09421	-0.38317	-0.01181

Group Statistics

Self-tranc		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= .17	121	2.542	0.971	0.088
	< .17	117	2.755	1.091	0.101

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	the Difference Lower	the Difference Upper
IC3	Equal variances assumed	2.591	0.109	-1.592	236	0.113	-0.213	0.134	-0.477	0.051
	Equal variances not assumed			-1.589	230.808	0.113	-0.213	0.134	-0.477	0.051

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= 5.40	106	4.053	1.723	0.167
	< 5.40	127	3.672	1.440	0.128

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	5.346	0.022	1.838	231	0.067	0.381	0.207	-0.027	0.789
	Equal variances not assumed			1.809	205.098	0.072	0.381	0.211	-0.034	0.796

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC2	>= 5.40	105	1.5333	0.74362	0.07257
	< 5.40	127	1.3976	0.70525	0.06258

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC2	Equal variances assumed	2.159	0.143	1.423	230	0.156	0.13570	0.09534	-0.05216	0.32356
	Equal variances not assumed			1.416	217.098	0.158	0.13570	0.09583	-0.05317	0.32456

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= 5.40	106	2.786	1.115	0.108
	< 5.40	127	2.535	0.965	0.086

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC3	Equal variances assumed	4.348	0.038	1.842	231	0.067	0.251	0.136	-0.017	0.520
	Equal variances not assumed			1.818	209.171	0.070	0.251	0.138	-0.021	0.523

Scenario 3

Group Statistics

Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= -.76	111	4.077	1.358	0.129
	< -.76	127	3.697	1.293	0.115

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	0.420	0.518	2.209	236	0.028	0.380	0.172	0.041	0.719
	Equal variances not assumed			2.202	228.303	0.029	0.380	0.173	0.040	0.720

Group Statistics

Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC 2	>= -.76	111	1.6284	0.74075	0.07031
	< -.76	128	1.4199	0.63287	0.05594

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 2	Equal variances assumed	6.400	0.012	2.346	237	0.020	0.208	0.089	0.033	0.383
	Equal variances not assumed			2.320	217.761	0.021	0.208	0.090	0.031	0.386

Group Statistics

Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC 3	>= -.76	111	2.853	0.935	0.089
	< -.76	128	2.544	0.870	0.077

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 3	Equal variances assumed	0.756	0.385	2.642	237	0.009	0.309	0.117	0.079	0.539
	Equal variances not assumed			2.629	226.512	0.009	0.309	0.117	0.077	0.540

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= .05	109	3.672	1.258	0.120
	< .05	129	4.045	1.378	0.121

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	0.898	0.344	-2.168	236	0.031	-0.374	0.172	-0.713	-0.034
	Equal variances not assumed			-2.185	234.574	0.030	-0.374	0.171	-0.710	-0.037

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC 2	>= .05	109	1.447	0.596	0.057
	< .05	130	1.575	0.760	0.067

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 2	Equal variances assumed	6.402	0.012	-1.426	237	0.155	-0.128	0.090	-0.304	0.049
	Equal variances not assumed			-1.456	236.010	0.147	-0.128	0.088	-0.301	0.045

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC 3	>= .05	110	2.536	0.855	0.082
	< .05	129	2.816	0.942	0.083

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 3	Equal variances assumed	1.139	0.287	-2.390	237	0.018	-0.280	0.117	-0.511	-0.049
	Equal variances not assumed			-2.408	236.044	0.017	-0.280	0.116	-0.509	-0.051

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= 5.33	115	4.171	1.372	0.128
	< 5.33	118	3.616	1.262	0.116

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	0.584	0.446	3.217	231	0.001	0.555	0.173	0.215	0.896
	Equal variances not assumed			3.214	228.270	0.002	0.555	0.173	0.215	0.896

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC 2	>= 5.33	115	1.5891	0.72259	0.06738
	< 5.33	119	1.4559	0.65875	0.06039

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 2	Equal variances assumed	2.757	0.098	1.475	232	0.142	0.133	0.090	-0.045	0.311
	Equal variances not assumed			1.473	228.350	0.142	0.133	0.090	-0.045	0.312

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC 3	>= 5.33	116	2.855	0.962	0.089
	< 5.33	118	2.542	0.847	0.078

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 3	Equal variances assumed	1.139	0.287	2.646	232	0.009	0.313	0.118	0.080	0.547
	Equal variances not assumed			2.643	227.250	0.009	0.313	0.119	0.080	0.547

Scenario 3 – Framed

Group Statistics					
Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= -.80	66	4.227	1.427	0.176
	< -.80	54	3.730	1.497	0.204

Independent Samples Test										
		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	0.088	0.768	1.854	118	0.066	0.496	0.268	-0.034	1.027
	Equal variances not assumed			1.845	111.071	0.068	0.496	0.269	-0.037	1.029

Group Statistics					
Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC 2	>= -.80	66	1.807	0.812	0.100
	< -.80	54	1.421	0.648	0.088

Independent Samples Test										
		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 2	Equal variances assumed	8.227	0.005	2.829	118	0.005	0.386	0.136	0.116	0.655
	Equal variances not assumed			2.893	117.935	0.005	0.386	0.133	0.122	0.649

Group Statistics					
Self-enh		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= -.80	66	3.017	1.000	0.123
	< -.80	54	2.576	0.928	0.126

Independent Samples Test										
		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC3	Equal variances assumed	0.121	0.729	2.481	118	0.014	0.441	0.178	0.089	0.793
	Equal variances not assumed			2.500	116.118	0.014	0.441	0.176	0.092	0.790

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= .05	58	3.669	1.371	0.180
	< .05	62	4.316	1.509	0.192

Independent Samples Test

		of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	the Difference Lower	the Difference Upper
IC score	Equal variances assumed	1.300	0.257	-2.452	118	0.016	-0.647	0.264	-1.169	-0.124
	Equal variances not assumed			-2.460	117.904	0.015	-0.647	0.263	-1.167	-0.126

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC 2	>= .05	58	1.500	0.688	0.090
	< .05	62	1.758	0.815	0.103

Independent Samples Test

		of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	the Difference Lower	the Difference Upper
IC 2	Equal variances assumed	2.766	0.099	-1.868	118	0.064	-0.258	0.138	-0.532	0.016
	Equal variances not assumed			-1.878	116.814	0.063	-0.258	0.137	-0.530	0.014

Group Statistics

Conserv		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= .05	58	2.584	0.895	0.118
	< .05	62	3.037	1.030	0.131

Independent Samples Test

		of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	the Difference Lower	the Difference Upper
IC3	Equal variances assumed	0.740	0.391	-2.561	118	0.012	-0.452	0.177	-0.802	-0.103
	Equal variances not assumed			-2.573	117.381	0.011	-0.452	0.176	-0.801	-0.104

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC score	>= 5.33	55	4.397	1.486	0.200
	< 5.33	62	3.695	1.417	0.180

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC score	Equal variances assumed	0.445	0.506	2.616	115	0.010	0.703	0.269	0.171	1.234
	Equal variances not assumed			2.609	111.846	0.010	0.703	0.269	0.169	1.236

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC 2	>= 5.33	55	1.723	0.809	0.109
	< 5.33	62	1.560	0.722	0.092

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC 2	Equal variances assumed	1.547	0.216	1.146	115	0.254	0.162	0.142	-0.118	0.443
	Equal variances not assumed			1.138	109.099	0.257	0.162	0.143	-0.120	0.445

Group Statistics

Social		N	Mean	Std. Deviation	Std. Error Mean
IC3	>= 5.33	55	3.060	0.989	0.133
	< 5.33	62	2.628	0.965	0.123

Independent Samples Test

		of Variances		t-test for Equality of Means						
									the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IC3	Equal variances assumed	0.007	0.935	2.390	115	0.018	0.432	0.181	0.074	0.791
	Equal variances not assumed			2.386	112.613	0.019	0.432	0.181	0.073	0.791

Appendix N: Coding manual – Automated integrative complexity coding

Terms of Use and Instructions

Terms of Use

This Automated Integrative Complexity system is copyrighted. If you use it, you are agreeing to the terms outlined here.

For Academic Research Purposes: This system may be used free of charge for academic research purposes only. However, you may not distribute it to anyone else, and you may not use it for any purpose other than academic research. If you are in doubt about whether it qualifies for free usage, contact luke.conway@umontana.edu to clarify.

The only qualification is that, should you publish something that includes data generated by the Automated Integrative Complexity system, you need to cite the following two papers (the first paper is for Integrative Complexity; the second is for Dialectical and/or Elaborative Complexity):

Conway, L. G., III, Conway, K. R., Gornick, L. J., & Houck, S. C. (in press). Automated integrative complexity. Political Psychology, XX, XX-XX.

Houck, S. C., Conway, L. G., III, & Gornick, L. J. (in press). Automated integrative complexity: Current challenges and future directions. Political Psychology, XX, XX-XX.

For ALL Other Purposes: If you want to use this system for non-research related purposes, such as (but not limited to) those involving business contexts, student screening, or government uses, you must contact Luke at luke.conway@umontana.edu before you start. Terms of use in these instances will be determined on a case-by-case basis.

Please respect these terms of use! We spent a long time developing and testing this system and putting it in a user-friendly format. While we want other people to use it, we do not want to be taken advantage of.

How the Two Files You Can Download Are Different

You can download two separate files. The first file (AutoICforDocuments) breaks documents up into 75 word paragraphs. The second file (AutoICforParagraphs) scores whole paragraphs without breaking them up. You should only use the paragraph format for relatively short segments. This system is designed to score relatively short paragraphs. The AutoICforDocuments breaks them up into optimal 75-word chunks. If you have a document

that is, say, 2000 words long, and you use the AutoICforParagraphs, it will likely assign it a very high score; the Paragraph version was designed for shorter, paragraph-length responses.

The primary purpose we had in mind for the Paragraph version was an easy way to score participant responses in laboratory settings. If you have large documents, you should use the Document version. But of course, you are free to download both and use them however you want to, as long as you meet the terms of use.

Below, we will describe these two systems separately. But they are using the same exact lexicon and using the same exact scoring criteria. The only thing that is different is the unit of scoring – that is, how it decides which words to score.

Scoring Documents (AutoICforDocuments)

Introductory Remarks and System Requirements

This system is intended to provide a proxy for the integrative complexity construct that has traditionally been human-scored. Rather than explain the validity evidence, strengths, and weaknesses of the system to you here, I'll instead refer you to the papers containing these things:

Conway, L. G., III, Conway, K. R., Gornick, L. J., & Houck, S. C. (in press). Automated integrative complexity. Political Psychology, XX, XX-XX.

Houck, S. C., Conway, L. G., III, & Gornick, L. J. (in press). Automated integrative complexity: Current challenges and future directions. Political Psychology, XX, XX-XX.

What the AutoICforDocuments does is assign a score, on a 1-7 scale, that represents an integrative complexity score. The AutoICforDocument system is designed to score documents. What it does to each document is the following: It breaks it into 75-word chunks (or paragraphs), and then assigns each "chunk" an integrative complexity score. You can get analyses from the system at the level of the paragraph/chunk, or at the level of the document.

Seventy-five is not an arbitrarily chosen number: We looked at over 1300 paragraphs that had been scored by both our system and by human scorers, and chose that number because it best approximated the number of words in paragraphs where the human-scored and automated systems gave the same absolute value (on average) for integrative complexity.

This kind of chunking will make the traditional integrative complexity purist (like myself) initially feel their stomach churning, because this is not the proper way to create paragraphs for human

scoring. But in actual fact it is perfectly justifiable. Human scoring is dependent on the semantic meaning, and thus it would almost certainly artificially lower the score of any set (for human scoring) to create paragraphs in a way that cuts across semantic chunks. But computer scoring is different. Because it is dependent not on the semantic meaning but on the density (and power) of language relevant to complexity, it really would not alter the score for a given document much if we used semantic chunking (as in human scoring) or word count chunking (as we do in our automated system; and as does every other automated system we know of). But in any event, it isn't an option: If you want semantic chunking, you have to have a human do it to do it right; and then the advantage of a computer system (which is that, although it is less precise, it can score way, way more material) is pretty much wiped out.

To use this system, you are going to need a computer with Microsoft EXCEL and the ability to put documents in WORD format. We have tested it using EXCEL 2007 and EXCEL 2010, and it worked on both. If you find it doesn't work on other versions you have, contact us.

You can do some minimal analyses in EXCEL, but if you are like me, you'll want to use a statistics package to actually analyze the data. If so, you'll need a version of SPSS or some other software that's compatible with EXCEL.

The system also assigns scores for two sub-types of integrative complexity: Dialectical complexity and elaborative complexity (Conway et al., 2008, JPSP; Conway et al., 2011, JOP). It further breaks down the integrative complexity, dialectical complexity, and elaborative complexity score into their differentiation and integration components. If you want more information about dialectical complexity and elaborative complexity, see these papers (you can get them from our website):

Conway, L. G., III., Thoemmes, F., Allison, A. M., Hands Towgood, K., Wagner, M., Davey, K.,Salcido, A., Stovall, A., Dodds, D. P., Bongard, K, & Conway, K. R. (2008). Two ways to be complex and why they matter: Implications for attitude strength and lying. Journal of Personality and Social Psychology, 95, 1029-1044.

Conway, L. G. III, Dodds, D., Hands Towgood, K., McClure, S, & Olson, J. (2011). The biological roots of complex thinking: Are heritable attitudes more complex? Journal of Personality, 79, 101-134.

Below, we describe how to use the system at a practical level. This seems like a lot of directions, but actually, once you download it and understand how it works, it is very easy to use.

Downloading the AutoIC file

The AutoIC system is contained on an EXCEL template file. You don't have to be familiar with template files to use this, but you do have to be sure to put the template file in the right place when you download it, or else you will not be able to find it when you want to use it. So please carefully follow these directions below. (If you use templates, these directions just tell you to save it in your Microsoft Office Templates folder).

1. Save the template in your templates folder. On our computers, this follows the following path:

\My Computer\Local Disk (C:)\Documents and Setting\<your login>\Application Data\Microsoft\Templates

a. "<your login>" should be a folder named after whatever your computer login name is. If your name is John Smith, most likely it'll be a folder named something like "john.smith."

b. So, when are downloading it, you should navigate to the templates folder that is in the Microsoft folder and save the AutoIC file there. If you are having a hard time finding it, contact us.

Document preparation for AutoIC

1. Documents must be put into Word format.

2. Documents must be cleaned of any extraneous information (e.g., anything that is not a direct quote from the speaker/writer you are interested in)

a. Note: If you don't clean it, AutoIC will still score it, but it will also score all the extraneous information just as if it were part of the actual thing you wanted to score.

3. If you want to use this to understand differences in complexity across different conceptual "cells" (e.g., foreign versus domestic policy statements), one document cannot contain two things that are in the same conceptual "cell." So, if you are interested in comparing Obama's language on foreign policy with his language on domestic policy, you must have separate word files for those with only foreign policy statements and for those with only domestic policy statements. If you are interested in comparing different political candidates' complexity during some debate with each other, then you must have separate files for each candidate (where each file only includes material from one candidate and not the others).

a. You can of course combine multiple documents into larger categories after the documents are scored (so if you have 10 foreign policy documents and 10 domestic policy

documents, you do not have to collapse them into only 2 documents). But this will be easiest if you use extremely clear labels for the documents when you name them, so that those document names map on to your conceptual framework. (Or conversely, use short names for the documents like “01” and “02” and then keep track on another file of the potential properties of each file number, so that you can easily create relevant variables in SPSS after the fact).

b. All of this is common methodological sense and has little to do with any limitations of our package. If you want to test differences between things, in any context you have to separate the things. You can’t test a difference between A and B if you put A and B together. And automated system is not a substitute for using good methodological sense!

4. The document names you give to each document should be easy to understand, because whatever you name the document will be the initial name by which you can identify the row in both EXCEL and SPSS. It’ll be listed under a variable called, creatively enough, “document.”

5. Put all documents in same folder; this folder should have NOTHING else in it except the files you are going to score.

Scoring Documents

1. Open Excel.

2. Choose File, New.

3. Click My Templates.

4. Double-Click on AutoICforDocumentPwdProtected.

5. If you get a yellow box, click Enable.

6. This opens a new file using the template. Immediately “save as” and put the new file into preferred folder; re-name it (if you wish). This will become the final EXCEL file for the documents you score.

a. NOTE: You must change the “SAVE AS TYPE” before saving. Right below the FILE NAME line there is a SAVE AS TYPE line. Click on the expand arrow and choose “Excel Macro-Enabled Workbook”

b. Click “Save”

7. To score documents, you need to then run the AutoIC macro:

a. Choose View, Macros.

b. This brings up the dialogue box for macros. You should see “AutoIC” in the “Macro name” box. Highlight it.

c. Click Run.

8. It will then bring up a dialogue box for opening files on your computer. (If this isn’t readily apparent, click on the Microsoft Excel icon for the original file at the bottom. On some computers, it automatically opens the dialogue box, but on others it first opens a blank page of Microsoft Word. So, if the latter happens to you, you merely need to click on the Microsoft Excel icon containing the original file at the bottom, and the dialogue box will appear).

9. Navigate to the folder with the files you want scored, and HIGHLIGHT ALL OF THEM. Then press “open.”

The macro is now computing complexity scores for your document! NOTE: We found that using Microsoft Word while it was processing crashed the macro. So, you can use other programs typically without any problem, but you’re probably going to have to avoid Microsoft Word while AutoICforDocuments is running.

How long will the processing take?

The AutoIC system contains an absolutely enormous dictionary and uses thousands and thousands of possible word/phrase permutations. Plus, it doesn’t just recognize words and phrases, it performs a complicated hierarchical and probabilistic scoring technique for each paragraph. As a result, it takes longer than the typical processing program to score materials.

How long? Depending on how many files you have, how big the files are, and how fast/slow your computer processor is, this could take anywhere from 1 minute to several hours. You can follow the status by looking at the status bar (underneath the tabs in the lower left corner). It will tell you what step it is on.

As an example, we timed three separate sets of documents through the AutoIC. First, we processed 32 documents of varying length – some were fairly long (almost 30,000 words) while some were short (less than a page). The average word length was around 4,000 words; the number of overall paragraphs/chunks was about 1,850. The AutoIC took about 6 minutes and 50 seconds to finish this set. This averages to a rate of 5 documents/minute.

Second, we processed 62 fairly short documents (mostly between 1-5 pages; average was about 1700 words; number of overall paragraphs/chunks was about 1,850). This took about 6 minutes and 55 seconds. This averages to a rate of 9 documents/minute.

Third, we processed 97 documents of various size (average about 5000 words/document; number of overall paragraphs/chunks was about 6,500). This took about 28 minutes. This averages to a rate of 3 documents/minute.

Combining these three datasets, this average to about 6 documents a minute (fewer per minute if the documents are longer, and more per minute if the documents are shorter).

So let's say you wanted to score 100 average-sized documents. We'll use the slowest rate (3/minute) and the fastest rate (9/minute) to estimate the range of possible times for computation. Extrapolating out from our little tests, 100 documents would take about between 11 and 34 minutes.

200 documents would take between 22 and 67 minutes.

500 documents would take between 1 and 3 hours.

1,000 documents would take between 2 and 6 hours.

10,000 documents would take between 18 and 56 hours!

But look on the bright side – even if it takes all day, you can spend a couple of minutes getting it started and then work on other stuff while it runs in the background; a small price to pay to score a large amount of information with little effort! (I mean, it isn't like YOU are working your tail off all day; you're just having to wait a bit for it to finish).

Interpreting the Output

After the output has finished, SAVE THE FILE. (If you ignored my directions above to save the EXCEL file as a new file the first time it opened, then SAVE AS right now. See directions above for doing this – you need to save it as a macro-enabled file.)

OK, after you've SAVED THE FILE, the first thing to note is that there are three tabs at the bottom: Paragraph, Document, and Words. You can click on them to bring up a different sheet with different information on it. What you'll see on the first two sheets will be a column labeled document containing all the document names. The other columns represent the output for each document, including the integrative complexity variables. The variable labels will be explained later in more detail. Here we provide the big-picture overview.

1. PARAGRAPH SHEET. The paragraph sheet presents data for each paragraph (or chunk) separately. One of the common ways to analyze data in human-scoring IC research is to use the paragraph as the unit of analysis. In this case, the paragraph would make more sense as a unit of analysis if you have a small number of very large documents (e.g., you are comparing two early works of Shakespeare against two later works of Shakespeare).

2. DOCUMENT SHEET. This presents the exact same data as the PARAGRAPH SHEET, only here it is aggregated for each document. So each IC-related cell represents the average score for the entire document, so the IC score would be the average of all the paragraphs/chunks in that document. My guess is that, if you have a large number of documents, this is the most sensible unit of analysis (and probably the one most commonly used in other linguistic analytic systems such as the LIWC or Profiler Plus).

3. The WORD sheet is not useful for quantitative analyses, but rather presents lists of all the words/phrases that were scored and the number of times each word/phrase appeared across all documents scored. This feature is useful for determining what sorts of words/phrases led to increased complexity scores in your dataset, and seeing if maybe some of those words are not complexity-related in your dataset.

a. For example, if you are scoring a dataset on people trying to lose weight, you might see that the word “weigh” shows up a lot (this root word gets scored as integration in the AutoIC). If it does, then you can select to exclude “weigh” and re-run the analyses. The AutoIC will then re-score the documents as if the word “weigh” does not count as complexity.

b. If you want to exclude a word or phrase, type a “Y” in the “exclude” column in the row where the word/phrase is. Then go back to view macro and re-run the AutoIC macro.

i. Note: If you do this, it will automatically delete the current data and re-compute everything, so if you want the original data too, save it as a different file first.

c. To illustrate, we computed the IC score for this Manual. It was 2.97. Then we re-computed it removing the words complex, complexity, dialectical, elaborative, integration, and differentiation (as those are used primarily in descriptive fashion in this manual, and do not indicate complex thinking). Removing those words dropped the score to 2.22. While that’s still pretty complex for a manual, and we’re quite proud of that fact, the 2.22 is substantially lower than 2.97 – and the lower score is a better marker of the actual complexity of the manual.

Opening the Output File in SPSS

SPSS opens EXCEL files. This is straightforward, but because there are two different "sheets" you might open, I'd read this below to be sure you understand how to do this for AutoIC (even if you've opened EXCEL files in SPSS before).

1. Open SPSS. Click file…open data.

2. This brings up the open data dialogue box. Where it says FILES OF TYPE, click the expand arrow and choose "EXCEL"

3. Navigate to the EXCEL file you just saved as output (you'll have to close it in EXCEL before opening it in SPSS) and open it.

4. This brings up an "Opening EXCEL Data Source" dialogue box. Generally, you accept the defaults, but there may be an exception here.

a. You should always have the "read variable names from the first row of data" checked (that's the default).

b. The Worksheet box is important. Remember that your EXCEL file has three sheets: Paragraph-level, Document-level, and the Words. So here, you need to select which sheet you want the SPSS output to be computed from. The default will be the Paragraph (chunk). But if you want it to be at the document level, select the expand arrow and select "Document" (it'll have some stuff indicating rows and columns after that, but don't worry about it).

c. Note: you can use the same excel file to create multiple SPSS files – so if you want both a document and a paragraph level analysis, you can just re-open the EXCEL file twice and create two separate SPSS files.

d. Note 2: The "Word" sheet is of no value for SPSS analysis as far as we can tell, so ignore it here.

5. Once you have the SPSS datafile you want up, "save as" an SPSS file under whatever name you want (I usually try to use the exact same name as the EXCEL file to make it easy to remember where I computed it from).

6. I'm assuming you know how to use SPSS or you would not have wanted to put this data in that format, so from there it's up to you to do analyses however you like. A few quick notes:

a. The variable names are the same as they are in EXCEL, except that I think it removes spaces and hyphens. This just converts the EXCEL file into SPSS format. See variable names below to interpret both EXCEL and SPSS format names.

b. You will probably have to recreate a new variable or variables for the "document" variable in order to do analyses in SPSS. This is because it will represent as a string variable.

i. SPSS won't allow you to do use a string variable for some analyses (e.g., for t-tests you have to have a numeric value; though you can do the same analyses in an ANOVA under "general linear model" keeping the string variable).

ii. This is a good reason for keeping your document names short, because you'll probably want to use "re-code into new variables" commands or some syntax (as I use) to re-compute them, and in my experience, this is easier if the variable names are short.

iii. I have written a handy SPSS syntax file for converting the document variable into any numeric variable you like. You'll have to adapt the syntax a little to your project, but the directions are explained in the file itself. You can download it at the same place you download the AutoIC files.

If you have any questions or problems, please e-mail us at luke.conway@umontana.edu. Happy computing!

Variable Names and What They Mean

On the PARAGRAPH SHEET:

Document = name of document from which chunk was scored

Chunk = chunk number within document; always listed sequentially (so 1 = first chunk in document, 2 = second, and so forth)

Complete? = did the chunk include a full 75 words (=1), or not (=0). Every chunk will include 75 words except for the last chunk in a document. AutoIC scores the last chunk, but this variable allows researchers to select out those "incomplete" chunks easily and do analyses without them should they choose to do so. There are pros and cons to both approaches: (1) If you don't remove them, you have chunks in your data that are not standard length; (2) but if you do remove them, you systematically lose the end of all documents. (In most datasets, it will make little or no difference; more on this when we discuss the document-level variables). On balance, though, our advice is to remove the incomplete chunks. On average, they are just adding unnecessary noise in terms of paragraphs with differing word lengths. And you're still going to be scoring the vast majority of the words in most cases anyway. If it looks like you are not (see DOCUMENT SHEET below), then you should just do it both ways (look at your

data with and without incomplete chunks). If you do, you'll almost certainly see what I'm telling you here: It just doesn't matter.

Paragraph = the actual paragraph that was scored, devoid of punctuation.

Words = number of words in the paragraph; it's always 75 except for the last chunk in each document.

IC = integrative complexity score for that chunk.

DIAL = dialectical complexity score for that chunk.

ELAB = elaborative complexity score for that chunk.

IC_Differentiation = Integrative complexity score that was the result of differentiation. Note that, to keep differentiation and integration on the same scale, neither of them starts from 1 (they both start from zero). The IC scale itself starts from 1. I point this out only so that you will realize that IC_Differentiation + IC_Integration does NOT = IC. Rather, you have to add one to that score to get the IC score. This is just to keep the differentiation and integration scores on the same scale.

IC_Integration = Integrative complexity score that was the result of integration. See note for IC_Differentiation about the scale. This is also true for all the differentiation and integration variables below; we're just going to stop saying that.

DIAL_Differentiation = Dialectical complexity score that was the result of differentiation.

DIAL_Integration = Dialectical complexity score that was the result of integration. See note for IC-Integration above.

ELAB_Differentiation = Elaborative complexity score that was the result of differentiation.

ELAB_Integration = Elaborative complexity score that was the result of integration. See note for IC-Integration above.

On the DOCUMENT SHEET:

The document sheet conceptually presents the exact same variables in the exact same order as the PARAGRAPH SHEET, only it deals with an issue that occurs when we aggregate. In particular, should the aggregated variable include the incomplete chunks (see Complete? variable description for the paragraph sheet)?

First, realize that unless you have a lot of very short documents, this is unlikely to matter in any meaningful way. (And if you have a lot of short documents, consider using the AutoICforParagraphs version). So, I don't think in the typical dataset it is likely to be an issue at all.

We dealt with the tension between these two things (not wanting to cut data but not wanting to use incomplete chunks) by (1) providing you with information relevant to how much of the data was scored (% words scored overall, mean number of words in each "chunk"), and (2) providing you with two separate sets of scores that parallel those from the paragraph sheet. One set removes the incomplete chunks; a second set includes the incomplete chunks.

We recommend using the first set, for reasons outlined in the PARAGRAPH sheet instructions above. However, you should look at the percentage of words scored variable and, if it consistently dips below 90%, look at both types of scores, to be sure nothing weird is happening. The odds are pretty strong that whatever method is used for dealing with the issue, your results will look the same.

Document = name of document.

Num Complete Chunks = number of complete chunks in the document.

Num Words in Complete Chunks = Total number of words in the document, minus the incomplete chunks.

Percentage of Words Scored = This variable is only relevant to the main set of IC variables (which remove incomplete chunks). For those main IC variables, this tells you, out of all the words in the document, what percentage was actually scored (this will be all of the words except for incomplete chunks). Unless you have really short documents, this figure is going to be above 90%, and usually will hover above 95%.

The next set of variables parallels those for the paragraph sheet, only it removes incomplete chunks. This is the set we recommend using for the typical data set:

IC = average integrative complexity score for the document, excluding incomplete chunks .

DIAL = average dialectical complexity score for the document, excluding incomplete chunks.

ELAB = average elaborative complexity score for the document excluding incomplete chunks.

IC_Differentiation = average level of IC differentiation for that document (please see notes on integration/differentiation for paragraph sheet), excluding incomplete chunks.

IC_Integration = average level of IC integration for that document (please see notes on integration/differentiation for paragraph sheet), excluding incomplete chunks.

DIAL_Differentiation = average level of DIAL differentiation for that document (please see notes on integration/differentiation for paragraph sheet), excluding incomplete chunks.

DIAL_Integration = average level of DIAL integration for that document (please see notes on integration/differentiation for paragraph sheet), excluding incomplete chunks.

ELAB_Differentiation = average level of ELAB differentiation for that document (please see notes on integration/differentiation for paragraph sheet), excluding incomplete chunks.

ELAB_Integration = average level of ELAB integration for that document (please see notes on integration/differentiation for paragraph sheet), excluding incomplete chunks.

The next set of variables parallels those for the paragraph sheet, only it KEEPS incomplete chunks:

Num All Chunks = Total number of words in the document, including the incomplete chunks.

Mean Words in Chunk = average number of words in the chunk; again, if it drifts far below 70, this suggests a higher percentage of your paragraphs are below the 75 marker.

IC_AllChunks = average integrative complexity score for the document, including incomplete chunks.

DIAL_AllChunks = average dialectical complexity score for the document, including incomplete chunks.

ELAB_AllChunks = average elaborative complexity score for the document, including incomplete chunks.

IC_Differentiation_AllChunks = average level of differentiation for that document (please see notes on integration/differentiation for paragraph sheet), including incomplete chunks.

IC_Integration_AllChunks = average level of integration for that document (please see notes on integration/differentiation for paragraph sheet), including incomplete chunks.

DIAL_Differentiation_AllChunks = average level of dialectical differentiation for that document (please see notes on integration/differentiation for paragraph sheet), including incomplete chunks.

DIAL_Integration_AllChunks = average level of dialectical integration for that document (please see notes on integration/differentiation for paragraph sheet), including incomplete chunks.

ELAB_Differentiation_AllChunks = average level of elaborative differentiation for that document (please see notes on integration/differentiation for paragraph sheet), including incomplete chunks.

ELAB_Integration_AllChunks = average level of elaborative integration for that document (please see notes on integration/differentiation for paragraph sheet), including incomplete chunks.

On the WORD SHEET:

Word = word/phrase scored somewhere in documents (key for interpreting is forthcoming)

Count = number of times word/phrase scored in documents

Exclude = type “Y” if you want to exclude word/phrase (see description of Word Sheet in “Interpreting the Output” section)

Scoring Whole Paragraphs (AutoICforParagraphs)

Introductory Remarks and System Requirements

This system is intended to provide a proxy for the integrative complexity construct that has traditionally been human-scored. Rather than explain the validity evidence, strengths, and weaknesses of the system to you here, I’ll instead refer you to the papers containing these things:

Conway, L. G., III, Conway, K. R., Gornick, L. J., & Houck, S. C. (in press). Automated integrative complexity. Political Psychology, XX, XX-XX.

Houck, S. C., Conway, L. G., III, & Gornick, L. J. (in press). Automated integrative complexity: Current challenges and future directions. Political Psychology, XX, XX-XX.

What the AutoICforParagraphs does is assign a score, on a 1-7 scale, that represents an integrative complexity score. The AutoICforParagraphs file is designed to score whole paragraphs. It does not break the paragraph up into chunks of equal length; rather, it simply scores the entire paragraph.

You can use it however you want, but you should not use this to score longer materials. This system was designed to score paragraphs that range from (roughly) 10-500 words. If you have really long materials (e.g. a document that's 2000 words long), you should use the AutoICforDocuments to score it, because that file automatically breaks the documents up into appropriate-sized chunks. (Or, at the very least, you should control for word length if the documents show a lot of variability). Otherwise, if you use the AutoICforParagraphs, you may get a ceiling effect.

To use this system, you are going to need a computer with Microsoft EXCEL. We have tested it using EXCEL 2007 and EXCEL 2010, and it worked on both. If you find it doesn't work on other versions you have, contact us.

You can do some minimal analyses in EXCEL, but if you are like me, you'll want to use a statistics package to actually analyze the data. If so, you'll need a version of SPSS or some other software that's compatible with EXCEL.

The system also assigns scores for two sub-types of integrative complexity: Dialectical complexity and elaborative complexity (Conway et al., 2008, JPSP; Conway et al., 2011, JOP). It further breaks down the integrative complexity, dialectical complexity, and elaborative complexity score into their differentiation and integration components. If you want more information about dialectical complexity and elaborative complexity, see these papers (you can get them from our website):

Conway, L. G., III., Thoemmes, F., Allison, A. M., Hands Towgood, K., Wagner, M., Davey, K.,Salcido, A., Stovall, A., Dodds, D. P., Bongard, K, & Conway, K. R. (2008). Two ways to be complex and why they matter: Implications for attitude strength and lying. Journal of Personality and Social Psychology, 95, 1029-1044.

Conway, L. G. III, Dodds, D., Hands Towgood, K., McClure, S, & Olson, J. (2011). The biological roots of complex thinking: Are heritable attitudes more complex? Journal of Personality, 79, 101-134.

Below, we describe how to use the system at a practical level. This seems like a lot of directions, but actually, once you download it and understand how it works, it is very easy to use.

Downloading the AutoIC file

The AutoIC system is contained on an EXCEL template file. You don't have to be familiar with template files to use this, but you do have to be sure to put the template file in the right place when you download it, or else you will not be able to find it when you want to use it. So please carefully follow these directions below. (If you use templates, these directions just tell you to save it in your Microsoft Office Templates folder).

1. Save the template in your templates folder. On our computers, this follows the following path:

\My Computer\Local Disk(C:)\Documents and Setting\<your login>\Application Data\Microsoft\Templates

c. "<your login>" should be a folder named after whatever your computer login name is. If your name is John Smith, most likely it'll be a folder named something like "john.smith."

d. So when are downloading it, you should navigate to the templates folder that is in the Microsoft folder and save the AutoIC file there. If you are having a hard time finding it, contact us.

Preparation for AutoIC Scoring

1. Open Excel.

2. Choose File, New.

3. Click My Templates.

4. Double-Click on AutoICforParagraphPwdProtected.

5. If you get a yellow box, click Enable.

6. This opens a new file using the template. Immediately "save as" and put the new file into preferred folder; re-name it (if you wish). This will become the final EXCEL file for the documents you score.

a. NOTE: You must change the "SAVE AS TYPE" before saving. Right below the FILE NAME line there is a SAVE AS TYPE line. Click on the expand arrow and choose "Excel Macro-Enabled Workbook"

b. Click "Save"

At this point, you should see columns for three variable names (which you may or may not use as you see fit) and the paragraph. That paragraph column is where you need to paste the

things you want scored. (If you already have a column of data in EXCEL format, you can conveniently paste it into the paragraph column all at once). DO NOT ADD OR DELETE ANY COLUMNS PRIOR TO SCORING PARAGRAPHRS! If you do not want the variable columns, keep them until after the documents have been scored and THEN delete them. If you want MORE columns, you'll have to wait until after the paragraphs are scored to add them.

The AutoICforParagraphs file will score each EXCEL box (or "cell") in its entirety. Thus, if the thing you want scored is in a word format, you'll need to remove all formatting (paragraph breaks, etc.) before you copy it or it'll put them in multiple boxes when you paste. If it's a long segment you want scored, you should do some checks to be sure the whole thing got in the box – some versions of EXCEL have word limits per cell.

Scoring Documents

Once you have all the paragraphs pasted in that you want scored, it's pretty simple to score them.

1. To score documents, you need to then run the AutoIC macro:

a. Choose View, Macros.

b. This brings up the dialogue box for macros. You should see "AutoIC" in the "Macro name" box. Highlight it.

c. Click Run.

2. That's it! It will run for a while and create new columns for the scored complexity variables. They are exactly the same as the "paragraph" variable sheet for the documents file.

Interpreting the Output

After the output has finished, SAVE THE FILE. (If you ignored my directions above to save the EXCEL file as a new file the first time it opened, then SAVE AS right now. See directions above for doing this – you need to save it as a macro-enabled file.)

To interpret the file, note first that there are tabs at the bottom for PARAGRAPH and WORDS sheets. These are exactly like the PARAGRAPH SHEET and WORDS SHEET for the AutoICforDocuments section, so I'll refer to the discussion of those two sheets in that section.

The only difference is that the Word Count variable will truly be more variable, because the AutoICforParagraphs scores the whole chunk. But this is only common sense and probably not worth the space I used to type this paragraph.

Also, the variables themselves are the same – and interpreted the same – as in the Paragraph section of the variable names for AutoICforDocuments. Please see that section.

Opening the Output File in SPSS

SPSS opens EXCEL files. This is straightforward. Open SPSS. Click file…open data.

1. This brings up the open data dialogue box. Where it says FILES OF TYPE, click the expand arrow and choose "EXCEL"

2. Navigate to the EXCEL file you just saved as output (you'll have to close it in EXCEL before opening it in SPSS) and open it.

3. This brings up an "Opening EXCEL Data Source" dialogue box. Generally, you accept the defaults, but there may be an exception here.

a. You should always have the "read variable names from the first row of data" checked (that's the default).

b. The Worksheet box is important. Remember that your EXCEL file has two sheets: Paragraph-level and Words. So here, you need to select which sheet you want the SPSS output to be computed from. The default will be the Paragraph (chunk), and here, that's what you always use.

c. Note: The "Word" sheet is of no value for SPSS analysis as far as we can tell, so ignore it here.

4. Once you have the SPSS datafile you want up, "save as" an SPSS file under whatever name you want (I usually try to use the exact same name as the EXCEL file to make it easy to remember where I computed it from).

5. I'm assuming you know how to use SPSS or you would not have wanted to put this data in that format, so from there it's up to you to do analyses however you like. A few quick notes:

a. The variable names are the same as they are in EXCEL, except that I think it removes spaces. This just converts the EXCEL file into SPSS format. See variable names in the Paragraph section above to interpret both EXCEL and SPSS format names.

If you have any questions or problems, please e-mail us at luke.conway@umontana.edu. Happy computing!

Appendix O: Consistency matrix - research design

Research Questions	Literature Review	Data Collection Tool	Analysis
1. What is the extent of the relationship between personal value system orientations and the decision-making quality exhibited by individuals during value clashing scenarios?	Schwartz (1994), Hall and Paradice (2007), Fritzche and Oz (2007), Schwartz, Ciecіuch, Vecchione, Davidov, Fischer, Beierlein,and Konty (2012)	Schwartz et al (2012) Portrait Value Questionnaire	Decision trees, Independent T-tests
2. What is the extent of the relationship between personal risk propensities and the decision-making quality exhibited by individuals during value clashing scenarios?	Sitkin and Weingart (1995), Weber, Blais, and Betz (2002), (Blais and Weber, 2006)	Weber et al (2002) Domain Specific Risk Taking Scale	Decision trees, Independent T-tests
3. Will decision-making groups, produced by a combination of the value- and risk traits, produce decision-making responses of varying quality?	Tetlock (1986), Houck, Conway and Gornick (2014), Conway, Gornick and Houck (2014), Suefeld and Tetlock (2014)	Tetlock (1986) Integrative complexity measure	Inferred from decision tree results showing evidence of both values and risk impacting decision-making quality
4. To what extent will the introduction of social-relational framing impact the decision-making quality exhibited by the individuals?	Fiske (1992), Fiske and Tetlock (1997), McGraw and Tetlock (2005, Schoemaker and Tetlock (2012)	Tetlock (1986) Integrative complexity measure	Decision trees, Independent T-tests