

**A MIXED METHODS APPROACH TO THE CONSTRUCTION AND VALIDATION OF
A PERSONALITY-CENTRED MODEL AND MEASURE OF
INDIVIDUAL DIFFERENCES IN WAYS OF THINKING**

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Abstract

This dissertation reports the process of creating a measure of the individual differences in the ways people think, based on a personality-centred psycholexical model (Roodenburg, 2006) not previously instrumentalized. In developing the scale, the same six factors and facet structure of the a-priori student ways of thinking model were maintained, and the adjectival items used to generate sentences. Rather than continuing with a quantitative method as used in the model development, and traditionally used to develop self report measures, the current research proceeded with a mixed methods approach, in order to capitalize on the potential richness of data from a number of case studies, both to deepen the understanding of how individuals think, and to alternatively validate the measure. A range of views were gathered by semi-structured interviews with ten participants, selected as representing Holland's occupational interests (Holland, 1996), and from a mature age range of 55 – 74 years, three males and seven females. The qualitative part of the process ran concurrently with data collection from the newly developed 120 item online questionnaire, with both quantitative and qualitative methods asking questions specifically about thinking. Phenomenological thematic analysis was completed before any analysis of the quantitative data.

Principal components analysis (PCA) was initially used in an exploratory manner, and then with Procrustes targeted rotations for a confirmatory assessment of how items fitted in relation to the original model. After item weeding, 21 of the 22 original facets appear to offer sufficiently reliable constructs, seven were highly reliable, with Cronbach alphas and IRT marginal reliabilities greater than .8; fourteen with above .7 for IRT, though slightly lower on alphas on nine facets. Cluster analysis of respondents was carried out to gain person-centred profiles. Augmented by PCA innovatively using a transformed data matrix, the various resultant typological groupings were found to explain from 89% to 97% of variance.

The results from both methodological approaches were then integrated, confirming the separately considered interpretation of results, thereby providing a mixed method validation of the ways of thinking (WOT) measure. Results demonstrated that when people, not variables, were considered both quantitatively and qualitatively, two distinct typologies emerged: the Realists and the Ideaists. Realists' thinking suggested concern with 'the here and now', what can be seen and heard, being primarily concerned with practical issues, and with a preferred focus on things tangible rather than the theoretical or abstract. The second group, identified as Ideaists, enjoyed thinking for its own sake, looking for meaning and understanding, with ideas rather than practicalities uppermost, and who when inspired would engage in actions driven by their well thought ideas. The study suggested the remaining individuals were either ambidextrous, with a preference for being a Realist but clearly able to use both ways of thinking, or alternatively were individuals whose preferences had remained undifferentiated. The value of the qualitative insights that distinguished between such individuals also enabled additional interpretation of the quantitative data, though ongoing and further sophisticated person-centred analytical procedures are needed to clarify definitive explanations between those identified as ambidextrous from those undifferentiated through a lack of consistent distinguishing traits.

Declaration

This statement is given as an affirmation that to the best of my knowledge

- all material presented towards this PhD is my own work
- due acknowledgement has been made in the text to all other material included
- contributions by others have been noted in the Acknowledgements
- none of the material herein has been presented for awards elsewhere
- excluding References anf 'Cr r gpf legu.'j g'j guku'ku'nguu'j cp'322.222'y qtf u'kp'ngpi jy
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Esther M Roodenburg 36j 'Lwp 2015

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Chapter 1 - A research project in ways of thinking

How often do we hear an associate, parent or partner express with bewilderment: “I don’t *understand* how you think like that - where are you coming from? Where could you possibly be going with *that* thinking!” Such lack of understanding of one person about another individual seems quite common, and yet the ability for humans to communicate despite such differences is rarely in question. What then offers an explanation? Is it simply a question of ability, reflected on by those concerned with contradictory behaviours of apparently capable individuals (Ayduk & Mischel, 2002)? Is it human nature, with its accumulated imperfections of past experiences that have created people we should expect nothing more than to behave accordingly (Buss, 2010): just human nature, regardless of a common desire to do otherwise? Or does a general lack of appreciation of our innately unique differences, that is, the genetically determined drivers as opposed to environmental influences (Harris, 2006; Plomin, 2001), create the failure to fully understand our individuality? Surely as researchers, we need to “stand outside the taken for granted assumptions that inform our everyday life” (Silverman, 2007, p. 147), to reflect on a number of potential explanations, with the distinct possibility that each may be confounded by one common theme: either too often it is assumed that everyone is the same, a clean slate waiting to be written on, or alternatively the lack of an informed understanding of our broad individual differences leaves us with no definitive or satisfying explanation.

One area where we would perhaps expect differences to be appreciated concerns how people seemingly innately differ in how they *think*, and this specific individual difference forms the overarching interest of this dissertation. The lack of understanding of our individuality in how we think is palpable: common *unthinking* views that ‘everyone thinks or should think like me’ may lie at the heart of frequent perplexity. It may be that this lack of understanding relates to the fact that thinking cannot be observed, but can only be implied by what is spoken, or alternatively from actions that lead us to infer we know what people are thinking. Regardless, neither of these really explains *how* we think; yet understanding this difference seems to be an essential aspect to understanding and predicting the human behaviour which is so dependent on such thinking.

This first chapter sets the contextual frame for a research that considers individual differences in ways of thinking, beginning with a brief overview of the broad area, followed by a summary of the purpose and perceived significance of this research. Some of the questions that flow from thinking about the topic of interest are then asked within the respective methodologies used in the research. The overarching research question is then presented before clarifying the research design. The need for a new measure is considered within the context of my authorial perspective, after which the chapter concludes with detailing how the thesis unfolds within the subsequent eight chapters.

The research context

The general nature and implications of individual differences continue to elude many practitioner psychologists, often confronted by their own lack of understanding of client differences, and the lack of

access to adequate measures that might help identify and explain core elements of human individuality. And for scholars, particularly for those trying to formulate common *style* descriptors as a way of understanding these differences, the quest is still far from complete. In regard to the focus of this research, different ways in which people think, various theories and models have evolved, most of which attempt to focus on those essential individual differences in the ways individuals seek to organize and process information (Messick, 1984).

In the larger field of individual differences, while some theories place an emphasis on a more *personal style* that perhaps can best be considered as those personal patterns of behaving which interact with personality, such as might personal preferences observed in decision-making or within organizational settings (Vernon, 1973), other theories more often examine variables that are traditionally seen to relate to ability (Kozhevnikov, 2007). Looking at individual differences through the somewhat opaque window of style highlights one of the many attempts to make some sense of our differences, seeking to classify various attributes of people according to the habitual behaviours and emotions that individuals have in common. However there is still little unity about what these differences are, let alone how they are best to be measured.

Considering the ongoing lack of unity in style models (Zhang & Sternberg, 2009a; Zhang, Sternberg, & Rayner, 2012), it seems important then, if we are to come to a better understanding of individuals, that some agreement is reached about what particular factors need to be considered. At the same time, however, we are also confronted by our uniqueness, and there *are* studies that capture the uniqueness of that individuality (McAdams, Diamond, De StAubin, & Mansfield, 1997). Even today such studies vary considerably in their focus: from those looking at developmental processes that may have created those differences in behaviour, affect or cognition (DeYoung & Gray, 2009; Reisenzein & Weber, 2009), through studies that grapple with language and cognitive aspects such as abilities that influence learning (for example, Furnham, 2011; Zhang et al., 2012), and those that contrast markedly with other research in that they simply marvel at the uniqueness of each individual, encapsulated by the very physiological differences that are as unique as the fingerprints of monozygotic twins (Harris, 2006).

How then can the broad problem of a better understanding of our differences in thinking be resolved? Surely by now, in the sophisticated and knowledgeable world of the 21st century, there should be some definitive answers about how to organize our understanding of human distinctives in a way that makes misunderstandings an exception rather than commonplace. Yet there are ongoing calls for an urgent need for greater clarity, both for things we have in common - interpreted by many as style - and for trustworthy and thoroughly adequate measures that would be able to discriminate important individual differences (Cools & Rayner, 2011).

A need for a new measure of individual differences in thinking

A further important point in thinking about the adequacy of any new measure for delineating individual differences is to consider utility and validity (Messick, 1995b), particularly in relation to the stakeholders for Chapter 1 The Project

whom the measure is created, be that the practitioner, the client, or specific communities. All stakeholders need a clear understanding of the measure's usefulness, its appropriateness and potential safety issues that might arise from its applications (DeVellis, 2012). Finding or constructing such a measure is a big ask, particularly when what needs clarity may be less than obvious or tangible, and more often, akin to the latent variables that make up personality constructs, offering measurements that can only be inferred from behaviours.

In acknowledging Messick's argument that the validity of a measure must also consider its use, the current research seeks to enable us to have greater insights into individuals who lack for the understanding noted in an early study, one that highlighted the benefits of *really feeling understood* (Van Kaam, 1959). A new measure thus purports to become a tool that facilitates such understanding, enhanced with a phenomenological understanding of individuals when carefully reviewed from different perspectives.

In commencing a study of individuality in thinking, it was clear that many elements, some already mentioned, would need to be considered and where appropriate, incorporated. Such a project also includes consideration of recent developments in the field of individual differences that have reiterated a need to address two core issues: firstly, a dearth of measures that report individual *preferences* and are therefore personality centred, rather than the traditional performance orientated measures found in cognitive style research (Rayner & Riding, 1997). The second concern asks whether the field of individual differences should be considered from an idiographic rather than the nomothetic perspective, which again is most often linked with performance (Chamorro-Premuzic, 2011). Rather than casing the general field of personality, broadly viewed as understanding what makes us human, and identified by the fact that we think, feel and act (Allport, 1921; Chamorro-Premuzic, 2011; Mitchell, 1891), this research is primarily concerned with the specific active phenomenon, namely that we all *think*.

Purpose and significance of this research

The struggle to identify the factors underlying thinking has continued, and is particularly difficult when the construct of *differences in thinking* is not readily observable though heuristically considered as existing. Finding a sound and reliable measure that could validate such a construct has also proved to be challenging. However in 2006, Roodenburg had developed a model with a *personality-centred* rather than an *abilities-centred* focus that is considered to have an important potential. This model (Roodenburg, 2006) presented an understanding of student ways of thinking (SWOT) from a teacher perspective, and had employed the well-developed psycholexical methodology previously used to develop the Big Five personality trait model (De Raad, 2000). The validity and comprehensiveness of this carefully developed model is demonstrated by how clearly it mirrors the hexagonal structure of Holland's RIASEC model of *personality typology* (1996), with its constructs closely connecting personality factors with occupational interests (Roodenburg & Roodenburg, 2009).

The purpose of the present research aimed to operationalize the Roodenburg (2006) model, firstly with a questionnaire. Classical test construction was utilized, using both exploratory and confirmatory factor

analyses to select items that confirm its factor structure, and iteratively to validate the model with careful statistical analysis. The refined items, all related to ways of thinking, were used in three different survey forms: an adult instrument that allows for a self-report, and another report form for use by important others, and the third slightly adapted for parents to use in regard to their children. Thus the Ways of Thinking (WOT) survey resulted from the first stage of the research using a *quantitative* methodology.

In reflecting a mixed-method approach, the second stage sought to further validate the SWOT model and the WOT measure *qualitatively*, a significant and innovative departure from common practice: Most studies to date that have attempted to elucidate the style construct have relied heavily on quantitative psychometric methods only for validation (Cook & Smith, 2006; Cools & Rayner, 2011), to ensure the items actually provide good construct validity. There has been a growing but only more recently acknowledged shift, particularly within social research, to using mixed-methodologies, allowing for a variety of qualitative designs that enable a more complete validation gained from different perspectives. Such a methodology was thought to “provide style scholars [and practitioners] with the unique opportunity to strengthen their conclusions and gain deeper insights into the [personal] implications of style differences” (Cools & Rayner, 2011, p. 300). By not being so concerned with the nomothetic or scientific details that can be quantified and statistically found valid, but rather in being committed to interpreting the more naturalistic and idiographic observations, the social researcher can present a significantly more individual perspective, that in the end serves to enrich and humanize the research endeavour (Thomas, 2009).

Data gathering from the newly developed WOT survey occurred concurrently with a number of case studies, providing an alternative means to validate both the model and its consequent questionnaire. This process can achieve a person-centred and subjective approach, often missing when measured variance has focused on the common variables only (von Eye, 2010). This subjective approach nonetheless involves a serious commitment to objectivity, through thorough and rigorous thematic analysis of case study narratives from which the findings eventually are considered phenomenologically, so enabling a potential to greater interpretive understanding (Molbak, 2012).

With the interplay of different research approaches, there is an implied imperative for a methodological integration of data from various perspectives, with potential new insights gained that do more than gather factual data. The *what* and *how* information so dominant in quantitative research could then be extended, in order to examine more of the *why* or causal relationships that cry out for some interpretive explanation of what has been observed: a process made possible when personal, individual reflections are explored and included (Mahoney, 2011).

A mixed-method research intention

To summarize the research intention: the first and foremost intention of this research was to construct a new psychometric measure of individual differences in ways of thinking that reflects human personality rather than abilities, and significantly was based on and remained centred on the factors that had formed the Roodenburg model structure and its related facets. In creating a questionnaire, however, this first phase of

the study involved an approach that looked at collecting numeric data only, using the same adjectives generated by teachers in the original variable-centred research that described their students' ways of thinking.

For the second part of the research, I decided to use methods that might discover idiographically how individuals think. Initially this entailed a separate focus through semi-directed interviews, but by using an iterative or recursive process, the data from the one-on-one *narrative* method was integrated with the alternative *numerical* data, a process suggested by Plowright (2011), as a well established integrated methodology. The term used by many as mixed-methods research is also an appropriate description of the research approach since it usually implies consideration of all data garnered by both qualitative and quantitative methods, with a serious effort to consider the inferences made collectively.

In the preparation phase of this project, a series of questions arose from the literature, and are presented here as important questions formed around the desired foci of the respective methodological perspectives, the answers to which would unfold doing the course of the research.

Quantitative Questions

1. Can a new questionnaire that uses the central factors of the Roodenburg SWOT model clearly and validly identify individual differences in ways of thinking?
2. Does the Ways of Thinking (WOT) questionnaire adequately cover all factors identified by the SWOT model?
3. How well does a respondent sample, obtained simply by snow-balling, as opposed to the comprehensive lexical approach used in the development of the SWOT model, adequately cover all facets of the WOT?
4. Can a self-report measure using a quantitative methodology alone do justice to the broad area of individual differences in ways of thinking?
5. Can a quantitative approach alone develop a valid and predictive measure that provides useful information about individuals and benefit those within the broader educational or general adult context?

Even at the early stage of considering such questions, I recognized the need for and known benefits associated with looking at things from different perspectives, rather than through a simple one-eyed lens (Layder, 2013). As a consequence, many questions evolved around a more qualitative, person-centred view, and asking these and similar questions that arose during the research process became an essential formative component to the research project.

Qualitative questions

1. How many individual cases are deemed adequate to cover the broad field of individual differences in ways of thinking? This was not easy to determine, given that using case studies in the development of a new measure had few precedents in psychological research.
2. In what way can a useful understanding of individual differences in ways of thinking be found simply from interviews that one researcher uses in a one to one interchange?
3. How can any interpretable tendencies reported about ways of thinking be of use for people other than the individuals concerned?
4. What can be said about such information gleaned by the researcher/participant interchange that might add new and valuable knowledge to the general morass of style differences?
5. In what ways can a qualitative approach bring anything of value to a questionnaire that might assist in predicting how other individuals think?

The Overarching Research question

I was keen to grasp the opportunity to operationalize the carefully and quantitatively built model of individual differences, one that had identified clear factors and facets associated with *student* ways of thinking (SWOT) (Roodenburg, 2006). The development of a worthwhile scale to measure the latent variables of ways of thinking became an investment of time that warranted more than simply a tick a box questionnaire – it required a research design that might find a possible relationship between an emergent variable (DeVellis, 2003) and the characteristics reported by a select group of individuals. This process suggested a need for a broad research approach that would include validating the model, the resultant questionnaire, and the use of a mixed methodology.

Acknowledging the need for a new measure, but also allowing for my understanding that individual differences should be really be listened to directly, this suggests an overall research question put simply would be: how well can a new measure, using the same factor structure and facet items of the undergirding model, identify individual characteristic ways of thinking that can contribute to a greater understanding of individuals? This question suggests the possibility that additional information might be beneficial, which brings us to the research design considered able to meet this need.

A convergent Mixed-method research design

An integration of both approaches is not often used in scale development, but was deliberately chosen for this research to assist in achieving what has been referred to as ‘putting the human back in human research’ (Tashakkori & Teddlie, 2010). This also acknowledges the view that psychology should first and foremost be concerned with our humanness, and should be enabled by a first person ontological perspective, though this is not always explicitly observable (Yanchar & Hill, 2003). I believe this approach has enabled a fuller

development of a personality-related measure of individual differences that specifically focuses on adult ways of thinking. In turn, using this less common mixed method approach in the field of psychology has also provided an innovative opportunity to evaluate and validate the underlying theoretical SWOT model, even though the sample deliberately selected in this research was not a student population. A summary of the research design is shown in Figure 1.1, demonstrating a recursive mode that required an iterative return to the alternative approaches during the later stages of the research.

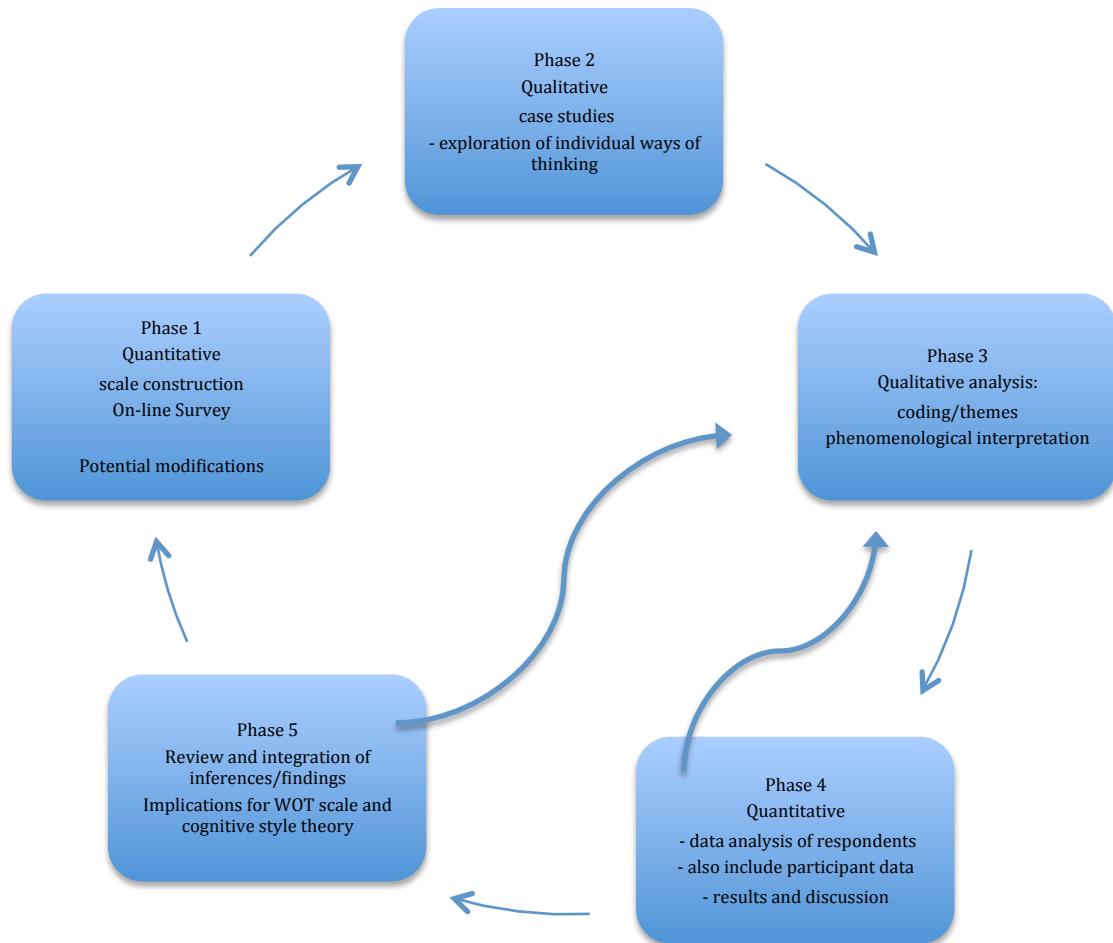


Figure 1.1. A mixed methods design in the construction and validation of a new measure, convergence through recursive design carefully sequenced, with Phase 2 having been commenced during ongoing Phase 1 data gathering.

The value of mixed method research is discussed in Chapter 2, but needs to be commented on here in relation to the design implemented. With no intention to eschew one methodology in preference for another, it was decided to *begin* with a quantitative approach, but only so that the theory which underpinned the extracted factors and facets of the model could be initially employed at the commencement of the scale development. This was done intentionally, and without the traditional instrument development design intent which had usually placed more *emphasis* on the quantitative phase (Creswell & Plano Clark, 2011). However, a mixed method design needs to maintain integrity in the legitimation process (Onwuegbuzie & Johnson, 2006), thus a detailed analysis and reflection of the data collected by a qualitative approach was completed and fully reported on *before* any psychometric analysis of the quantitative data obtained by

responses to the online surveys, even though the survey was already constructed. The initial phases were thus kept separate in order not to contaminate the views from either approach. However, a convergence of the data occurred during the final phase, in an iterative review of the quantitative data importantly through the lens of the qualitative findings. The confluence of the results and associated discussion demonstrate how this process makes an important contribution to the deeper understanding of individual differences in ways of thinking. A brief rationale for this methodology needs to embrace my own perspective as the practitioner - turned - researcher, to which I now turn.

Author perspective - a new measure needed

My personal interest in individuals and their apparent personalities has long been part of my life: this began as a frequently ill child, with time to observe and numerous naïve attempts made to draw my own conclusions about why people did what they did. Later, having been a teacher and then as a practicing psychologist, dealing with strange behaviours reported by individuals (*within*) and often conflicting behaviours *between* people, it became relevant and pressing to consider some way these differences might be usefully identified, delineated, and measured. For such an understanding, a measure was needed that could be both psychometrically valid and yet could also provide both enlightening and reliable information to other similarly curious people about the age-old question: what really makes us tick? Apart from a popularly used but psychometrically dubious Myers-Briggs Type Indicator (MBTI) (Pittenger, 2005; E. M. Roodenburg & J. Roodenburg, 2010), finding such a measure proved elusive, so I had been keen to see a promising model I had watched develop become more than just an operational potential.

My perspective on individual differences has always accepted both the nomothetic and the idiographic views, one that allows the astute observer to make some predictions about how certain individuals are likely to behave, whilst also maintaining a view that it is inappropriate to put even seemingly predictable people into *a box*, thereby excluding any potentiality of a fluctuating profile essential to their uniqueness. From my observations as a psychologist, I have come to the conclusion that humans mostly like to see themselves as having things in common with others, and yet still want to believe in an inimitableness that makes them special. To this end, the development of the ways of thinking (WOT) questionnaire has taken the following road, with certain pauses, twists and turns not always as expected. Reflections are often written in the first person, demonstrating my own position that is actively involved in and committed to understanding individual differences from a very personal perspective.

Thesis structure – the way ahead

This first chapter forms an introduction to the research project, providing a brief look at its purposes and related questions; it remains for Chapter 2 to document the wider research field from which the research questions arise. The broad cognitive style arena is reconsidered within the individual differences confine of how we think, particularly as this is relates to a trait-like personality psychology. As part of a literature review, a brief regard for the philosophical and ontological foundations of this research is discussed in the light of other related and relevant research. This review also necessitates looking at the historical reliance of

individual differences, and style research in particular, on quantitative research methods, as compared to qualitative approaches, and the need for a mixed methodology to augment our understanding of individual differences in ways of thinking.

Chapter 3 then presents how validation of a new measure can fit around the underlying construct of the student ways of thinking model, before examining the different validations required for a quantitative as compared to a qualitative approach. The integration of these differences then is reviewed, so that a mixed methodology can be recognized as having a suitable and appropriate rationale for its use in this research.

Chapter 4 (being Phase 1) focuses on the construction of the questionnaire, both from the context of past measures, and as a framework for a new instrument. The chapter outlines the procedures involved, including how the items were generated, the format of the developed measure, and the statistical analyses used in factorizing people, item review/weeding and relevant conclusions drawn.

Chapter 5 reports on the qualitative approach (Phase 2): this firstly reviews the rationale for the methodology itself, then consideration is given to this approach within a mixed method design, particularly in the development of a new scale. This chapter also reports on the specific qualitative methods chosen, detailing how and why the particular participants were selected, and a brief outline of the method of information gathering.

The detailed reporting of the participant/researcher interviews and results of the ten cases selected for the qualitative work occupies Chapter 6 (Phase 3). Lengthy reflections were deemed essential to give full account of the time-consuming and reiterative process of analysis and its eventual findings. This process involved coding, discovering patterns and themes observed and reported on, and the final inferences gained that suggested a need to phenomenologically consider the findings. Reflections on the phenomenon of ways of thinking (WOT) demonstrate there is more to the *how* individuals think (characteristics observed), and seeks to explain the additional insights as causal influences (*why*), content of thinking (*what*), and context of thinking (*when* and *where*), and are represented by a proposed Interactive Ways of Thinking model. This phenomenological approach is then used to help identify and differentiate two distinctly different types of individuals attached to ways of thinking, reported as portrait profiles: The Realist thinker and the Ideaist thinker. A third profile simply describes a number of individuals who do not fit either profile, with a clear rationale for why these three participants were each reported as an Undifferentiated thinker.

Returning to the analysis of the quantitative data, Phase 4 is presented in Chapter 7, first giving an overview of that quantitative phase before discussion of the statistical analyses and results of the data set obtained from respondents to the WOT questionnaire. Some reflection on the relevance of the ten participants and their profiles is then included, as significantly assisting in the interpreting and making meaning out of the numbers.

In Chapter 8 (Phase 5), a brief summary creates a logical introductory segment to the integrated inferences drawn from both methodologies. Important to the overall research findings, the separate and joint

goals are considered through the results of the mixed methods, with a quantitative consideration of the case studies, and then conversely, a qualitative review is made of the respondent data, so that a combination of inferences is drawn that validates and justifies the methodology used in this research. These findings are reported in both narrative and numeric forms of the data, and largely are evidenced by graphical figures.

The final chapter, Chapter 9 seeks to succinctly reflect on the results and inferences of the research, along with a brief discussion of implications and recommendations. This chapter also suggests potential future research deemed warrantable in a fundamental human need, a need to understand and be understood by others on the journey. But for now, we turn to Chapter 2, which presents a representative review of past research in related areas of interest that, when considered in relation to the current research, might be seen to have contributed to an extended knowledge base for a better understanding of our fellow sojourne

Chapter 2 - Looking back before moving forward

As long-time observers of people, joining the throng of inquisitive people as far back as 400 years B.C. to the writings of Hippocrates and many other philosophical works between now and then, we observe an ongoing quest that has “pondered questions about human nature and attempted classification schemes for making sense of the varieties of individual differences in important attributes and their causes” (Mischel, Shoda, & Ayduk, 2008, p. 4). Within the broad discipline of psychology, there is a struggle to express the key facets of individual differences. In particular, questions still remain about agreed conceptualizations of what ‘makes us tick’ and how these components can best be identified. Throughout this second chapter, I include an illustrative sample only of the key past protagonists who have played a pivotal role in the development of today’s theories and practices in the field of individual differences.

Past research concerning individual differences has often been concerned with the intrapersonal level, yet those very individual personal patterns of behaving, feeling and thinking have often been examined within a interpersonal social context (Cervone, 2005). Varied theoretical positions have explored the many potential constructs of interest and those that focus particularly on thinking styles. The focus for my particular research more specifically concerns questions about individual differences in *ways of thinking*, however, reconsidered as distinct from the broader field of cognitive style in which it theoretically had been based, and therefore this distinction necessarily occupies the primary place when considering the most relevant literature. During this review, it will be important to include a rationale for validating both the model and a new measure of its constituent constructs, and why this should focus on a personality perspective rather than on abilities or indeed any of the other variable options frequently considered significant by those studying individual differences from a style perspective.

‘Thinking about thinking’ is not new (Abele, 1985; Dominowski & Bourne, 1994; Flammer, 1983). However, when considered from a personality perspective, it becomes apparent that secondary issues surrounding personality are also relevant, taking us into an old arena that continues to ask contemporary questions about traits versus states, acknowledging that new definitions, new knowledge and explanations are constantly evolving (Buss, 2010; Ehrlich, 2004; Harris, 2006). Research reflections will also necessarily include potential relationships between situational context and individuality, a consistent issue that has long been observed (Bem, 1983; Mischel, Shoda, & Mendoza-Denton, 2002), and is also encountered within the present research.

Another long-standing question will then be revisited, the nomothetic-idiographic dichotomy, first mentioned by Windelband in 1894 and adopted by many since, including Allport (1937; Barenbaum & Winter, 2010); this question too becomes part of what my research tries to grapple with, being wholeheartedly in agreement with what many in psychological research today insist are essential elements to understanding the whole person (J. W. Grice, Jackson, & McDaniel, 2006). The potential for a ‘whole person’ perspective also links with the oft associated extremes of research methodologies seen within the quantitative-qualitative approaches (J. W. Grice et al., 2006), and needs to include consideration of issues

that relate to their associated philosophical underpinnings (Conway, 1992). Again, this current research is committed to seeing this divide become less distinct with a mixed methodology and consequently also forms an important part of reviewing the relevant literature.

Ultimately these reflections present an overall proposal that I hope will be discerned in my study: if people are understood at an individual level only, they are perceived to be distinctly different, and potentially remain at risk of feeling quite isolated. Relativity to context is important. My experience and that of others (Bowlby, 1978; Cain, 2009) has suggested that individuals feel more understood and accepted when their distinctiveness is better understood, particularly by significant others. On a basic level, people need to form attachments (Baumeister & Leary, 1995), with a need to belong ever more evident today, though one could argue that contemporary social connections often seem fast and fickle, limited in the deeper interpersonal relationships that contribute to a healthy view of self, one that arguably is needed by a vigorous society (Bandura, 2004). Gaining greater understanding of self and others can thus provide individuals with a better sense of self (Swann, Chang-Schneider, & Larsen McClarty, 2007), with a greater potential to enjoy those personal and distinctive attributes, whilst at the same time can allow appreciation of common ways of thinking characteristics in others. Thus a broad, well-balanced understanding that leads to self-appreciation can promote a sense of connection with others, in spite of any perceived distinctive *oddness*, and can thereby enable erstwhile *misfits* to feel the benefit as individuals of being “well integrated within a coherent sense of self” (Ozer & Binet-Martinez, 2006, p. 408), being more likely to understand and accept themselves, and therefore others (Aanstoos, 2005).

This chapter seeks to briefly acknowledge and seek a perspective on all of these concomitant issues, as a broad contextual introduction to the research topic that strives to understand what particular individual differences are important concepts in the ways we think, and thereby provide support for a model of differences in thinking. Following chapters will address methodological questions around developing a trait-like instrument for the model, including issues around construct and item validation and reliability, before moving on to later chapters detailing the specific qualitative and quantitative methods used in data collection and analysis. But first we need to consider individual differences from a historical perspective and then within the context of the current research.

Individual differences – intra and interpersonal

There are clear implications for a study of the individual, with intra and interpersonal differences often being linked to methodology. For example, when reflecting on the contributions to quantitative psychometrics made by Sir Francis Galton (Galton, 1879), Spearman (1904), another early contributor to abilities research, suggested that “psychologists with scarcely an exception...do not even attain to the first fundamental requisite of correlation, namely a precise quantitative expression” (1904, p. 96). Alternatively, when we turn to individual differences associated with personality and social psychology, others like Cattell (Allport, 1962; R. B. Cattell, 1946) were convinced of the need to combine experimental or quantitative methods with individual differences measures, which included self-reporting as well as insights by peers. Here we see

early insights into the broad field of study that required different methodological emphases, depending on the particular construct of interest.

From early days in the history of formal psychology, and more particularly in the field now recognized as the psychology of Individual Differences, we find a variety of researcher intentions: for example, those who identify individual differences in abilities (McGrew, 2005); behavioural and personality related factors (Fleeson, 2001); or even biologically predicated differences (Buss, 2010). These differences demonstrate historical links to such notions as big-hearted, small- or tough-minded individual difference indicators, many of which still remain expressions in popular language. Other research focusing on various individual differences include cognitive motivations (C. A. Hill, 2009), genetic and neurological differences (K. Armstrong, 2007), and the list goes on. Many of these perspectives refer to intra-personal differences, with a ‘whole person’ claim that aims “to find ways of comparing individuals so that we can judge the similarities and differences between them” (Mahoney, 2011, p. 12).

The theoretical intention to discover more of the whole person is commendable, and one that my own research largely has sought to espouse. However, one inherent problem identified by Mahoney in individual differences psychology points to the limitations imposed methodologically, with measurement mostly confined by the psychometrics that typically uses a quantitative methodology that does not fit well with its intentions to understand the person as a complete, unique unit. Until recently, using quantitative measurement tools was the well-established pattern of many researchers in the field, particularly since the mid-20th century (for example, Chamorro-Premuzic, 2011; Roberts & DelVecchio, 2000). A reliance on quantitative evaluations maintained a mechanistic view of the world that suggested more concern with so-called scientific objectivity and replicability (Revelle, Wilt, & Condon, 2011) than with individual import and perspectives, perhaps indicating, as others have stated, that there was little understanding that *any* method that required the scientist to “remove the human, subjective, value-laden component” was not only impossible but in fact was quite undesirable (Shimp, 2007, p. 146).

My research contrasts strongly with common research practice within the field of Individual Differences that predominantly relies on psychometrics. Advances in this field continue to speak of individuals in such terms as *The Science of Data, Abnormalities, and Residuals* (DeYoung & Gray, 2009; Revelle, Condon, & Wilt, 2011). Such a focus attends to *variables* of interest rather than on people, and has resulted in what Lamiell (2009) argues in decades of research that refused to see its limitations. It appears to be a contradiction in terms when individual differences are reduced to the “scientific measurement of dispositions … to make predictions about individual characteristic ways of behaving, feeling or thinking” (Mahoney, 2011, p. 14), and a concomitant epistemology that assumes that all phenomena can be transformed into quantities or numbers. This will be further discussed in the next section, when I compare quantitative and qualitative research methods.

Known also as Differential Psychology (Revelle, Wilt, et al., 2011), Individual Differences researchers do make an effort to identify what Mahoney (2011) neatly described as the *what* processes

involved with the particular identified individual differences. However, he also suggests that often there is “less attention focused on the determinants - the *why* - and even less attention focused on the functions - the *how* of individual differences” (2011, p. 4). In contrast, the current research is mainly concerned with the *how*, and is specifically committed to knowing more about how people think. Through the use of combined methodologies, however, the what and the why aspects are also given some attention, as they help to fill out the pictures presented of individual cases, in an eventual attempt to consider in a more person-centred way how these perhaps may identify and explain between-individual similarities and differences.

It is significant that Individual Differences data has technically been aggregated data (Caprara & Cervone, 2000). Such data risks the loss of unique characteristics that are mostly gathered from self-report measures (Mertens, 2015). Few in this research field have questioned the nomothetic approach, in spite of its claim to regard the whole person as of utmost importance. It seems paradoxical to me that idiographic data is rarely mentioned, suggesting that many still consider any advances other than using a quantitative approach as “pure subjectivity” (Revelle, Condon, et al., 2011). Claims for *scientific* research as being synonymous with numeric objective data have rightly been questioned more recently, however, and deemed by some to be even impossible (Potter, 1996), an issue to which I return in Chapter 5. For the moment, however, it is important to note that in theory at least, Individual Difference psychology attests to the importance of the individual, and the present research methodology is aligned to that view. What it does not conform to however is the underlying ontological positivist perspective that would dismiss a reality that involves perceptions and dependency on mindful interpretations of the individual (Plowright, 2011ch.14.). It is appropriate now to consider the underlying philosophical stances of past research in personality and Individual Differences psychology, before outlining the relevant epistemological and ontological assumptions of the current research.

Orienting philosophical assumptions and influences

The question of how do we know what is real seems to be foremost in the research concern of Individual Differences, and perhaps explains the focus on the *what* content rather than on the *how* and *why* questions. However, if we accept the view that effective and honest researchers need to admit their own position within their reporting (Creswell, 2013), then it follows that this must include acknowledging both our ontological view of the world, and how we come to our beliefs, including our way of knowing, with an understanding of how these philosophically connect with, and support the methodology of choice (Rayner & Peterson, 2009). This assumption however has not always been presumed until more recently, so I will endeavour to draw attention to some of the important contributors to the philosophical underpinnings of my own research.

Lingering with those researchers who have professed a commitment to understanding individuals and their differences, Allport (1937) rings out as a major formative proponent. Deeply committed to the understanding of the whole person, he propounded a more careful evaluation of case studies than was adhered to by others at the time (Barenbaum & Winter, 2010), so that we find Allport presents us with an acceptance of the idiographic. Yet he also demonstrated throughout his research the importance of the

nomothetic (Allport, 1937). His philosophy of life is evidenced rather than formally adhered to, with an integration of his ontological beliefs in such non-material but human experiences as love and religious faith for example (Allport, 1954). This position was also held by William James (1902); indeed both men demonstrated a consistent stance that all meaningful knowledge is only to be gained through investigation, and this necessarily included the subjective reporting of such phenomena by the individuals concerned. Allport's epistemological worldview accepted an empiricism that was informed by information received from others, and his knowledge about people was carefully formed by using both inductive and deductive reasoning (Allport, 1962). He also allowed for the possibility of change: ontologically, knowledge was considered provisional, and therefore importantly was considered more likely to be expanded by seeing the issue or phenomenon from a number of perspectives (Wertz et al., 2011).

This perspective is an underlying attitude I have tried to maintain in this study, which reflects and respects the views of Yanchar (2003) and others like McAdams (McAdams, 2010) who assume that amongst other less quantitatively discovered *truths*, psychology must consider first-person perspectives that include the lived experiences of individuals and their subjective interpretations. In this way such an ontology is not limited to observable or material entities, and furthermore suggests “our ontology must be open to continual clarification, re-examination, and re-interpretation” (Yanchar & Hill, 2003, p. 22)

Another direct contribution to the psychology of individual differences, and therefore also to this current research, comes from the more philosophical understandings of Husserl (1859 - 1938). His ontological views proposed that phenomenological knowledge itself could benefit from information and insights gained through the unconscious, with epistemological implications concerning the value he placed on individual accounts and their lived experiences (Husserl, 1931/2012). These views were adapted and more formally expressed through a phenomenological methodology. Such views were further developed by Amedeo Giorgi (Giorgi, 2012). Giorgi had experienced the frustrations and limitations of reductionist methods associated with experimental psychology. Subsequently, again like Allport, Giorgi advocated a whole person approach that today is regarded as an essential in *qualitative* research. In reflecting recent phenomenological qualitative research (Davidsen, 2013), and also that of its cousin, phenomenography (Bernard, McCosker, & Gerber, 1999), my use of interviewing individuals also acknowledges my acceptance of the value of enabling a greater awareness of self and behavioural patterns by an interactive and conscious process between participant and researcher, to form an interpretative phenomenological understanding of individual differences; in this case, in their ways of thinking.

The meticulous but somewhat cumbersome process of formal phenomenology advanced by Moustakas (1994) has for me thankfully been reconsidered through Interpretative Phenomenological Analysis (IPA). The necessary components of IPA are extended by what Davidsen (2013) observed as the need for interpretation, understanding the meaning beyond or beneath the details. IPA suited my position as a practitioner, and I found encouragement in this process in Creswell and others (Creswell, Hanson, Clark, & Morales, 2007; Wertz et al., 2011) whose overview provides for numerous potential variants from a phenomenological research perspective. Case studies were one of these perspectives, and through individual

studies I was enabled to use a challenging but important *mentalization* or reflective evaluation of the meanings on the phenomenon being investigated (Harrell, 2002). This process proved to be an important part of the current research, and will be explored further in the chapter on qualitative analyses.

It seems there have been limited attempts to use alternative methods in the Individual Differences discipline that might allow for reflection on knowledge gained from data outside mainstream psychometrics (see for example Revelle, Condon, et al., 2011). Delving into this conundrum brought me to consider the philosophical views of Yanchar and others who importantly *have* challenged the restricted methodological and philosophical assumptions of an epistemological dependence of psychometrics, one that entails what they refer to as a “positionless critical analysis” (Yanchar, Slife, & Warne, 2008, p. 267). Green and Thorogood (2009) draw attention to the fallacy of holding such a narrow perception of neutrality and objectivity that is commonly associated with empiricism, one that they point out cannot be assumed, particularly within the social sciences. Such an allegation however might also appropriately be applied to any methodology, particularly when that belief system ontologically constrains the information and therefore has aptly been accused of methodolatry (Bakan, 1967; Holliday, 2007; Yanchar & Hill, 2003), thereby limiting the knowledge that might otherwise be accessible through a broader spectrum of research approaches.

Such a limited perspective stands in contrast to Yanchar and others (Janesick, 2000), myself included, who accept the need to collect information from various perspectives to inform new knowledge. This process involves a focus on hearing or observing what others say and do, an example of which is seen ineffective medical practice (Srivastava, 2011). It also includes theory making from the documented and analyzed meaning ascertained, with a necessary evaluation of the content under investigation, a focus that historically was not so important as its epistemology (Danziger, 1990). Necessary caution was also promoted, to ensure that an ontological emphasis be fully comprehended by a critical thinking that should always be concerned with a careful interpretation of the information received (Yanchar & Westerman, 2006).

A broad ontology impacts on the epistemic style of any research (Eigenberger, Critchley, & Sealander, 2007) which, with the move away from the strict rational analytical processes that only deal with numeric data, to me has been a reassuring development in psychology (Bartholomew & Brown, 2012; Deary, 2009; J. S. Wiggins et al., 2003). There are many in research today, particularly within the social sciences (Woike, 2008), who concur with a philosophical view that in order to know something, one has to allow for finding out and including a reality as understood by first person accounts of lived experiences, with the expectation that such an approach to research can assist in making sense of meanings made by others (N. K. Denzin & Y. S. Lincoln, 2005). This view is confirmed in qualitative research today, with a greater awareness for the need for due diligence “to understand the context in which the parties generate their meanings and interactions” (Silverman, 2007, p. 82). Granting the importance of this caution, with associated care regarding the necessary interpretive element of those more “personal points of view” (Wertz et al., 2011, p. 25), this careful attitude reflects the concerns espoused earlier by William James (1902). Nonetheless, it is still important to explore subjective individual perceptions that “with all its complexity and ambiguity...must be included in any coherent account of human action and mental life” (Yanchar & Hill,

2003, p. 25). The corollary implies however that in order to deal with the complex nature of our individualities, quantitative research alone may not be adequate.

Furthermore, it is relevant to remember there was a time when those persuaded of a psychoanalytic position (Bandler, Grinder, & Andreas, 1982; Freud, 1940) suffered from the strong reaction by some to introspectionism as a legitimate science, in favour of the behaviorism of Watson (1930) and Skinner (1974). Yet given that inner self-reflection encouraged for example in case study interviews is perhaps little differentiated from what is understood today by the psychodynamic (Bateman, Brown, & Pedder, 2010; Westen, Gabbard, & Ortigo, 2010), we find another swing is made by Costall (2006) who makes an argument *against* the notion that introspection could never really be supported as having a legitimate research potential. Indeed, it is possible to argue that only a small part of self-knowledge, including the reasons underlying one's behaviours, may be consciously known, let alone understood, suggesting the rest largely can be considered unconscious and therefore needing interpretation (Wilson, 2002). Practitioner experiences, like those observed by the great story teller and therapist Milton Erickson (Gunnison, 1987; Rosen, 1982), have frequently indicated a need to bring unconscious or forgotten details into a person's conscious awareness, exploring at a deeper level his or her attributed meanings of past events. In this way, a clearer understanding, for participants and for the researcher/therapist, can be developed, one that assists in forming a trustworthy and veridical understanding of reality. More of this is further discussed in the section titled Cognitions.

My current preferred personal stance is related to a pragmatist perspective, along with critical realism that allows for a mixed methods research (Creswell & Plano Clark, 2011; Maxwell & Mittapalli, 2010). But also, in reflection of what an eclectic multiple worldview permits, my research includes somewhat of a postmodern philosophical perspective that might suggest "there is no *one* way of understanding things, and no *one* way of doing inquiry" (Thomas, 2013, p. 183). I am committed to applying this view to my current research, with its ontological questions surrounding ways of thinking, and to the epistemological question of how we can know anything of worth about thinking, particularly when it comes to perceived differences expressed by individuals in reflection of what they hold to be real.

Thinking itself is considered a cognitive function, and thus has usually been associated with research on abilities. An inclination to think is an essentially human activity, and is of interest amongst researchers of different persuasions (Flammer, 1983; Heath, 1964; Hogan, 2007), to name but a few who have stimulated my own research. But since most research about thinking has been considered within the social and educational perspectives of cognitive style, I now turn to initially embedding the current research into that same theoretical setting from which it was derived.

Cognitions

The well-established significance of cognition in understanding people justifies investigating differences in thinking as a human process, firmly embedded in the study of Individual Differences. Descartes supported the importance of thinking in his definitive "I think therefore I am". Thinking or *cogniting* is commonly

referred to as the active mental processes underlying human choices and behaviour (Kozhevnikov, 2007). It is this thinking capacity and an inherent human inclination to entertain alternative thoughts that possibly explains why it has been seen as essentially related to intellectual ability, though the need to consider it in conjunction with emotional processing has more recently become an accepted axiom by some (Haddock, Maio, Arnold, & Huskinson, 2008). Cognitive therapies and their underlying theories have questioned the meaning associated with an individual's "state of mind" or "transient internal conditions" (Matthews, Deary, & Whiteman, 2009, p. 77). These theories suggest a growing awareness of how such internal states may impact or be involved in individual cognitions and behaviours, albeit at a subconscious level.

Other theorists (Lazarus, 1981, 1995; Spielberger, 1966) suggest that the impact of emotions on human cognitions are but reflections of an individual's internal but conscious processing or in other words, an evaluation of external events or situations. Here again we observe a tension between the conscious and unconscious, with varying degrees of agreement between theorists (Kihlstrom, 2010). Similarly this tension is evidenced in everyday communications, popularly expressed in expressions such as "I don't know why I did that...what was I thinking?" Though these questions are considered outside the necessary focus of this research, they do indicate that the very act of thinking often involves other issues that are quite often invisible, unrecognized; some researchers have even thought that all that is relevant is behaviour, which is simply treated as if occurring without any awareness of mental mediation (Burgos, 2004). Nonetheless, there are those from a behavioural standpoint who do accept the importance of mindfulness and cognitive processes, and the need for reflexive research that acknowledges human values in the thinking process (Paul, 2006; Shimp, 2007).

There is general consensus among cognitive researchers that regardless of whether unconsciously processed or otherwise, one's cognitions or beliefs do impact individual behavioural choices, and many of these are found in relation to their associated theories and therapies – for example, Cognitive and Cognitive Behaviour Therapy, both rooted in learning theories (Carr & McNulty, 2006; Rachman, 1997); Social Cognitive Theories and therapies (Bandura, 2004, 2006), as well as the more recent neuropsychological studies that connect the role of biological and neurological evidence of the cognitive with affective processes (Mirolli, Mannella, & Baldassarre, 2010). Schwarz and Clore (2007) also acknowledged an interplay of the strategies involved in cognitive processing with associated feelings (Schwarz & Clore, 2007).

While cognitive researchers explore different areas, such as learning as distinct from individual differences associated with teaching styles (Dunn & Dunn, 1978; M. Eysenck & Keane, 2009), there are common underlying assumptions about the role that cognitive processing has on an individual's behaviour, even while questions remain about how *much* is unconscious (Meszaros, 2008), or how much cognitive functions may be impacted on by explicit (consciously known) or implicit (unconscious) motivations (Schultheiss, 2010). Arguments like these present important insights for the current research, and will be further elucidated in chapters five and six, when the qualitative means of gathering individual self-understandings are discussed.

Sharing thoughts or cognitions and cognitive appraisals lie at the heart of human relationships (Hargie, 2011), with varying degrees of awareness about how much past experience, whether remembered or not, impact on one's personality. Other associations about sharing thoughts are observed in other research, for example in research that has provided insight into individual differences in the *need* to think, as indicative of an individual's varying need to enjoy effortful cognitive activities (Cacioppo, Petty, Feinstein, & Jarvis, 1996; Feist, 2012).

The current study somewhat builds on early efforts that identified a relationship between the need for cognition (A. R. Cohen, Stotland, & Wolfe, 1955, p. 291), described as "a need to understand and make reasonable the experiential world", but in relation to particular personality traits. Klein in the 1950s had identified such relationships as "patterns of adaption to the external world that regulate an individual's cognitive functioning" (Moskvina & Kozhevnikov, 2011, p. 20). Such patterns in thinking, ordinarily considered within quantitative research, will be considered in this current research, but will be encapsulated phenomenologically from a qualitative case via cases, reporting on the individual insights that expand on the *meaning* attached to their own pattern of thinking.

Patterns in thinking gradually became generally known as *cognitive style*, as a potential construct that might identify individual differences in thinking to which we now need to drill down, to focus our attention more specifically, and in the process of gaining context, to examine its history.

Cognitive style – ways of thinking

Over many years, cognitive style has eluded a tight and consensual definition, with loose suggestions that it represents "consistencies in an individual's manner of cognitive functioning, particularly with respect to acquiring and processing information" (Moskvina & Kozhevnikov, 2011, p. 19). Theoreticians still search to identify what factors may best describe the ways of thinking that groups of people employ in processing and performing cognitive tasks, the historical and commonly accepted view of what cognitive style is about (Aanstoos, 1987; Rayner & Cools, 2011; R. Riding & Cheema, 1991). Initially, experimental studies had identified two types of individuals: those individuals who in using *perceptual attitudes* were known as *sharpeners*, being distinctly aware of differences and contrasts, and to whom Klein (1951) compared those who as *levelers* were more likely to notice things or stimuli that were clearly *similar* while disregarding the differences. For example, when subjects were asked to assess similarities or differences in shapes, conclusions were drawn about them on the basis of how they accurately these were perceived (Jonassen & Grabowski, 1993). These individual difference distinctives might well have been called cognitive styles, seen as patterns that regulate an individual's cognitive information processing when coping with the external environment (Kozhevnikov, 2007).

A second period in cognitive style development has distinguished internal characteristics measured by personality and intelligence measures, with a proliferation of styles that offered a bipolar choice: for example, people who demonstrated field-dependence or field-independence (Witkin, 1965), and impulsivity/reflection (Kagan, 1965). But reviews of these and other such indicators of style have met with

varying degrees regarding their practical applications (R. J. Riding, 2000), and with little ongoing agreement about their theoretical structure. However, early explorations in style did point to some of the internal characteristics that were taken up in the third phase development, where styles were extended within applied contexts, and considered as influenced by external environmental factors. These latter developments can be seen within the educational settings, for example, have been interpreted as learning styles (Dunn & Dunn, 1978); as well as personal styles (D. A. Kolb, 1984), with problem-solving and adaptive styles viewed in relation to cultural and social factors. Increasingly styles studies were investigated in relation to personality constructs (Miller, 2007; Walker, 2005; Williams, 2004) and as such sought to determine *preferences* in the ways of completing various tasks. However, according to Moskvina and Kozhevnikov (2011, p. 21) previous efforts had showed a “lack of a general theoretical approach that would lay the foundation for...cognitive style dimensions” so that during the 1980s, cognitive or learning styles research was reportedly in decline, though this *reported* dearth of interest and activity may simply reflect the lack of clarity in the styles’ construct and its poor theoretical basis in that era. Nonetheless, Nielsen (2012) argues that the number of published articles about the ever widening plethora of different styles research has increased, with gaps remaining around metacognitive questions, such as ‘thinking about thinking’ (Nielsen, 2012).

It was during this later period in cognitive style research since the late 1980s that two major trends were observed. The first trend encouraged a further *splitting* of cognitive style into various preferred actions of individuals, for example either fixed (non-adaptive) or adaptive capabilities when problem-solving (Kozhevnikov, 2007). In the earlier Witkin’s (1965) study for example, multiple variations and overlapping of perceptions involved in cognitive processing were proposed as being dependent /independent of an individual’s internal metacognitive *mechanism*. Such mechanisms were described by others as what sets an individual’s tendency to be more or less flexible in their “preferred way of thinking” (Moskvina & Kozhevnikov, 2011, p. 24). However this view does not provide specific conclusions about the extent to which an individual’s style may involve choice. Still others, as in Riding and Cheema’s (1991) cognitive style model, continued to postulate two independent dimensions: holistic/analytic (as referring to process information in whole or parts), and the verbalizer/imager (as a preferred tendency to verbally or visually represent and process information), that again leaves the field with general but as yet non-discriminating research findings.

Allinson and Hayes (1996) had more successfully developed a more discrete measure of style, one that postulated a *unidimensional* construct, with an opposite poles measurement tool that still inferred cognitive style as information processing, a style described as *intuitive* or *analytic* - this formed the basis of the Cognitive Style Index (CSI). Though this Index was an encouraging development, a review of the literature since then that attempts to validate its usefulness have met with varying degrees of success. For example, some have found support and application for such this measure within tertiary educational settings (S. J. Armstrong, 2004; Evans & Waring, 2008). Another study (Hodgkinson, Sadler-Smith, Sinclair, & Ashkanasy, 2009) was more critical, finding a third ‘spontaneous-cautious’ dimension, rather than the

proposed two unifactorial factors of intuitive-analytic, and on this basis, the researchers rejected the CSI on the basis of the psychometric methods used to *parcel out* or combine certain results when doing such was in the researchers' favour.

The second trend within this last period of cognitive style developments sought to *unify* various cognitive style theories, which trend seems to have encouraged a systematizing of observations that frequently found relationships between various styles. Here we find Zhang and Sternberg's Intellectual Styles (2009b) that through numerous studies (Zhang et al., 2012) sought to incorporate a complex mixture of styles into a superordinate analytical-holistic dimension, including teaching and learning styles under its cognitive or intellectual styles umbrella. This bid to unify the two fields of ability and personality within intellectual styles is also an important consideration of many theoretical issues, including heritability and neurological considerations, though with differing responses from a number of researchers that suggest equally uncertain conclusions (Grigorenko, 2009). A recent review of styles research (Nielsen, 2012) points to numbers of unresolved issues, not the least being the quality of style measures, with a lack of equivalence reported between the numerous instruments used to measure style.

Sadler-Smith belongs to this latter period of cognitive style development, creating his own Duplex Model of cognitive style, in an attempt to simplify ways of thinking into two distinctive different modes of processing information: again termed the intuitive and the analytic, but at the same time allowing for a more versatile style, this being an interplay of the two (Sadler-Smith, 2009). However, though this was a new and potentially helpful model that has sought to unify a very disparate field, it seems to have joined the host of measures that largely reflect differences in abilities, and that as yet await adequate measures that more particularly find their use within the general population.

Further studies that built on the earlier attempts to unify have became part of what is regarded as the third trend in cognitive research in which the complexities of styles have been acknowledged (Moskvina & Kozhevnikov, 2011). Not only does this trend include an interaction between styles and other cognitive functioning, such as memory, but this trend also considers cognitive style as an interaction between personality traits, abilities, and environmental factors, including those imposed by different learning contexts (Boyatzis & Mainemelis, 2011; Moskvina & Kozhevnikov, 2011). This trend has continued to involve empirical studies, including attempts to specify underlying neural mechanisms. However, such endeavours may be said to be "highly dependent upon the analyst's epistemologies and theoretical presumptions, many of which are implicit...and shaped by the assumptions inherent in particular statistical routines" (Roodenburg, Roodenburg, & Rayner, 2012 p. 220).

Regardless, styles research reflects ongoing important questions about its efficacy, with current acknowledgement of the "serious difficulties inherent in trying to integrate different models of styles" (Rayner, Roodenburg, & Roodenburg, 2012, p. 51). Numerous studies remain unclear about what cognitive style should include, and how it can best be measured: questions asked fifteen years ago (Rayner & Riding, 1997; R. J. Sternberg & Grigorenko, 1997) and are still being raised (Rayner & Cools, 2011), suggesting

there are still no clear definitions for a unified understanding of the construct, nor any clarity in regard to its applicability and cross-cultural usefulness (Cools & Rayner, 2011).

In summing up this section, it is important to reflect on how the theories undergirding cognitive style research have moved through very general classifications to ones that are very specific. For example, Messick (1984) understood cognitive style to be a conflation of ability, a unipolar maximal performance measure, and personality, concerned with typical tendencies. Though style was considered to be a stable individual difference in psychological functioning, many simplistic views can be found that present cognitive style as being synonymous with, or at least reflective of learning or teaching styles (Jonassen & Grabowski, 1993). Nonetheless, from these theories a large number of dichotomous constructs emerged and were reviewed, with few finding great validity (see p.136, Coffield, Moseley, Hall, & Ecclestone, 2004). Within an educational context, some theorists proposed a style construct that could not be understood unless related to motivation (Apter, 2003); others have suggested that the patterns observed in the ways students learn as “resulting from a combination of personal and contextual influences” (Vermunt, 2011, p. 173). This latter contextual element in terms of individual patterns will be reflected on in Chapters 6 and 8, observed in relation to individual perceptions about lifetime effects on personal ways of thinking.

While much research continues to debate the views that relate the development of personal styles to situational experiences (Orom & Cervone, 2009; Pashler, McDaniel, Rowher, & Bjork, 2008), relevant questions remain, especially around whether traits or preferences are stable or potentially more flexible (A. Y. Kolb & Kolb, 2009; Sharma & Kolb, 2011). For example, in representing a departure from orthodox research that was bound to using nomothetic approaches, using an idiographic profile Furr (2009) opened up even more questions about person-situational relationships. There are some however who have questioned any usefulness at all in knowing about styles, particularly in regard to enhancing educational performance, except perhaps as having the potential to improve teacher tolerance of student diversities, and as suggested by (Peterson, Carne, & Freear, 2011, p. 170), for the social benefits that enabled teachers to “engage more learners”. Such a conglomeration of general views on styles, particularly within educational settings, leads one to consider the need for a more denotative, specific identification of what cognitive style really is.

The connotative general perspective has remained foremost however, and is regarded by many as an interface between abilities and personality and therefore most often measured by performance (R. J. Sternberg & Grigorenko, 1997). Few researchers like Hofstee (2001) have conceptualized cognitive style to be related to personality. Given Hofstee’s well established argument that intelligence, as a performance measure, and personality, which considers trait-like behavioural *preferences*, are like oil and water that don’t really mix, some agreement is found that supports the view that *style* also warrants a personality-centred perspective (Roodenburg et al., 2012). However, though there has been a growth in personality and trait psychology (Matthews et al., 2009), reviewing the literature has found few examples of research that has added new cognitive style measures that are personality centred. Further clarification is needed concerning ways of thinking as a trait-like construct, and will be made in the next section, under personality-centred cognitive style.

To date, some headway in cognitive style has been acknowledged (Cools & Rayner, 2011) that reiterates more research is needed: firstly for collaborative research between academics and practitioners; secondly, for international corroborations that may incorporate multidisciplinary perspectives; and thirdly, that research should strive for cross verification or *triangulation*, made possible through more diverse design/data collections and associated methodological opportunities. Such recommendations motivated the current research. Furthermore, the valued perspectives of the same researchers supported an expansion of psychometrics has created greater potential for furthering style construct modelling. In addition, in an epilogue to the 2012 Handbook of Intellectual styles, that reviews the broad cognitive styles field, the authors recommend the theories themselves need to be sorted, but also that “the field needs better assessments – ones that are on par with those in the fields of cognitive and personality psychology” (R. Sternberg, Zhang, & Rayner, 2012, p. 416).

The appeal made by Roodenburg (2006) for denotative research that would operationalize his personality-centred model of thinking styles serves to remind us of an early attempt made to define cognitive style (R. Riding & Cheema, 1991): it was restated more specifically as that which “reflects the way in which a person thinks” (R. Riding & Rayner, 1998, p. 7). The current research has sought to continue this search, concomitant with a discrete focus on a specific construct of individual types of thinkers, qualitatively linked with a personality perspective, rather than abilities. To this end we now consider personality in order to contextualize an understanding of personality-centred cognitive style.

Personality-centred Cognitive Style

Personality has long been regarded as a mixture of characteristic differences by which an individual might be identified, be these emotional, behavioural, or mental (Mischel, 2009). Going back to Allport, since considered by many as the father of modern personality, he advocated the term *personality* as a more objective term than *character*, the value-laden term commonly used at that time to describe the psychology of the individual. Allport defined personality as the “dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to the environment” (1937, p. 48), with a veiled inference on its functionality and a potential to change that married well with his insistence on the uniqueness of the individual. In his determination to separate his understanding of personality psychology from social psychology, however, Allport had early ignited an interest in *traits*, while at the same time acknowledging that traits may not be so reliable when applied to the individual (Barenbaum & Winter, 2010). Although Cattell (1943) was also committed to studying personal traits, he was far more convinced that such could only be ascertained by the measurement of *abilities*, thus seeking to find by correlational factor analysis those traits said to identify a manageable number of underlying variables that make up personality.

What then are these underlying personality structures called traits, and how can they best be defined? When early quantitative research is examined, we find there are two major understandings of traits: one concerns ‘surface’ descriptives of personality differences, while the other provides a heuristic, causal view

which suggests ‘source’ traits are inherited, considered constitutional differences that were initially thought to *causally* impact on our tendency for specific individual behaviours (R. B. Cattell & Kline, 1977). These two views can be seen in a variety of personality studies, such as (Tellegen, 1991) and an early work of Buss (Buss & Craik, 1983). A steady stream of studies have revised the number of traits that can be said to describe personality, and the identification and classification of particular types of traits have used both common language lexical approaches and self-report questionnaires (Goldberg, 1981). Continued research during the last century has seen similarities of *variables* that when found together form traits, so that numbers of measures were developed to identify what trait characteristics can be distinguished from others, enabled by new techniques of analysis (Gorsuch, 1988).

Research related to traits culminated in the 1990s with the presentation of the Big Five factors or clusters of traits (McCrae & Costa, 1997) of the Five Factor Theory of personality (FFT) (Costa & McCrae, 2002; John, 1990; McCrae et al., 2000). Many discussions around these traits acknowledge the nature-nurture issue, so that the five basic tendencies encompassed by the Big Five traits, Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience, are understood as temperaments, biologically determined and relatively stable over time (Costa & McCrae, 1994; McCrae, 2001), though that long-standing debate has been revitalized to include person-situational issues that seemingly refuse to go away (Mischel, 1968, 2009; Mischel et al., 2002; Shoda, Mischel, & Wright, 1994; Shoda & Smith, 2004).

These well-established core or source traits are thought to influence thinking and behaviours, regardless of context, including cultural diversity which sometimes require different formats that can challenge their replicability (McCrae, 2009). However, such core traits are considered distinct from the less stable traits such as role-type behaviours, social behaviors such as shyness, or those observable habitual patterns which as “culturally conditioned adaptations” are therefore thought more likely to be influenced by environmental issues, including expectations and attitudes of teachers and parents (Strelau, 2008).

In spite of the emergence of the Big Five personality trait measures, and the broad cultural acceptance of the adequacy of the number of factors it included (A. A. J. Hendriks, Hofstee, & De Raad, 1999; Kashiwagi, 2002), questions remain regarding other types of traits that warrant investigation, for example such as honesty-humility (M. K. Johnson, Rowatt, & Petrini, 2011). This suggests some agreement with McAdams and Pals {McAdams, 2006 #262} who, in trying to grasp individual differences, considered the need to place the individual within contexts of time, place, and characteristic adaptations, and accept that even apparent core traits demand a framework that connects all of these other considerations, to enable an understanding of the whole person.

More recent research has now proposed that personality traits be regarded as on a stable continuum (Asendorpf & van Aken, 2003), with the Big Five at one end for example, as *core* traits that seem evident at a very young age, and those less stable *surface* traits, thought to be more or less random at the other end, while still related to an individual’s developing personality. In style this was mirrored in the early work of

Curry in her conceptualization of the *style onion* (Curry, 1983). This conceptual model is commonly referred to as one helpful analogy to explain individual differences (Cools & Bellens, 2012), and particularly within for example a three-layered concept of learning styles (Cassidy, 2012). The model defined the core layer as including stable traits, evident in early childhood and therefore personality dimensions, while the outer layers included traits that were less stable. However, the recent analysis of two different studies found no solid support for such clear relationships between the ‘layers’ and learning, thereby these researchers reiterated the need for evidence before accepting any model (Cools & Bellens, 2012). Nevertheless, Curry’s (1983) proposed second layer concerned information processing, which she distinguished from the core layer she referred to as the Cognitive Personality Style, and is of interest in the current project. This second layer also suggests a propensity for individuals to either “stick with concrete experiences, facts and simple recall” or instead involve an “orientation towards synthesis and analysis of data” in its associated questioning of information (1983, p. 9); such types are reflected in the current research – see more in Chapter 6.

Questions have been raised about the stability of general or prototypical traits over time (Asendorpf, 2011; Donnellan & Robins, 2009), particularly in the context of the person-situation debate (Matthews et al., 2009). Other traits were deemed questionable through being value-laden: Conformity, for example, an early example of a trait seen to be socially desirable (Siegel, 1958); or Agreeableness and Conscientiousness, other more recent examples that are considered to be socially desirable traits (Digman, 1997). The notion of social desirability is an important one, and is reported on in relation to the analysis of the quantitative data – see Chapter 7 for more discussion. It may be important to simply note here, however, that Nuevo et al., (2009) suggested that in the elderly, social desirability does not pose any threat to the validity of the study, adding some support for the decision to use matured people over fifty-five in the current study.

Regardless of the questions proliferating trait theories, however, certain traits are regarded as characteristic individuals hold as their behavioural preferences or dispositions (Funder, 1991). But recent attempts to understand the complex issues around personality and traits is incorporated in the broad definition of personality as “an individual’s unique variation on the general evolutionary design for human nature, expressed as a developing pattern of dispositional traits, characteristic adaptations, and integrative life stories complexly and differentially situated in culture” (McAdams & Pals, 2006, p. 212). This broad understanding of trait theory is also affirmed by others within this field, who suggest that “idiographic thoughts and feelings...may also inform understanding of the meanings individuals assign to their own personalities and life events” (Matthews et al., 2009, p. 411). Here we have a hint of a new and growing perspective in personality that questions the typical quantitative methodological constraint on trait psychology (Mahoney, 2011), with an associated awareness that has encouraged a move away from earlier dependency on grand theories that “tend to highlight the similarities rather than the differences between individuals” (Chamorro-Premuzic, 2011). This methodological perspective will be given more attention under Nomothetic and Idiographic foci, and also later when considering mixed methods research.

It is also important to note here, in relation to traits, that Holland’s Occupational Interests typology (1996), while principally concerned with occupational and career guidance, is often regarded as a set of

personality constructs. Holland's RIASEC typology (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) closely concords with the SWOT model which underscores the current research. In his model, occupational interests reflect both personality and cognitive style, hence its use in the current research into different ways of thinking: Selectively seeking people from different occupational backgrounds to representatively sample a full range of styles that potentially reflect on types of people. But these and other related questions serve to draw attention to how an understanding of traits might be better served if, as Deary puts it, we knew "more about the foundations of traits" (Deary, 2009, p. 104).

My personal research perspective rests on the premise that *other* methodological perspectives are more likely to uncover some of the descriptive and causal foundations of traits, rather than by a continuing proliferation of psychometric measures only. In this way, an alternative perspective can give wings to an otherwise limited method that is seemingly trapped by its historical reliance on the psychometric study of personality that, as a discrete entity, does not usually consider underlying personal and potentially causal relationships. As others have noted (Jensen-Campbell, Knack, & Rex-Lear, 2009), the previous focus of research in this area has limited the opportunity to understand how personality influences people's daily lives and likewise in reverse order as well. More recent researchers in personality however do acknowledge certain specific personality traits to be core factors affecting social relations and related life experiences, with a corollary that implies an impact of social relations on personality that warrants more research (Mahoney, 2011; Nakash, 2003; Sander & Scherer, 2009). My acceptance of such potential relationships underlies the use of interviews with individuals in the current research, expected to facilitate the exploration of one small connection between a personal trait-like construct (ways of thinking) and its flow-on adaptive effect on the individual, that has been observed within particular social settings in other trait research (Lamiell, 2009; McAdams & Pals, 2006).

Using a *trait-like* focus to understand differences in thinking also prompted the decision in the current project to use a mixed-method approach to address the apparent need for a qualitative approach in a discipline that as already stated has largely depended on a quantitative methodology. There is a complex plethora of phenomena seen as traits within personality psychology (Caprara & Cervone, 2000), and since arguably the current ways of thinking research reflects a personality approach rather than abilities one, the study considers particular *preferences* individuals exhibit in regard to their characteristic ways of thinking. As such, the research content ontologically demands a different method, as recommended by those who see this as a necessary paradigm shift (Creswell & Plano Clark, 2011; Green & Thorogood, 2009; Jennifer C. Greene, 2007).

Nomothetic - Idiographic foci

Given the vast array of theories about individual differences, it seems important to me that this study include an approach that is neither a focus on the nomothetic nor the idiographic but essentially does both. In other words, new research needs to consider both nomothetic and idiographic information in order to more

comprehensively understand individual ways of thinking that can legitimately demonstrate a person-oriented approach that others have considered, many of whom have already been mentioned in this review.

To appropriately justify this paradigm shift, we need to recall again the early work of Allport (1942) and others (mentioned already) over the last 100 years of personality psychology. Here we see the contrasting idiographic personal details offered by many case studies but then considered as aggregated quantitative data that provide more general views about humankind. Nomothetic studies in personality psychology occupied a large portion of the 20th century, allowing researchers to make comparisons *between* individuals. However, as previously argued, these rarely considered a study of the individual in itself as important (Barenbaum & Winter, 2010). In addition, many of these studies were based on the *abnormal* traits observed in individual patients. In confronting this limitation, even within this context, it is important to note that “without evidence from other people, we cannot assume that what is found in one individual will also apply to others” (Cloninger, 2009, pp. 10-11).

Teasing these limitations out a little further, and building on the typological work of Jung as a psychiatrist (Malamud, 1923), further research took up this particular concern, with an aggregation of trait-like characteristics observed in *normal* individuals with the development of the Myers-Briggs Type Indicator (MBTI) (Myers, 1962). This measure describes types of people by a number of *attitudes*: these importantly include the extroversion/introversion factors later identified by the Big Five personality inventories. Though MBTI tests have maintained a popular usage, their psychometric dependabilities remain contentious (Pittenger, 2005) though anecdotal experience makes positive claims about its usefulness. At best its dimensions might be more applicable when considered along continuous dimensions, rather than as discrete types (Arnaud, Green, Rosen, Gleaves, & Melancon, 2003), and these researchers suggest that the MBTI may provide more acceptable insights if it were subjected to a more idiographic analysis. In respect to such issues, my research attempts to place an emphasis on the idiographic accounts from a sample of individuals, with a later counterpoint of nomothetic data, that is, by considering their personal views in relation to data normed on the basis of other individuals who reported their ways of thinking by way of the newly developed WOT questionnaire.

Research in individual differences has continued its trend to identify general similarities, rather than on distinctive differences, with recent examples reflecting the inadequacy of the quantitative approach to cover all that captures the essence of individual personality distinctiveness (Cervone, 2005). Growing interdisciplinary awareness of the benefits associated with different forms of individual *narrative* inquiry has paved the way for its more confident use in psychological research (Clandinin, 2007). The use of qualitative analysis has advocated utilizing various and sometimes quite flexible methods in relation to how it is used, and what the research seeks to discover, and includes for example thematic analysis (Braun & Clarke, 2006). One method of thematic analysis provided by Braun and Clarke does not impose a rigid method, but rather seeks to provide a useful guide for researchers to achieve good research that describes “patterns across qualitative analysis” (Braun & Clarke, 2006, p. 8) yet one that is not constrained by a particular theoretical framework. Even so, it is clear that regardless of the epistemological basis for the research, it has

appropriately been suggested that any attempt to include an interpretation needs to consider a system that informs such reflection (Willig, 2007). In this way, thematic analysis can reflect the meaning that an individual makes of experience, while at the same time can the researcher to make her own position transparent, acknowledging any theoretically informed interpretive stance.

Narrative inquiry often makes effective use of interviews, which in the hands of a sensitive and capable researcher/interviewer brings out a deeper meaning of the life experiences shared by the participant/narrator. As Merton (2015) points out, such inquiry allows an in-depth interview that "...follows the narrator's story and is based less on a previously developed interview guide...The listener's role is to encourage the narrator to provide more detail and deeper understanding"(Mertens, 2015, p. 294). Examples of narrative inquiry are ubiquitous, found across numerous disciplines, many of which are concerned with how individuals makes sense of life, (Singer, 2004), or for example develop personality a socialized sense of self, aptly described by *The Storied Construction of Personality* (Thorne & Nam, 2009). Such a method of data collection and analysis has been adopted more recently in psychological research that has considered the whole person perspective, rather than the 'snippet' gained when studied as traits only. Such studies demonstrate the expanded meaningful understanding made possible when overlapped (Thorne, Korobov, & Morgan, 2007), with life stories enabling the return of "personality psychology to its original calling, in which individual lives rather than traits were regarded as the basic unit of personality (Allport 1937; Murray 1938)" (Thorne & Nam, 2009, p. 497).

The balancing of nomothetic and idiographic approaches often requires the use of quantitative and qualitative methodologies, particularly when regarding personality factors from a dynamic perspective that has usually been researched within a quantitative context (Shoda, LeeTiernan, & Mischel, 2002). Combining idiographic/nomothetic approaches is aligned to a mixed methods research not routinely used in developing a new personality-type measure, despite such methodologies having been advocated almost twenty years ago (Pervin, 1996). It is this methodological mix to which we now turn.

Combining methodologies: a mixed methods approach

As has already been mentioned, the use of sole methodologies for research in seeking to understand individuals has long been questioned and mixed methods recommended (J. C. Greene & Caracelli, 1989). Yet until the last two decades, quantitative methods have still dominated research within individual differences psychology (Alise & Teddlie, 2010). This dominance had raised considerable concern, especially since much of that research had involved the diagnosis and assessment of personality *disorders* (Widiger, Costa, & Samuel, 2006), though it should be noted that such research now at least advocates for *normal* populations and not just a focus on pathological personality issues. Implications from previous trends have often meant an exclusion of those who had not attained the normality criteria. It is heartening to observe, however, that the strict adherence to only quantitatively derived measures is being challenged and reconsidered, making way for less categorical classifications than the classical dimensional measures, so that, for example, "semi-structured interviews...[now]...provide a considerable amount of information for

understanding ...interpreting...and resolving ambiguities" (Mullins-Sweatt & Widiger, 2009, p. 652), and are advocated for use as accompaniments to existing quantitatively derived diagnostic tools.

The move to incorporate qualitative methodologies has gradually become more accepted within individual differences psychology, as it is seen as particularly advantageous in opening up the way for identifying less measurable latent variables, such as for example, subjective well-being (SWB) (Pavot & Diener, 2011). Such research has continued to foster robust debate about the theoretical models on which it has relied, yet such debates have increasingly accepted the need to more deeply consider and accommodate the wider gamut of individual differences that challenge those theories (Mahoney, 2011). How to achieve this broadening of the field satisfactorily remained a problem, however, while the emphasis remained fixed on a quantitative approach as the preferred methodology. Quantitative research demands a large number of respondents to meet significance requirements, for example, a particular problem arising when a small but significantly strong individual difference can be identified within the subgroups of the larger sample, as found for example when identifying relationships between certain personality traits and for example, well-being (Piers Steel, Schmidt, & Shultz, 2008).

In relation to the initial driver of the current research, with aims to instrumentalize a model of differences in ways of thinking, using a quantitative methodology was initially thought to be my most efficient and appropriate path for the development of such a questionnaire. Questions that surfaced about that approach however reignited my long-held curiosity concerning the largely unexplored or understood individual differences in thinking from a different methodological lens. As stated earlier, questions remain about styles that quantitative research has not satisfactorily answered. Numerous questionnaires developed over the past two to three decades have been subjected to some important meta analyses (Coffield et al., 2004), discovering few quantitatively developed measures that can be said to be reliable and worthwhile within individual differences personality psychology. A demand for change was therefore apparent, influencing a move to research that might be more personally enlightening, and able to give meaning to the numbers (Creswell, 2009).

The case for a mixed method approach in an individual difference context

Although the quantitative only focus in individual differences psychology has continued, the challenge has been made: to make more sense of the quantitative data, and therefore to include qualitative methods that are trustworthy, reliable in their accuracy of reporting, and do not simply dismiss a longstanding methodology as either outdated or no longer being the research flavor of the times. Rather, the researcher should now be confident to make "methodological choices based on their assumptions about reality and the nature of knowledge that are either implicitly present or explicitly acknowledged" (Mertens, 2015, p. xviii). Thus my decision was made to use a person-oriented qualitative approach, in greater appreciation of the clarity that this study might potentially bring to the larger field of individual differences.

Early research in qualitative research was undertaken by quantitative researchers such as Allport (1937) and later (H. Eysenck & Eysenck, 1995), using different ways to gather those more personal accounts

often missing in quantitative endeavours. Recent qualitative research, for example using narrative inquiry, important information was appropriately sourced, coded and then subjected to complex quantitative analyses. This study demonstrates how subjective reflection on past experiences can differently impact individuals, enabling some important nomothetic interpretations about others (McAdams et al., 1997), which is one process option still encouraged when combining the two approaches (R. Campbell, Gregory, Patterson, & Bybee, 2012). In contrast, and in a positive move into qualitative research, as seen in other disciplines, (Howell Smith, 2011; Mogk & Goodwin, 2012), we find quantitative scientists, often trapped in fixed ways of thinking and analyzing, encouragement is given to “try to break down the barriers that our own frameworks erect and allow ourselves to be open to surprises” (Kieffer, 2006, p. 10). Furthermore, it is important to note the gradual increase of mixed methods research, though these are frequently found in applied disciplines rather than in disciplines such as psychology that still methodologically largely remain committed to quantitative approaches (Alise & Teddlie, 2010; Feig, 2010). Some mixed methods research have demonstrated a dependence on a subjective *sense* of what individuals make of their lived experiences, rather than on a “pursuit of objective truth” (Thorne & Nam, 2009, p. 491), with suggestions that future research in personality psychology consider how story telling for example helps individuals manage their own respective traits or dispositions.

Similarly a mix of qualitative and quantitative research has also been applied to social issues, particularly when that research was endeavoring to discover common themes that might contribute for example to an understanding of personality developments in certain groups, such as in adolescence and young adulthood (McAdams et al., 2006), or in forming views about how individuals deal with difficult life events that may be a factor in their identity formation (Pals, 2006). In this last research, however, it is important that we observe a move to forming *causal* connections, allowing individuals to reconsider the past experiences/negative emotions enlightened by positive present day experiences to bring about personal transformation, using both quantitative and qualitative analyses, while maintaining an emphasis on individual responses.

This relatively recent return to gathering data by a variety of ways has brought about a growing openness to considering both approaches as legitimate for differential psychology. But such openness has brought with it a need for developing new methodologies that are appropriate and trustworthy, for example, new tools for trustworthy analyses (Attride-Stirling, 2001), and requires essentially a critical thinking that allows for new defining research practices and approaches (Yanchar et al., 2008). Yoshikawa (2008) and Yanchar (2006) claim these should include, amongst other considerations, an understanding that research questions should dictate the methodology, rather than the reverse, as also did others (Tashakkori & Teddlie, 2010). So when we look to mixed methods research, we find an ever-expanding library of important literature that seeks to both question and clarify the operational rules (Powell, Mihalas, Onwuegbuzie, Suldo, & Daley, 2008). Such research also reports creditable concern to ensure these new conventions do not become so restrictive as to prevent innovative research that might discover new knowledge (Bryman, Becker, & Sempik, 2008).

There are various types of mixed methodologies and I would like here to briefly comment on some of these, before pointing to the rationale for the one chosen for the current research. Early quests into mixed methods research were sometimes met with ostracism, skepticism, and views that questioned its legitimacy for scientific endeavors. Many remain concerned that neither one method nor another should hold a preeminent position (Howe, 2004; Sandelowski, Voils, Leeman, & Crandell, 2012). Questions also focused on valid procedures in conducting qualitative research. These questions need to be reviewed against the previously dominant focus on quantitative research, and subsequently viewed against a growing inclination for qualitative research, before moving into research in everyday life that demanded what Greene referred to as “multiple ways of seeing and hearing” (Jennifer C. Greene, 2007, p. 20).

An early understanding of mixed methods sought to incorporate both quantitative and qualitative approaches (Guba & Lincoln, 1994). However, later research sought to include mixed methods with an orientation that not only utilized both approaches, but also synthesized the philosophical, design, and interpretative aspects of both paradigms, in a separate methodology of its own, often referred to as MMR – Mixed Methods Research (Tashakkori & Teddlie, 1998; Yoshikawa et al., 2008). While regarded by some as a third research paradigm (R. B. Johnson & Onwuegbuzie, 2004), other researchers have questioned the distinctiveness of such a mixed method view, pointing to the need to be more flexible rather than so prescriptive in regards to how this should be conducted, in order to maximize the benefits of a methodological mix (Teddlie & Tashakkori, 2012).

Within the wide gamut of differing views on what constitutes mixed methods research, there are a number of well-accepted possibilities for designing mixed methods research, from those that simply share commonalities between qualitative and quantitative approaches (Harrits, 2011; Morgan, 2007), whilst others are aimed at pluralistic and eclectic methods that may follow deliberate processes, chosen particularly to achieve best research within specific contexts or cultures (Bartholomew & Brown, 2012; Creswell & Plano Clark, 2011). For example, within research counselling psychology, much advice is now available for what methodological combinations are recommended for best usefulness and social viability (Hanson, Creswell, Clark, Petska, & Creswell, 2005; Jones & Sumner, 2009).

Plowright (2011) however, in his determination to create an integrated approach to research, refused to consider the distinction between qualitative and quantitative as valid, preferring to focus on the structure needed for best achieving cohesion of all elements of the research. Only when employing a structured way of doing research does Plowright suggest it is possible to make claims about the research being both credible and warrantable: he considered this involves “providing the best available evidence to support the research claims and arriving at logically and valid conclusions” (2011, p. 138). Though I am in agreement with trying to avoid any unnecessary dichotomy of approaches, and thus also being committed to an integrated approach, I believe using such well-understood descriptors as qualitative and quantitative need not be confining, especially when a greater clarity is enabled by identifying research designs, as for example being either sequential or concurrent (R. Campbell et al., 2012). And when presenting any results, the qualitative and quantitative descriptors may be quite important, particularly when any interpretative findings are further

explained in relation to re-considered views of all conclusions formed, particularly with any non-supportive or seeming contradictions between the numeric and narrative interpretations (Yanchar, 2006).

The value of triangulation in its various formats, including the debatable and potentially risky use of respondent reviews (Torrance, 2012), has also been acknowledged as an important consideration for mixed methods research (Denzin, 2012; Mertens & Hesse-Biber, 2012). And though much has been written about the potential problems inherent in seeing things from very differing perspectives, encouragingly most have concluded these problems are not insurmountable (Yoshikawa et al., 2008), and therefore should not prevent the broadening research that can result (Bazeley & Kemp, 2012).

The current research perspective

In light of the issues reviewed in this chapter, the conclusion made for a proposed mixed method approach acknowledges that, along with careful use of a quantitative means of data collection, analyses and test interpretations, a thorough and rigorous thematic analysis of case-by-case studies was crucial within the qualitative aspect of the research. This approach was considered the best means of providing a rich tapestry for evaluating the person-centred relevance of differences in preferred ways of thinking, as carefully reviewed in the context of interviewing individuals from within the larger cohort. In other words, a mixed methodology allows me to look at the phenomenon of thinking. Thematic analysis becomes a valuable clarification of the differences reported idiographically about ways of thinking and a way of evaluating the findings from an analysis of respondent data gathered from the WOT measure. This approach in no way contradicts my views regarding the importance of the whole person and an individual perspective that consequently is often reported in the first person. A mixed methods approach however enables me as a researcher to make inferences about the similarities between people, in ways that Wertz et al referred to as midlevel generalities, distinguishing features that might evidence *types* of individuals, “the essences of which can be clarified in contrast to each other...distinguished by their processes, meanings” (Wertz et al., 2011 p.158).

Discovering similarities between individuals can be an important part of the mixed method approach, but cannot be thought to have all the answers. Reflecting a philosophical position that there is more to life than what meets the eye, the individual qualitative perspective offers one view made possible through reflective interchanges, in one-to-one sharing. At the same time, and as has been confirmed by the research reported on in this chapter, such perspectives alone may not satisfy the broader questions that seek to understand any construct such as ways of thinking. Even within a qualitative phenomenological analysis, we find one further way to weave certain single threads together, but as the study by Wertz and his colleagues demonstrate, in their analysis of *five* different views of the same two participants, strong evidence is provided for the potential of extended interpretive understanding through alternative mixed methods.

Looking ahead:

In reporting how the current research was played out, I hope that, like others convinced of the benefits to knowledge in using mixed methods (Yanchar & Hill, 2003), I convey an attitude that demonstrates a necessary “tentative and vague understanding...and continue to reexamine and re-interpret it in the light of progressively new understandings” (2003, p. 22). Furthermore this research offers a respectful acknowledgment that my interpretations and evaluations, like those of Yanchar and Hill, “can not assume will satisfactorily account for all experience” (2003, p. 22). My research is driven by the ontological and phenomenological questions around the fact that we humans do think (Slezak, 2002), and often quite differently from one another, and is therefore coupled with a longing for any additional knowledge that might be more firm, less tentative and therefore beneficial, to both individuals and potentially to a wider community of individuals seeking greater understanding of how individuals think.

As expected when using a mixed methodology, drawing threads and findings together can create some difficulties: this requires the researcher to remain open-minded, but also, as we are reminded by other researchers, needing to be mindful that this complexity can also provide a means whereby one can “clarify thinking and that the tensions will result in improved approaches to research and evaluation” (Hofstee, 2012 p.44). This current research thus became committed to hearing the perceptions of a select number of different individuals, none of whom was considered to have diagnosable pathological needs, and all being considered old enough to have attained an age of maturity that enabled a reasonable sense of self that might be relied on (Donnellan & Lucas, 2008). Such an idiographic approach was adopted as an innovative potential for appropriately validating of a new measure. The initial nomothetic data collection was made from a broad spectrum of individuals and included those individuals later selected for the qualitative participant sample.

Like many practitioner-researchers, the goal of this research was to find such insights that might make a difference (Denzin, 2012), particularly for those individuals who on a spectrum of differences often feel misunderstood. To this end a new scale that operationalized a model of how individuals think was but one part of the project. Integrating findings of the mixed methodology was considered to be a valuable process by which a potentially important validation of the new measure could be possible, a process that would normally have been achieved by a quantitative approach only. The next chapter reports a fuller exploration of what a mixed method *validation* involves, especially when applied to developing a new measure.

Chapter 3 - Validation and Mixed Methods

Having situated the present research within the field of individual differences, Chapter 2 argued that the field of cognitive style had become so broad that further research would benefit from being conceptualized within a more specific trait-like psychology of personality. Some of the associated philosophical and ontological questions in that field were discussed, as also its historical reliance on quantitative research methods, rather than on what qualitative approaches provide not least with their potential to focus more on the individual. A case was subsequently made for the value of a mixed methodology. The specific construct of interest, individual differences in ways of thinking, was contextualized, having been initiated by a well-developed measurement model of student ways of thinking (SWOT). However, this construct lacked for want of a valid measurement tool. When attempting to develop a measure and when employing methods that depart from dominant quantitative expectations, we face the challenge regarding the different positions towards *validation* held by a growing number of other complementary research methodologies. This central issue then is one that concerns maximizing the scope of the validation process whereby a new scale may be considered to adequately measure the construct it claims to measure (Cronbach & Meehl, 1955; Simms & Watson, 2010). It is in the context of scale development that validation becomes an important consideration.

Purpose of this chapter

In the past, research into scale development has stressed the importance of finding evidence for the veracity of any construct and that this lies in establishing one or more of the many indicators of its construct validity (Messick, 1995b). Consequently, the task in this chapter is to demonstrate that in the construction of a WOT measure, its validity is carefully and comprehensively considered (Clark & Watson, 1995), by focusing on *construct validity* in determining the extent to which a new personality-type measure can claim to identify individual differences in ways of thinking.

Validity in psychology has primarily relied on quantitative psychometric definitions (D. T. Campbell & Fiske, 1959; John & Soto, 2007). However, in a departure from this methodology, this chapter will present a rationale, formulation, and application of how a balanced multi-method validation process can be achieved through a mixed method approach. This process requires a consideration of how validation of a new measure needs to fit around the underlying *construct* of the student ways of thinking (SWOT) model, before moving on to examining the different validations required for a quantitative as compared to a qualitative approach. The integration of these different validities then is reviewed, so that a mixed methodology can be recognized as having a suitable and appropriate rationale for its use in this research.

Chapter overview

Traditional concepts of validation consider it to be divided into three types: content, construct, and criterion validities (Messick, 1995b). At the same time, Messick recognized the three validation types were somewhat fragmented in terms of their comprehensive meaning and usefulness in test interpretation. He proposed a

more general validity standard, although this remained within the psychometric context of scientific inquiry, employing quantitative forms of measurement for evaluation of inter-individual variation. When considered within a quantitative paradigm, the process of validation has identified the importance of a clearly articulated construct (in this case, individual differences in the ways of thinking), and involves consideration of appropriate criteria by which the validity of that construct is judged. A general understanding of validation thus occupies the first part of this chapter.

Recognition of the limitations in making valid generalizations that apply at the intra-individual level (Potter & Levine-Donnerstein, 1999) has clearly exposed the need for new approaches (Roodenburg & Roodenburg, 2011). Based on the arguments raised in Chapter 2, a person-oriented approach is considered important, rather than what typically might be seen in variable-oriented perspectives gained through a quantitative only methodology (Bergman & Andersson, 2010; Bergman & Trost, 2006). This person-centred approach contrasts with what may best be described as seeing only *shadows* of the person when considered as variables of interest, and these should not be mistaken for the real person.

However, given that self-report measures are most commonly used to assess individual differences, a brief consideration is then made of the validity of such measures. The chapter then presents a considered view of how validity applied to the original SWOT model, followed by a presentation of the key means of validation within the respective methodological approaches: quantitative, qualitative and mixed method research. Given that validity is not the prerogative of quantitative research only, nor that validity should be ignored by qualitative research due to its acceptance of the importance of subjective data, a view of validity within a *combined methods* research follows, recognizing its goal seeks “to utilize the strengths of two or more approaches...and by attempting to minimize the weaknesses” of one or the other (Onwuegbuzie & Johnson, 2006, p. 54).

While addressing the necessary variations in the expectations and criteria of validation from the different methodological perspectives, the chapter thus examines evidence that justifies the legitimate use of mixed methods research in the development of a new assessment tool. The chapter then concludes with how validation may be applied in the construction of the ways of thinking (WOT) measure.

Validation

Validation – in general

In forming a theoretical model or proposition, the researcher needs to be able to demonstrate its validity can be determined on a number of different levels. This includes consideration of the meaningfulness and “quality of the data, the results, and their interpretations” (Creswell & Plano Clark, 2011, p. 210), with evidence that clearly demonstrates that it is the *process* by which that validation takes place. Substantive validation evidence is critical when developing a scale, so that the resultant scale can be said to be valid, measuring what it set out to measure (John & Soto, 2007; Simms & Watson, 2010).

Looking at validation in personality psychology, regardless of whether there is an idiographic focus on individuals in particular, or normed groups of people in general, it is important to articulate the constructs under investigation: those things that dependably can be said to describe or infer differing aspects of individuals that ontologically are held to be useful and meaningful in explaining the reality it represents (Cloninger, 2009). The degree to which a construct is valid, or is said to work, is largely dependent on the “richness and extensiveness” (McAdams & Pals, 2007, p. 7) of the agreed knowledge (*nomological network*) about that construct. The nomological net consists of what are regarded as lawful contextual relationships. The strength of the nomological net around any construct may be enhanced or challenged by research, which allows for confirmation, challenges, enhancements, and even possible changes to what had to date has been agreed on as what we *really know*.

When driven primarily by a quantitative paradigm, constructs are typically validated as measurable components of various theories. However, Mertens (2015) argues that personality theories are less dogmatically maintained now than in the first half or more of the 20th century, where rationalistically-oriented proponents often claimed that their particular theory was somewhat immutable, and not needing to be tested, with proponents like Freud or Jung for a longtime being given a guru-like status. The subsequent influence of an empirical epistemology ensures that each theory proposes “measurable features of individual variations ...and are often called constructs” (McAdams & Pals, 2007, p. 6), regardless of how temporary the theory may be. The important point here is that, *constructed* constructs, also known as latent constructs, can be identified as factors and key components. Thus there is also a need to establish various validities through their relationships with other factors and measured variables. Valid measurement models for example are achieved through exploratory techniques such as factor and principle components analysis (Gorsuch, 1988) as well as by confirmatory techniques such as structural equation modelling (R. B. Kline, 2005).

An ongoing debate continues to ask whether such constructs are *believed* to exist or simply act as heuristics (S. T. Meier, 1994; Molenaar & Ram, 2009), though pragmatically this is not an essential argument. Theoretically that debate is simply acknowledged here, but is considered outside the scope of this research. Real or not, latent variables cannot be readily assessed or directly observed, so that validation becomes an indirect *process* (Simms & Watson, 2010), during which the means and measures used to discern their features and their associated inferences become available through well-developed statistical techniques in which correlation and regression play an essential part.

However, as indicated by their chapter entitled *The Importance of Being Valid*, John and Soto (2007) reflect on the complexity of measurement models of personality and other psychological constructs, particularly as these models are mostly concerned with assigning a *meaning* to constructs that “represent the best possible approximation of the phenomena of interest” (2007, p. 462). Thus, when heuristics are used to describe non-apparent behaviours, in the operationalization of such constructs, such as in developing a scale, the validation *process* seeks a wide range of evidence that supports the meaning assigned to the construct. This process is used to facilitate for example an evaluation of how well a scale measures a given construct, and at the same time can be said to thereby validate the underlying theoretical model. It is important to note

an additional consideration made earlier by Messick (1995b) that validity must also encompass the *purpose* for which the test is constructed, an assumption accepted by others (Cronbach & Meehl, 1955), so that the interpretation and attributed meanings of the test scores becomes an important part of the validation process.

Before considering validation in relation to the SWOT model, a brief overview is now presented of the validity of self-reports, since self-reporting remains the most frequent form of personality type measures.

The validity of self-reports

Self-report measures are often open to criticism as potentially inaccurate and therefore not dependable (Craik, 2007; McCrae & Weiss, 2010). Though not always considered by formal tests, serious questions remain about how well people really know themselves and whether they are willing to honestly self-report (Allik et al., 2010; Wilson, 2002). As a practitioner, I had observed many clients, having claimed to know themselves, becoming aware of an understanding that often enabled a perception of self that was far more credible than one previously held. There *are* questions about whether people can really know themselves (J. D. Campbell et al., 1996), though Wilson (2002) suggests that some individuals have so much information that they may find it difficult to respond truthfully or accurately, making it seem possible to conclude that we are *strangers to ourselves* (Wilson, 2002). Conversely, however, there is a wide range of research that suggests that, even with children, specific and brief self-report measures are still very useful, particularly when identifying a particular understanding of need, such as for example determining whether someone is suffering from a Post-Traumatic Stress Disorder (Verlinden et al., 2014). Despite criticisms by those who would doubt the validity of self-report measures related to personality, a number of studies do confirm a “substantial (though not complete) agreement between descriptions from self-reports and those obtained when the same questions were put to knowledgeable informants – spouses, roommates, friends” (McCrae, 2009, p. 150).

In the context of personality *trait* psychology, we find a substantial body of research that supports the use of self-report measures, which are regarded as effective and valid tools (McCrae et al., 2004; Roberts, Wood, & Caspi, 2008; Robinson & Sedikides, 2009), to name just a few. This positive view of self-report measures is particularly evident when traits, deemed to have a core of consistency over time, having a strong genetic contribution (Matthews et al., 2009), are compared with those measuring more temporary or *state* sources of self-knowledge. For example, research points to apparent conflicting evidence about the *perceived* certainty of an individual’s self-knowledge that may be related to inconsistent mood states, yet when accepted as traits may thereby create some internal confusion that is reflected in their self-reporting (Robinson & Clore, 2002; Swann et al., 2007). It is suggested however that *uncertainty* in a view of self is less likely to be consistent over time, with a corollary that suggests a self-certainty associated with congruent self-knowledge will more likely contribute greater validity to the self-report measures of well-developed *stable* traits (J. D. Campbell et al., 1996). Robinson and Sedikides add to these discussions with the suggestion that self-reports may be less valid for those individuals who “are less capable of appraising the

significance of momentary events” so that their more stable traits are less known by them, being “more biased by their emotional traits” (2009, p. 465).

Despite the studies that question how well people know themselves, and the debate about what unconsciously may affect one’s *identity* or self-view, particularly when that conflicts with *social* self-views (Gomez, Seyle, Huici, & Swann, 2009; Swann & Bosson, 2008), agreement is still commonly held that self-reports remain the most popular and valid assessments for measuring trait-like constructs (Lucas & Baird, 2006; Paulhus & Vazire, 2007). Saucier (2009) also agreed that when personality is considered from within an individual behavioural perspective, “self-report is often the most direct way to elicit such content” (2009, p. 394).

Others concur with the positive view of the use of self-report measures, suggesting that high face-validity is more possible if these are kept simple, and when the sought-after information is clearly identified (Ferrando, Lorenzo-Seva, & Chico, 2009). Greater honesty in responses to self-report measures is considered more likely when the construct is presented as clearly and denotatively as possible, so that no ‘double-guessing’ is needed because of ambiguity (Simms & Watson, 2010). Self-report measures are frequently taken for granted as the “ultimate measure of personality...(and) remain the most popular choice”(Paulhus & Vazire, 2007, p. 227). This pragmatic view is probably because of the apparent ease of administrating such measures, where a potentially vast amount of information is inexpensively gathered. When taking into account the *process* of validity with which the measure is developed, it is the commonly accepted proposition that respondents can be relied on to provide unambiguous information about themselves that makes interpretation relatively simple (Chamorro-Premuzic, 2011).

In developing any new scale, the process of validation necessarily becomes complex, and even more so if the data includes sources other than that generated from respondents to a self-report questionnaire (as recommended by Silverman (2006) and others (Creswell, 2009; John & Soto, 2007). But first, we need to review the validation process used for the current research, beginning with the original model of student ways of thinking.

Validation and the SWOT model

The theoretical perspective of the current project is viewed from a personality-centred cognitive style model, and thus remains within the field of personality and individual differences. As a brief reminder, the model (Roodenburg, 2006) had specifically considered teachers’ perceptions of individual differences in 16 – 18 year old *student ways of thinking* (SWOT). The model was developed by using a statistically rigorous psycholexical approach previously used in trait psychology in establishing the Big-Five personality factors (De Raad, 2000; McCrae, 2009). The initial impetus for the current research therefore was committed to operationalizing the identified facets that make up the factor structure of the SWOT model, applying a quantitative classical test theory approach, which typically leads to a variable focused research perspective.

A point of digression that may be helpful to flag here is that as the research progressed in a later phase, investigating qualitative approaches enlightened me to the potential for a person-centred perspective, even within a quantitative methodology, offering an important and exciting possibility, that is, in looking at *individuals* who may in turn be representative of particular clustering of *people*. For example Asendorpf (2006) and others (Meyer, Stanley, & Vandenberg, 2013) recommend the use of such advanced analytical strategies for person rather than variable oriented research, adding an important validity potential when applied to the quantitatively determined SWOT model. The specifics of this analytical process are discussed more fully in Chapter 4, which presents the quantitative methodology used in the current research.

To return to considering the validity of the initial SWOT model: this was to some degree supported by its conceptual similarity or convergence with the hexagonal structure of Holland's personality-based RIASEC model of Occupational Interests (Holland, 1996; Roodenburg & Roodenburg, 2009). This circular model organizes individuals as Realists, Investigatives, Artistics, Social, Enterprising and Conventional, with a strong association found between *types* of individuals and their career choices. A similarity to those factors found with the SWOT model suggested some reflection of Holland's types and the Big Five personality factors further. Holland's model is well established and highly regarded (P. I. Armstrong & Anthoney, 2009; Tracey, 2008), and Plutchik and Conte called for more research to advance its nomological net, to consider the different foci of interest between it and the Big Five (Plutchik & Conte, 1997). Subsequently, a number of studies have been conducted that identify to varying extents similar relationships (P. I. Armstrong, Day, McVay, & Rounds, 2008; Barrick, Mount, & Gupta, 2003; Bonitz, Armstrong, & Larson, 2010).

Theoretical relevance is one of the commonly accepted criteria for validity (Messick, 1995a) which means that any measure must be aligned to an underlying theory. In this context structural validity is found in the theoretical relevance of the RIASEC to the SWOT model; see Figure 4.2, next chapter. Furthermore arguments regarding validity suggest that the model itself can benefit from research that encourages an exploration of what things these models have in common (convergent validity), while specifically looking at ways they may form separate constructs, that is by discriminant validity, in justification for the differing perspectives they offer. By viewing individual differences from a slightly different perspective, that is from thinking rather than occupational preferences, the SWOT model may be able to add important augmenting knowledge to the relationship between cognition and occupational interests.

However, while the model itself was promising, any further validation first needed the SWOT model to be fully instrumentalized, this also being important for it to become a useful tool able to be understood both idiographically and nomothetically. This goal reflects the argument that “test validity must be evaluated in the context of its purpose” (S. T. Meier, 1994, p. 174), and supports a view that “test validity has more to do with its practical utility than any theoretical pursuit of absolute factors” (Roodenburg, 2006, p. 47). It was envisaged therefore that a valid measure in adult ways of thinking (AWOT) would offer the possibility to gauge the utility and validity of the latent constructs of the underlying model. Furthermore, being able to use this measure in education and other contexts gives an indication of validity in applicability,

and potentially offers to bring benefits through a greater personal self-understanding, thereby facilitating a greater appreciation of the implications of the differences discovered about individual ways of thinking.

Having established an overview of these issues, we now proceed to review them in greater depth under their respective validatory headings: Quantitative; Qualitative; and Mixed Method validations, and then in relation to the new WOT questionnaire. In this way, the different perspectives made about validation may become a little clearer and provide a credible view of the relevance of mixed methods to the current project. The order in which these are discussed is a reflection of historical precedence and not one of relative importance.

Quantitative validation

Quantitative theory has traditionally focused on its ability to quantify ‘reality’ in numbers, within a belief that scientifically gathered and analyzed data needs to be found to be objective, deductively validated, and reliable. *Empiricism* was the operative word: epistemologically it argued we can know things by scientifically observing; we can make reasoned observations; and what is to be observed can be clearly identified and analyzed (Mertens, 2015). Such a view meshes ontologically with what is sometimes referred to as *a correspondence view of knowledge*: the view that what you see and touch is reality (Hunnex, 1986). It has depended on finding evidence of significant correlations about a construct under investigation and other respective measures that support *construct validity* (Cloninger, 2009). *Positivism* has contributed a similarly focused approach by describing how one might confront questions of knowledge, in the belief that “a stable reality is out there” that can be naturally or empirically observed (Green & Thorogood, 2009, p. 13). The term positivism, coined by the French philosopher Comte in the middle of the 19th century, had suggested that “the most advanced form of thinking was the scientific form” (Thomas, 2009, p. 74) and for a long time it was *the paradigm* that ruled the world of scientific research.

There are some very positive implications for such scientifically determined certainty: identification and measurement of a construct; opportunity to make succinct summary comparisons or associations between groups or variables; and a clear capacity to test a particular hypothesis, with set protocols or *rules of thumb* that thereby may be used to refute or support a given theory or its findings. For example, Tabachnik and Fidell (2001) proposed that 300 cases are needed for dependable factor analytic valid conclusions, with a clear rejection made of any factor with an eigenvalue of less than one. The validities of such research methodologically were suspect only on the basis that certain criteria could not be deduced or ascertained from statistically valid tests, or alternatively, other tests were not available against which its findings could be validated (D. T. Campbell & Fiske, 1959). Later studies challenged such criteria, so that new theories and more advanced psychometric analyses allow for greater flexibility, even with regard to the validity associated with ballpark sampling options related to the number of variables of interest (Mertens, 2015; K. R. Murphy, Myors, & Wolach, 2009).

In an encouraging illustration of the benefits of free, sound, open academic debate and peer reviewed research, the positivistic view has increasingly been challenged at the theoretical level as well as in research

design (Burgos, 2007), and has been particularly noted in trait personality psychology (Mahoney, 2011). Responses to such challenges can be seen for example in de Winter's valid application of quantitative analyses with small sample sizes (de Winter, Dodou, & Wieringa, 2009). Mertens (2015) also points out the limitations of necessarily imposing large sample sizes on research, suggesting they may have questionable *statistical* significance though valid *practical* significance. Moreover, such unnecessary restrictions have also become evident, firstly by more available and often statistically complex means, as shown in one exploratory study on inter-individual variability of behaviours where clearly one size does not fit all (Vindras, Desmurget, & Baraduc, 2012). The same researchers provide a second illustration of changes in quantitative researcher views, demanding an honest reappraisal of how much and how well the interpretation of results is handled by the researcher. This view, though often *popularly* accepted, has provided researchers with a clearer understanding that even statistics, no matter how carefully accomplished, have their limitations particularly in relation to meaningful interpretation. These are particularly evident when it comes to individual responses that do not fit into the norm, the average, or the required level of significance (Vindras et al., 2012).

The need for an expanded understanding is even more obvious when the study involves human interactions and interpretations, resulting in potentially very different perspectives of the tenability of findings (Tracey & Rohlffing, 2010). If numbers only are considered, it is possible that deeper understanding, so necessary for each stage in the validators process, may be neglected. Ultimately it can be seen that the structure of the scale or the conclusions drawn can only make sense "in terms of extant theory, and through more interpretable factors" (Roodenburg & Roodenburg, 2011, p. 38).

Understanding that one needs to interpret numerical findings dovetails with a more recent awareness that an optimal ascertainment of validity cannot simply leave out those factors that may only have relevance to such issues as social and cultural influences (Shimp, 2007). Shimp takes this even further, advocating an unusual move for quantitative behaviour analysts, that of being more reflexive, in order to make meaningful judgments of the data. In other words, more common acceptance has been made of the criticism leveled at quantitative research's inherent detachment from the real world of people, which some have referred to as *decontextualization* (Stanovich & West, 2000). Such an approach would usually depend on an analysis of aggregates of *inter-person* details (J. Grice, 2010), rather than on the *intra-personal* world of the individual which historically has always been held to be so important (Allport, 1937). Later, Allport (1966) suggested the need for a commonsense understanding that people are real, and therefore should be understood in the context of real life, and not limited by the methodological constraints.

In deference to Allport's conviction of the uniqueness of each individual (Allport, 1962), a view still maintained by most personality psychologists (Chamorro-Premuzic, 2011; Corr & Matthews, 2009), a word of caution has also been sounded about how outliers are often treated in quantitative data analysis. Though potentially clear indicators of individual differences, the standard process of data aggregation has meant that outliers are commonly dismissed, though now there is better understanding that this practice "can lead to distortions or, in the worst case, statements that do not apply to anybody" (von Eye, 2010). Such individual

cases may really be quite influential in terms of statistical decisions made, and therefore necessitate reinterpretation (Viruel-Fuentes, 2007). Outliers may also influence the validity of the number of factors retained, and may be a contributing element to bias results, such as with social desirability or acquiescence (Liu & Zumbo, 2012), and thus creating an important invalidity of results.

The strict application of a quantitative research methodology may have been unfairly maligned, however, often having been *assumed* to be driven by interest in black and white facts only. It is suggested this may have more to do with its philosophical underpinning than its outworking in practice (Creswell & Plano Clark, 2011). The perception of extremism within a strict quantitative perspective is reinforced by researchers such as Epstein who is understood to maintain “as meaningless any attempt to characterize an individual apart from statistically-based comparisons of that individual with others” (Lamiell, 2009, p. 72). Although often being constrained by such a perception of the ‘correct way’ of doing scientific discovery, however, quantitative methods have provided a sound and fruitful basis for research. It is only fair to note that scientific research has long sought to find alternate ways of integrating and presenting new knowledge, with more recent studies attempting to delve into answering many of the questions that ask why, previously often thought to be only appropriately associated with the reflections of qualitative research (McGrath, 2011).

Recent quantitative research in personality has been further confronted and challenged by a pragmatic approach (Morgan, 2007), seeking to confront inadequate and potentially spurious statistical conclusions. Pedhazur and Schmelkin (1991b) suggested that such conclusions may do nothing more than raise questions when, for example, a scale’s appropriateness, its relevancy or its usefulness for a given population is in question. But it is within this pragmatism that we also find a rise in mixed methods approaches (R. B. Johnson & Gray, 2010), bringing with it a greater freedom of choice for a range of methodologies, and a commitment to finding what a combined methods’ approach can produce in terms of best understanding or valid meaning making of the phenomena of interest (Biesta, 2010; Creswell, 2009); more of this will be considered under mixed methods validation.

Putting aside its early unsustainable claims of ‘having all that is needed’ to establish validity, the quantitative research perspective however should not ever be condemned as simplistic: validation is achieved through many and varied stringent statistical analyses (T. J. B. Kline, 2005; Lattin, 2003). Though recognizing the need to be concerned with *internal* validity, for example, quantitative researchers are not just concerned about the construct itself, but also about how a construct relates to the content, typically examined in its relationship with that construct. Such validity concerns also demonstrate a growing commitment to what Messick (1995b) had long advocated: a careful and dynamic evaluation of how well the scores or findings obtained support the theory they espouse to reflect. As well as seeking to discriminate one variable from another, the quantitative approach to validity is equally and importantly committed to a process of identifying what things it does not measure, with an important additional component being its ability to ensure some *external* validity (Sherry, 2006). In Messick’s concern for how respondents’ results are used, he added another validity check to an already long list, which he called *consequential* validity (Messick,

1995b); in this he posited an early reference to his awareness of the need for *meaning* when interpreting any test results. This now becomes an important consideration within a quantitative research paradigm.

Reflecting again on validation in relation to the development of a new scale, we find one particular difficulty arises when seeking to measure a latent variable, sometimes called a hypothetical construct (Cloninger, 2009), a phenomenon *believed* to exist but not readily assessed or observed (Katsikopoulos, 2011). In this task the researcher is confronted with many questions, including not just how that latent variable is to be measured, but also why this particular construct warrants a new measure. The validity and reliability of such a measure must therefore involve analysis that considers the underlying factors of that construct. Such factors can be manipulated in various ways, in an effort to build a nomological knowledge network mentioned earlier (Clark & Watson, 1995). This net allows for a wide view of what construct factors are best retained and how well these relate to (converge with) or are independent (discriminant) of each other (Mahoney, 2011). This dynamic, complex, and involved process of validation is referred to as *substantive* validity (Kashiwagi, 2002; Simms & Watson, 2010). Substantive validity demands a clear mandate to justify a new measure that is based on extant theory.

A quantitative approach certainly involves many and various considerations that can impact on the measure's validity. Confounding issues such as respondent self-deception and impression management are understood to variously affect individual response biases (Ferrando et al., 2009; Ray, 1983) and thereby can contribute to the invalidity of the scale. Such biases however can now be confronted with statistically competent programs that minimize their effect, some of which are able to select out such general factors as acquiescence and social desirability (Leite & Cooper, 2010; Rammstedt, Goldberg, & Borg, 2010). Problems associated with issues of social desirability and image management are well-known, and highlight the need to make allowances for these. There are a number of methods suggested to counter such problems, however, both in the construction and the analysis phases (Martin Backstrom, Bjorklund, & Larsson, 2009; Hofstee, Ten Berge, & Hendriks, 1998; Leite & Cooper, 2010). Other research has also demonstrated that there may be a relationship between sample size and the complexity of the construct parameters that can also impact on the validation process of scale development (Worthington & Whittaker, 2006).

Justification within a quantitative methodology is a term closely allied to validity which, as Simms and Watson (2010) maintain, must reflect the *purpose* of the human inquiry, particularly when comparing and integrating descriptive and individual characteristics. Specifically when constructing a new measure, Simms and Watson point out the need for a dynamic validation process, to enable meaningful interpretation and corroboration of individual data with the largely numeric, more predictive elements suggested by the results obtained from the analysis of its quantitative data. This assessment reflects what Cronbach and Meehl (1955) had maintained: the process does not validate a *test* but rather is “a principle for making inferences...some of which may be valid and others invalid” (1955, p. 297). So to facilitate greater meaning, adjectival items used in a model for example can be extended into behavioural sentences for a questionnaire, a practice supported by Widiger and Trull (1997) with variations of the stem sentence for example that allow for *contextual* validity. Such items demand a clarity and simplicity, yet also a breadth of items that would

make sure the content of such an assessment instrument was “relevant to and representative of the target construct” (Haynes, Richard, & Kubany, 1995, p. 238). In this way, care is taken concerning the appropriateness of items and how these relate to the construct, so that *content* validity can also be achieved.

As already mentioned, variables that quantify the constructs under consideration have largely been the focus of quantitative research, with concern for how these variables may correlate with or be different from other variables of interest. So for example, like within the Five-factor model of individual differences, nomothetic studies may consider extroversion or sociability as variables that can be measured within a given population, with conclusions drawn from correlations or distinctions from other quantifiable variables, such as attachment or age (L. L. Meier, Orth, Denissen, & Kuhnel, 2011). A quantitative approach has historically been inherently variable centred, so that its focus is more on the *similarities* or “regularities [rather] than it is with individual anomalies” (Potter, 1996, p. 305). There are very few examples of research within mainstream psychology, at least until very recently where, rather than a behaviour-centred latent or emergent variable, the variable of interest is person-oriented. Since a person-centred orientation is more usual within a qualitative approach (De Fruyt, 2002; Durr & Tracey, 2009) it will be discussed further in that context.

Given the focus for the current research is clearly about individual differences, it is important to reflect on validity from the perspective of the qualitative researcher, for whom the scientific and nomothetic constraints are often displaced by a desire to gain a valid and authentic personal viewpoint (Creswell et al., 2007). Such perspectives are now considered more acceptable, indeed recommended, as they enable the collection of empirical data that can enrich and broaden one’s research, in order to gain insights about which valid inferences about the construct are more possible and tenable (Kashiwagi, 2002).

Qualitative validation

With the rise of interest in and concern for the person-centred approach to Individual Difference research, there has been concern that a perceived lack of precision in early qualitative research be countered by consideration of what makes a study a *quality* one (Mertens, 2015). Uncertainties about validity have often been raised about qualitative research, particularly when interpretative research is concerned with an individual view rather than with a quantifiable variable consideration. Reference is made to the need for substantive and acceptable evidence, for example, when the focus is on trying to find appropriate means for discriminating particular social and psychological phenomena, such as in health needs (Burnard, Gill, Stewart, Treasure, & Chadwick, 2008). As in all research, the need for evidence is important, particularly when seeking to answer complex questions in education, for example, or where a multiple research approach is strongly advocated to gain insights from different stakeholders’ perspectives (Green & Thorogood, 2009; R. B. Johnson, 2009).

There are various perspectives held by qualitative researchers concerning validation, and Creswell (2013) has provided us with a good overview of terms used. These vary from research that considers validation as equivalent to a quantitative only understanding, to an understanding that Creswell himself

advocates, suggesting the use of *same* terms being quite acceptable, regardless of methodological preference and their having slightly differing meanings. Creswell does not seem to find a mix of new and old terminology inappropriate, so that speaking of validation within a qualitative context, he maintains that validation is an attempt “to assess the ‘accuracy’ of the findings, as best described by the researcher and the participants”...preferring “the term *validation* to emphasize a process...rather than verification” (Creswell, 2013, pp. 249-250). But notably, he also advocates the researcher employ certain *strategies* in order to reflect on the accuracy and therefore the validity of the findings. Such strategies encourage a careful practice that ensures the research achieves acceptable levels of *understanding* and *authenticity*.

Potter (1996) on the other hand refers to the large *potpourri of definitions* found amongst qualitative researchers, and acknowledges several issues “where the practices of the two approaches are surprisingly similar” (1996, p. 299). These include the frequent use of non-subjective impressions by both approaches, and suggest both may seek to provide *credibility* through connecting their findings with others’ findings and interpretations. Though Potter reports similarities between the two approaches, his use of the term generalization takes on a different connotation from the qualitative term of *conceptual leverage*, this latter suggesting “broader systems of explanations” rather than an “expansion of conclusions beyond the limits of the data” (1996, p. 228) implied by generalizing for example to other populations. It is understandable however, that Potter uses the terms internal and external validity in much the same way as quantitative researchers would do, without any apparent contradiction.

The epistemological views inherent in qualitative enquiry contrast starkly with those of researchers associated with the theoretical ontology of quantitative enquiry, the latter more concerned with the *what* questions rather than the *why* and *how* of the former (Mahoney, 2011). In contrast to quantitative research where focus is on extracting maximally independent variables, philosophical underpinnings of qualitative research in psychology make for viewing individuals holistically, predominantly asking the how and why questions. Such understandings are gained within the natural environment, or as some put it: individuals are *contextualized* within their family, their community, or even within their own personal story (Thomas, 2011; Woike, 2008). As one would expect, this approach values verbal communications, so that the sharing of personal insights provides the meaningful data; such data is considered rich in subjective experience, and is capable of generating new insights and knowledge of an individual’s perceptions, as for example about creativity (Silvia, Martin, & Nusbaum, 2009). Such personal information is also considered capable of a more comprehensive *induction* of meaning or understanding of the individual person, as opposed to *deductions* most often associated with numerical aggregated data about many individuals.

When *subjective* perceptions are gathered as evidence, the qualitative researcher is faced with credibility issues. These issues form an important alternate conception of what validation is understood to mean within the qualitative research approach (Eisner, 1991). As noted by Eisner and others (Creswell & Plano Clark, 2011), concern is expressed that qualitative data needs to be *trustworthy*, which often necessitates obtaining corroborative evidence. Being aware that qualitative research might be seen as producing limited ‘scientific’ evidence because of its anecdotal nature (Silverman, 2006), calls have been

made for “new techniques and concepts for obtaining and defining trustworthy data which avoids the pitfalls of orthodox notions of validation” (Lather, 1991, p. 66).

Within a personalogical approach, we find the work of Bourdieu (1973), a sociologist committed to grappling with different forms of knowledge, who referred to qualitative data as *phenomenological knowledge*. His focus reflected a similar perspective to that which was held about style in the same era (Gregore, 1984), so that his views consider phenomenology as a legitimate or valid study of how people *individually* report their interactions with the world, as a *phenomenon of interest* viewed from within a particular group or class of people (Creswell, 2013). Rather than simply searching for homogeneity and consistency or uniformity between people, so that valuable information is not excluded on the grounds of its being subjective or just different, qualitative researchers are encouraged to *embrace* different viewpoints gained through the sharing of such subjective observations or experiences (Harris, 2006; Harrits, 2011). Such knowledge, including that which can be gleaned by qualitative methods such as narrative ethnography (Gubrium & Holstein, 2008) or case studies, allows day-to-day life experiences as documented by the researcher that may contribute important and valid meaning to the general knowledge. This qualitative approach allows an interactive sharing of potentially very different perceptions, with a two-way interchange between the researcher and participants that provides a dynamic and open-ended assessment that is not often possible with quantitative research.

It is important here to recall Allport’s belief in the valid use of personal documents; for example, documents provided by the participants that he considered valuable in their own right, thereby confirming his insistence on the legitimacy and necessity for the inclusion of idiographic insights for greater knowledge in understanding the uniqueness of the individual (Allport, 1942). In this we can see what later qualitative researchers have sometimes referred to as “ecological validity...in that [it] aims to encounter human life genuinely, as it is lived outside the research situation” (Wertz et al., 2011, p. 89). This view also acknowledges the importance of determining the best sources of information, with associated consideration of the *credibility* or *the veracity* of that empirical data (Guba & Lincoln, 2005). It is in this reconceptualized understanding of validity that qualitative research allows for a perspective that includes terms such as *corroborative* or *consensual validation*; data that finds agreement with that gained from various sources; or referential adequacy that depends on critical evaluations by others, all of which have been said to contribute to credible research (Eisner, 1991). By such means, the qualitative researcher thereby finds evidence that supports his findings, “evidence that breeds credibility, that allows us to feel confident about our observations, interpretations, and conclusions” (Eisner, 1991, p. 110).

Along with the requirement for research to be overtly credible, accuracy of reporting is valued highly. At the same time this view is counterpointed with the argument that the validity of research must also maintain an essentially reflexive interpretive approach, with the researcher committed to positioning herself within the study, an axiom expected of the qualitative researcher in freely admitting how her life and work experiences may influence and contribute to the findings (Mertens & Hesse-Biber, 2012). In this way, the researcher’s interpretive understanding may add value, meaning, or understanding to a personal insight or

sometimes to the multiple realities received from others, an accepted ontological assumption of qualitative research (Creswell, 2013).

Creswell also refers to the need for a logical process of interpretation: building themes that are constantly checked against the data, at times collaborating with colleagues, in an endeavour to ensure the inductive process can be found trustworthy. Plowright describes this process as making *abductive inferences* through a *retroductive* process, so that reported past experiences can be said to help “develop an explanation for an event in the present” and thus enables the researcher to “explain regularities or recurring patterns” (Plowright, 2011, p. 112) reported as an individual’s subjective perception of reality. Either way, such inferences involve an interpretative element, and therefore some researchers suggest there may be a need for *verification* of the analysis (Burnard et al., 2008). One means of checking researcher accuracy is provided by what Burnard et al. refers to as *respondent validation*, when the participants are engaged with reflections after the interviews are written up, or when asked to reflect on meanings determined during a collaborative review.

Apart from the time-consuming process this involves, however, there are other reservations about how valuable and valid such checks may actually be, and this concern posed a significant and relevant question in the current research. In part this caution is supported by Silverman’s significant comment about qualitative research, when he stated that “individual realities...are always under construction” (Silverman, 2007, p. 91). My personal observations in clinical work frequently noted potential problems that for example saw individuals who, as has been observed by others, “changed their perceptions ...respondents [who] modify their opinions” (Burnard et al., 2008, p. 431), highlighting the questionable efficacy of this method to provide greater authenticity than what can be understood by the researcher herself.

Given that qualitative researchers do need to be aware of faulty or created memories, where dependency on recall of the past can itself pose some threat to the veracity of information gathered, careful deliberation is essential when analyzing, evaluating and interpreting such data. This position is supported by Potter (1990), who draws attention to a distinctive difference observed in qualitative researchers concerning their understanding of what *quality* research is about. This questions whether research should be purposefully constrained by procedures and methodological rules, or more about open and reflexive research, with careful choices made about the need to form research boundaries, both in time and place (Creswell & Plano Clark, 2011). These research distinctives suggest that qualitative research can involve very different purposes, as has been observed in research other than psychology (Stokes & Feig, 2012), and these need to be articulated before judgments of the research quality and usefulness can be made (Mertens, 2015).

Qualitative researchers also need to be aware that their own positions on any information can easily impact on the storyteller, and also on the meanings assigned to the narratives given (Wertz et al., 2011). In this context, *triangulation* has been advocated as a necessary adjunct: different perspectives that can be compared or contrasted, to enable different views and insights that might not only counter bias, but also

might encourage collaboration with those from different perspectives, such as practitioners and theorists (Cools & Rayner, 2011). Triangulation will be considered in more detail in the next section on mixed-methods validation. At this point, however, it is worth noting that to deal with this concern within qualitative-only research, some have argued for teams of investigators and peer reviewers to gain what Hill referred to as a consensual qualitative approach (C. E. Hill et al., 2005), or gathering of data from different sources, providing cross comparisons in order to validate agreement in the findings. Regardless, it is understandable that there is some disagreement about how well this might be achieved (Denzin, 2012; Fielding, 2012), with potential for differences to simply be annulled or explained away, or alternatively become such an issue that creates a division that cannot easily find valuable solutions or worthwhile interpretations. Indeed, an important point needs to be made here: one reason that qualitative research is so important is that such differences are encouraged, enabling different voices to be heard, not silenced by the researcher (Tufford & Newman, 2012).

Here we are confronted with the question of what is truth, particularly since for some within the qualitative approach, “the concept of truth is replaced with a consequential theory of meaning” (Denzin, Lincoln, & Giardina, 2006, p. 776), so that truth statements are said to be *established*, and often through social interactions, and with historical representations contributing to what individuals understand as their reality. Claims for research that is authentic and ethical, as seen in (P. H. Collins, 2000), suggests that clarity of criteria in the legitimization process be matched by due responsibility and care in the reporting and interpreting phase, prior to any knowledge claims. Such care is also closely related to how questions are asked: for example, that these be asked in a manner so as not to contaminate the respondent’s own perspective by the researcher’s view (Holliday, 2007) or vice versa. This is seen as a particularly crucial and complex problem when questions arise about affect, handling emotions, or questions concerning self-knowledge (Harrell, 2002; Nakash, 2003). It is also paramount that the mindset or theoretical position of the interviewer does not influence the way in which a question is asked.

Also in respect to the validity of a qualitative approach, it is important to acknowledge that the relationship, experiences, capabilities and competencies of the researcher/interviewer will be deeply reflected in the appropriateness of the interpretation of the information (Norman K. Denzin & Y. S. Lincoln, 2005; Potter, 1996). Both Denzin and Potter argue that the level of researcher involvement may contaminate findings, and can be difficult to control for. However, given the distinctive qualitative assumption that a researcher should never manipulate either the informer or any of his/her information, being aware of such a potential should alert the researcher to exercise care to avoid this potential problem. On the other hand, the researcher must also be alert to the possibility of being given unreliable and potentially unhelpful self-reports that may suffer from the lack of honesty and integrity, which equally may create invalidity issues since these are not readily observed and unlikely to be admitted to.

Furthermore, the challenge to what is reality may occur from the researcher’s perspective in the presentation and interpretation phases of the research, when a phenomenologist adds her own reflections (Creswell, 2013). This has led to what some refer to as a need for bracketing, as a way of setting aside

potential bias, be that at the research conceptual beginnings, in the data gathering, or later at the interpretive phase (Fischer, 2009). There are difficulties involved in this approach, demanding great care in how this is done, and at what time in the research process it is appropriate (Tufford & Newman, 2012). LeVasseur (2003) however suggests that one way to counter possible misleading interpretations is by suspending personal reflections and interpretations in favour of a natural and open inquisitiveness that draws out the interviewee or story-teller.

This inquisitive approach may be possible for an experienced and thoughtful psychologist, concerned that her integrity and competence in questioning is matched by a sincere concern for hearing each participant's perspective. Such an approach, made in a warm yet sufficiently open environ, advocated in therapeutic contexts by Rogers (1980), along with a genuine curiosity, enables what Ladkin (2005, p. 109) suggests is a dance between subjectivity and objectivity, between "knower and known; meaning, interpretation and truth". This reflects the relational aspect of Husserl's collaborative and active engagement (Husserl, 1931/2012), which thereby can encourage a reciprocal researcher-participant self-reflection that further contributes to the validation process. In so doing, this process of shared meanings between the researcher and the participant as collaborators can facilitate participant responses being least affected by other factors, such as the need to impress, or conversely, be silenced by the fear of being judged. In this way, the essence of a study about the individual is highlighted by a person-oriented approach that again reiterates what personality psychology has always advocated: studying individuals should be about the whole person (Allport, 1937), and not about the variables that simply represent them (Lamiell, 2009; Mahoney, 2011)

Qualitative research accepts the legitimacy of uniquely individual information, and is demonstrated by the sensitivities within the participant-researcher interchange, enabling an essential element that can add greater meaning, aiding the veracity of an interpretive perspective. Within reflective conversations, valid understandings are gained by the social researcher, for example, that might not be possible for the methodologically constrained positivist (Thomas, 2013). Though open questioning that offers some insights *may* risk suggesting an answer, responses given to such should only be upheld if or until further evidence is forthcoming, thus the imperative to form only tentative answers concerning *why* this is so. Such a process makes it more possible to reflect on and discern some components of human agency and may uncover certain conclusions that are embedded within "mechanisms of cause and effect" (Yoshikawa et al., 2008, p. 347), enabling authentic explanatory instances of relationships not easily found with quantitative research alone (Green & Thorogood, 2009).

Rather than aiming for objective truth, traditionally thought to be the domain of neoclassical experimentalism with "its dogmatic adherence to an exclusive reliance on quantitative methods" (Howe, 2004, p. 42), qualitative researchers often refer to the importance of *verification* as validation, while others prefer to use terms such as *authenticity* and *trustworthiness* of data as useful and important types of validation (Creswell, 2013). Within interpretive qualitative research, validation has been referred to as "a judgment of the trustworthiness or goodness of a piece of research" (Angen, 2000, p. 387). It is appropriate to season such remarks in the context of Silverman's provocative conclusion concerning qualitative research

where validity, regardless of the terms used, is constrained by the strategies that help justify the research. Silverman suggested such strategies should always be “methodically inventive, empirically rigorous, theoretically alive but with an eye to practical relevance” (2007, p. 145). While the challenge to achieve such quality research is not easily attainable, this aim equally applies to quantitative research, and therefore certainly needs to infiltrate the process of integration in mixed methods and the interpretation of all data.

The inherent value of subjectivity forms a large part of qualitative research, but how well this is done may often contribute much to its being judged by others as worthwhile (Avis, 2003). One way this is achieved is by giving voice to the individual, be that the voice of the researcher and/or the voices of the participant cases, presenting an open and honest admission of the researcher presence within the interpretive component, and offers an alternative process of validity that is often ignored or at least down-played in a quantitative approach (Chang, 2008). Commenting on the interpretive part that reflexivity or objective self-awareness needs to play in qualitative research, Nightingale and Cromby (1999) deliberate on how objective research can really be, even within the discursive framework of social constructionism, and urge researchers to “explore the ways researchers involvement...influences, acts upon, and informs such research” (1999, p. 228). The value of such interplay is evident in social research in particular, where an acceptance of the interaction and questioning between researcher and participant can arguably produce greater understanding for both (Yoshikawa et al., 2008).

So, how do qualitative researchers allow for validity? Currently a range of views reflects differing epistemological positions held by qualitative researchers. At one extreme lies a position that *accepts* a pure subjectivity of knowing, so that such researchers “can only provide their own idiographic, subjective interpretations” (Potter, 1996, p. 42), implying their research cannot be treated as anything but right and valid. According to Green and Thorogood, validity refers to “an improved understanding, rather than improved accuracy” (2009, p. 242), suggesting it may focus on the veracity or credibility of its interpreted findings rather than the cold hard facts as reported. Yet another distinct position is that of phenomenologists who are committed to systematic collection and analysis of data (Moustakas, 1994), data that has been given freely and understood as subjective, so that an interpreted understanding of that *truth* is the *meaning* attributed to the data by the individual (Van Kaam, 1959). Yet at the same time, there are also pragmatists within a qualitative paradigm who, in accepting a ‘what works’ philosophy, would claim that knowledge itself can only be evidenced or found true and valid for a particular study and therefore often quite transient (Potter & Levine-Donnerstein, 1999). Such varied positions on validity are seen reflected in one thesaurus that presents synonymous terms such as usable, convincing, legitimate, authoritative, authentic, well-founded, justifiable, sound, reasonable, each selected as appropriate descriptors of valid arguments in support of the specific research intention.

Validity in qualitative research is also often associated with justification, already mentioned within a quantitative context, and places a greater emphasis on the validity of the *arguments* the researcher can make. These need to be presented as sound and legitimate, a process considered especially important if one is making a case for meaningful relationships between the evidence and some existing social theory or beliefs

(Sandelowsk, 2010), though remaining open to possible reinterpretations by others. This view reflects a growing acceptance within qualitative research that different goals require different questions, necessitating the use of different methods. These views have spawned many postmodern views of validity, reflected for example in feminist research with expressions such as *voluptuous* validation, by which is meant that the researcher, “sets out to understand more than one can know and to write toward what one does not understand” (Creswell, 2013, p. 247). For others, understanding and the credibility of interpretations must involve *consensual* validation, so that having corroborative evidence becomes an important issue (Eisner, 1991).

There are also differing philosophical streams, some still emerging, that espouse differing epistemologies that imply different understandings of reality, and these call for different criteria for validation. These offer multiple opportunities within qualitative research, being referred to as the “generative tensions of pluralism” (Wertz et al., 2011, p. 82). Such differences in epistemological assumptions need to be identified, as they can influence how a qualitative methodology is played out. We see here however that qualitative research can arguably be justified in terms of a range of acceptable epistemological approaches, which result in new views of conducting qualitative research (Guba & Lincoln, 2005).

Reflecting on early qualitative studies that were often criticized for presenting certain material as evidence but lacking structure or form that epistemologically might allow one to make sense of the proposed conclusions, Thomas (2009, p. 109) recalls the attitude reflected in the German phrase *Einmal ist keinmal*, meaning *What happens only once might as well not have happened all*. Some individual stories, though often important in themselves, at times may have lacked for a protocol of reporting, and the experience and insights of the perspicacious researcher to make of them valid observations that would justify their written presentation as quality findings (Sandelowski, 2007). But for those qualitative researchers convinced of the power of one to tell a story that has a ring of truth (J. Grice, 2010), such criticism is justifiably rejected.

Regardless of the variety of validity types, each form necessitates an openness of inquiry, and relies on how well the researcher retains the given meaning of the data, with a number of checks suggested to make sure this validity is maintained. Holliday (2007) for example suggests that *hedging* or distancing oneself, or *softening* the reports made, may enable the researcher to make valid qualitative claims. But it is also possible to argue that producing evidential meaning can also make a valid contribution to knowledge that for example “emphasizes the relation between knowledge and justification” (Avis, 2003, p. 1003), without having to dogmatically claim a definitive understanding, but rather one that should be open to critical inquiry.

In light of the need to achieve impartiality, even while deeply engaged with their participants’ meanings, some would advocate a systematic review of findings by other researchers, or as part of a team to consider any interactive effects, and to ensure the veracity and credibility of interpreted meanings (C. E. Hill et al., 2005). This becomes even more important when the study involves a broader ethnographic methodology, whose purpose might be closely tied to personal identity such as might exist within a broader

cultural or sociological context (Woike, 2008). However, many qualitative researchers insist that it is the quality and techniques of research that are essential (Klassen, Creswell, Clark, Smith, & Meissner, 2012), and it is these that can ensure interpretations are founded on credible and reliable reflections of the *truths* reported on rather than the validation per se (Creswell et al., 2007; Green & Thorogood, 2009). This becomes part of an *authentic process*, highlighting the importance of keeping close to the truths expressed, and enables an assessment of its veracity, a valid expression of the legitimacy of such research.

In summary then, the number of cautions mentioned need to be directed towards the research process in order for the research be found acceptable, valid, and worthwhile. These are important, regardless of whether one uses a narrative approach such as story-telling, with a single in-depth case study (Plowright, 2011), or when the research focus is on a sample cohort for a more ethnographic and socially committed study, reported from the researcher perspective as an insider; whether the research depends on diaries, or data collected from interviews, structured or otherwise (Silverman, 2006). Such cautionary comments relate to the method of collecting data, to the analyzing and coding of data, and most important of all, to the interpretation of the findings (Thorne & Nam, 2009). These are again reflected on in mixed methods research, but first, a brief revision of the comparative understandings of validity from the two separate methodological approaches.

Comparisons between quantitative and qualitative validations

Some criticism has been made of qualitative research that suggests its findings are simply anecdotal, when its method enables a “choosing of just those extracts which support” their argument (Silverman, 2007, p. 61). Silverman also warns the qualitative researcher of the potential danger of seeing interpretation as so important that one might give up on the facts. Others like Seale, Gubrium and Silverman (2004) draw attention to questionable claims of rigor and thoroughness made by some qualitative researchers, when a lack of methodological structure creates the possibility of misinterpretation or amplification of induced meanings without proper checks. At the same time, Seale et al also admit this may be as equally true of quantitative research, particularly when used alone.

When considering validity within qualitative studies, which accepts the subjectivity of individual responses, some draw attention to the limited *usefulness* of purely subjective representations of reality for anyone other than the reporter (Green & Thorogood, 2009; Holliday, 2007). Epistemologically, this view of subjectivity does not invalidate the study, particularly for those qualitative workers for whom reality may be known only by what is given by the individual, and for whom multiple social realities are therefore possible (Avis, 2003). But a welcome demand that it become more systematically coded and reported (Willig, 2007) is complemented by those qualitative researchers who are committed to seeing that the usefulness (one form of validity) of even one case study can be transformative, emancipatory, with increased knowledge offering a potential to improve society (Creswell, 2013; Mertens, 2009).

Common to both quantitative and qualitative approaches is the important intermediary part played by the researcher, though perhaps is given more acknowledgement by qualitative researchers. In reporting

the metaphors of reality told to them, be these in numbers or words, the potential import of the researcher's own expressions or views is well recognized (Teddlie & Tashakkori, 2003), potentially played out in both the questioning, the analysis, and the interpretation of the data.

Research generally has also been confronted by questions asked in educational and social contexts, wondering for example if the methodology used is resorted to simply because its users do not know any other methods or do not feel comfortable or experienced enough with other approaches, be these either quantitative (Gorard, Rushforth, & Taylor, 2004) or qualitative (Creswell et al., 2007). In other words, such criticisms seem to reflect the competencies of the researcher, rather than a question of the validity of any study in terms of its purpose and methodology.

When we look to the medical field, for example, case studies have frequently been used, but usually couched in quantitative analyses and predictive validity concerns. Researchers in psychology however only recently have become aware of the need to challenge old practices of research methodology, enabling the important use of case studies but demanding different validity requirements outlined above. The challenge to orthodoxy was deemed particularly warrantable within the social and health sciences, given that there are essential and practical ramifications of any research that will most likely impact on individual human experiences (Stokes & Feig, 2012). But given our human capacity for understating or overstating our case, either from the subject's (*emic*) perspective, or with the added complication of our researcher (*etic*) inclination to interpret and create our own meaning of experiences (Willig, 2007), a balance is needed between these two perspectives, with a strategy that validates results and meaningful conclusions made from our research. This process of validation often includes using different methods of analysis, if not also requiring different methodological procedures themselves (Mertens, 2015).

With care to accommodate the potential flaws within the separate and distinctly different approaches to research, the resulting study may thereby be regarded as legitimately contributing to worthwhile valid research (Silverman, 2007). Regardless of the terminology used, and the respective contexts of each, it seems apparent that both quantitative and qualitative research approaches each entail equally acceptable validators means that justify their own specific strategies and their continued use, given the theoretical basis and motivational aims of each research (Bryman et al., 2008). When a study relates to the construction of valid measures, however, even early researchers clearly understood the necessity for various types of observations and investigations, in order to find and build what Cronbach and Meehl (1955) had long regarded as a valid construct. So we find within a quantitative understanding, the psychometric criteria for validity was clearly defined as "the degree to which elements of an instrument are relevant to and representative of the targeted construct" (Haynes et al., 1995, p. 238).

In the current research context, however, acceptance of the validation process, which identifies the principle by which inferences can be made, is regarded as equally important, as it allows for and affirms the veracity and usefulness of a mixed method approach to the construction of a new measure, so that validity is

now reviewed in that context. To my mind, this has an early ring of the veracity and usefulness of a mixed method approach to research committed to scale development, to which we now turn.

Mixed Method Validation

Within the contexts of health and social psychology, mixed methods research has increasingly attracted a lot of attention, particularly from those who justify its use as a legitimate *third paradigm*, as an alternative to quantitative or qualitative only approaches (Morgan, 2007). The growing acceptance of mixed methods research, as different from multi-method (tending to stay within a certain methodology), allows for various combinations within methodological choices to integrate either research goals, the data collection, and/or various methods of analysis and resultant findings, or all of these (Creswell & Tashakkori, 2007).

Meta-studies review the ascendancy of a mixed method approach over the past decade or more, and provide varying assessments of the success and acceptance (Dures, Rumsey, Morris, & Gleeson, 2011), while validity has been identified as the most important consideration in the research project (Creswell & Plano Clark, 2011). Within mixed methods research is an appropriate awareness that consideration be given to the respective underlying philosophical assumptions and the associated epistemologies of each methodology (Klassen et al., 2012). The philosophical debate about the underlying presuppositions is an ongoing process, with recognition of the competing schools of thought that underpin such methodological differences. Some suggest these hold important implications for the research design, with specific strategies employed to consider the validity or legitimacy of a mixed method design (Teddlie & Tashakkori, 2009). Along with the quality of the research, others consider validity issues in relation to analyses of data and interpretive stages of the mixed method research (Onwuegbuzie & Johnson, 2006). Importantly, a variety of methodologies serves to bring a range of alternative perspectives, a valuable breadth to research, as well as ensuring that approaches are not simply considered important on the basis of current fashion that might see one approach dominating the others (Small, 2011).

Consideration of validity from both quantitative and qualitative perspectives has offered some cognizance of the differing philosophical underpinnings. However, in the following brief discussion I hope to illustrate how a mixed-method approach can broaden our understanding by offering differing lenses, based on differing epistemologies. In so doing, a mixed method approach intrinsically can accommodate an enlarged range of epistemological criteria, so that a larger number of types of validity also become more available (L. Cohen, Manion, & Morrison, 2007, see p.105). This necessitates asking what sort of validity is required for the different stages within the mixed method research, with a recognition of the underlying questions that ultimately need to revolve around the focus or construct of interest (Dellinger & Leech, 2007).

Because the long tradition that granted the importance of validity has dominated quantitative research, the last section focused on some of the expectations of the various means and standards by which this can be achieved by qualitative research. The opportunity for a mixed methods research however suggests an alternative to one that defensively sticks to one particular method, in what has been called *methodolatry* (Bakan, 1967; Danziger, 1990; Janesick, 2000), by which a research potential may inadvertently be

sabotaged. From a mixed method perspective, a process is enabled that allows for how the story evolves, rather than being determined and therefore disrupted by the choice of methodology.

Mixed method approaches however are not achieved by simple eclecticism, though some early advocates might seem to have suggested this to be a superior option to a mono-method research (R. B. Johnson & Onwuegbuzie, 2004). Clearly, in the absence of carefully evaluating how each method complements the other, indiscriminant combinations can and will fail to bring about a ‘wholeness’ sought from different perspectives (Creswell & Plano Clark, 2011). If there really is to be a valuable integration of research findings from various approaches, choosing a diversity of methods for its own sake seems counter-productive, producing unlikely combinations that may be as unpalatable as chalk with cheese. Uncritical eclectic combinations are made even more problematic when differences in apparent philosophical and epistemological frames have not been carefully enunciated in a way that allows *potential* incompatibilities to at least be considered. It is understandable that it is now recommended that care should be made to select the methods that can best coalesce to find a convergence of knowledge, and thereby provide insights that at least encourage a dialectical pragmatism, that had been advocated in the 1970s and 80s (Mitroff & Mason, 1981).

Bringing this discussion into the 21st century psychological context, concern for how and why a mix of methods is selected may best be understood by thinking about it as a process, similar to what is necessary when looking at ways that might enable culturally different people to live harmoniously together. Sharing of what things are important to each group of people is needed first, including the underscoring of those differences that may be non-negotiable. Yet there is also a need to find those human values that creatively can encourage the living together, that make for better supports and benefits that far outweigh the disadvantages. Such harmony can only be possible if people are prepared to discuss these differences openly, with an attitude of acceptance and trust that is mutually respectful, not defensively dismissive. Similarly, we can find many mixed methods researchers who have already found relief in the diversity of research methods employed (R. B. Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2012), and these serve to confirm the beneficial freedom expressed by others in dismissing much of the oft choking dichotomous attitude of the either - or of the qualitative - quantitative only debate (Plowright, 2011; Powell et al., 2008).

Not only is it the *validatory process* that is enlarged with what Teddlie and Tashakkori (2012) termed Mixed Method Research (and will hereon in this section be referred to as MMR, though without implying a strict methodological structure advocated by some and not by others (Sandelowski et al., 2012; Small, 2011; Teddlie & Tashakkori, 2012)). Confounding problems that would *diminish* the value of a research project can also be minimized, if not eliminated by MMR. For example, Pek and MacCallum (2011) recognized that the issue around outliers as potential cases of influence in quantitative research that really warranted attention, and so devised some very complex statistical means by which these cases, otherwise excluded, might be incorporated into the interpreted meaning of the data. Thus by using MMR, such erstwhile doubtful cases may not only be included, but may actually contribute important understandings to the whole picture under review (Klassen et al., 2012).

MMR also allows for examining contextual issues, with a systemic framework that can elicit meaningful relationships between constructs within specific contexts or situations (Tashakkori, Brown, & Borghese, 2010). So for example, Plowright refers to *warrantable* research (2011, p. 138), suggesting that a researcher using a “process in a *skeptical frame of mind*...provides the best available evidence to support the research claims and arriving logically at valid and true conclusions.” Such an approach reiterates a need for justification associated with the research methodology, it being intricately considered an important part of the validating process in mixed methods approaches.

The concept of validity in relation to MMR includes many different considerations. As maintained by Teddlie and Tashakkori (2012), for example, validation is a term that is inclusive of all types of information, differences in analytical processes, as well as with theoretical considerations that suggest “a paradigm pluralism”, rather than one that traditionally conceptualized research validations as linked to a particular methodology. Although many of these perspectives are also reflected in what quantitative research epistemologically engages with, they broaden the whole metaphorical sea of possibilities within MMR in explaining or justifying findings: such terms as consensual validity, referential adequacy, ironic validity, dependability, with many similar terms used by qualitative research found equally important within mixed methodologies (Creswell, 2013, pp. 244-245). Such validities allow a clear justification of the argument being presented by the researcher, with terms chosen that appropriately provide support.

We are confronted here with some of the benefits that accrue from stepping outside a methodological paradigm, but then, we need to ask: Is this really a third and separate paradigm? Or is this more like now having greater freedom of methodological choice? Perhaps this reflects what has been suggested by the imagery of looking through a crystal, gaining its various *prismatic* perspectives (Mertens, 2009; Richardson & St. Pierre, 2005), rather than by two-dimensional, or even triangular perspectives. Such perspectives incorporates the refreshing idea of opening of our windows, or taking us out of the constraining and often windowless silos that can prevent us from seeing things about *reality* that others may already have seen. The validating process is thus enlarged, broadened, and potentially strengthened by alternative views, similar to the benefit of stronger lenses offered to the visually impaired. The notion of a third paradigm posited by Teddlie and Tashakkori (2012) may simply be one option, certainly better placed to deal with the continual demand of personality psychology that historically has expressed a need for diverse approaches, though always with some creative tension. That tension was obvious in Teddlie and Tashakkori’s (2003) overview, having found that many in research believed that “compatibility between quantitative and qualitative methods is impossible due to incompatibility of paradigms that underlie the methods” (pp. 14-15). This sense of unease has also been evidenced in concern for understanding the individual (idiographic) alongside interest in (nomothetic) people comparisons (Cloninger, 2009). But within MMR a modern research solution bridges “the schism between quantitative and qualitative” (R. B. Johnson & Onwuegbuzie, 2004, p. 15), approaches that allow both to be researched together.

Frustration with trying to meet the specific validities observed by researchers, some quantitative researchers (Onwuegbuzie & Johnson, 2006) have encouraged others to adopt different terms and

requirements, such as legitimization instead of validation. Later, as similarly regarded about validation, legitimization is conceptualized as a *process* (Onwuegbuzie, Johnson, & Collins, 2011), but more importantly, this term reflects a view that a new bilingual nomenclature is warranted, to be found acceptable to both quantitative and qualitative researchers (Teddlie & Tashakkori, 2009). Ultimately such terms suggest an ongoing concern that MMR, regardless of how that mix is combined, be released from links with either approach, and free to “develop a vocabulary of distinct mixed methods terms...” (Creswell & Plano Clark, 2011, p. 278), which suggests that a more accepted practice of a specific mixed methods nomenclature may help to identify and clarify the research orientation.

A slightly different perspective is given by Craik (2007) who, in summarizing developments in personality psychology, refers to a need for an *integrative methodological pluralism*, to ensure imbalance or ill-founded claims of validity are corrected for. In this context, he suggests it is important to differentiate the validity of any potentially conflicting evidence from divergent perspectives, so that in the end, such apparent contradictions can be dealt with by “meticulous investigation, theoretical rigor, and rational argumentation” (Harrits, 2011, p. 161). In this way, the either-or dichotomy is replaced with methodological *eclecticism* (R. B. Johnson & Onwuegbuzie, 2004), though not a random eclecticism: what mix is chosen needs to be carefully assessed to complement the research demands.

The questions are many that consider the practical issues of how to achieve the integration of such different research methods, and those mentioned here are but a sample that relate specifically to validity concerns relevant to this particular research focus. Triangulation for example in this context takes on a specific meaning, enabling perspectives that some would say corroborate the evidence, making for an important illustrative effect that might be seen as convergent validity (Fielding, 2012). This particular validity perhaps reflects an early challenge in the process of test validation, which aimed to find links between inferences made with any “convergent evidence supporting them and to discriminate evidence discounting plausible rival inferences” (Messick, 1995b, p. 747). In this way, triangulation is concerned with to what extent findings can be said to agree or diverge from each other.

An emerging understanding of triangulation (Denzin, 2012) suggests research should be concerned with bringing about change, regardless of the methodology. It demands an interpretative perspective, where the “researcher-as-bricoleur-theorist works between and within competing and overlapping perspectives and paradigms” (Denzin, 2012, p. 85). In Denzin’s understanding, which originally had considered multiple views within qualitative research only, triangulation now should reflect a quality of knowledge seeking that is unconstrained by methodological expectations, and confined only by its intent to make findings meaningful to a needy audience.

This more structurally constrained understanding of triangulation concerns what may be achieved by a methodological mix, whether there is a clear rationale for it, and where this confirmatory triangulation is obviated in the way findings are presented. In this way the purposeful combination and integration of research findings is carefully considered, that in the end might enable various good effects, not just with a

well-validated measure, but with additional validation, either by what others have confirmed, or by providing important broader knowledge that can benefit social justice concerns (Denzin, 2012). Ultimately, some would suggest this reflects the extent to which triangulation means integration and interpretation of data (Fielding, 2012), or alternatively is more about corroboration (Creswell, 2013): in the current research, triangulation may well involve both meanings, with a cross-over validation normally considered within quantitative research.

Another dimension somewhat neglected or often thought of as irrelevant for qualitative research is now being included: how the numbers may be important in the integration of findings (Mertens & Hesse-Biber, 2012). Using a mixed method approach not only provides different perspectives, as in the constructivist versus interpretivist traditions (B. J. Wiggins, 2011), but also moves from a previous approach that would have remained descriptive into one that also brings corroborative evidence to the analytical process, in a crossover of data. This opportunity brings out the potential for a validity that in quantitative terms might include generalizability, where findings from one instance might be applied to others. In qualitative terms, such ‘validity’ is often referred to as *transferability*, when the researcher asks whether things learnt in one instance may have insights for another (Creswell, Klassen, Plano Clark, & Smith, 2011). In mixed methods, a pragmatic approach is not so concerned about the technical difference between these two approaches, but rather would ask “how much of our existing knowledge might be usable in a new set of circumstances, as well as what our warrant is for making any such claims” (Morgan, 2007, p. 72). Answering such questions in turn enables an integration of the findings, with dialogue between approaches that offers an alternative validation (Teddlie & Tashakkori, 2012), a possibility yet to be commonly discerned in the construction of a new measure. Being careful in the interpretive validatory process needs to ensure that we do not make the mistake of which Cloninger warns us: that “we cannot assume that what is found in one individual [or case] will also apply to others” (Cloninger, 2009, pp. 10-11).

With the proliferation of personality-based measures over the last twenty years, a growing use of different methods has suggested that validity can best be achieved with an emerging integrative methodology. How this applies to the construction of a new measure now needs our attention.

Validity implications in developing the WOT scale

So far, this chapter has focused on reviewing what a balanced validation process can include, and how this is conceptualized within various methodological approaches. Questions regarding some of the acknowledged limitations of a self-report measure were considered within the quantitative validity section, and were later reconsidered within a qualitative perspective, including such factors as potential lack of participant self-knowledge and response biases. These concerns acknowledge the inherent weaknesses in a self-report measure, though there is indisputable agreement in the literature that it clearly “opens a pipeline to prodigious amounts of unique information about the target” construct (Paulhus & Vazire, 2007). It remains for test-retest opportunities to consider a measure’s predictive validity, an essential aspect of the quantitative

approach, to enable an accumulation of data that would demonstrate its credibility as a measure, in this case, of differences in ways of thinking.

The understanding made above of mixed method validity now needs to be tied to the research intent, which for this project involves the construction of a new measure. How this was done is presented within Chapter 4, which reports the quantitative phase of the research. But several comments need to be clarified here, to provide an important reflection of how validation is applied in relation to scale construction.

Apart from the validities observed and reported on early in this chapter regarding the SWOT model, similar quantitative validities were considered in the construction of the WOT measure itself, also referred to more specifically in Chapter 4. But consideration of how a mixed method validity applies to test construction cannot be completed until the qualitative participant-researcher interchanges are presented and analyzed in Chapters 5 and 6, to be thereafter followed by the quantitative data analysis from the actual WOT questionnaire, found in Chapter 7. Only then will the mixed methodology become more apparent, and thus be able to provide the basis for arguing the relevance of the associated validities. But it may be important here to flag that it was in applying many of the alternate validities mentioned in this chapter that has enabled me not only to *construct* a valid measure, but has also provided the means by which meaningful interpretations of all types of data have been possible. A dynamic process of validation will finally be reported, using a mixed methodology not to date commonly used in the development of a scale of individual differences. When conceptualized as a measure of differences in ways of thinking, a case is made that this methodology is appropriate and advantageous in the context of individual differences psychology.

Conclusion

In this chapter I have made a case for the importance of the integration of data obtained from different methodologies, to form a corroborative body of knowledge that offers potential validity to research. A commitment to a mixed methodology was considered basic to the research project which demands both its justification and its usefulness (Mertens, 2015), and becomes an important consideration within the validation process for the developing WOT measure. I have considered how validation in general is realized, how it applied to the original model, and how validation becomes an important component in the search to find meaningful and interpretable findings of a mixed methods research.

In considering the process of validation from different perspectives in what is often considered a paradigm shift, it has been argued here that such “contributions can be made from various perspectives, and the potential resides in combinations of them” (Schoenfeld, 1985, p. 402). This broader mixed-methods view of validation has also contributed support to a view that justifies dismissing the either-or earlier stance previously held towards qualitative or quantitative only methods, and encourages a research methodology that will provide information gleaned not only idiographically, but through a careful analysis of all data that suggests a potential predictive value nomothetically. From my recent perspective as a developing researcher,

and from my longer perspective as a practitioner, this validators process offers an important contribution to the development of a reliable, trustworthy and valid measure that holds promise for its usefulness to individuals as well as to educational and group settings. How the measure was constructed is reported in the next chapter.

Chapter 4 - Quantitative Methodology – Construction of a new measure - Phase 1:

A heuristic measure

The previous chapter considered the important nature of validation within the context of qualitative, quantitative and mixed methods approaches, with particular interest as to how this process applies to the construction of a new measure. Included in the validation process, person-oriented versus variable-oriented approaches were differentiated, and seen to be more possible within a mixed methodology.

As has already been mentioned, the research intention, to create a new measure of individual ways of thinking, involves a focus on a trait-like understanding of a concept that heuristically might be measured, though difficult to ascertain. Heuristic research has long been associated with discovery, grappling with meaningful understanding of human experiences, and trying to develop ways of investigating a phenomenon that might provide answers of both personal and social significance (Moustakas, 1994). Within a traditionally quantitative context, however, Allport had early recognized that there is a need to scientifically discover such trait *tendencies* which he affirmed are never directly observable (Allport, 1966). Subsequent researchers have explored various means by which statistical analyses help to test what Allport had identified as *heuristic realism*, to achieve an acceptable standard that suggests how well the study has been conceived, and findings meaningfully interpreted (Asendorpf, 2009; Deary, 2009).

Psychological heuristics have often depended on core human abilities for making inferences, and these have often resulted in acceptable basic statistical rules of thumb being used to determine ‘adequate’ as opposed to ‘optimal’ levels of significance of the inferences made (Hodgkinson & Clarke, 2007; Katsikopoulos, 2011). Such heuristics that are accepted as existing but difficult to apprehend have used various means as simple devices that help us better understand individual trait differences, without implying these are “real and thus causative influences on the way we live and act” (Roodenburg et al., 2012 p. 211).

While acknowledging the need to comprehend individual tendencies at the unique level, we accept that there is a need to consider the relevant theory in relation to the individual difference trait in focus, here identified heuristically as ways of thinking, so that this theoretical foundation forms an important part of the quantitative validation process in “finding an improved view of the person” (Allport, 1966, p. 8).

So, before considering the very real human lived experiences and individual perspectives on the heuristic in focus, this chapter reports on the quantitative procedures carried out to generate a new measure, the construction of an adult *ways of thinking* (AWOT) questionnaire. The foundational model that formed the basis of the questionnaire grew out of cognitive styles and research based in a quantitative approach, and importantly was considered in relation to personality rather than abilities. The early part of this chapter then briefly looks at the rationale for and method chosen to demonstrate how a psycholexically driven research was applied in the development of the original model of student ways of thinking (SWOT). This is followed

by reporting the specifics of the method used for the subsequent construction of the AWOT measure; this in turn serves to further validate the underlying model.

The context of the new measure: personality-based

Personalogical research can be understood in part at least as an endeavour to find within the context of personality psychology the various terms that might identify particular individual traits, or what some regard as stable states (Cacioppo et al., 1996). A *lexicon* of commonly used words to describe other peoples' behaviour was early acknowledged as an excellent basis for discovering any structure in personality, with the subsequent application of one or other form of exploratory factor analysis used to identify a set of underlying factors. One very early dictionary approach was used by Allport and Odber (1936), who collected thousands of words that distinguished various human behavioural differences, and is considered to have spawned an ongoing plethora of lexical studies in trait type research. The underlying assumption, that significant traits that are evident as individual differences become encoded in common language, has become well accepted since then (Goldberg, 1981).

In support of the psycholexical focus used in this research, De Raad (De Raad & Barelds, 2008) and earlier with others (1998; Goldberg, 1990; John, 1990) also determined the stability and the interrelationships of certain traits, using similarly generated representative adjectival lists to investigate the structure of personality, extending the various methods of data collection and analyses, and often considered temperament as well as personality (De Raad, 2000; De Raad et al., 1998). Among those that have become well-developed and well accepted are (i) a number of five factor models, including the Big Five Personality Inventory (BFPI) (A. A. J. Hendriks, 1997), and Costa and McCrae's NEO Personality Inventory (1985); (ii) 3 factor models such as Guilford's model (1981) or Eysenck's Personality Inventory (H. Eysenck & Eysenck, 1975); (iii) Cattell's 16PF, as a 4 factor model (H. B. Cattell, 1989). Though research questions continue, for example in the five factor schemas concerning the fifth factor and how this is distinct from ability, and though some have even questioned what traits are *really* traits (Deary, 2009), it now seems there is some consensus on the so-called Big Five factors: Extraversion; Agreeableness; Emotional stability or Neuroticism; Conscientiousness; Openness (to learning) or Education.

Importance of the framework of past measures

The framework provided by the psycholexically derived Big Five personality factors has subsequently contributed much, not only to the study of personality, but has "also led to renewed interest in *performance-related* personality traits" (De Raad & Schouwenburg, 1996, p. 305), with important implications of those identified as such for education and learning (Goldberg, 1990).

Personality modelling was considered as offering an excellent basis of modelling differences in ways of thinking (SWOT), the personality type orientation that considers *preferences* rather than *capabilities* as suggested by ability orientations. It is important to review this model here, particularly in regard to the

model's development, explicating the rationale for both the construct and the factors in the forthcoming instrument.

Moreover, considering the credentials of the lexical hypothesis gained through its pivotal role in research as an accepted fundamental in personality trait theory, it was deemed an appropriate basis for the development of a personality type conceptualization of ways of thinking as a preference measure, that had similarly formed the SWOT model. By carefully setting parameters to capture thinking adjectives per-se, it allowed for a focus on the particular trait of *thinking*, rather than being yet another more general measure of personality.

Development of the SWOT model

The initial work by Roodenburg (2003) in establishing the original SWOT model prior to this research is only briefly summarized here. This work involved capturing a comprehensive lexicon of personality type descriptors. These formed the basic taxonomy that could then be subjected to exploratory factor analysis and explored in other ways that have become well established in personality, including cluster analysis and various representations through *circumplex* modeling. As with personality, this stepped methodology sought to establish an optimal number of facets within a hierarchical factor model.

As found in the lexical work of others (Costa & McCrae, 2009; De Raad & Perugini, 2002), the comprehensive lexicon in Roodenburg's study initially provided a large number of adjectives. The initial list of 5203 adjectives, (reduced to 1092 when duplicates were removed), was generated by asking 690 participating teachers to describe the various ways of thinking of different students each. Teachers from across different disciplines were asked to think about 3 – 5 different students they knew well, and taking one specific student at a time, to list as many words as possible that might describe that student's way of thinking, considered within a stem sentence: "X is a ... thinker" or "X thinks ...ly". The accumulated data was then consolidated, with two psychologists evaluating the adjectives to make up an appropriate agglomeration of similar adjectives. For example, synonyms became represented by key words, and *value-laden* words deemed *not* to be descriptive of cognitions or ways of thinking (such as loyal and righteous) were culled. Imperfect antonyms such as quick and slow were maintained separately; several near-perfect antonyms were also kept to allow other similar synonyms to be included. The process resulted in a list of 99 adjectives deemed to be sufficiently representative. Careful semantic evaluations using a thesaurus and dictionary sought to minimize a risk of both overrepresentation or bloated specificity (R. B. Cattell, 1978), and a lack of representation or under-representation (Messick, 1995a).

The 99 adjectives were checked in focus groups by a large number of teachers ($N= 596$), again representing different subject areas and interests. These experts as capable and experienced teachers were able to validate a clear acceptance of the appropriateness of the adjectives selected as more than adequately describing the broad spectrum of students' ways of thinking. This review process was conducted in an effort to ensure that experts in the field "evaluate both relevance and representativeness of the items" (Simms & Watson, 2010, p. 247).

Finally, the list of 99 words were formed into a rating scale and teachers ($N=572$) asked to rate two students they knew well and perceived as thinking quite differently against these adjectives. The 1144 responses were then split into two data sets, a calibration set and a replication set. Both acquiescence and social desirability were identified and the data sets adjusted accordingly yielding residualised data sets. The calibration data were subjected to various exploratory factoring techniques led by *varimax* rotated orthogonal and oblique principal component solutions.

The factors that emerged from the exploratory process were further refined using Jöreskog's recommendations of the application of structural equation modelling (Jöreskog, 1993) in a two-step model building process. This involved refining each factor one by one, within the context of single-factor congeneric models to maximize convergent validity, and then pairwise two by two, to maximize discriminant validity. The process was applied in building the SWOT model until adequate fit was achieved for the entire model, with satisfactory replication achieved with the replication data.

The resulting final structural model of 21 facets within six style factors was further modeled on data where social desirability had not been removed, yielding a nested factor model. (See Figure 4.1 below). The final factors identified in the ways of thinking model were: Intuitive, Creative, Subjective, Controlled, Narrow and Sensate (Roodenburg, 2006). The 21 facets are indicated as measured variables, all being related to the nested Social Desirability factor. This final model achieved excellent fit: $N = 572$, $df=163$, $CFI = 0.974$, $AGFI = 0.924$, $SRMR = 0.031$. and $RMSEA = 0.043$.

Subsequently the model was further considered as an abridged circumplex representation, as well as by cluster analysis, giving insight into the relationships between the 21 adjectives that now confirmed these facets as a reasonably balanced set of adjectival items, as descriptors of the variations in the ways people think (2006). The abridged circumplex model was compared to Holland's Occupational Interests RIASEC (Roodenburg & Roodenburg, 2009) so that the parallels between the models (see Figure 4.2) reflect appropriate convergence in support of the six higher order structure factors as offering cognitive explanations for occupational preferences.

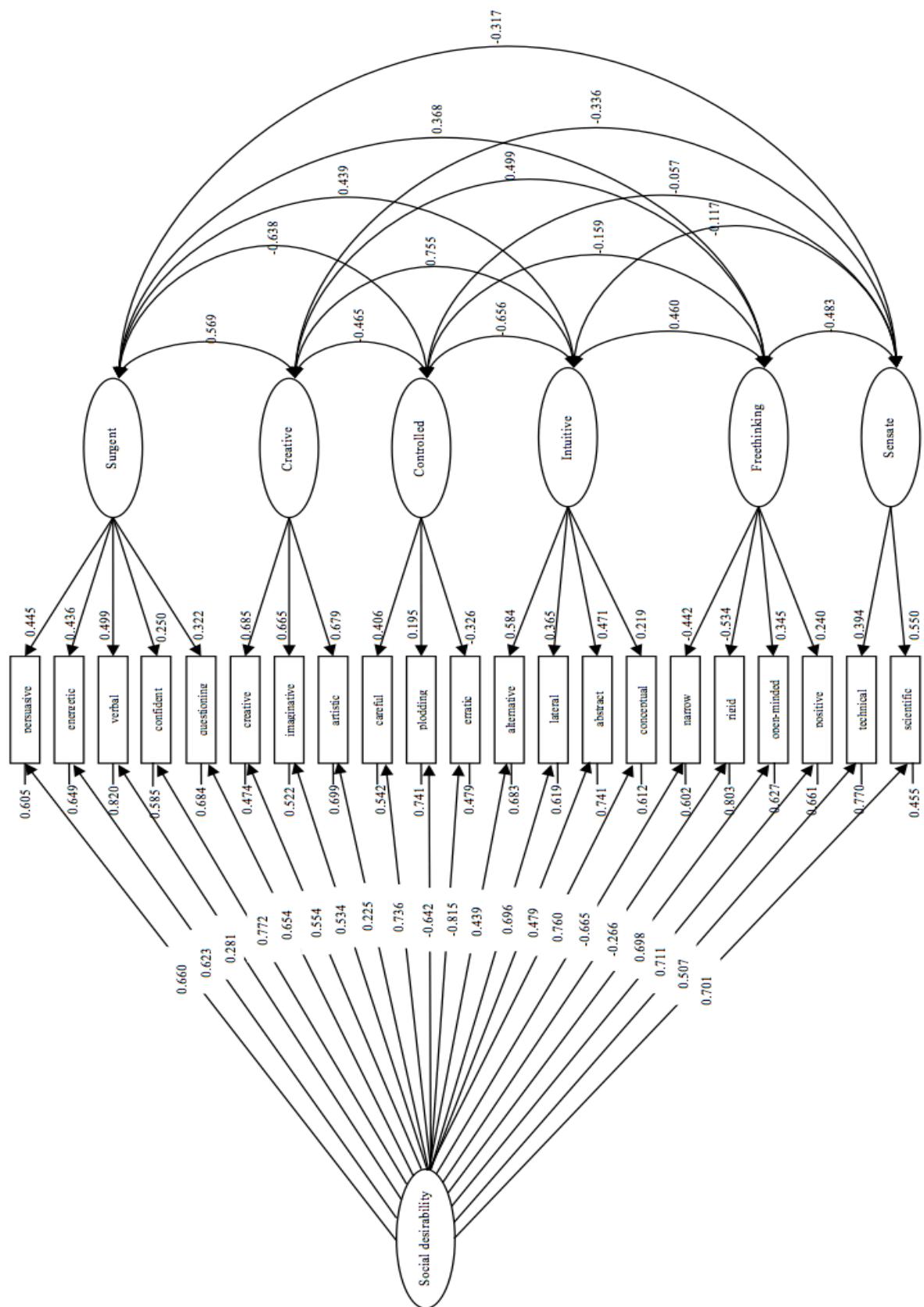


Figure 4.1. Final Nested Factor Model (SWOT) – Roodenburg (2006, p.197)

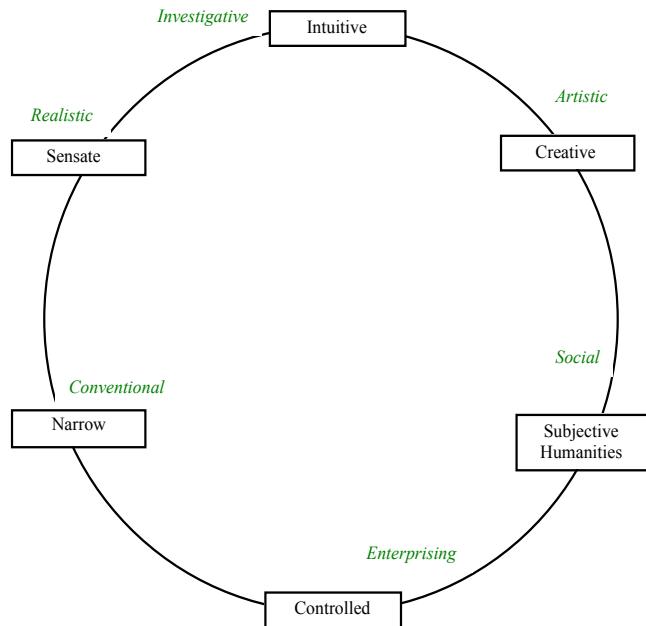


Figure 4.2. Holland's RIASEC model of occupational interests with Roodenburg's (2006) student ways of thinking facets superimposed in green (See more in Roodenburg, 2009)

However, though this psycholexically developed circumplex model (SWOT) was considered acceptable and understandable within the more *connotative* arena of personality, Roodenburg had indicated (2006 Ch.9) that a more *denotative* behavioural questionnaire was needed for this model to gain credible validity and usefulness in the field of personality. Hence the initial motivation for my research program which started out as simply seeing the need to construct an instrument for the model. The initial research intent was to instrumentalize the model employing Classical Test Theory. To properly operationalize such a connotative model, Classical Test Theory requires at least three denotative questions for each facet. How this could be achieved becomes the procedural focus of this next section.

Procedures adopted for the new measure: ways of thinking (WOT)

Having decided to instrumentalize and validate the SWOT model, as already acknowledged, such operationalization should involve a commitment to the original, clearly identified target SWOT constructs, with such clarity being an essential aspect of constructing a reliable and well-grounded valid measure (Clark & Watson, 1995). However, an essential question concerns the veracity of the founding model: exactly how psychometrically sound and well defined were the constructs in the original SWOT modelling? The creation of a questionnaire in this manner is actually reverse engineering as it were, with the work of constructing items, factors requiring that associated content validities need to be well established (DeVellis, 2003; Worthington & Whittaker, 2006).

The requisite veracity of this work stands on an assessment that the SWOT modelling work carried out by Roodenburg (2006) had been extensive, the quality of the model evidenced by the model replicating well, and subsequently was shown to be appropriately convergent with measures such as Holland's Occupational Interests (Roodenburg & Roodenburg, 2009). The instrumentalization could thus progress with sufficient confidence, committed to the SWOT model factors and using the same adjectival items, to provide the requisite and clearly articulated *nomenological net* (Cronbach & Meehl, 1955) of the facets mapping

differences in ways of thinking. Importantly though, instrumentalization should allow for a confirmatory review of the original model where the need becomes evident. Thus some adjustments such as item modification or even culling would be allowed for during data analysis and refining the emerging instrument before the final version could be considered complete.

Item pool generation

While adjectives alone were used in the original development of the SWOT model, sentence type questionnaire format is considered preferable to the adjective only type in a user-friendly instrument available for more general use (Goldberg, 1999; Kashiwagi, 2002). Adjectives alone can seem quite abstract, isolated from behavioural meaning, and lacking an acknowledged context (Widiger & Trull, 1997). (See Appendix 1 for complete list of adjectives, with behavioural meanings). The problem of using adjectives rather than sentences has been particularly noted in the broader area of personality measurement, an area that typically seeks to measure similar latent variables, and where using heuristic terms typically requires reasonable inferences be made (Revelle, 2007).

Clarity of meaning for any items was naturally considered to be very important, with an additional cognizance of the necessity to identify the context of each item (Clark & Watson, 1995). In order to form a questionnaire, the 21 adjectives denoting the facets were regarded as the basis for generating items. In a good questionnaire, such facets each typically need around three items to form a reasonable basis for ascertaining the single *factor* (DeVellis, 2012). In order to gain enough items from which to select three of the best, each of the adjectives needed to be translated into at least six active statements. Items are best and most easily understood when maximally denotative: as behavioural statements they offer greater clarity (Pedhazur & Schmelkin, 1991b). So for example the adjective words *creative*, *abstract* and *technical* needed to become adjectival phrases, each attached to a nominated ‘person’ as advocated by De Raad (2000), and is presented as a function of thinking: Person A is a *creative thinker*; Person B prefers to *think abstractly*; Person C enjoys thinking *technically*.

A number of contextually different stem sentences were also generated. These were used to assist in making each item more clearly understood as a measurable and behavioural personal *preference*, and later to form a framework for grouping the items in the final questionnaire. Examples of the variety in these stem sentences that enabled contextual meaning are: How much do you think...(*poetically, open-mindedly, rigidly*)? or Do you like ...(*being adaptable, thinking imaginative thoughts, thinking in pictures, theorizing*)?, while another item group was presented as a statement: You find yourself...(*thinking outside the square, able to convince others, appreciating mystical discussions*). In this way the six overarching behavioural or contextual phrases that were carefully generated by myself and another psychologist served to maintain both clarity and readability, and to identify the essential adjectival meaning that needed to be understood.

In formulating questions for each of the 21 adjectives, the actual adjectives themselves were not always presented in each item, though the essential *meaning* of each was retained, in a process of reverse

engineering, making use some of the word synonyms that had been previously agglomerated into the final list of 99 adjectives of the original model.

The items were then randomly used with one of the stem sentences, mainly to facilitate the maintenance of interest for those completing a relatively long survey of some 120 items. For example, an item about *creative* thinking, using the stem sentence “How often do you...” was presented with: “*come up with unconventional options?*”; the same adjectival associative *meaning* with another stem sentence “do you like...” was presented with “*doing things differently from the norm?*” Using differing stem sentences also allowed the constructed scale to gain different insights and more personal understanding of each of the adjectives thought to describe an individual’s way of thinking.

Although it was tempting to make a brief questionnaire, researchers concerned with psychometric reliability have advisedly been encouraged to err on the side of being too long rather than too short (Tracey, 2010). The decision to thus extend the questionnaire into sentences was also made on the recommendations of Paulhus and Vazire (2007), who maintained the benefits of improved reliability for test construction that used multi-items, with increased likelihood of both clarity and contextual simplicity. In addition, multi-itemed surveys can provide a more fine-grained insight into a broad spectrum of differences, while at the same time be better able to identify what certain item sets may have in common (Fowler, 2009).

While developing the questionnaire, application for ethical approval of the study was made, to which we briefly give attention.

Ethical considerations

Ethics approval was granted for the project by Monash University, (**CF09/1118: 2009000576 Differences in ways of thinking**), considered a low-risk project involving adult humans (18+) since questions asked were clearly not deemed to be psychologically disturbing (see Appendix 2). Project management ensured the appropriate protection of personal privacy, both with the gathering and storing of anonymous data, during and after the project.

When completed, the survey was finally made available with SurveyMonkey, an on-line survey cloud based facility. The explanatory statement clearly gave participants the rationale of the research, detailing who was responsible for it, who was overseeing the project, as well as indicating the commitment to privacy protection. It also clearly gave permission for respondents to opt out of the questionnaire at any time, and provided details of who to contact if any issues were thought to be of concern or problematic.

The Ethics approval was subsequently amended, to allow a selected number of individuals to be interviewed in the qualitative phase, with attendant appropriately adjusted explanatory statements and consent forms (Appendix 3 and Appendix 4): details of these will be further clarified within the qualitative phase reported in Chapter 6.

Format of the Measure

The SurveyMonkey program used to present the questionnaire allowed the order of the questions/statements in the questionnaire to be randomly mixed, so as not to encourage any pattern of answering; this allowed for reducing the potential prediction of patterns in the data, to assist in minimizing some of the self-report problems associated with both social desirability and acquiescence (Paulhus & Vazire, 2007). Similarly, presenting a balanced set of items naturally needed to include some opposites, without presenting these as strict denials, so that, for example, quick and slow thinkers were both included and in different ways, to assist in the initial scale construction at least, thus limiting a potential effect produced by either compliant or ingratiating subjects (Hofstee et al., 1998).

The online survey was produced in three formats: the first one was to be answered as a self-report of adult ways of thinking: AWOT-SR, and this one is the focus of this research. The target construct was clearly articulated on each page. In this format, participants were asked to respond “as you think an astute friend would answer about you”. This practice was encouraged in an attempt to improve subjective responses often deemed unreliable (G. Boyle & Helmes, 2009), potentially encouraging greater honesty, perhaps in line with a wish made by the poet Robert Burns that individuals might *see ourselves as others see us*. This preface to the self-report was chosen in preference to that suggested by Costa and McCrae’s self-report form R (1992), which used a third person response format: *he/she* is a ... rather than saying *I am a ...thinker*; Costa and McCrae’s choice, as an unusual attempt to make of a self-report an *observer rater*, seemed to be rather a large leap for people to make, especially in a written format of self-analysis.

A second format of the survey was also presented on line, as an option that could gain responses from one adult about a well known other adult, the AWOT-OR, with slight changes obviously needed for the page-by-page instructions. It also required amended stem sentences, so that for example *How often do you ...* became *How often do you think this person...*, with only minimal but necessary adjustments made to main items.

A third version was made for adults asked to report on the way they thought a child they knew well would think – the CWOT. Again, this format required minimal modification to the instructions, with small changes to actual sentences, while maintaining the essential meaning of the items. The three versions were created to allow for a *future* comparison and further validation of the model factors under scrutiny, and for a more complete endorsement of the scale items themselves.

The WOT questionnaires sought such demographics as would provide details potentially helpful in later analyses such as age, gender, occupation, and highest educational qualifications, post code, and date completed. The items were then arranged in simple format of one page per stem sentence, with a tick the box option of what best represented the person of interest, considered on a 7-point Likert scale: *not at all – rarely – occasionally - 50% - often – nearly always – always*. The same format was then used for a short version of a Big Five Personality Inventory, so that as a well-known and established measure, the results might later be used in the validation process of the new measure. This additional survey was optional and importantly was

presented *after* the items of the new WOT instrument, so as not to contaminate responses, particularly in the initial stage of the development of a new scale (Worthington & Whittaker, 2006). For the WOT survey itself, each item on each page had to be completed before the respondent could continue to the next page.

SurveyMonkey is well suited to recruiting via what is known as snow-balling - the research was succinctly described along with indicating a choice to be anonymous to a group of friends and associates, themselves being from various walks of life and a broad range of ages, approached via various means, and also asked to encourage others to fill in the survey. Some contacts were alerted to the survey by personal email sent out individually and via social media seeking help with further research. There were no incentives offered, apart from a statement that if an individual was interested, he or she could reveal their names via a separate email, requesting further information of any important conclusions found by the research about individual differences in ways of thinking. An optional choice was thus provided at the commencement of the questionnaire for such participants to include their names as linked with their responses.

Discussion

In hindsight, the questionnaire form could have been made available to a small initial pilot group to check for any potential semantic difficulties, ambiguities and comfortable face validity. A practice recommended by more experienced scale developers, this may have minimized such difficulties and need for later item-weeding (DeVellis, 2012). However, given the factors and adjectival facets were already the accepted structure, the item generation was not considered to be complex, so that the omission of a pilot survey was not considered to pose any serious threat to its validity. Only one item appeared to create some problems of face validity, and that was one that was concerned with thinking *heuristically*, and clearly an obvious semantic problem for many.

Once the three forms of the constructed survey were on-line, there was an opportunity for me as the researcher to put aside the theoretical constraints of the research, to turn my attention to the qualitative aspect of individual interviews to take precedence: in reading, planning and making decisions about an appropriate sample that would be used to look at the same construct or focus of interest, individual ways of thinking. Some early responses to the WOT were consulted only to simply to ascertain what individuals had indicated an interest in follow-up conversations, and therefore might provide interesting participants in the interview process. Thus the phase 2 qualitative component of the project began, before the quantitative data gathering was completed and intentionally prior to any data analysis.

The option of a more complex iterative process of going backwards and forwards between the two methodologies was not thought to be a preferred mixed method procedure so was not pursued, at least in the initial phases. There are many valid and worthwhile design options, and these were thoroughly investigated before making a decision (Creswell & Plano Clark, 2011). Rather than following a prescribed mixed method design, however, it seemed appropriate to adapt Creswell's *dynamic* approach, one that fitted my pragmatic philosophical stance that sought to give both qualitative and quantitative strands equal emphasis and value. But I found what had also been suggested by more experienced researchers (Teddlie & Tashakkori, 2009;

Wittink, Barg, & Gallo, 2006), that the integration of data from each approach poses a serious challenge, making the design one that sometimes suggests a convergent/parallel design is best, especially when separate data collection is occurring concurrently. At other times, however, the need for sequencing became apparent, particularly relevant to the analytical phases of the separate data. The main reason for leaving the analysis of the quantitative data was to enable a greater freedom within an idiographic approach, so as to avoid too much concern for the theoretical constraints that might spoil or contaminate the more personal qualitative data. This meant that after the initial construction of the WOT questionnaire, the research moved on to the case studies.

In conclusion

The operationalization of the student ways of thinking model (SWOT) (Roodenburg, 2003) formed the initial focus of this research, being concerned that its construction clearly reflected the theoretical framework, the same factor structure, and even maintained the adjectival facet items of the undergirding model. These adjectives were then extended into phrases, in order to facilitate greater meaning and context for the respondents, using a number of stem sentences with all adjectives, as has been recommended by earlier research. It remained for the later analysis of this quantitative data to be able to discern how well the SWOT model had been instrumentalized, and to what extent the questionnaire covered the broad construct of ways of thinking, particularly within an *adult* context.

In following the chronological progression of this research, the next part of the thesis moves on to the qualitative methodology, Chapter 5, to be followed immediately by a presentation of a comprehensive qualitative analyses and findings of the interviews with participants in Chapter 6. The reader therefore will need to wait for the analysis of the questionnaire data, as phase 4 until Chapter 7 - unless a choice is made to skip the next two chapters, though these now sequentially demand my full attention.

Chapter 5 - Qualitative Methodology

Exploring individual ways of thinking – Phase 2

Chapter overview

While early quantitative responses were being gathered by the adult ways of thinking (AWOT) survey-on-line, attention was turned to commencing the qualitative work of phase 2 of this project. This chapter reports the first part only of the methodological process of that phase, thus providing a linkage with the qualitative findings of Chapter 6. It is also considered to be an important point at which to review any *apparent* status implied about the different methodologies based simply on the order of their presentation. This discussion is then followed by a summary of the actual qualitative methods chosen for the development of a new personality-related measure of ways of thinking. Consideration of what participants were chosen, with a brief personal viewpoint provided that justifies why these and not others were selected, is followed by specific ethical considerations that were considered relevant in relation to this particular methodology.

Thereafter, the remainder of the chapter presents the specific *procedures* for the idiographic focus of the research: first with regard to individual case studies, and thereafter a thematic focus is appraised within a phenomenological framework.

A reminder of the methodological paradigm

My professional life has always involved a healthy fascination with all types of people, constrained by my personal values of unconditional and positive regard for all, regardless of how *peculiar* those individual differences seemed to be. Trying to explain these idiosyncrasies however was another story: a story that could only be told by some of those whose ‘differentness’ was not explained by a normative quantitative measure. However, the development of a reliable and valid measure seemed important, one that might facilitate answers to some of the nomothetic questions about what specific ways of thinking certain groups of individuals share in common. It was also the initial starting point for this project, with a strong desire and commitment to operationalize a model (Roodenburg, 2003) that had clearly distinguished student ways of thinking. This model is reported on in Chapter 4.

The decision to include qualitative data became more important when considering how comprehensively any questionnaire might satisfy the questions related to how some individuals are viewed, particularly if they do not ‘fit’ usual profiles, with additional questions about what makes them different; why their very individual differences should be excluded and possibly had often even been unacknowledged. It was also understood that an effective measure should also be able to reflect such personal insights that might only be possible through a qualitative approach, this being able to include the necessary “attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (N. K. Denzin & Y. S. Lincoln, 2005, p. 3). Other issues were related to the traditional dependency and limitations imposed by the statistical analyses of quantitative results, and deserved a qualitative alternative.

The question of how individual ways of thinking might be identified or measured was clearly quite complex and multidimensional, demonstrably found to be many faceted when thinking about thinking (Hogan, 2007; Sadler-Smith, 2012). Contextual observations by people about why they think the way they do are additional to the commonly expressed interest in the trait-like thinking characteristics, and these for example may relate to family of origin and social training (Mischel et al., 2002). Such questions may also reflect questions related to how the potential demands of relationships or career options may be impacted by this phenomenon of interest. But so that these complex issues might be thoroughly investigated, it seemed that more than a questionnaire was needed. A mixed methods research approach could enable an exploration of what individual understandings and meanings associated with thinking might contribute important and meaningful inferences to the nomothetic data obtained from the questionnaire. A mixed methods approach enables an alternative process of validation of both the model and the measure, and was discussed and argued for in Chapter 3.

Before the quantitative data collection was completed, the qualitative process began in which a several individuals were selected who had indicated when answering the WOT their further interest in individual ways of thinking and who would be happy to be contacted for future insights: the broader selection criteria are discussed shortly. But first, the enduring question of which comes first must be addressed in relation to methodological order.

Status and roles of Qualitative and Quantitative methods

The growing acceptance that valuable research can be achieved with very different methods has brought about an integration of such, variously called Mixed Methods approaches to research, (for example, Creswell et al., 2011), or by others as the use of Multi-Method Strategies (Bryman, 2006). Others have seen Mixed Methods Research (MMR) as an emerging distinctive paradigm: a well-differentiated methodology that is “solidly based on a rejection of the dichotomy between the qualitative/quantitative approaches and enjoys a distinct nomenclature, methodology, and utilization potential” (Tashakkori & Teddlie, 2010, p. 272). Still others would argue that there is no need for such a clear paradigm, with a tenable acceptance that there are many different forms, techniques, and variations in the ways mixed methods research can effectively attain results not possible by sole methodologies (Alise & Teddlie, 2010; Harrits, 2011). This argument suggests that an eclecticism often prevails that defies or otherwise demands clarification of the design, preferably before research commences. Regardless of what really constitutes mixed methods research, however, the debate by some about which type of approach should come first has continued in the methodologies arena (Alise & Teddlie, 2010). There are examples of researchers from within ‘opposing’ approaches who offer seemingly defensive arguments about which particular methodology is treated as an auxiliary method (N. K. Denzin & Y. S. Lincoln, 2005); there are others who suggest one methodology as being more important and therefore perhaps should be given pride of place (Creswell, Shope, Clark, & Green, 2006), and this warrants some attention in relation to the current research.

The *order* in which this particular mixed methods approach was conducted does not imply a preferential status of one methodology over another. The well-developed model had already theoretically defined the constructs and associated factor structure and their facet items, so that its operationalization clearly signaled a new measure. The construction of this questionnaire thus became the first stage of a sequential approach. Some respondents to the questionnaire who indicated interest in being available provided a potential sample of individuals for the second phase, providing a qualitative alternative evidence of individual perspectives on ways of thinking. This phase was set to begin as soon as possible, so that a final integration of data from both approaches was integral to the process that formed the fundamental justification and validation of the new measure.

The qualitative recursive process began, with care taken to ensure that the second phase was only constrained by the first phase in its focus of interest; data gathering and subsequent analysis, open-ended questions asked, and the general conversational approach remained free to discover specific individual reflections and lived experiences around the phenomenon of interest. Analysis of this subjective data, including clarification of themes and patterns discerned and coded, was completed for all participants *before* returning to the quantitative data, even prior to any consideration of how the numeric data ‘fitted’ with the theoretical model and the initial questionnaire. In other words, neither method was deemed more important than or superior to the other, either by order of presentation or by the results obtained, and regardless of analytic procedures undertaken.

With this research design clarified, we now specifically present the means used to best investigate the multiple realities that may be discerned within a qualitative approach.

Specific methods used and why chosen

A number of alternatives now commonly available for qualitative research demanded a clear rationale for the methods selected that best suited this particular project. This is advocated by well-established researchers such as Creswell (Creswell & Plano Clark, 2011), with an underlying assumption that firstly, the research purpose should drive the methodology used (Tashakkori & Teddlie, 1998), and secondly, a mixed methodology rejects any inherent incompatibility between the differing research approaches chosen (Teddlie & Tashakkori, 2012). Given the design of the current research requires a mixed methodology, along with the numeric data to be gathered from a questionnaire, a need for idiographic and textual data was deemed appropriately available from a number of different cases, to gain specific and in-depth personal views about their individual ways of thinking. This qualitative method differs from a more ethnographic approach which would require a researcher to find multiple data sources for the focus of interest, at the same time requiring the researcher to become a participant in that quest, a method that has been the more typical way for qualitative research to use individual studies (Creswell, 2013; Thomas, 2011). For the current research, however, it seemed likely that all the relevant contextual information around ways of thinking was likely to be available through thoughtful and focused interviews with a range of different individuals. The rationale for the sample chosen is presented under Sampling.

Given the research focus was quite specific, a phenomenon best described heuristically as individual ways of thinking seemed to suggest a phenomenological method an important adjunct to a number of case studies. Such a methodology would seek ways to encapsulate significant statements of understandings made by individuals, that when considered *together* might best illuminate and illustrate textual units of meaning about individual ways of thinking. In this way such insights can provide what Van Manen (1990) suggests are possible connections or mediations between the meanings given by multiple cases, particularly possible when using semi-structured interviews.

Case Studies

Researchers using mixed methods have varied expectations regarding the legitimate number of case studies required to make a valid and worthwhile research study: this has been anything from a single case study (Wertz et al., 2011), up to ten as suggested by Creswell (2013) if using data from case studies to explicate a specified phenomenon. Alternatively some would advocate 20 – 40 cases (Castro, Kellison, Boyd, & Kopak, 2010), who when using Integrated Mixed Methodology, reflects a paradigm that identifies integration very distinctly with “unified conceptualization of information as ‘research evidence’ which can take the form of verbal text ...or numeric data evidence” (2010, p. 344). However, I am in agreement with Holliday (2007, p. 84) who stated that “a very small qualitative study can be just one piece of a very large jigsaw puzzle...which, when put alongside other instances...begins to build the larger picture”. Also pertinent to the issue of reaching some level of saturation, information that might be said to be enough, is the suggestion that in a small study with a specific focus being investigated, that level of saturation is more possible than in a larger study that encompasses many areas of interest (Mason, 2010). I therefore am satisfied with the decision made to interview a small number of participants (10), as diverse exemplars of differences in ways of thinking, including male and female individuals.

Sampling as participant selection

It is common practice in *quantitative* research to refer to sampling as the method and critical rationale for why certain groups are studied: for example, Thomas (2011, p. 62) stated that a sample “has to be a portion that shows the quality of the whole”, though he further argued that one can *select* the cases and “without any expectation that it represents a wider population.” Other more qualitative researchers have not always regarded this view as such an important assumption, particularly if one were to use a qualitative method such as Grounded Theory, where participants are deliberately chosen according to *theoretical sampling* (Creswell, 2013). As an extension to such exceptions when mixed methods are involved, there are even less rigid expectations for the selection process, so that the term *sampling* of cases is often accepted as appropriate and legitimate (B. J. Wiggins, 2011; Yoshikawa et al., 2008). To remain within the accepted ‘normal’ limits of qualitative convention, the term *participants* is used in this study, to describe those purposively *selected* for the study, though the criteria for selection is understandably varied in relation to the purpose of the study. These are distinguished from those termed *respondents* who provided the quantitative questionnaire data.

It is worth noting here that cases to be selected were not decided before the research project began, nor in fact were they selected at the same time. As my awareness of the central concepts became sharpened, so the selection criteria for different cases changed. Initially I had expected to take a random group of those respondents to the WOT questionnaire who had registered as interested in further information, but it became evident that this might not provide a thorough investigation of the orienting concept of my project about individual *differences* in ways of thinking, thereby ontologically limiting the potential availability of new knowledge. My reading concerning such differences therefore led me to look at a framework (reported in earlier chapters) that might overlap personality-type and occupational preferences. Thus the selection of participants had to include available insights that considered these two components for each individual case. A clear decision then was made: to choose cases slowly, getting a feel for each one related to his or her way of thinking, before choosing another participant whose personality and/or career choice was identified as being somewhat dissimilar to previous cases.

In the current study, therefore, several participants were selected because they had indicated a further interest in the study of individual differences on their WOT responses, from whom it was then possible to select on the basis of their occupational interests being different from others. This allowed me to have a spread of individuals who reflected Holland's Career typologies (Holland, 1996). In this way, their representativeness was not for generalizing purposes, but simply to ensure the widest possible perspectives, as seen from individuals who had taken different career paths. Several participants were also chosen by virtue of their being previously known, either to me or to others, as being individuals who appeared to think quite differently from others, as potential 'outliers' from a quantitative perspective. Justification for this selection process was based on the suggestions of Thomas (2011), who I found affirmed my early inclination to choose certain known cases, claiming that such knowledge "is a ready-made strength for conducting a case study" (2011, p. 76).

From my perspective as a psychologist in practice, having had many interchanges with a variety of individuals, and recognizing that particular individuals *in essence* are different from others, using the above selection criteria enabled me to select what I considered to be a reliably different number of participants for this study, and from which some important phenomenological inferences might be drawn, providing what Husserl called an eidetic generalization (Husserl, 1962). I believe this was justified, not just in acknowledgement of but indeed as capitalizing on my research presence as a psychologist, as an appropriately aware and alternative data source, a view shared by others (Giorgi, 2009; Ulanovsky, 2008). Such a view has been accepted as a legitimate adjunct to qualitative research, and ties in with its commitment to a necessity for research to include a reflexive methodology (Fischer, 2009); at the same time, this view meshes with my own and others' (for example, Rennie, 2004) researcher stance as a counselling psychologist.

The fact that the participants selected came with a range of educational backgrounds was coincidental, rather than one that required careful consideration between interviews before selecting the next

case, being more concerned with career choice than level of educational attainment reached or implied abilities.

Table 5.1. Participants and their selection rationale

Gender	Participant: Code name	Reason for selection	Educational Level attained	Indicators of Holland's RIASEC - Un/Employed - U/E
M	1: DJR	Well known by colleagues as deep thinker - confident - Introverted personality	PhD	Teacher - tertiary Investigative - E
F	2: DeR	Known by friends as enjoying broad conversations, loves ideas but impractical	Yr. 12	Social - Secretary - U
F	3: CC	WOT – extreme introvert – lacking confidence	Yr. 10	Conventional - U
F	4: LO	People-person though very introverted on WOT	Grad-Dip Social Work	Social worker - E
F	5: DMJ	Known to enjoy unstructured lifestyle	Occupational Therapy Diploma	Investigative/Artistic - U
F	6: MRJ	Very internal person WOT – deep broad thinker many interests	Grad-Dip, Art BA	Creative/Artistic - U
F	7: GLT	Self-confessed “doer” on the WOT – uninterested in theory	Nursing Diploma	Practical/Realistic - U
F	8: MAC	Practical associate – uninterested in theory	BMus, Grad-Dip. Education	Teacher Practical/Realistic - E
M	9: JED	Well known Artist – isolated lifestyle	Yr. 12, Art Diploma	Artistic – Self-E
M	10: Eli	Well known in media as very capable, quick thinking, versatile	Master's in Education	Ex-Principal – teaching consultant – Enterprising – Semi-retired

As can be observed in Table 5.1, the ten individuals were purposefully selected to cover a wide variety of vocationally diverse individuals, and their respective idiosyncratic ways of thinking. As an experienced researcher, Silverman has justified this action, stating that purposive sampling enables one “to choose a case because it illustrates some feature or process in which we are interested” (Silverman, 2006, p. 306). In this research, freedom to purposefully select cases was expected to facilitate greater insights into the specific research question concerning differences in the ways people *think*. This approach was also justified on the basis that random selection would not provide such relevant information to the research questions, a view clearly supported by previous research (Plowright, 2011; Yin, 2009).

All ten of the participants were also purposefully selected as being over 55 years old, a choice made for two important reasons: (a) this selection would make rapport easier, with stage of life and expectations of participants more likely to be similar to my own, so that the danger of the researcher being of a different age-related ‘culture’ was minimized and the benefits maximized (Janesick, 2000); and (b) with an expectation that a maturity of self-acceptance, potential honesty, and with an increased motivation to be reflective about life and therefore about the construct and its associated complexities, and (c) was more likely with an older age group than with a young or more multi-aged cohort (McCrae et al., 2004). Though research in personality traits has not always demonstrated an age-related stability (Donnellan & Lucas, 2008), much has

been reflected on about the concept of ‘self’ as expressed by those in the older age bracket (Allen, 1987; L. L. Meier et al., 2011). Such studies have also raised important questions about how much one’s subjective view of self has been socialized or impacted on by circumstances along the way (Gubrium & Holstein, 2006).

The current quest has sought to determine how a perceived *truth* is intertwined with subjective meaning (Ladkin, 2005), in this case demonstrated by an increased understanding of each individual’s perspective on how they think. This process enables an *intentional analysis*, originally attributed to Husserl (1962), which involves reflecting about the how and what of one’s life experiences that may have challenged or contributed to the concept of interest, as the individual’s customary way of thinking. Again I reiterate this process itself justifies my selecting only those participants from a mature-aged cohort, since conversations with individuals from this older age group have frequently suggested this later stage of life generally provides both opportunity for and permission to spend more time in reflection about their lived experiences, and strongly contrasts with those discussions commonly experienced with younger people for whom the immediacy of the present makes such thinking less likely.

Detailed analysis of the textual data obtained by the case study interviews was facilitated by a computer program, Dedoose (Lieber & Weisner, 2011), it was expected that much phenomenological information about the ways of thinking would become available: information that might not only help to bring to light fresh understandings of what it really *means* to think differently, but also provide insights that might dispute or eventually validate the questionnaire itself. So we move on to briefly consider the rationale for using this approach in this research which, in terms of its being an Interpretative Phenomenological Approach, the purposive sampling used in this research is regarded as acceptable and legitimate.

Phenomenological Analysis

Though originally based in Husserl’s (1962) method of research that was mainly understood in the context of philosophy, phenomenology in psychology has become a well-respected descriptive study of human experience, so it falls naturally within the context of a qualitative methodology. It has maintained the need to “abstain from or *bracketing* of prior knowledge...to attend to what Husserl called the ‘lifeworld’ (*lebenswelt*)...to freshly reflect on concrete examples of the phenomena under investigation” (Wertz et al., 2011, p. 125), though always with an honest appreciation that “this is never fully possible” (Davidson, 2013, p. 321). Some would suggest phenomenological work has currently moved full circle philosophically, “in a return to the Greek conception of philosophy as a search for wisdom” (Creswell, 2013, p. 77), with a requisite suspension of judgments about what is *real* until a greater understanding is fully explored by others in the same search. Phenomenologists today, however, particularly within the human sciences, regardless of whether their ‘bent’ is towards a more philosophic transcendental phenomenological or a grounded theory approach, all seem to advocate rigorous methods to study subjective experiences, and their associated personally attributed meanings (Moustakas, 1994).

Using detailed analysis of the information obtained from subjective first-person accounts, phenomenology enables serious reflections of lived experiences of individuals, in order to find what has been termed a description of a commonly held *universal essence* of the phenomenon to which the particular individuals have become consciously aware (Van Manen, 1990). Discovery of this essence has mostly been possible through a number of individual case studies. Phenomenological psychological studies have considered research into such *real life* experiences as grief, suffering, and ageing, endorsed by the view that all presuppositions of the researcher should be set aside at least until a more definite *wisdom* is known through greater understanding (Giorgi, 2010; Malterud, 2012).

It is important to note that, although reflection and meaning-making about an experience is integral to phenomenological studies, its analysis in general does not always encourage *strong* conclusive interpretations of the collected data, but rather looks towards conceptual generalizations that may increase knowledge, albeit knowledge that is regarded as corrigible, always changing or needing to be revised (Wertz et al., 2011). Using a somewhat different analytical strategy, Interpretive Phenomenological Analysis (IPA) works idiographically with one participant at a time, the researcher being the facilitator for the *participant* to come to some closure about what interpretable meaning is attached to the phenomenon of interest. In this way IPA captures Heidegger's early notion of the researcher's analysis, that draws out information and then seeks to make sense of the phenomena from the inter-subjective experience shared (Heidegger, 1962), with that interpretation essential to understanding the phenomena clearly situated in a specific time and place.

This understanding of the versatility of phenomenology can now be particularly useful as a bottom-up approach, looking at the data procured from the participant's perspectives, with this data assisting the researcher to gain a richer interpretation of the phenomenon of interest (Davidsen, 2013). At the same time, IPA can also provide relevant insights that confirm or add to existing theory, so seems to provide me as a pragmatic practitioner with a useful approach, concerned with veridical insights into the phenomena of interest from a select number of individuals.

Various methods of analytical procedures have been suggested that researchers should use: for example, allowing for greater freedom, as expressed by Merleau-Ponty, who regarded phenomenology as "a manner or style of thinking", and "that one learns phenomenology by *making it one's own*" (Wertz et al., 2011, p. 130). Within the broad movement since the 1960s, however, many researchers have formalized what has become very descriptive phenomenological analysis, so that for example, the study of humans can be subjectively focused, yet still maintain a rigorous study of both the experiences and behaviours of the individuals being studied. Giorgi (2012) in particular appreciated the two elements, where method of research was important, having been trained as an experimental psychologist, yet who like Husserl, could also be deeply committed to sensitively allowing each individual to express their own perspective of the phenomenon being explored, rather than imposing the researcher's own view of it. It was only thereafter that the researcher, having reviewed all the information given, could then break that data down into units of meaning, in an effort to transform what was divulged into *meaningful* terms about the psychological import

of the phenomenon of interest. This method basically has been used by many (for example, Aanstoos, 1983), though has also been modified to encourage a more structured analytical process (Moustakas, 1994).

Phenomenological analysis is generally concerned with reflections of lived experiences of a phenomenon, presented as cognitions in which participant meanings are fully described, and then interpreted, often involving a “double hermeneutic whereby the researcher is trying to make sense of the participant making sense of X” (Smith, Flowers, & Larkin, 2009, p. 187). Use of *narrative analysis* as used by Gubrium and Holstein also alerts the researcher to the need to be careful in this researcher-participant interaction, with particular reference to the very questions and how these are asked (Gubrium & Holstein, 2002, 2008); care with such issues forms an important aspect of appropriate phenomenological interpretative understanding.

In the current research, then, the phenomenon of interest revolves around how individuals think, a common experience and yet diverse in its expression. Accordingly, I have utilized the latter type of analytical procedures mentioned here, including interviewing of a defined age but vocationally representative number of individuals. Some aspects of an IPA approach developed naturally within each interview, partly from a desire for closure that permeates my own explorative pattern within a counselling context. But I remained aware, as acknowledged by others, that IPA like other qualitative methods “offers no recipe, the researcher must adapt the method to...her particular way and topic” (Davidsen, 2013, p. 329). Thus the interpretive analytical process evolved, adapting throughout the months taken for the interviews, so that a final understanding of the phenomenon of ways of thinking is reported more fully in Chapter 6: Qualitative appraisals. The remainder of this chapter however now focuses on the actual analytical procedures involved with the case study aspect of this research. This includes ethical considerations, followed by a brief description of the mechanics of the data collection that closes this qualitative methodology chapter, leaving the next chapter to explicate the analysis.

Procedures

Interviews varied in length from 50 minutes to almost 100, though the majority lasted approximately sixty minutes, not including the natural pleasantries exchanged, both before and after the interviews. Individual interviews were conducted over a three month period, beginning with one of the participants who had indicated a willingness to be further involved in the project contacted by phone or email, and a time arranged for the interview to suit both of us. A choice was offered concerning where this should take place: for all except one, participants preferred to be interviewed in their own home. One, a single professional man who had recently retired from a very public career, and was now an educational consultant, elected to attend my office at Monash University. I also sensed it was important that each individual know that my questions would only serve as a guide for our conversation, rather than that he or she should be restricted by the specific question: this was to allow more individual freedom in answering questions, referred to as semi-structured or directed interviews, to provide “some leeway for the researcher to ask questions that arise out of the conversational exchange” (Layder, 2013, p. 83). Only two of the participants needed to be encouraged

to speak more broadly in answering specific questions, whilst on the other hand, there were several participants whose responses were so lateral and almost seemed unconnected to the inquiry that the specific question needed to be reissued, a small but important individual difference that will be given further attention in Chapter 6.

Ethical considerations

As mentioned in Chapter 4, Ethics approval had accepted the project as being a low-risk study, with a subsequent minor amendment that granted the interviewing of a number of participants (Appendix 2). This included formal documents to be presented to each participant before commencement of the interview: one gave an introduction to and purpose of the project, and the second being an informed consent form, which clearly indicated permission for withdrawal at any time.

Each participant was informed about the need to record the session, to enable more accurate analysis, with assurances of confidentiality both during and after the completion of the project, before being asked to sign the consent form (Appendix 4).

Having clarified issues around confidentiality, including the safekeeping of all information given to me prior to, during and after completion of the research, I engaged with each participant as I have previously and consistently done with clients:

- maintaining a friendly and open attitude that expressed genuine positive regard;
- a commitment to ensuring that each understood that any information would be treated with utmost care for their privacy and confidentiality;
- even in transcriptions, personal details were de-identified, either because of their public position, their standing in a small rural community, or (as in one case) his notoriety with the media;
- siblings or family members referred to by name were also changed or omitted, to protect their privacy as well as any potential recognition of participants.

Since those interviewed had also completed the questionnaire and voluntarily included their names, it was also very important that in the analysis of the data, both within each case study and across the participants in terms that helped elucidate the phenomenon of interest, care was needed to ensure that each individual profile should remain known by a code only, so that in the reporting, this has been closely attended to.

Data Collection

For each interview, a small inobvious digital recorder was placed on a near-by table so as not to create unnecessary stress, alluded to as necessary for the purpose of later analysis and to remain downloaded on my

computer only as long as was needed for my research. This instructional detail formed part of the routine procedure that included the signing of the informed consent forms, with an option to withdraw at any time. Immediately following the interviews, all interviews were transferred to my computer, before personally being transcribed after each interview for safe keeping prior to and during subsequent analyses. Transcribing the interviews, suggested as an important part of the interpretive component of qualitative research (Bird, 2005), provided further opportunity for reflection regarding the interview process: for example of my own questioning, of participant responses, and on any changes that needed to be considered for each subsequent interview. Thus the transcriptions themselves began the process of analysis: enabling reflections, awareness of variations, broad coding of repeated insights, thematic possibilities, and sharing with colleagues the growing ideas, both latent and manifest, about the differences observed. This second phase occurred over several months, sometimes referred to as data immersion (Braun & Clarke, 2006), forming a recursive pattern of reflections about individuals before moving on to the next interview, and then often back in reflection again on the previous one.

The qualitative process of analysis and its findings are necessarily long and detailed, and therefore are reported separately in the next chapter. Chapter 6 thus includes discussion about the findings *within* the overall analysis, to minimize the amount of repetition that would otherwise be expected. It is also important to note that this qualitative analytical phase follows directly from having completed all interviews, so that any comparisons with data from the quantitative phase was still unknown, and was not revisited until after what is reported in the next chapter.

Conclusion

This chapter has reviewed the qualitative methodology used for the research into individual ways of thinking, with its emphasis on ten individual cases. This small group of mature-aged individuals, aged between 55 and 74, were purposefully selected, opportunely known or as having indicated an interest in further understanding individual ways of thinking. Participants selected were expected to share some personal insights that are not normally explored by a quantitative measure: some of these differences were possible simply because of occupational interests, others by what is popularly expressed as reportedly being a *different personality*, with several previously known to me who were thought to match such descriptions. Interviews were therefore expected to reveal more individual insights than can be gained from a tick a box questionnaire, with the additional benefit from reflections possible in the researcher-participant interactions.

Along with these personal perspectives, the phenomenon of *ways of thinking* naturally occupies the central theme of the interview questions, and thus has become an integral part of the analysis and findings within the qualitative phase, and therefore now continues into Chapter 6.

Chapter 6 - Case studies - Qualitative Analyses and Phenomenological Findings - Phase 3

Chapter overview

In order to discover how a qualitative approach may contribute to the ways of thinking project, reporting on a number of case studies was a good place to start, to potentially expand on the self-report data with more personal views and insights on this multidimensional phenomenon. The method of analysis firstly considers the case studies, beginning what Potter (1996, p. 117) describes as “a natural curiosity to learn more about the who, what, when, why and how” about each individual’s understanding of ways people think. The general evidence was then reviewed as patterns of thinking, frequencies observed and coded, then reevaluated with an induced thematic appreciation of all participants’ data, and appraised phenomenologically. This distinguished various themes; these themes were again analyzed and reviewed within the context of thinking. A model is proposed that conceptually presents a summary of the interactive effects of these themes as they relate to ways of thinking. My analyses and findings are intertwined with the specific transcribed insights made by participants, with the final analysis presenting three distinct portraits inferred from the data reductions, and evoked by an iterative process of moving from one participant to another. The chapter concludes with a brief summation of potentially important inferential conclusions that have arisen from this qualitative methodology of data analysis.

Qualitative Method of Data Analysis

All ten interviews were similarly structured, covering the same sorts of questions about thinking, including “Can you describe what sort of things go through your mind when you are thinking about (activities or needing to plan ahead)” or “do you find thinking something enjoyable?” or “Is thinking something you find quite stressful?” (see Appendix 5 for more interview questions). The answers were allowed to flow as naturally as possible, so that participants set the pace and the conversational directions, though always brought back to the topic of how one thinks. Sometimes this meant any order of questions changed radically for each interview, and the list only there to ensure all types of queries were addressed. I transcribed all recorded interviews within a day or two after each interview: the time taken to complete these transcriptions gave me the benefit of careful reflection on what had newly been revealed. At the same time, I was able to note any important reported or remembered details (and were written in parentheses), including any body language that had accompanied specific phrases: facial expressions, changes in voice pitch, crossed legs and such things as pauses, that may have provided some inference that later might assist in gaining greater understanding of the individual’s inferred meanings. These are summarized under Observed Interview Behaviours: Appendix 6 - Dedoose Codes.

Several days elapsed following each transcription, enabling a reread of the whole transcript for an important immersion into the sense portrayed about each individual’s understanding of his or her particular way of thinking. This enabled me to do what Wertz described as “a process of understanding that moves

back and forth between wholes and parts” (2011, p. 331). In this important reflective process, I not only sought to discover the hermeneutics involved in the phenomena of thinking, but also to understand more intimately the individual from within the perspectives each had given of the meanings attributed to their own historical and cultural contexts. At the same time, I needed to again be reflexive concerning my own values, attitudes and prior personal beliefs about ways of thinking that needed to be set aside (epoché or bracketed). Only then did I attempt to summarize each person’s transcript into what eventually delivered a great number of phrases and ideas that each had used about thinking. This included alternative thoughts that most participants had made about others’ ways of thinking as being different from their own, such as a good friend or partner. Here is an example of a partial list of phrases used by just one participant, with her comments about thinking reduced to a third person format, presented here in alphabetical order.

Example of interview reflections – participant perceptions of ways of thinking

Case 2 – DeR

- always interpretive,
- an appreciation of others’ alternate views, over her own
- bubbling pot of ideas
- contemplative
- contextually confined, yet always analyzing and evaluating, trying to understand
- disciplined
- enjoyment gained from sharing thoughts and ideas
- enjoys coming to closure, but aware this could change in future
- experiences that have proved her intuitive responses/behaviours are right, such as in certain practical matters that are so habitual, she has confidence to act quickly
- fears of being wrong or being thought of as an idiot/a failure if unable to do
- finding words and pictures that fit well, but which can also create distractions on the discovery journey
- focused
- getting involved with the meaning, and consequent disregard for or forgetting of unimportant details and facts
- interest in and excitement for learning and understanding new things, particularly in understanding people and why they behave as they do
- intrinsic interest, such as in discussions of a social nature
- lack of confidence/self-assurance that even extends to problem-solving
- lack of formal study, resulting in a smaller world in which confidence developed

- lack of sleep/ time to reflect
- looking at things from different angles
- looking at things from various perspectives
- love of learning,
- making sense of thoughts by others, essential in accepting the relevance of ideas
- memories of early experiences that set her against trusting her own insights/ideas/thinking
- mulling over things, and often at the subconscious level – this leads to knowing things that don't seem to have been thought through at the conscious level
- need to be solution-focused, which can be too demanding, impossible to think through if immediacy is expected
- need to understand how and why it works
- opportunity to share feelings, perceived as necessary to gain more objective understanding and more positive perspective
- pattern of mulling over things, particularly relational issues, which can result in negative conclusions
- personal subjective feelings, both positive and negative/painful
- potential ideas – often needs to put these to paper to allow focus
- purposeful for immediate need/relevance
- reads between the lines
- reflective (of conversations or books engaged with)
- search for meaning
- slow, careful
- speaks of various thoughts being randomly thrown into a bubbling pot – followed by adding something more or taking away
- speech often slow, connecting various thoughts that may have seemed disconnected
- stimulation for thinking is from reading or ideas suggested in conversation
- stressful if technical
- thinking is usually directed or purposeful – wanting to solve, plan or achieve something
- thinking more deeply about something is often surprising, with lack of confidence in her ability both to think deeply and as a consequence to adequately share thoughts with others
- thinks around things,
- thinks inside her head before sharing out loud

- time alone, with space conducive to reflecting on goals, and activities to achieve these
- to make life more livable, more comfortable
- to personally work out the implications of issues confronted
- to understand, a basic building block or driving need
- wanting to gain the big picture, the whole picture

It is noteworthy that the size of the summaries differ considerably, and though clearly there are similar patterns or themes observed in all, each participant expressed that pattern with different phrases. For example, one such analysis demonstrated a theme observed that reflects *how one thinks*, and Table 6.1 gives some exemplars of this theme as expressed by four different participants.

Table 6.1. Comparisons: Four case examples of how one thinks

Case 2: DeR	Case 10: Eli	Case 9: JeD	Case 1: DJR
unconfident with facts narrow yet I always like to think about what <i>others</i> think	matter-of-fact and positive analytical, observant	different from most others individual – can't describe it	stream of consciousness wandering in a web of ideas
questions but inside my head think slowly and often embarrassed by that	logical quick and responsive to needs/others' ideas	disciplined when task oriented, but unstructured with ideas in pictures/ in colours and diagrams	undisciplined but follows my logic slow and broad, often conceptual; contemplative;
focused on avoiding potential problems practical in routine thinking,	not creative but adapts quickly to others' suggestions practical, looking for implications;	creatively and reflective can be quite technical; obsessive about details	focused always on a need to understand <i>can</i> be practical/technical when interested
like to understand before doing anything like thinking artistically, but not confident to do much	not complex responsive	inside my head, complex; vague ideas: need a task detailed for correctness, yet vague if sharing ideas	integrative – searching for meaning disregarding or forgetting unimportant details
mostly in words, as if talking to myself with instructions	occasionally in real pictures but mostly in words, either out loud or inside my head	always in pictures, designs, patterns; can't find correct words to say how I think	quite conceptual, so I love thinking in colours, diagrams and abstractions

While this table is but a small glimpse into *how* four different people reported thinking, and a similar chart could also be possible for the other six cases, it became clear that there were compounding issues that at least needed to be reported and ultimately considered when analyzing and interpreting the data across the interviewed cases. But first, a more complex analysis demanded a system that would enable me to better absorb the smaller details while positioned within the bigger picture context of ways of thinking.

The iterative process of case analysis

After the completion of each transcription, the case study was uploaded to Dedoose, a cross-platform web-based program for analyzing qualitative, quantitative, and mixed methods research (Lieber & Weisner, 2011). This program allowed me to effectively analyze the data from interviews: though mostly it was used

in my initial coding and in ascribing meaning units, this program could eventually be used to integrate data from the questionnaire surveys should this seem to be warranted. The program also allowed me to consider to what degree the coded data were unusual or to assess whether there were commonalities across cases: data were clearly marked by colour differentiation, with the frequency of any particular code appear being numerically readily available as well. Though these numbers as such were not so important, they were useful in terms of helping me determine the ultimate broad understanding required for the phenomenological aspect of the study: for identifying what phenomenologically is thought of as “capturing the essence of that which is being coded” (Potter & Levine-Donnerstein, 1999, p. 262).

In relation to the phenomenological analysis of the data, there appear to be good precedents for the interviewer to be involved in the process of gathering quite subjective information from a reasonably heterogeneous group (Giorgi, 2009; Moustakas, 1994), but importantly such praxis needs to accept that my view was but one of a number. So placing of that view aside regularly took place, as I looked at the individual perspectives on their way of thinking. At the same time, my interest in that phenomenon naturally engaged me in what hermeneutically-inclined phenomenologists like Van Manen (1990) espoused, looking at interpreting what the reported meanings of lived experiences could reveal about the phenomenon.

I will now report the actual steps taken after the initial transcriptions were thoughtfully completed and reviewed, citing examples from two or three of the cases at each of the four stages – coding, the iterative review, patterns of thinking, and discovering themes. These examples will be used to highlight and to explicate the process thus enabled, to demonstrate both the process of initial analysis, and also to reveal the rationale taken that led in turn to the realization of apparent themes.

Stage 1: Coding

To assist me in what seemed a large task of analyzing all the transcripts, I regularly imported each individual’s transcriptions into Dedoose, and then methodically highlighted every phrase I came across that referred to the central focus of thinking, regardless of context or meaning. With each *response* (here citing participant quotes in *orange*), any differentiating word (or phrase) that referenced thinking at all, I then allocated a *code word/phrase*, reported here in *green*. For example in answer to my question: do you often *enjoy* taking time out, just to sit and think? *part* of the Case 1: DJR response was *I think I find, um, if I don’t get time to think on my own, within a sort of inward journey, um, I start to get disoriented... so I need time just to think things through* – The codes then were recorded as *internal-inward journey*, and *thinking something through* and *needs time to think* The answer to the *specific* enjoyment question only came later, as part of a long, circuitous answer to another question: Do you think *your* way of thinking is different from others or is different, say, from your best friend? The same participant DJR answered quite broadly (and stated slowly) included...*yes, the act of thinking in itself is just an enjoyable thing to do, whether its thinking something through or just thinking about a lot of new connections* – the same code *thinking something through* was used, but had the added codes of *enjoys thinking* and *makes new connections*. So when those sorts of comments or words were used again, the same codes were applied.

These codes then became available for each new case, so that with Case 2: DeR, the same codes are also found in phrases like Yes I really prefer thinking something through on my own – rather than having someone waiting for me, no I wouldn't like that...though this response was in the context of a question about thinking alone. At a different time, in the context of a question about how she *likes* thinking, she continued with: I enjoy thinking if its something about um, something that is relevant to what I am doing or ... and its not too far in the future. I'm not, yes I don't particularly enjoy thinking about things that are too far in the future, like next year or the year after ...but if it concerns me, something fairly immediate, I'm happy to think about that, so that the same coded words given to DJR were also found with DeR. To clarify whether or not *her* pattern of thinking changed when with others, the question was asked about liking to share her ideas with others, her reply included I prefer thinking on my own if I've got something to work out, um, I'd prefer to do it, um yes sort of privately, ahm (longer pause) yes, but only if I have something I need to think about. And in answer to a slightly different question, she added a clarification to the *first* question about enjoying thinking for its own sake, she was able to state clearly that ... I think some people actually really enjoy the whole process of thinking, like a physical activity, they might enjoy running, you know, other people enjoy thinking (Researcher: yes ?...) – but I don't, I think when I *need* to think.

Just looking at this one concept, the enjoyment of thinking, and in various contexts, the codification process made it clearer that when the same code words were applied throughout the transcription, I was already able to start making some inroads into perceiving themes that might need to be investigated further, and that might possibly also apply to others. If we return to Case 1, for example, in a completely different context when asked about his perception of how others may think differently from him, his reply included some of the coded words already mentioned, like inward journey, but he went on to emphasize how important thinking is for him, saying I don't understand those people who just seem to not need to think, and seem to know things by not thinking! Additional coded words then included knowing without thinking, indicating not only his view of thinking, but also gave a brief insight into his perception that others do it differently from him, almost as if they don't think. What was also starting to emerge was how the context could alter the perceived thinking process for one person but not necessarily for another.

I need to take this first analysis a little further, including DJR's comments that reflect how complex his thinking often was, as he continued in the same context of his thinking pattern being different from others, when he said yeah, I can just be thinking, and that act of thinking in itself is ah just an enjoyable thing to do. And um, if I've read a book, I'll be thinking about a lot of things that come together about that book, but I won't have a structured thing. And if I've read something that has a lot of new information, then I enjoy thinking about the new connections and the implications of that, so that will draw me. When I've read some things in the paper, that will draw me in too. Or like when I've seen a movie, I don't just go away and think of the next thing; that sort of stays with me for the next day and sort of, bits and pieces come up; ah yeah, its as if my subconscious has suddenly made new connections and keeps popping up saying "oh this is interesting, Don!" This one long response highlighted not only the previously identified code words enjoys thinking, but then added a lot of others: for example, implications, makes new connections, subconscious

knowing, new information draws me, thoughts keep popping up. The very next question about the importance of understanding flowed naturally from his last comments, to which he quickly replied (unlike his slower responses to more reflective questions): I think understanding is *very* important, to me. I could be misguided, but I really hanker to understand and be investigative and um, whenever I see something, I need to, I WANT to understand it: how it works, why it works, I can't help myself! And that can be electricity, engineering, water supply, and that can be things I'm not really (interrupts his own thinking with) and people: I want to understand what makes them tick. I really like inquiring into that. I've got a very inquiring mind and I notice things; I can't help it!

This response stood in considerable contrast to Case 2 DeR, for whom thinking was very much purpose driven because of a need to solve an issue or a problem. She mentioned such thinking could be quite stressful, so that she did not find thinking enjoyable, no, and had particularly emphasized this in another context by stating, no I don't like problem solving – I'm not good at it. Additional insights began to appear, like when DeR was asked about what makes sharing ideas with others so difficult for her, she responded with Oh I really don't know, but I do know its like, it's sort of a malfunction in my brain, by the way!, and it is born from experience, but when you said, about doing this, immediately I think "crickey", and there's a slight panic reaction in me, because I'm being put on the spot like "you've got to say what you think now "(gets softer)...yeah! And later, when reflecting on her perception that there is a right and a wrong way of thinking, implying her way of thinking, because different, was very often felt to be wrong, she commented: that makes the process so much more annoying and inhibiting (R: Hm, more up hill), yes! - because you think Oh, this is me, and I'm not doing it right, or whatever, um, and so to think that, yeah, that each way of thinking is valid, that's quite ...liberating! Yes! (a little relieved laugh). Code words added here included right/wrong way of thinking, liberating, and negative self talk, thinking difficult, but interestingly, also created an opportunity for a therapeutic process. Here I began to see examples of how an individual's way of thinking is impacted on by beliefs and values about self, by attitudes developed because of the family of origin and its social or emotional limitations; in effecting their views about *thinking* as opposed to *doing*, which in turn may have imposed some changes to their natural or inherent way of thinking.

Further reflection with one individual about such differences provided potential explanations of their essentially different ways of thinking – or sometimes raised further questions about what may have impacted on their own values that in turn had previously been determined by financial necessity. For example, DeR had made reference to her schooling, where the critical attitude of a teacher towards her way of expressing her thoughts as "woolly thinking" had really blown her confidence and had stuck with her, though she had loved learning. She subsequently mentioned when I left school, and I was 18, I cried!... and that sounds pretty pathetic. Later she returned to this, as she described her parents wishes I didn't go against them..., I just accepted their (speaking softly, almost in a whisper): " oh, just take up this nice little secretarial opportunity; you don't want to be wasting your time with a whole lot of books.." And I just accepted that... Later she returned to a growing self-awareness with I do regret that I didn't grab it at that point in my life, and tried to reflect on the why by saying in part, I wasn't mature enough to say no to them. Again, this

reflection about her way of thinking had her sharing that fracturing of life in early years, for removal and dislocation, for some, can cause, like for me, um, thinking patterns that wouldn't have been, if I been more secure. In other words, not only can analysis clarify how one individual thinks, but can highlight *contextual* issues such as when and where, that also influence *how* one thinks, and therefore also *what* one thinks. Thus the thinking *content* of what one thinks can also be seen to contribute to confidence in one's self, and subsequently even limit the pattern of how one thinks in general.

When this process of identifying codes had been applied to several of the participants, the codes were then considered as presenting possible themes, with consequential variations on a theme also emerging with subsequent participants. Sometimes these themes were simply seen as things I had already known, like how one's personality, for example being introverted, can affect one's inclination to think out aloud, or even analytically, trying to understand...how can you do *anything* if you don't understand? This was spoken by DeR, and gives one of the many excerpts made by both individuals just cited, in reference to their expressed surprised views on how others might possibly be different in this regard. All three of the ones mentioned so far had admitted to needing their space in order to think. All three accented a need to understand, before being able to act – unless, as DeR put it: I'm practical in a physical sense, you know when it comes to um, organizing my physical environment, but I don't see myself as a practical thinker, no....having previously identified she could only think fast when it came to doing things that, because of practice and experience had become easy for her. This contrasted with her acknowledged fear of new and novel tasks, and again represented an aspect of reported slowness in thinking, a need for time to think that was commonly expressed by the same three participants.

But as I thought about others, and particularly about those whose way of thinking seemed to be quite different from my own, I was forced to reflect on how my own stance, my own culture, my own family of origin, had possibly influenced my own patterns of thinking, including my limitations that may have influenced even the way I asked questions. So with each additional interview, an awareness grew that I might need to soften the way I asked things, or to leave bigger gaps of silence, to provide participants time to think about and express alternative insights gained from thinking about the questions themselves. Positioning myself reflexively in the analytical process, even before the next individuals were interviewed, encouraged me in what I then more intuitively understood was meant by an iterative process, so that the *to and fro* between gathering data, analyzing it, then gathering again made a lot more sense.

Stage 2: Iterative review – the phenomenological opportunity

It became more clear as the coding increased with each interview, that even amongst such a small group of people, there were already some important significant statements that clustered around themes; for example, as referred to in the above quotations, confidence or lack of it became an issue frequently admitted to, that impinged on the participants understanding of their particular way of thinking; context was also another frame of reference, regardless of whether perceived by some to be important, and by others as being irrelevant; the need to understand for some, as compared with others who just simply thought about getting

something done; for some, their feelings impacted on and influenced their thinking processes, whereas others found emotions to be far less influential - all of these and more were pointing towards a growing perspective of the phenomena associated with ways of thinking, both specifically as expressed uniquely by individuals, and in more general terms, across a number of cases.

Though these themes mattered more (or less) importantly for each of the participants, the textual themes described, that is, the *what* that they actually reported, were often reported as experienced in the *content* of their thinking, so were then reconsidered in terms of *how* the individuals had expressed their experience of thinking. When these two descriptions were combined, the how and the what, an opportunity was created for a phenomenological approach that helped form the clustered themes into written descriptions “that convey the *essence* of their experiences”(Creswell, 2013, p. 273). Examples of these are presented later in the chapter. But at this point we need to consider the next stage of analysis – descriptions of the separate codes as they grouped together, in repetitive *patterns*.

Stage 3: Patterns of thinking

When two or more categories or codes are repeatedly connected, a pattern or correspondence between them can be seen, and this began to suggest a framework of both differences as well as similarities between cases, that Creswell refers to as “naturalistic generalizations...that people can learn from the case...or can apply to a population of cases” (2013, p. 201). For example, a pattern was observed between several cases that may be referred to as the way they thought conceptually, without concern for the practical aspects. If we take another example Case 6: MRJ, who had initially referred to her life as being scatty, when she reported thinking deeply, **I can think I'll sit down and read for an hour, then I'll read for 5 minutes, and my mind will take off with thoughts about something in it, so I'll get up and my thoughts will continue, because** as she reflects shortly after this comment, **when I think, I go into a bubble. So what I've planned is gone and I wander around in my thoughts – and my husband Andy might come into the house and scares the living daylight out of me; because coming back to earth is always a bit of a shock...** Then as if in support of this, MRJ went on to say **because when I'm thinking, I never accept anything as fact...I think I might be as near as possible to understanding...I'm trying to see connections, and finding this doesn't fit here and belongs over there...** When then asked what she is doing when her thoughts take her in all sorts of directions, she admits **I always want to know, and to understand things – I think that's why I live!**

When looking at the analytical way of thinking that MRJ used, for the specific purpose of coming to understand and to know something, we see similarities with both the previously mentioned cases, even though there was an obvious lack of confidence in the self-perception of Case 2 that reflected the inadequacy of the way she had *believed* she could think. All three expressed a clear need to be analytical, to understand things - but with an apparent difference that can be interpreted through associated comments made by each; for example, the educational opportunities for growth were lacking, an explanation made by Case 2 during the interview. In contrast, MRJ expressed confidently her unique pattern of thinking: **I really enjoy reading about how other people think and see whether I'd like to think like them, or argue with them**, so that if in

conversation, and feeling disinterested in another's way of thinking, she said I will picture it all in incredible shapes and patterns in my head, and I think, if I did actually see it in real life, it probably would have little resemblance to how it really was, but yes, I do form their ideas into colours and shapes...then added Yeah, (slowly) otherwise I would be off with the fairies (laughs). So here we can see a pattern of thinking that was purposeful in terms of needing to understand, but another pattern emerging that registered the important consideration of influences on thinking.

Both positive and negative past experiences were reported by all participants, as often they reflected on interactive effects of their individual histories with their subsequent patterns of thinking – suggesting tentative explanations for how these might have developed or discouraged their individual way of thinking. For MRJ, in spite of the lack of understanding by her family regarding her personal pattern of thinking in symbols, there was also a love of words which developed and flourished from an early age, so that at primary school I loved drawing and poetry, acting and making up plays, so at the end of the year, the teacher would let me and a small chosen few to go and perform to some of the younger classes, acting out nursery stories and rhymes and so on. So I hadn't thought about symbols much until the algebra - and then the geometry in High school...This was so exciting! However, along with this was an incredible self-awareness that led her to keep most of her different way of thinking to herself, because I tried making people understand me for years, but I got sick of it really. She had long been aware of how different her way of thinking was, which she described as its interesting... but I'm always thinking... in sort of shapes, or diagrams I suppose. If I'm thinking about a novel, about the themes and philosophy throughout, I'm always thinking in pictures. But when I'm reading philosophy, I usually think in diagrams. But when considering in another context about how she had accepted and lived with being a different thinker, she commented: I guess I have thought that for some time now: What they think of me is more about who *they* are than who I am!...but I still get sick of it!

So far, observable patterns were far from being fully explored, though with each new interview, a growing collection of such insights revealed some things held in common by some participants, others somewhat overlapped, and yet for others, descriptors were quite distinctly different. For example, of the three already mentioned, when asked about their feelings, all acknowledged these as playing an important part in their way of thinking: Case 1 described feelings as they really do impact on my thinking ... stops my mind from being creative and I just can't think. Ahm, now, my (pause)...if I'm in a very negative mood, I'll see things very pessimistically. If I'm passionate about something, or if I'm really irritated about something, I think I can talk in hyperbole, and be really irritated, and can take a certain point of view, and that, that pushes me to hyperbole, and colourful language an' can be quite strong language... that I describe that in, and I find I need to express it. But once I get that out of my gut, then I can go back to being more clear minded about things. Case 2 also described her feelings as affecting her thinking *Very* much so, very MUCH so, and again I could say sometimes *too* much so. Case 6 also admitted the impact of feelings on her thinking as Oh, (big sigh) up until Arapax, oh totally, I was all..., from my head....down to my little toes!

(laughing). But since then, much less impacted by my feelings....though at times, my feelings about being so different from others I often got sick of, so I learnt not to share what I was feeling!

But as a starkly contrasting example, if I turn to Case 10, very clearly feelings were not treated as so important, though he admitted he was always committed to being acutely aware of others, so that he said **I'd like to think I can be gracious when I may have been a bit hurt or disappointed by what was said...sought to find an explanation for it, rather than taking it too much to heart**. All comments made by this participant about others were never *I feel or I felt* but simply as reflected in a factual statement like **I do like chatting to people, I like listening to them, though haven't always been a good listener but I think I've improved in that! ...I do love analysing them while engaging with them and noticing how they think differently**. The word *feel* was never used by him, even when asked directly about how he felt, but always **I think...I liked to think...I'm quick to think...watch people, interested in seeing how they relate**. It was as if feelings were not really relevant. This pattern was embedded in the clear practice of being analytical, though without an interest in being philosophical – and an analytical trait that had a different purpose from the three cases already referred to – his purpose was to solve a problem, to find a practical solution as stated: **I could come up with a lot of different practical options, but I don't think that I always come up withthe most creative ideas. I don't think of myself as a terribly lateral thinker - I'm not someone who comes up with way-out thoughts. I depend on others to be creative – I'm more likely to assess the practical implications of their creative ideas!** This excerpt brings us to another clear pattern that evolved: a *theme* that was expressed quite differently by each of the cases, but remained a theme – that of the inherent different purpose reported for the pattern of thinking, that I came to consider as reflective of the *why* an individual thinks differently. This then brings me to an exploration of the next stage: discovering themes.

Stage 4: Discovering themes

The Dedoose computer program played an important role in facilitating this stage of the analysis. Both the huge diversity and the frequency with which certain codes and subsequent patterns were made became increasingly more obvious, and pointed to themes that at least needed attention, even if ultimately it might not always have been possible to uphold the logic of such connections across cases. But when carefully reviewing the codes as a mix of descriptors about thinking, even in one transcript, it became apparent that each phrase was contextually embedded. A number of overarching descriptors clearly differentiated the ways one individual thought, for example as cited in the above personal texts, within differing places and times, while other descriptors differentiated what things in the past seemed to have impacted on the particular present way of thinking.

Completing other case reflections in the same manner revealed a similar pattern. Having considered all transcripts many times, there seemed to be some interesting patterns emerging: descriptions of *how* the person thought, *when or where* the person thought like that, *what* sort of things the person thought about that gave evidence of her/his way of thinking, and in addition, evidence reported on that seemed to indicate

influences about *why* the person thought the way they did. Here are these basic themes listed alphabetically as presented by Dedoose.

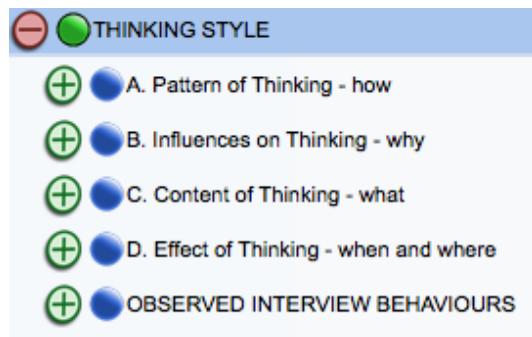


Figure 6.1. Dedoose assist for Thinking Style themes

The plus signs for each of the thematic patterns when expanded could reveal the codes recorded under each participant. With this template, I was readily able to include such repetitive coded phrases or words within the appropriate contexts. For my own reflection, it was helpful to note observed interview behaviours so I also recorded such data that might prove to be useful in this context. When I had finished all ten participants, my checking revealed what I had sensed was an authentic reflection and generally observable pattern, but I was concerned that this might just be my subjective view, so I had another psychologist peruse several examples, and was justifiably relieved when she supported this general framework.

Though the focus of my research remained on *how* one thinks, I present another case reflection here, but this time with the four thematic descriptors observed and applied to the example. This may help to illustrate my conclusions about what other factors may need to be considered in future research, considering them as having a potential impact on individuals and their thinking.

A deeper reflection: individual meanings attached to thinking

Using Case 5 – DMJ: Adjectives/phrases that highlight four interactive/meaningful thinking descriptors

A. Characteristic Pattern of thinking: how

- undisciplined
- reactionary – responsive to needs/crises
- cautious, careful
- random
- shallow
- chaotic
- lazy/not quick

- scrambled
- positive
- enjoyable, for the moment
- slow, searching for meaning
- always interpretive
- critical, evaluative of usefulness
- detailed, need to be correct
- planner, avoiding undesirable consequences
- imaginative
- feelings-driven - relational
- technical when dealing with practical issues,
- creative and unconventional with practical problem-solving tasks
- careful with details
- thoughtful

B. Contributory Influences on Thinking: why

- awareness that things could go wrong
- need to understand – not as facts but as grasping hold of life, contributing another dimension to the way life is lived
- motivation to know how and why something works
- seeking meaning, to understand more of what life is all about
- need to consider the implications
- feeling free or a lack of freedom
- in social context, driven by the need to connect and be caring
- in practical context, driven by the need to solve a problem, create order
- enjoyment of the moment, with the desire to be engaged with life
- interest in and excitement for learning and understanding new things
- lack of confidence in own abilities, own need for creativity
- lacks understanding of own and other's personalities
- lack of stimulation – particularly social
- continual observations, picking up details

- undeveloped sense of what career she was really suited to
- intrinsic interest in area or topic for discussion
- enjoyment and feeling appreciated, especially from shared conversations
- personal emotions, feelings, mood
- life's experiences
- place in the family - youngest of five
- enjoyment derived from learning new things
- lack of time to reflect, necessary to find meaning
- feeling stressed, with too many tasks/expectations to perform
- need to be solution-focused, as a stimulant to thinking seriously
- any subject matter that grabs attention, even if just fleeting
- imagination and creative energy stimulated from perceived need of others
- lifestyle that enables time to think

*C. Content of thinking: **what***

- often with pictures, especially if interacting with others, trying to get message over
- random thinking of one thought then jumps to another, tries to put them into a meaningful thought/idea
- spikes of ideas/thoughts, before expressing these to others
- words or phrases selected after turning them over, to form right beliefs/ideas
- deeper thinking often leads the direction of thoughts to understand, to find meaning
- undisciplined and therefore often time wasting, unless has a purpose/direction
- turning thoughts over and over, linking them to things read or spoken by others
- making meaning of experiences,
- free thinker/imaginative only in safe own environment, internal, not for action
- creative when thinking about practical, hands on tasks
- about technical matters, in the context of creative solutions to practical problems
- observing, watching, trying to understand people and what's going on
- in solving a problem or coming to conclusions about anything, doesn't give up
- in thinking about others, concludes their thinking may be: rigid, limited, emotional, flighty, conventional, black and white, unfeeling, disciplined, organized,

D. Contextual effects on thinking: when/where

- being alone, lifestyle to have time and space to consolidate thoughts/plan inside head
- integration of thoughts often achieved in discussion with others
- potential ideas/projects often from observations of real life experiences
- responding to ideas suggested in conversation, or as inspired from music
- meaningful and ordered thinking things through occurs when sharing ideas that really connect with others
- deep emotional connections adds to one's thinking/understanding, particularly about others
- shared thoughts in pictures, expressed in chosen words that fit well and sound nice
- when contextually confined to problem-solving, always methodical and analytical
- evaluative and reflective thinking really occurs when thinking how well the idea fits with experiences in reality
- excited by thinking and learning about how life is
- quite enjoys doing creative practical tasks, when uninterrupted time and energy provides the motivation and inspiration -
- ordered thinking in bringing things together brings great personal satisfaction.

Completion of all cases in the same way revealed both similar and contrasting individuals, and their respective thinking patterns; these reflected interpretations are associated with what Barrell et al. had called implicit meaning (Barrell, Aanstoos, Rechards, & Arons, 1987). Each attributed meaning can be said to be tied up with a “multi-dimensional significance” (1987, p. 435), that can all be further expanded with such differentiation of similarities and differences found within one or more of the areas uncovered by the above lived experiences. My ongoing and deeper reflections included what I regard as *following the threads of meaning* invoked by an interplay of the four perceptions made above about ways of thinking, generating an explanatory model.

A proposed explanatory model

Considered reflections of all that my interviews had evoked resulted in my proposing an initial simple model. This model conceptually represents how an individual’s way of thinking (WOT) may need to be considered as an *interaction* between one or more of these four aspects of thinking. I have called it The Interactive WOT Model (IWOT). It may offer an important interpretive framework in which to understand the ways of thinking phenomenon. It has sought to bring together not only the central *how characteristics* of thinking and the *what content* of thinking, but also the *when/where contextual* aspects of thinking, all of which may be importantly interpreted through asking some of the *why or contributory influences* questions. I suggest, as also did Barrell (1987), that *cause* in this qualitative context refers to the discovered meanings understood from within the lived experiences, and therefore the causal question may be appropriately

answered by the participants themselves in shared and meaningful insights with me as the researcher. The model seeks to bring together these wider implications of the broader perspectives concerning how we think.

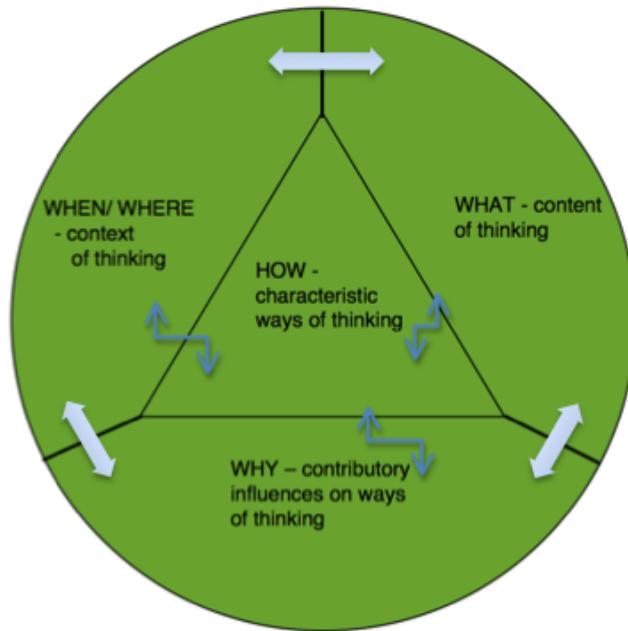


Figure 6.2. The Interactive Ways of Thinking Model (IWOT)

This model, formed directly from my considered interpretive analysis of all cases, has taken into account the multiple codes described, the patterns that emerged, the overall phenomenon of interest, and the themes that were evident. The wide gamut of information provided all sits into one or more of these areas, so I suggest that this model seems to cover all cases, and also allows for unique combinations. For example, Case 4 LO refers to her way of thinking as *I think in pictures when people are talking particularly, when I'm thinking something through, and when I want to have it in some sort of order, rather than being very scrambled in my head*. But then she almost immediately described how that way of thinking was influenced or impacted on by other things: *because I have a particular love of words, I love to make a sentence or a sound that feels nice and fits right, in my head*, as she accented her feelings, her love of words, and by the fact that the content of her thinking involves *lots of ideas - I'll think one thing and then I'll be thinking about something else, and then I'm thinking about something else, and then something else, and something else... (R: hm) – and I try then to put it all together to think what I think*. Just in one example, we can see the interactions spelt out: in this case alone, there are many examples of *complex* way of thinking.

Yet if I take another case, a simplicity in the way thinking can be observed, as Case 8 MAC stated: *I don't spend a lot of time just thinking – unless its purposeful*. Describing what happens when thinking, she said: *what really first comes to mind is, what are the things I really want to think about, rather than just letting myself phase off into no man's land*. In this excerpt, MAC reflects on the place, purpose and value attributed to thinking, and that eventually allows her to reflect on her way of thinking as *I do that fairly quickly, um,... it may only be a very short time I spend just sitting thinking, before I actively start doing*

something about what I'd been thinking. And later: I would describe my thinking as fairly concise – so I try to use as few words as possible in my thoughts to come to a direct understanding or solution. She went on to describe her thinking, as contrasted with a friend, whose characteristic thinking moves around things, and from my perspective takes ages to get around to the crux of the matter. MAC then went on to say more about how her thinking compared with that of her friend, which she saw as quite different: my thinking is more considering the practical implications, whereas his thinking is actually more based around...the philosophical underpinnings that might have some relationship to the issue. Again, MAC's awareness of the differences between the two are shown in the following excerpt: My understanding of it is...that his thinking is often just for the sake of thinking – he just enjoys thinking and its almost irrelevant whether it is about this or that, unless he's highly interested in something. Mine is much more likely to be stimulated by an interest or a need that drives that thinking.

The model suggests a complexity of possible interactions that not only accounts for an explanation of an individual's way of thinking from one perspective only, but also provides for the likelihood of overlapping effects: for example, from the *context* interacting with *content* and vice versa; providing some insights into the effects of the *contributory influences* that may separately or together interact on an individual ways of thinking at any one time. The last example referred to above, one of many that could be cited, draws attention to the very personal perspectives of the lived experience concerning the ways people think. However, the broad phenomenological concepts of thematic perceptions needed to be revisited, in an attempt to return to the research focus more distinctly, to consider the data in specific relation to the *characteristic how* of thinking.

Iterative process in explicating the ways of thinking phenomena

As a necessary iterative reflection of all that had been shared and thought about over the past few months, this required a more definitive understanding of the evoked codes within characteristic ways of thinking. The themes already had shown the possible complexity, and were supported by what Molbak (2012, pp. 189-190) had referred to as “one’s perception...just as is thinking... is never separate from an existential possibility of being a person”, inferring the wonderful potential for individual differences to be related to the interactive effects of one’s lived experiences. However, in singling out the concept of *how* one thinks phenomenologically led me to realize that what was now needed was the *clustering* of reported differences that might more clearly explain them. This needed to be within an interpretive framework, in order to gain an “insight into shared human phenomena which can never be experienced in their totality by any one individual, but requires an act of abstraction by the researcher who seeks to describe the constants of an experience from underneath its many possible subjective permutations” (Molbak, 2012, p. 193).

Though this latter form of an existential phenomenological understanding of psychology would limit how much one might ascertain an objective and nomothetic perspective, given that even subjective experience is seen to be never static but always changing, nevertheless I had come to the conclusion that it is important to try to grasp what underlying concepts may be relatively stable. From a psychological

standpoint, this stability undergirds most theories of individual differences (Donnellan & Robins, 2009), and has therefore been an important foundational key element in meeting the ultimate goal for *this* part of the research: to contribute qualitatively in developing a new questionnaire. At the same time, it is important to acknowledge that this basic principle does not deny the potentially important role of human agency, even within the present concept of individual differences in ways of thinking. This very human element can imply that both biological and emotional factors may play an ongoing role, and certainly requires consideration, but is beyond the scope of this research. The primary focus remained: to answer the query about how one person thinks differently from another, so I needed to identify from the multiple cases interviewed what deeper collective understanding might be obtained concerning specific patterns in ways of thinking.

Bearing in mind only the descriptive code words related to *how* one thinks saw them naturally forming into groups: this process is referred to as textual or structural descriptions (Moustakas, 1994). To illustrate such groupings, I found a frequency of certain words that were used as code descriptions, like questioning, technical, detailed, think critically, careful, factual, logical, straight-forward, practical, precise, rational, non-philosophical, that seemed to indicate these thinkers might be described as *analytical* thinkers. The Oxford dictionary points to many of these words as being synonyms for analytical. After further reflection, and sharing these with a colleague, the fact that these participants were analytical needed to be qualified: the focus of individuals who used these words predominantly remained on tangible facts, with a concrete way of thinking that facilitated analytic movement to gain more factual information. A word that better seemed to fit the description of this one group of analytic thinkers was that they think *realistically*: uninterested in thinking philosophically, in allegories or metaphors, but rather preferring to think and speak in terms that kept their ‘feet firmly on the ground’. Their answers to most questions could be analyzed as brief, factual and to the point: any departure from this was only so that the details might be better known. Asking the details in order to know the tangible facts was their central quest, so I have called Group One the *Realist thinkers*.

Emerging perceptions of how other individuals think

In contrast however were the number of cases who, yes, were also committed to analytic thinking, but the difference seemed to suggest an alternative method and purpose of analysis: reported as a deeper involvement with both ideas and supporting evidence, to the end that these individuals might gain meaningful knowledge and more importantly, understanding. The process of thinking for them was often indicative of their interest in the deconstruction of ideas, theories, and language, reporting such things as ‘reading between the lines’, in order to discover the meaning. For this group, asking *why* was always the important and essential aspect of analysis. For example, Case 1 reported: for me, understanding *why* those rules: whether those rules are in electricity or theology, for example, it is extraordinarily important. So for me to understand WHY we have been given any law, that can lead to an intolerance of any rule or law that has been made simply for its own sake. And in the context of dealing with more practical issues, he said I very much want to deconstruct whatever, and I need to deconstruct them... and I very quickly see

mechanical relationships between those deconstructed constructs. Then I can understand...and can do what I set out to do.

Other examples of such thinking help identify this altogether different group of thinkers, indicated by such coded words and phrases as: *wandering in a web of ideas*, *creative*, *different from others*, *poetic*, *thinking in colours or symbols*, *original*, *contemplative*, *imaginative*, *thoughts going in all directions*, *like stars coming out at night*, *lateral*, *complex*, *philosophical*, all direct transcriptions from the cases that formed this apparent second group. It seemed to me these individuals indicated a strong preference for ideas, rather than a focus on down-to-earth consciousness that was more evident in the first group. I tentatively named these the *adventurous* or creative thinkers, individuals who did not like thoughts being too constrained, who enjoyed the possibilities created by ideas, thoughts, as Case 4 LO put it, speaking slowly and meditatively, with frequent pauses:

I love nurturing thoughts (speaking slowly), those that make me think ... something wonderful about life, or something that I have never thought about life before, that kind of gives another dimension, to how I experience life – and a kind of instinctive knowing about life. And that instinctive about knowing is never a certainty but its kind of, well it might be like this, and that's wonderful, and I've never thought of it like that, maybe its...maybe this is just how it is, and maybe it's not, but that was a great thought to have had about that, and I'm really glad I've had that thought.

Another example of this ideas-focused way of thinking was made in an interchange with MRJ, also speaking slowly, with deliberate pauses:

Having heard the word innate, hm,...the idea that something is with us from our beginning was quite new and exciting to me... And um, I suppose... I've just had a flash of memory about knowing things, that meant something to me... When I went to Central School, that was when we first were introduced to algebra, and that was the most mind-blowing thing, that you could, - my first introduction to symbols – just how one could use letters as symbols and numbers blew me apart, I just couldn't believe it (Res: And a good experience?) MJR: Oh yes! It was just, well as good as a shot of heroin, I feel like – it was...I still remember how I felt, the time and place and I still think of it from time to time, it was just wonderful!

Many such examples were evident from this group of interestingly different and expressive thinkers. But again, reflection on their descriptive, often graphic nomenclature led me to discover more about their being analytical thinkers. Analysis for *this* group involved a searching for meaning related to deeper understanding, questioning the meaning of life or events, with a focus not on the real world, details that can be observed and quantified, but rather on impressions gained, complex concepts that were more vague than tangible, the world of ideas. Though often these impressions could be described as artistic, this word was only used by me, and was not responded to as how they saw themselves thinking. The choice of specific 'correct' words, and the need for placing these meaningfully within a spacial awareness for their ideas, this was *really* important in their trying to grasp and express their own mode of thinking. All these cases claimed

thinking of itself to be a pleasure, regardless of desired or planned outcomes. They referred to *doing* as secondary to *thinking*, unlike the realists who were more inclined to do and then to think.

Reference needs to be drawn here to the very typical answers made by this group, in response to so many questions: they were often long, involved, complex and full of non-concrete ideas, with both acknowledged and inferred explications about their interest in thinking in ideas. Not being an ‘ideas’ thinker myself, keeping up with this world of ideas was often quite challenging, so that I had to be patient, concentrating on what was really being presented. As can be expected, this made their analyses much more time-consuming too. I have coined the word *Ideaists* for this second group of individuals: all frequently reported an interest in thinking in ideas, whether these were represented in words or pictures. Checking the Dictionary meaning of ideas also confirmed a relationship between many of the words encapsulated by this group of Ideaists.

In support of this term, my curiosity about the word prompted an Internet search: this revealed a small number of web sites that used the word Ideaist with a similar connotation or meaning. One site for example (dated Dec 13, 2011) indicated an internationally formed group of people under the title Openair Product Management. In one of its blogs, the authors stated:

“Ideaists are dreamers. They aren’t limited to the provided framework. It’s as if they aren’t familiar with the company’s product or culture. Ideaists will consistently color outside of the lines. They constantly ask “Why can’t we,” “What if we,” “How about if,” and “Can we do it this way?” Ideaists are great for product planning and innovation”.

The Guardian also (Oct.3. 2008) had called for “bright ideaists”, calling for “the UK's brightest and best techies and visionaries to contribute ideas to help build a better world”. I maintain therefore that there is a precedent for using this word, albeit not previously known or utilized, as far as I can ascertain, within a psychological and more academic field.

It is perhaps important to note that all four participants in this Ideaist group (see Table 6.2 below) might also be referred to as *idealists*, wishing they could live in a perfect world. But since that term was not acknowledged by any of the participants, I could not infer that all were indeed people who primarily functioned as idealists, though indeed may actually do so. Further cases, and perhaps revisiting the same ones interviewed, might generally find that this Ideaist profile of individual thinkers may find they are also Idealists: this latter term, however, commonly refers more to a general descriptor of principles or values held highly that motivate and guide an individual’s decisions, so may not really be applicable in this context since we are primarily concerned with *how* people think, rather than the *why*.

An alternative group of code words were presented to me by the remaining three cases, which at first suggested a third and decidedly separate way of thinking. Though this group of people were thoughtful, engaged in the process of trying to understand and express how they thought, frequently their words included chaotic, can’t say, non-philosophical, not academic, practical, not practical, thinking in my mind, think

different to others, hectic, worried, cautious, slow, unconfident, complex, never stop thinking, moves in all directions, practical, day dreams, need time to decide, think slowly, to name but a few of the self-descriptors cited by these three participants.

Seeking to see what commonly was meant by what had been expressed by these three individuals, Case 3: CC, Case 2: DeR and Case 5: DMJ, it became evident there were many thinking descriptors that referred more to the negative *content* of their thinking, and to their understanding of the *contributory influences* on what they thought, rather than there were clear understandings of their *characteristic* thought patterns. For example, in an interchange with CC:

I probably spend too much time thinking really – (Res: Is there such a thing as too much thinking?)
CC: Well probably... if its on the worrying side of thinking... I like to be fully prepared for anything that may come up (Res: aha), so I probably spend a lot of time thinking about what could happen, then spend a lot more time to come up with a plan to cope with it.

She further stated her disinclination to share her thinking by saying *its not something you verbalize, its something that's in your mind*. A little later, in reflecting on whether her pattern of thinking was different from that of her partner, she commented that *all I know about what he is thinking about is what he is doing at the time. I don't know if he's thinking, if he has plans, or has ideas, because I don't see them coming out or I don't hear them coming out!* (Reflective pause -) But maybe he sees me the same. I'm *thinking* a lot of things but I don't tell him, because it would take hours to tell him everything I've thought about in the day! (*both laugh*). This reflection of hers not only suggested a lack of insight about their differences, but also had a negative judgment about her own pattern of thinking that, as she made reference to shortly after this, *Its rather hectic ...sometimes even borders on frenzied, I think.*

Even when encouraged to perhaps better understand her own thinking, by my interchange about bigger picture thinking that I had noticed in the way she was sharing her ideas, her thoughtful response indicated a growing insight whereby she said *as I think about it, it's probably in my very nature....yes, like my Dad,* followed by *he would always be thinking of negative things that might happen.... he always thought about what could go wrong.* There were many similar comments that infer a lack of understanding, appreciation and positive perception of her thinking, and embedded in the content, helping me make what I considered to be an authentic appraisal of the meaning she had imparted.

When I looked further at the second case in this group, Case 2: DeR, I was struck again by a similar negative view about her own perceptions of her way of thinking: some of these have already been cited earlier in relation to coding. Several more here may make this clearer, to support the position I came to that indicated she too expressed a lack of confidence, a lack of self-awareness, and a negative view of her thinking that was similarly unhelpful in feeling affirmed about her worth as an able, deeply thinking human being. For example DeR said: *Its like there are different ways of thinking that people have, but there's a perception that there is a right way and a wrong way! and I don't get it right!* On her stating that *I wouldn't say I'm a quick thinker,* I then asked her if she thought she was a *deep* thinker, to which she replied: *About*

some things yes, but sometimes, that is not very helpful...(Res: why do you say that?)... because of a negative conclusion... This lack of confidence was also later referred to in her comments: if as a result of my interpretation of these things I think and then act in a certain way, that can lead to more negative thinking ...so if I could be less *subjective*, I could be a little less negative, and a, a bit more honest... more seeing things not so much from a personal point of view. The content of thinking here and many other citations also reflected her awareness that feelings played a big part in the way she found herself thinking, again very similar to what had been alluded to by CC.

The third case in this group, Case 5: DMJ also provided similar insights by someone who lacked confidence in her own ability to think; lacked an awareness of how to describe her way of thinking; and possibly as a consequence, she also lacked a clarity of understanding about her partner's way of thinking. For example, DMJ said I enjoy thinking AND doing, but my lifestyle means I do have opportunities for thinking that I do like....to which she later added when asked about how to explain that thinking, I don't think I'm a very organized thinker – I jump around an awful lot. Earlier, DMJ had stated I don't think very well really (tentative laugh) (Res: You don't think so, DMJ?) No, its just very random...I think very shallowly (continued embarrassed giggling). Here we see the same negative view of her way of thinking as the previous two in this group, though in a different context she later admitted ...when I'm thinking deeply about something, I do try to find the right word to express what I'm really thinking and what's going on...(Res: So words are important to you, DMJ?) Oh Yes, yes, I enjoy words, I come to a word, like peripatetic in a crossword, and we look it up for its meaning and its sound, and you can't wait to use it!

When asked to describe her thinking, there are some indications of potential deeper thinking that would have been more enjoyed, if it were less, as she put it undisciplined (R: an interesting word)..I know I should be more disciplined and more organized... because I know I waste a lot of time. She described this thinking as a need to feel free to *think creatively*, but followed this with a clear note that sounded out quickly just with thoughts (Res: ...Right) and (as a fast statement) not to carrying anything out! The story again unfolded of someone without confidence needing to carry out her thinking ideas, but in contradistinction to others she knew, she later admitted her way of thinking was very unconventional... something genetic there too, as a predisposition to being creative...but ...often, when my feelings are over-riding a rational thinking... I've become more aware of that, over the years, so I can share with a trusted friend what I'm feeling.

When asked about the way she perceived her partner's thinking pattern, she at first claimed they were very similar – another indicator of her lack of knowledge and insight, for later in a different context, she reflected on his being unemotional, factual, an engineer, that perhaps suggests a lack of linguistic differentiation of meanings that were difficult for her to enunciate. When we together discussed the differences in real-life scenarios, she later was able to say I don't think of myself as a fast thinker, but about her partner's as being fast, and that he thinks about Ahm...the logistics, and making things work, whereas I think about the implications on... say, on how others may feel about the decision and its impact ... sort of more looking at the bigger picture than he does. Again there are indicators of how much her feelings

influenced her decision-making, such as when I'm very influenced by...ah, the weather, if rainy, I do really struggle...I do what I have to do, and it just dampens my creativity. At times, she also was aware that her cautious thinking actually prevented a potential creative process: when I have to plan something, I do, I take my time, to cover all bases. As an important aside, as I was leaving her home after the interview, her partner arrived home from work. A brief introduction to why I was there resulted in his spontaneous comment: I can tell you how DMJ thinks – with her feelings! No kidding, pure and simple! I stick to the facts, but she thinks in feelings, all over the place!

Many more examples could be cited, but I hope these sufficiently support my view that, although there were some clear indications that any of these three *may* have been included in the Ideaistic category of people, rather than in the more Realistic group, the confounding codes highlighted a lack of confidence and self-knowledge, along with self-doubt that engendered a negative view of their own way of thinking. They consistently used code words such as narrow, reactionary, non-creative and chaotic thinking, thinking inside my head. These descriptors may be partially explained by the fact that, although each was minimally trained and worked some time in a fairly narrow and limited occupational field, none had experienced the benefits of career opportunities related to a tertiary education that *might* have given their developing and naturally more creative ways of thinking wings with which to linguistically fly. In fact, all stated they would have done things very differently had they had more courage, and been more confident when younger. It was also interesting, however, that none of them was able to establish what that *something different* might have been.

Given a lack of differentiated thinking that was evident in the other two groups, this third group was distinguished by their personal lack of confidence, and a consequential lack of a developed way of thinking that they could identify and own. By their own admittance, for example, they reported their thinking as rather confined, focused on practical thinking, though clearly they each were conflicted about the actual notion of being practical. An alternative word constrained might also have been an apt descriptor, though the Dictionary suggested its connotation as synonymous with being more controlled, inhibited and self-conscious, which did not altogether describe the thinking of this group. Potentially the term confined seemed to me to be non-judgmental, with no apparent implication about what had caused that way of thinking. However, there appeared to be no consistent perception about their individual thinking, with contradictions made by each about themselves, so that some perceptions actually changed somewhat during the course of the interview. I therefore chose to use the word Undifferentiated thinkers, as more accurately reflecting their few positive views but importantly contrary insights, with code words such as narrow, curbed, limited and slow that clearly contradicted their own perceptions of their way of thinking as being practical and fast. Their views also expressed a lack of adaptive thinking, a distinction that demonstrated a marked difference with others who commonly implied adaptability in their way of thinking.

In relation to this last distinguishing characteristic, a more detailed reflection was made of all seven of the cases in the analytical groups, to further make meaning of the thinking identified in both groups. This enabled me to realize that both the Realist thinkers and the Ideaist thinkers were individuals who evidenced a large commitment to thinking adaptability. Accordingly, I have then grouped the two together as Adaptable

thinkers; however, my intuitive understanding and past experience causes me to suggest that more cases might in fact deny this unity. Some additional exemplars from both these groups potentially may evidence some from either group as being less adaptable than these cases have suggested. Such additional insights would then simply leave the *two* groups as separated at the second level: Realist and Ideaist Thinkers, with a seemingly separate group that might best be described as undifferentiated Thinkers.

The following table allows one to reflect on the differences observed between the three groups of people, with some communality of attributes, allowing these to phenomenologically represent all the cases interviewed. Colours that highlight the differences will be consistently maintained when later referring to these clusters in more detail.

Table 6.2. Grouped Case comparisons: Inductively developed thematic categories as WOT Attributes

Thinking Types	Realists	Ideaists	Undifferentiated
Attributes	Cases 7; 8; 10	Cases 1; 4; 6; 9	Cases 2; 3; 5
Adaptivity			
Adaptivity	Analytical/adaptive in finding specific details	Analytical/adaptive, while gaining understanding	Non-adaptive, fearful of changing thinking; rigid
Implications of thinking			
Implications of thinking	Practical; confident; matter-of-fact; pragmatic solutions	Idealistic; enjoys thinking for itself; solutions don't need to be practical	Different from most others; unconfident; diffident in expressing thoughts
Thoughts			
Thoughts	Shallow rather than deep; straight-line	Deep; wanders in ideas; contemplative; lateral	Narrow yet often flighty; anxious; slow
Preferred focus for thinking			
Preferred focus for thinking	Details, pragmatic, real world; to know facts; tangible information	Logical; philosophical; theoretical; conceptual; meaning; understanding	Details that need attention - aware but unsure/confused re how to solve issue
Verbal or visual			
Verbal or visual	Mostly as words; sometimes in pictures but always true to life	Imagery: pictures/ words/ colours; diagrams, symbols & abstract ideas	Labored thinking, confined by finding the right word; ideas in pictures
Time needed to think			
Time needed to think	Quick; impatient with others' slow thinking	Slow; contemplative; broad & lateral, so value and need time/ can't be hurried	Slow and limited; focus of thinking mainly to avoid possible problems
Characteristic mode of thinking			
Characteristic mode of thinking	Very focused; realistic but can get stuck with facts; not creative; here and now	Creative and reflective; not disciplined; freely explores; enjoys sharing unrestrained deep & integrative thinking, searching for meaning;	At times non-focused; mostly thinks inside head; can be disciplined/structured to complete a task; prefer simple non complex thinking
Purpose of thinking			
Purpose of thinking	Looking for implications related to the facts, mostly directed by immediate need	Big picture: disregards/ forgets unimportant details; exaggerative, expansive; loves the wonder of ideas	Random, bubbling ideas that keep being mulled over; tries to be quick but frustrated
Clarity of thinking			
Clarity of thinking	Factual; detailed; not complex; straight-forward; accurate with technical matters	Observant; quite complex; details important when need to be right to understand or when thinking technically	Wooly; unaware of <i>how</i> their thinking differs from others; negative thoughts, odd, weird, not clever thinkers
Driven by			
Driven by	Getting the factual details clear in order to do/make	A deep constant need to understand/ be understood & to know if interested	Lack of confidence & knowhow; fearful of negative consequences

Phenomenologically derived portraits

From the themes derived from case analyses, the phenomenologist is able to write a composite description that highlights or gives the essentials of experiences commonly reported. So rather than looking at clustered variables, as would traditionally be done in quantitative research analysis, I here look at the three clusters of *individuals*, and have attempted to present each cluster of individuals as one person, though in fact they are three or four respectively. Each portrayal of the three *types or groups* does not suggest that these descriptions are like a piece of clothing, where ‘one size fits all’; within each portrait, therefore, the representative depiction presents what things are held in common, but will also be counterpointed against individual comments that identify differences even within their respective groups.

Conversely, presenting three distinctly different portraits in no way suggests that each are so different that they share nothing in common: as already stated, for example, analytical thinkers can be seen within the both groups of thinkers. In addition, details can be as important to get right for the Ideaist as for the Realist, though this will be less evident for the Ideaist who is either not interested in the field under discussion, or because of a personal decision made about what things are more important. The cornerstone of a cluster of individual thinkers is the overriding *preference* that each has presented over the other group preference. The phenomena around the concept of ways of thinking have demonstrated how in many cases, and at specific times, an individual uses the alternate group’s mode of thinking. This is reflected in contextual matters, as well as reported within their conversations about the content of thoughts. However, I tend to think that this may represent what analogously is seen with the predominantly left handed person, who does most things with her left hand, but has developed a pattern of using her right hand for, say, ironing. In other words, the commonality referred to within each cluster represents a preference, but does not exclude an oft perceived ambidexterity that broadens, for example in the thinking process, how well the mode of thinking is available in different contexts.

Another important concept here refers to feelings, emotions and moods, and the relevant impact they have on each person, regardless of their preferred way of thinking. The degree to which these have an affect on an individual’s way of thinking is as personal as the number of instances of participants. In deference to this complexity, the uniqueness of each can never be disputed or simply washed over. It is equally interpretable that this affect component can also account for a long-term two-way effect on an individual’s personal style of thinking, that in turn impacts on the confidence with which an individual subjectively understands, appreciates, and uses that thinking. As observed even amongst those of the undifferentiated group, there were many things reported on that gave hints of ways of thinking found in both the other groups. It would be helpful in the future should more cases be considered, however, to reflect further on a deeper understanding of how an individual’s way of thinking may indeed be differently perceived, particularly if these were individuals who provided differing evidence of the experienced impact of feelings on thinking. And again the question naturally arises about how well the individual participants were in tune with their own feelings, inclinations and preferences.

But there remained the greater challenge: to report my discernment of the essence of the reported phenomenon of thinking, adequately covering the similarities and differences heard, whilst at the same, doing justice to understanding the individual cases through their reported “meaningfulness of human experience as it (was) actually lived” (Barrell et al., 1987, p. 445). To create a flow of information that is easier to read and comprehend, three different portraits are presented using many of the phrases and code words identified by individuals, though I have not identified these as quotes. They are each written in first person format, to highlight the subjective and human-centred focus of the research. It must also be noted that I have interpolated snippets of my own interpretive understanding of the portraits presented, though these were discerned with individual participants through a reflexive interplay, during the course of their interviews.

In prefacing these three verbal pictures, note the fonts chosen, by which I seek to highlight something akin to the simple, florid and alternatively contained thinking styles that mimic respectively each of the three profiles. I would also like to suggest, as if these profiles were to be presented as pieces of art, that the *first* more visual picture would be of a *Realist* individual enjoying completing a task. Though such a picture might basically be in black and white, there would be contrasting splashes of colours throughout, to highlight what details an individual might consider important.

The *second* painting would be a more abstract, colourful, yet more contemplative picture, with forms and shapes that might only *represent* an issue, or be a valued insight, like a representation about someone being watched by the *Idealist* artist, hoping his/her art would be loved, appreciated or understood by the viewers.

The *third* picture is less clear: the shapes and patterns would be rather indistinct, like shadows of reality in muted pastel colours, possibly with a somewhat *undistinguished* individual trying to complete a task, but calling for the help of another more definitive person nearby.

Portrait One: the Realist thinker

My ready response to a question about my way of thinking is quickly formed, allowing me to give what seems an obvious answer: As a practical person, I think in very concrete terms. I describe what I can see, hear and touch quite accurately, with a careful attention to detail, but without giving unnecessary ones. I do think in facts, and am likely to consider those people who take too long to tell a story or to get a job done as really wasting time. I have learnt over the years to be more patient, though obviously some who are realists like me haven't, and they can seem very unkind. I can acknowledge my feelings when sincerely asked about them, but it is my intention to keep feelings in their proper place, so that my thinking is not too affected or might get the better of me.

When it comes to my view of myself, I can be very specific about what I know, and also ruthlessly honest about what I see, both in myself and in relation to others, for example, things that point to personal limitations. I don't think of myself too highly, because the facts seem to speak for themselves, so

I can quickly dismiss comments that seem to be flattering, especially those suggestions that I would do really well at something that has not been part of my experience. This lack of past experience can influence how I decide (and sometimes too quickly), like whether or not I can agree to something requested of me; it can also be related to the choosing of one of several options that quickly consciously come to mind when making a decision. In some cases, I will often resort to writing things down, just so I can see these options more clearly, and to make sure I don't forget what I've decided to do – but I know there are some people who think like me but who never write their thoughts down. Because I am practical, often people think I can do anything, but I do have difficulty with more complex tasks and new challenges; partly I think because I don't want to test my potentially undeveloped skills, and partly because again I am impatient with having to read the 'how to' information, that might either be too time-consuming or potentially beyond my understanding.

To be efficient with time, I have learnt to do a lot of thinking on my own: this allows me to more quickly get a set task or job completed, whether this is pleasant or unpleasant to have to think about. When it comes to problem solving, I look at the problem, gather as many facts that I might need to consider, as quickly as possible, before starting work on the solution. Some of my type seem to be more able to take time with this initial part, but I often find I am doing before I've really spent much time thinking out a plan. Some of us are accused of acting then thinking, and that is sometimes really true! Then of course I can get frustrated, because I haven't properly understood the problem or the underlying theory. I am actually quite impatient with theoretical issues – I would prefer to focus on what is tangible, seeable, and therefore I don't like dealing with things that are too complex. When I realize inside my head that I am lacking some understanding, and mostly because I have not had any experience with a particular issue, I am likely then to turn to someone else who does seem to enjoy thinking for its own sake. But I only want that person to tell me the barest details needed: I get impatient to want to get started. If too many details are needed, I can get overwhelmed by them. At that point, I am likely to want someone to complete the task whom I believe is more competent to understand and enjoys the complexity that I don't!

I seem to find most people like myself can think quite quickly, even on my feet if need be, though the more introverted ones of us don't like sharing their thoughts out loud, unless they are with people they feel comfortable with. I think confidently about things I have learnt by experience, but I can be diffident about claiming I can do something, especially if it seems too difficult. Some who think practically like I do seem to have really good ways to structure their days, but my personal preference is to go with the flow. Some like me seem to enjoy being really tight with scheduling, being good at appreciating time limits, while others of us tend to organize our thoughts, and therefore our plan of attack, simply to avoid not getting something done that we've already thought is important to do.

As I've got older, I have learnt some things that have changed my ways of thinking a bit: like with the planning, and has also developed regarding being more adaptable with time. For example, when I

was younger awareness of time always drove me to speed, rather than a more thoughtful approach that has become easier; years of experience has helped, and probably ageing too, in slowing me down! The time issue though still makes me very aware of the actual time, so that I am pretty good at knowing what time is needed, for example, instinctively knowing the shortest route, and thinking fairly accurately about how long it may take to complete a task.

When it comes to dealing with things that have upset me, I find, as some others with my way of thinking do, that it is best to write things down. Then I can more easily just 'turn the page', and get on with the next thing needing my attention. Some others who are quite realistic about life quickly form black and white opinions and beliefs, based on one experience only, while others of us will at least have learnt to be a bit more open-minded about what are the facts, before really making up our minds. Once this has been done, however, it is not easy to change this view, unless the stark facts really hit home, making it impossible to retain a previously held perspective.

When asked about my thinking pattern, like if there is nothing really needing to be done, I recall finding it difficult just to think vaguely, or imaginatively: at such times, I enjoy reading a novel, or book of historical facts, rather than what I call sitting idly, doing nothing. I also enjoy watching people, or TV, thinking about the implications of what they are doing, making certain assumptions probably based again on past experiences. And if nothing else to do, no good books to read, I actually enjoy getting out some craft activity, thinking as if talking to myself with instructions about how best to complete it. I can also enjoy physical activities, like going for brisk walks, but preferably with lovely things to see along the way that engages my positive thoughts, and preferably on new routes, so there is something fresh to see and therefore think about. For when I think about my way of thinking, I do prefer thinking positive thoughts, and quite quickly try to dismiss any thought that could be troublesome.

In my thinking, I am often described as being creative, because I often think spontaneously, and at times don't like being constrained by what others think or traditionally do, though I recognize that this doesn't apply to all who might otherwise think like I do. It is also true that other people who think in more realistic terms can be described as conventional and non-creative – I don't know whether this is because of my personality, my experiences that have encouraged me to be more of a risk-taker than others, or perhaps may simply be because I like to feel free from obligations to be other than who I am. I expect people to accept me as I am, but I am aware that this probably means not everyone will like me – so be it. In this way, my thinking realistically sits well with such a view, and enables me to think much the same way about others who think quite differently from me. I know that different thinkers can often fill the gaps that I can't adequately fill myself. Such people become a good and complementary balance to my more focused perspective that at times can be quite limiting and be a nuisance. Though the more deep and complex thinkers can also be very frustrating, most of the time when I understand what a person is like, I do value their way of thinking - particularly when the need to understand has made my dealing with life more challenging than I like it to be. But enough reflection: I must get on with living!

Portrait Two: the Ideaist thinker

The thing that first comes to mind when asked about my way of thinking has me going inside myself, asking questions like: how do I answer this? What do I really know about this? Why is it that I can't really make this clear enough to myself, let alone to someone else? What aspects do they want me to really consider, and in what context? Already I can say that my way of thinking has me involved in always looking from various perspectives, grasping for meaning, trying to find adequate ways to determine what might need explicating, and always, always trying to understand. Always has me thinking about the right way of thinking, getting things right, but never seeming to come to closure about so many thoughts that confound any final definition, any adequate explanation that fully explains how I think that must always include my understanding.

Some who talk to me about how I think encourage me greatly, because they too seem to struggle with the complexities of living, let alone all the other unending questions I face, like what someone means when they say this or that. In other words, my thinking always has me trying to read between the lines - and then I can be accused of making things up, getting it wrong, exaggerating, or simply not understanding, so then I am left in a vagueness that is quite uncomfortable. Because clarity of meaning is so important to me, when I am feeling out of sorts, disturbed by an event or crisis of conscience, or simply through tiredness or an over-commitment that has not enabled me to get enough time to process what has been happening in my life, my thinking then becomes very unreliable, very lacking for being able to think clearly about what the real issues are that need to be addressed. This then becomes a circular problem: when I can't think something through, meaning is lost, and life becomes thought about as even more complex than it would normally be.

On the other hand, when things are going well for me, I really enjoy thinking for its own sake - and this can be about many, many things. For example, I can enjoy just imagining, and get carried away in ideas; meditating, contemplating the beauty of the world around me; without really taking in the details. Or I can enjoy thinking philosophically about life and what things mean; where life might take us; and I can even get carried away with what potential new things I might write about or think of creating. Like others, I can get thoroughly involved in analyzing things; particularly when I am confronted with some issues that I want to understand. But this analyzing can keep me caught up with lots of associated ideas, rather than just thinking about the simple earthy facts of the matter, because in typical fashion, my thinking needs to understand the complexity.

All this can lead me to losing a sense of time, and although I might know I need to get some specific things done, time just seems to disappear - unless of course I strictly monitor what I am doing. As described by others who seem to connect with my way of thinking, some of whom are quite artistically creative, they likewise describe their thinking as like being in a

bubble; like me, their experience is of great enjoyment in just wandering around in their ideas, and we can get quite lost in them. Living can then interrupt such a flow of ideas and can cause us to feel shocked when the reality factors hit!

I also find that my thinking doesn't always come to me as words: sometimes there are simply diagrams, colours, shapes that inspire, and these may be followed with dreaming, and this can be like being in another world. Sometimes this leads to thinking about making or doing something the patterns have stimulated. Much of my creative thinking revolves around ideas; and I find most people who think like me really value being able to share these ideas, no matter how 'way out' these may be. It is also interesting that when we do share ideas, written or verbal, we can all be very particular about the choice of words to express these carefully, to make sure that we are fully understood.

Understanding and being understood is so important to me. Any lack in this can leave me feeling impotent, or even angry, because understanding is something I always work hard to achieve with integrity. Being misunderstood makes me doubt myself, especially if others doubt my integrity, which is really an essential part of my thinking preference. Misunderstanding can make me thoroughly disenchanted with life, and can result in my thinking pessimistic and unhelpful thoughts. As you can see, my feelings about myself are essentially part of my thinking, and at times can be a preoccupation that makes normal living difficult.

When things are great, however, my inspirational thinking spins off positively, both to inspire others, but also to get me really excited. This can even mean that what would seem a simple otherwise boring task can become complex, with lots of other ideas thrown into the mix, so that I can almost become obsessed with the details. For some of us Ideaists, this may be in mathematics or statistics. Others of us go overboard in our chosen artistic activities, endeavouring to make these perfect. I guess this explains why we can feel desolate if the uniqueness of what we have produced is not appreciated.

Some Ideaists say they have learnt to be very disciplined in their thinking, in order to produce well-developed pieces of art, but this doesn't come easy to me. My preference would be to live in a world where there is no time constraints, where my thinking could take off into a world of who knows where, and who knows who might go with me - preferably someone who is equally interested in ideas! But no, I know intuitively that this wouldn't be good, for me as a person, someone for whom integrity, my sense of wholeness in a meaningful existence, makes me want to do worthwhile things with life. And knowing how undisciplined I can be in my thinking, over the years I have now come to appreciate, rather than feel threatened, by those whose way of thinking is so different from my own. For example, those people who are factually oriented, and for whom thinking is straight-forward, and relatively simple, those thinkers do allow me to sense, even as they lovingly challenge me, (particularly when my own thinking is

making a mountain out of a mole-hill), that my complex thoughts have gone far enough and need to be brought back to a more finite reality.

I can also appreciate that my way of thinking often concerns the bigger picture, and so it can be important to share my understandings with others, especially with those who get stuck with the details, the things of the here and now that means they don't or can't think about other potential possibilities, and who lack any thought of the necessity for future planning. And when these more factual people express appreciation, I am even more likely to become enthusiastic; I'll then feel more competent to advise and steer the more complex decisions that are necessary. I have come to know that many of the more factual thinkers don't even see the problems, and therefore I sense they may actually need something from me!

But I also know that, while I have good insights into the larger concerns, once these have been shared, I am sure I often need the practical thinkers to come up with some of the more earthy solutions that can make it happen. My enthusiastic thinking often occurs after I've been inspired by someone or something, like a great book or good discussion: then I want to see things happen. But if this involves a lot of repetitive tasks, my visionary thinking starts to wane, looking for someone who can finish it. At times, my inspired thinking means I start something quite imaginatively demanding, but half-way through it gets put aside, taking up another inspiration, so that I often have lots of things on the go at one time, which can be exciting but also quite draining.

I do so enjoy a good discussion that challenges my own views; however, these inevitably are with people who also relish thinking more laterally, 'outside the square'. But sometimes, I have experienced spending many hours with such people, and in the end, I feel exhausted: this has me reflecting on what there is about my thinking and theirs that creates such fatigue, when I have enjoyed it so much. Clearly, trying to make sense of the issues, it involves finding meaning in what has been shared, and without clear theory that would enable my coming to some authentic truths or at least some happy conclusions that I can live with, these deep conversations can indeed become disturbing and unsatisfying. It seems even creative thinking, for me at least, though maybe not for all thinkers like me, needs to produce something of worth, something that can be tied to something of reality, even if only to some tangible implications, understanding or application to life - these remain important in my thinking. And this may explain why, when thinking of simple numbers or learning facts, that had made school so awful for me, or pulling weeds in the garden, though these of themselves might be mind-numbing and boring, especially if repeated too often or for too long, such pursuits can sometimes stop my interminable thinking for a while, providing a much needed time out, a rest from my normal serious thinking. At other times I can enjoy the respite provided by such mindless 'real' endeavours, like lawn mowing, to let my mind enjoy its

natural love of wandering off into pastures green, unfettered by having to come to any important resolutions.

Even as I reflect on what we as a group of Ideaists have shared about our way of thinking, I am struck by listening to our usually long-winded, complex ideas that cause even our sentences (as I read them here!) to rarely be expressed in simple terms. Explanations are always important, because I find understanding is so important, and I expect others to also find that so - but my thoughts can be so long-winded and complex.

I need to explain, however, that my thinking, as with others Ideaists, the opportunity to think deeply and complexly is really enjoyable - a bit like eating chocolate - but deciding when enough is enough is always difficult to determine in advance. I have therefore come to understand that some discipline needs to be exercised. Such a habit might enable me not only to accomplish tasks I want or need to accomplish: it would also give me the time that I need for the creativity my mind, my thinking needs, to recharge its oft tired, over-worked batteries - a great idea...I hope I can carry through on this one! I think it certainly needs to happen before thinking about taking on any new, meaningful, and often complex thinking that I do find exciting to think about, and so fulfilling when I eventually bring them to fruition

Portrait Three: the undifferentiated thinker

When asked about my way of thinking, I felt totally incapable of describing how I think. What I do say is that I don't like having to think too deeply because this stresses me out. I sometimes think I was born with a brain dysfunction, because there are many times I am not able to know what I think, let alone be free enough to share my thoughts. My thinking is quite quick when it comes to automatic things, doing things I know I can do, uncomplicated things like housework, shopping and even thinking about and planning a holiday. So now that I think about it, I do know I am not stupid. In fact, there are many times when I observe others, I can clearly see how stupidly they act, but I can't put my finger on why they seem to not learn from past experiences. I have and always will.

When I think carefully about how I do think, and I'm normally careful about everything I do, I can say there are times when I enjoy thinking, especially if it has something to do with the here and now – thinking too far into the future always seems too difficult to imagine, so I don't – I am not good at letting my imagination go, because that can get me thinking quite negative thoughts, and I find it hard to stop them. I also find that solving a problem can be quite stressful, particularly if it involves personal relationships, personal issues. I know in my head I can be very aware of things that need to change; like when it involves practical issues, these I can deal with. I guess this helps me to realize my being more confident to think for myself is only when I have had a lot of experience with something. I really didn't have a problem looking after the kids growing up – I just had to do the same things most of the time. But I have also noticed that when sitting in a group, even amongst friends, and discussing some decisions that need to be made, I do think quite deeply about the implications, and at times, would start to share my thoughts, only to find the group had finished and moved on to something else! I feel stupid then, both because I was too slow, and also because I believe the group had

not seen the bigger picture as I had, so they had made a rushed decision that I could have prevented, if only I'd shared my thoughts.

I think before doing everything, really; this takes a lot of time, and sometimes people get a bit impatient. When asked about my thinking and what thoughts I have about needing time, I have just now been encouraged to think that through. Having realized I'm not stupid, I have to think again... I do know that as a child, I was often quite anxious – I felt a bit different, not like everybody else, and that had me not daring to take the risks others seemed to find easy. I still daren't. I only like staying where I feel safe, and thinking about things I know I can handle. I remember later on in school years, I could write quite well, about anything, especially if I understood it. Some others like me have also said their teachers didn't seem to understand them, and criticized their thinking too – saying they had wooly thinking. I remember my reports always said I needed to concentrate more: I do think I spent a lot of time day-dreaming. I didn't feel school was a happy place, so I hoped life after that would be a lot more comfortable. And mostly it was.

But I do resent not being encouraged to go further at school or on to Uni – and this might explain why I stuck with thinking a lot on my own, and without much confidence, and not too far away from the real world I had been living in. I sort of felt Ok when doing office type work, though was glad to leave it behind: working with others always had its nice social times, but nothing too much was demanded of me, so it was sort of comfortable.

When I've talked to others who also didn't have a real career, some said they always loved the idea of learning new things, so reading books came easy for them. One person like me, though, found it difficult to concentrate in reading, so we agreed we have to pick up things like magazines that are light, short, and about things we are interested in. I find my thinking itself keeps on and on about something I'm interested in, so that can also mean that my head gets tired of thinking. I know it sometimes helps to share with a friend, because that clears up a lot of what I'm feeling, but I can't expect that all the time – otherwise they'd always be listening to how I might ramble on!

I must admit I hadn't really understood how my partner thinks, though at first I thought we were pretty similar. But when talking about ways of thinking, and the potential for being quite different came up, I was able to think more clearly about how different we actually are. I have assumed we were the same because we share a lot of values – this has become more so with years together. But I sort of know he thinks differently because he thinks about the straight facts, and the logic – he doesn't seem to get caught up with his feelings. I don't always *know* what he is thinking, because he often just goes and does, without much discussion. But I need to talk, especially to make any important decisions – fortunately he seems good at listening then, and that helps to put my mind at rest, to stop my incessant worrying.

I now understand what my partner sometimes says about me, too, that my way of thinking is so often clouded by what I am feeling: and when that happens, I expect someone else to think for me, because I can't think straight... although, I do resent that when it happens. I *feel* that I'm quite good with ideas about what we could do, or where we could go, and even when thinking about what things need to be done, say at home. I also feel I can assess things and think about some good things, make some good suggestions. But then its usually my partner has to be the one to make it happen, to actually physically do the work. I often have doubts about whether I can do things, unless I'm shown how. Some like me say that they have the ideas, and their partner makes it happen, and I admit that happens with me too.

I wish sometimes that I had more confidence to think for myself, and to say more confidently what I am thinking. I suppose I still have some time to learn: because when I'm encouraged, I do find it easier to say what I really think. If I'd been able to do a different job, I might now have been less uncomfortable in sharing ideas and thoughts. But really, I still don't know what I would have done, though probably it would have been to do with helping people – I like that, and do spend time thinking out ways to help, when I can. But I know I quickly get down on myself, and I become more anxious, so I stop the thinking and do something I like doing – like being in the garden, or planning the next trip! I really enjoy that sort of thinking – its not stressful.

A brief summation

How do I conclude this chapter, full of personal journeys and insights gained through my consciously intentional questioning, listening carefully to a select number of people who seem to have quite different ways of thinking? How can I sum up what individual ways of thinking really are, from these ten cases? And how can I conclude this report on the opportunities for growth observed through these interviews, to make an authentic and honest evaluation of any potential *long-term* benefits found through the findings attributed to these separate interviews?

I do know that I have sought to stay faithful to comments and insights of these individuals, and in completing this phase of the research, I had briefly asked for any feedback of the process after each interview. This was done at the time, rather than a more formal check that would have sought retrospective reflections, knowing that some individuals are more or less able than others to evaluate comments made of themselves, and when it comes to viewing themselves as others see them, numbers of questions had arisen in research. For example, some research has found the retrospective opportunity for feedback as presenting some potential problems, as seen in the responses of a participant in another qualitative study, in which the particular case was later asked to reflect on a phenomenological account of her interview, she commented: “...though I had little argument with the themes...I never felt I was being misrepresented...I was left feeling all at once I had said too much and should also have said more” (Wertz et al., 2011, p. 349). That experience certainly seems to justify a cautionary note, having the potential for creating inner conflicts that may arise about the findings. When these relate to any perceived expertise of the researcher, additional issues may result, particularly when that includes psychological understanding that might “go beyond, and even contradict, the participant’s self-understanding” (2011, p. 359).

I was surprised to have found, however, such interactive sharing with ten quite different individuals to have been an effective means of discovering such incredible details concerning different ways of thinking, with valuable insights gathered from each participant’s one hour of interactive sharing with me as the facilitator. I have analyzed and collated these findings in a very bottoms-up approach: by this method, participants were encouraged to provide their own subjective and mostly naive perspectives as best they knew how. I was impressed too that this method of data collection grasped a huge plethora of ideas that produced important codes, leading to the identification of patterns, and then finally, using an iterative process of analysis of all the information shared, to the discovery of apparent undergirding themes.

I was even more fascinated that reflection of individuals' separately divulged perceptions of their lived experiences enabled a clearer understanding of what meanings were attached to their understanding of their particular way of thinking. All participants stated that the interviews were found to be positive experiences, with statements that reflect their having been glad to have had the opportunity to interactively think about themselves, with each expressing surprise at how much they had learned about themselves in such a short time.

While these findings are satisfying, I do understand that they are merely reflective of the findings of a small group of people. If a different ten had been selected, I *may* have had some different responses to reflect on. But as it stands, the findings suggest that there were two main groups of thinkers found in this study: the Realists and the Ideaists. These two seem to be frequently encountered within our everyday experiences, ones that popularly report on comments about people as being doers or thinkers. Unlike this popular perception, however, the distinction made in this research does not suggest that Realists do not *think*, but rather that they think fast, and spend only enough time to help them register what is before them before acting. In this multiple case study, I have found new evidence of meaningful insights and perceptions of distinctly ways of thinking from these few participants that supports my understanding of there being two main groups of thinkers.

I propose then that this first group represents all those individuals who prefer to concentrate their thinking in terms that tell us in detail how they think that relates to a *real* world. It may be that this group is the larger group, particularly where the society demands a reversal of the value suggested by the phrase "too many chiefs and not enough Indians". For these individuals, regardless of whether they admit to an impact of feelings, their thinking primarily expresses concern with what can be seen, touched and handled. This thinking suggests their preference relates to how they analyze their world and how they can best deal with it, so that, for want of a better word, I have called them Realists. Such Realists are concerned with practical issues, with solutions to problems found by their thinking pragmatically, rather than being controlled by ideas that they mostly consider to be philosophical, vague and 'other worldly'.

The second group can be described as those whose thinking is experienced as ideas, ideas that may or may not be practically supported. Their ideas often are philosophical, and thus often perceived to be conceptual, theoretical, vague, complex and not bound or restricted by the confines of the 'real' world. Identified as Ideaists, their language is often expressed in colourful, even exaggerated terms, as they focus on the big picture of a world of ideas they need to understand. They enjoy thinking for its own sake, and report that often this thinking does not necessarily seem tied to words, but can also be experienced as shapes and symbols, which again they seek to find meaningful in the context of their subjective views of life and living.

The third group seems to be less defined; in fact, it appears to be a cluster of people whose own understanding of the way they think is quite limited, unexplored, and largely misunderstood. As such, I have called these the undifferentiated thinkers. As a group, a common perception appears related to their limited and often negative view of themselves in relation to understanding their own *and* others' ways of thinking.

These three enjoyable people seemed predominantly to doubt their general abilities, unsure of how they prefer to think, with their pattern of thinking largely unknown and seemingly undeveloped. One could speculate that these individuals simply lacked confidence: this may reflect genetic predispositions and traits towards being anxious, for example, or alternatively, might suggest that experiences had so negatively impacted their own way of thinking, perceived to be so different from ‘the norm’ observed around them, that they had not allowed or trusted the development of their individual thinking style. This lack may also be attributed to their reported lack of familial encouragement or opportunity for further education, with a concomitant limited prospect for self-development. All expressed disappointment at missing out on the enjoyment and growth that is often experienced in the cut and thrust of difficult and demanding job expectations.

This qualitative exploration has been both a challenging and informative process, enabled by an interchange between each participant with someone who affirmed them and, importantly for some, who seemed to understand their dilemma about how they did think, so that each case expressed appreciation of the quiet reflective opportunity. I was struck by the power of that structured reflective context, and wished that it might have been followed up with a greater encouragement that might expand and progress that self-awareness. I was also aware however that my role in this research should not become conflicted with the empathic understanding that had naturally been part of my earlier pattern in psychological therapy. I therefore remained committed to observing and appropriately reporting, deliberately using a reflective phenomenological method that “does not intrinsically entail practical, transformative aims and outcomes” (Wertz et al., 2011, p. 289).

In the end, this qualitative analysis has encouraged me to look forward to making some worthwhile and significant abductions about ways of thinking, through an integration of data obtained from both methodologies: this forms the substance of the next chapter. But I would like to end this chapter of analysis with a wise statement I believe to be veridical about my own analysis:

“Analyses and findings are viewed by phenomenological researchers as corrigible and subject to critiques and correction...the inexhaustible diversity, depth, complexity, and fundamental mysteriousness of lived experience always exceed our knowledge” (Wertz et al., 2011, p. 160).

With this qualitative appraisal almost at an end, the quantitative questionnaire data called for a long awaited focus for analysis, to discover what important statistical results might be found in relation to a more nomothetic understanding of individual ways of thinking, and to evaluate these in relation to the theoretical model proposed at the commencement of this dissertation. This next step had been put aside while the qualitative work prevailed, but is now appropriately returned to as Chapter 7: Quantitative Results and Discussion. Only subsequent to this chapter can an important mixed methods integration and evaluation of the findings from both approaches be considered, and forms the substance of Chapter 8.

Chapter 7 - Quantitative Evaluation - Refining the Questionnaire - Phase 4

Chapter overview

Having spent time considering all the nuances about ways of thinking as revealed through the interviews with the ten participants, the focus now moved back to analyzing and evaluating the quantitative data. This had been postponed until Phase 4 in order to ensure the independent integrity of the qualitative phase.

Previously Chapter 4 outlined how the three versions of the WOT were constructed so that on line questionnaires enabled a wide variety of individuals, of differing backgrounds and levels of education, differing age and career backgrounds, with a particular interest in the adult self-report measure (AWOT-SR). The second format was for adults responding about other well-known adults (AWOT-OR), and a third version was for adults to report on their children (CWOT-SR).

While my research focus has remained on the AWOT-SR, at this stage the response sets from all three forms were considered, but only as a basis for evaluating items and item selection/weeding: further research on the WOT-OR and the children's version (CWOT) is considered outside the scope of this thesis. Furthermore, this analysis was part of a project in collaboration with another researcher, Shane Costello (see Acknowledgements), who is using this data in preparation for further quantitative work that will allow for completing instrumentation across the three versions.

After presenting a rationale for the statistical approaches used, with reference to issues around image management, particularly acquiescence and social desirability, this chapter then presents the specific method used, which includes the number of cases and their demographics, before moving into the process of item weeding for item validation, where both Classical Test and Item Response theories are considered in relation to item fit. How the final results were determined is followed by the clarification of the facet structure of the WOT questionnaire. Thereafter the specific statistical analysis is applied to the ten participant responses to the questionnaire, and how these fit within the full nomothetic data set. In so doing, the qualitative findings about the participants are included only as they offer a further reflection of their representativeness in relation to the mean responses of the larger group of WOT respondents, particularly in regards to the factor and facet structure: these provide the groundwork of quantitative results needing to be explored in the next chapter, which brings together the qualitative and quantitative results in an iterative, mixed method process.

Rationale for statistical procedures

A number of issues relevant to our quantitative analyses are considered before detailing the findings. Brief summative rationales are given, firstly for a process of handling the confounding effect of image management, mainly concerned with acquiescence, and then the application of Classical Test theory to refining structure and item selection. This is then followed by considering the rationale for the augmentation of item selection processes with Item Response Theory.

Controlling for Image management

Acquiescence has long been recognized as the tendency individuals have to consistently respond to a Likert-type scale in an affirmative manner (Couch & Keniston, 1960; Cronbach, 1946). Where all questions in a questionnaire are in one direction, positive skew often results, by adding correlations between items for reasons other than those reflecting the constructs of interest. When there is a *balanced* set of opposites, the effect is cancelled out. When there is an imbalanced set of items, the more unbalanced the set, the greater the undesirable and confounding correlation between variables, thereby obfuscating the architecture or structure of the variables of interest (Pedhazur & Schmelkin, 1991a). Although Nunnally (1978) regarded the effect of acquiescence as trivial, more recent studies have shown that acquiescence can account for up to ten percent of total variance, thus having the potential to significantly distort rotations in factor analysis (A. A. J. Hendriks, 1997; J. Roodenburg & E. M. Roodenburg, 2010; ten Berge & Hofstee, 1999).

Considering the capacity for acquiescence to confound structure through contributing unwanted variance, there is an advantage in using data sets freed from acquiescence in any analysis that has a significant exploratory aspect. Acquiescence is not a function of items, in which case it would simply be a matter of either adjusting items or removing them on the basis on their inherent susceptibility, as is the case with Social Desirability. Rather, as Rammstedt, Goldberg and Borg (2010) explain, it refers to an individual difference of respondents, the tendency of an individual to positively endorse Likert-type items, irrespective of content. The concern then is how to determine each respondent's particular tendency to acquiesce without requiring further information than that provided in the questionnaire. Hofstee, Ten Berge and Hendriks (1998) provided a really well-ordered procedure that makes use of actual questionnaire responses. In the Hofstee et al. formula, acquiescence is determined as being the grand average expressed as a deviation from the midpoint score of each individual's responses over a balanced set (recommended 15 to 30) of opposite pairs of items. Hofstee et al. (1998) then advised that such a data set free of acquiescence could consequently be formed from residuals that result from regressing item scores on individual acquiescence scores. This method has frequently been cited by others since (Ferrando et al., 2009; Leite & Cooper, 2010), and therefore was considered a worthy one for the current analysis.

While social desirability (SD) was the other aspect of image management (IM) that was controlled for in the original SWOT development, in the current research removal was considered unnecessary, if not undesirable for a number of reasons. Firstly, SD is arguably an attribute of individual constructs so that “social desirability and item content are inextricably connected” (Hofstee et al., 1998, p. 899). This makes its removal more contentious in personality type research, with some regarding social desirability to be essential to construct meaning (Knowles & Nathan, 1997). Secondly, removal of both SD and IM can leave a quite fragile residual data set (J. Roodenburg & E. M. Roodenburg, 2010). Thirdly, the less there is a need to correct for any IM, the more simple and convenient the subsequent instrument will be for day-to-day practice (Ferrando et al., 2009). Furthermore, in confirmation of there being no need to remove SD (Rushton & Erdle, 2010), it will be noted later in this chapter that analysis using data *inclusive* of SD for the WOT model shows this model to adequately reflect the a-priori SWOT model.

While it appears best not to remove SD, it is acknowledged that SD is none the less still an important factor, but one that is perhaps best addressed at the level of item construction (M. Backstrom & Bjorklund, 2013). This had been done with the development of the WOT questionnaire, as reported in Chapter 4, and can also be seen in Table 7.2, where several items were added that clearly acknowledge social facets. The actual analysis then required a number of steps to specifically address what items really fit the model, to which we now turn.

Psychometrics for Item Evaluation and Model Validation

Classical Test Theory (CTT)

Previous discussion made the case that the SWOT is a well-determined a-priori model, soundly based on CTT and the lexical hypothesis. Despite having such a well-defined model, the process of item evaluation is nonetheless not simply one of item selection based on item fit with that model. Most importantly, since there is no prior validated instrument, item evaluation needs to allow for adjustments to that model itself, along with the process of item selection, hence a need to adopt a process that is both exploratory and confirmatory. Considering the WOT facets and items are of a structure and type akin to personality traits, such adjustable confirmation is arguably best achieved by applying the CTT analytical approaches that have commonly been used to this end in personality research (Matthews et al., 2009). These involve using Principle Components Analysis (PCA) first in a somewhat exploratory manner, and then for confirmation, Procrustes targeted rotations, where congruence coefficients allow for the assessment of how items fit (De Raad, 2000; A. A. J. Hendriks et al., 1999).

Since as outlined above, acquiescence poses a potentially significant confound for *exploratory* analysis, a dataset free of acquiescence was adopted for this analysis. An alternate inferential method was also used to determine relative item fit.

Item Response theory (IRT)

Though IRT is regarded as technically more complex than classical test theory, and originally was used mostly within abilities research (Hambleton & Jones, 1993), IRT has more recently gained usage in the development of personality measures (John & Soto, 2007). It is recommended for research that considers both item fit and person fit, and thus was deemed appropriate for this research, given IRT reliance on “relative fit” that requires and welcomes inferential and interpretative analyses (Morizot, Ainsworth, & Reise, 2007).

CTT and IRT are often seen as somewhat incompatible alternatives, however as DeVellis (2012) points out, both can co-exist and the results are not very different in terms of evaluating items. Furthermore, DeVellis (2012) considered IRT as appropriately available for a Likert-type test context, though traditionally was applied to ability tests. While CTT requires items to be singularly correlated, IRT is designed to accept a wider degree of item independence, in allowing three essential parameters of items to be assessed: difficulty, capacity to discriminate, and susceptibility to false positives or guessing. Of interest in my study are the first

two parameters. While the perspective gained from CTT is one of evaluating items in the context of an overall model, the advantage here is that IRT provides an evaluation where the overall model is of little importance. The focus in IRT is straightforward: applying probabilistic theory to evaluate the performance of items within facets (Tatsuoka, 1986).

While the removal of acquiescence is of benefit in a CTT based analysis, and where there is a significant exploratory aspect, the application of IRT offers an opportunity to determine the adequacy of items' functioning as they present in actuality, in practice. In most cases, questionnaires are generally scored without being able to take acquiescence or any other image management into account (Paulhus & Vazire, 2007), though some recent work with pure measures of personality has suggested improvements that include future use of evaluative neutralization of self-ratings (M. Backstrom & Bjorklund, 2013). In the current research, however, implementing IRT based on an intact dataset thus has shown distinct benefits. The benefit of using this complementary approach for this research lies not least in the capacity of IRT to provide an analysis based on non-residualized data, this being less easily disturbed by rogue variance.

It is also important to note here the usefulness of augmenting Cronbach's alpha (α) with IRT in terms of reliability estimates when constructing a new scale. While as an estimate of internal consistency coefficient alpha provides one reasonable estimate of a scale's reliability, the assumption of an equivalence of items is not always tenable across all levels of a broad trait-like construct such as ways of thinking, and equally is limited across a widely disparate respondent population (Simms & Watson, 2010). The required focus of item-orientation in relation to the latent constructs was therefore deemed more appropriately examined with IRT.

We move on to report the quantitative analyses and results of the WOT questionnaire data.

Method – quantitative data analysis

Number of cases

All responses to the WOT were downloaded from SurveyMonkey and imported into SPSS 22. Originally there were 164 respondents. Six duplicates were removed, and a further eight removed due to participants commencing and not completing, then starting again, which were identified by duplicate names/gender/DOB; thirteen cases were removed due to extensive missing data, and five cases were removed as being from countries other than Australia – this was to minimize any potential effects from cross-cultural differences. The final number of respondents ($n=132$) was sufficient to meet the minimum respondent to parameter ratios of 1:5 recommended for the various planned applications of principal components analysis (PCA) (Worthington & Whittaker, 2006). The original SWOT model comprised 22 lower-order components, and these form the facets of seven higher order factors. PCA was also applied to evaluate the internal structure of the individual facets, where the lowest parameter ratio involved eight items and 132 respondents, that is, 8:132. Table 7.1 reports the final demographics for the WOT questionnaire data respondents.

Table 7.1. Demographics of all WOT respondents

Demographic	Self-Report		Other-Report		Child-Report	
	n	%	n	%	n	%
Gender						
Male	37	28.0	61	52.1	117	50.0
Female	94	71.2	56	47.9	117	50.0
Did not disclose	1	0.8	-	-	-	-
Total	132	100%	117	100%	234	100%
Age						
Minimum	21	-	18	-	7	-
Maximum	84	-	84	-	12	-
Mean	42.0	-	40.2	-	9.42	-
Standard deviation	14.8	-	14.1	-	1.11	-
Educational level attained						
Not completed sec. school	5	3.8	13	11.1	-	-
Completed sec. school	8	6.1	12	10.3	-	-
TAFE certif/diploma	17	12.9	20	17.1	-	-
Undergraduate degree	46	34.8	48	41.0	-	-
Postgraduate degree odiploma	42	31.8	23	19.7	-	-
PhD or professional doctorate	7	5.3	1	0.9	-	-
Other	7	5.3	-	-	-	-
Total	132	100%	117	100	-	-
State of residence						
New South Wales and ACT	14	10.6	22	18.8	28	12.0
Victoria	108	81.8	86	73.5	206	88.0
Queensland	5	3.8	3	2.6	-	-
South Australia	3	2.3	3	2.6	-	-
Western Australia	2	1.5	-	-	-	-
Tasmania	-	-	3	2.6	-	-
Final total of subjects	132	100	117	100%	234	100%

Note. While principal concern was with item fit within the self-report population only, use was made of data available from other research involving the two alternate versions of the WOT, for the purposes of item weeding, thus involving data from three populations

Item weeding

The first task was that of item selection. This process involved a detailed process of item selection, needed to evaluate the internal reliability of each item in terms of its consistency of fit. In line with CTT, PCA was used in a manner analogous to single factor congeneric modelling, to initially validate the within-facet structure. Item Response Theory was then used on the full data set (non-residualized), to further ensure the performance of items within facets. Subsequently, items identified with potential misfit problems were

reviewed by three psychologists in the area before a final evaluation in terms of Cronbach's alpha. In the final analysis, the adequacy of breadth among the ten qualitative participants was considered by examining whether the facets were adequately discriminated within that group alone.

Application of Classical Test Theory

Using the data residualized for acquiescence, PCA was run one by one for each of the six SWOT factors plus a social factor, with the number of components to extract within each factor determined by the number of the facets in the SWOT model. For example, the items in Factor 1–Surgency were run as a five components extraction, since there were five components in the original Factor 1. In accordance with well-established principles for the use of factor analysis and classical test theory as outlined above, the following criteria were used for determining the misfit of items for considering potential deletion:

- Theory – where the primary loading on an item was from a different facet to the one in the original model – for example one item originally on F1.1 received a higher (i.e. primary) loading from F1.3.
- Low communality ($<.3$) or weak primary loading ($<.3$).
- Significant cross-loading (difference between primary and secondary loading $<.3$).
- Procrustes rotation, examining the item to a-priori facet fit against a perfect matrix [1,0]. Item level congruence $<.8$ indicated misfit.
- PCA of single factor model to identify any items that were adding little value to the overall factor. For example, all items in Factor 1 were analyzed as a single factor solution and any items with a loading of $<.3$ were considered as contributing too little to the factor.

Item Response Theory

Each facet was subjected to a two-parameter logistic model IRT analysis: the focus is on ensuring the performance of items within facets using probabilistic modeling, where item difficulty and discrimination is estimated across the facet data. It is considered that an item of low *difficulty* should in all probability result in participants of all levels of the construct endorsing *correctly* (or highly), and similarly for high difficulty. For example, cases estimated to be *high* on Confidence should endorse Confidence items highly, regardless of item difficulty; while individuals who were estimated to be *low* on Confidence would be likely to endorse low level items more highly, and higher levels much lower. Thus:

- Each item's level of misfit was noted across each facet.
- A single factor model was also examined, similar to the CTT forced single factor - for example, all Factor 1 items were considered together as one scale, and misfitting items noted.

Results and discussion

The results of each stepped procedure are immediately followed by a brief discussion before moving on to the next step in the analysis.

Final determination of items

The process above meant that each item was subjected to a total of six analyses across the three populations (i.e. respondents to the three versions of the WOT), yielding 18 indicators for evaluating each item's misfit. More details of this process is available from a paper presented at an Australian Psychological Society conference (Costello, 2014).

As a final check, three experienced psychologists then reviewed the results, formulating two cut off levels: items with ten or more indicators of misfit were removed, while items with seven to nine misfit indicators were evaluated for patterns of misfit on the basis of the following questions:

- Was the misfit predominantly in one population only?
- Was the misfit predominantly in one type of analysis?
- Was there a semantic reason evident for the misfit compared to other items in the facets?
- From the qualitative research perspective, was there a theoretical reason to retain an item that may otherwise be indicating some misfit, such as an item capturing an important element of thinking?
- Finally, were any of the retained misfitting items recommended for revision?

For the final revision of facets, Cronbach's alpha and IRT were estimated on data where acquiescence was not removed: α reliability ranged from .52 to .86, while IRT marginal reliability ranged from .71 to .91, except for one facet (Plodding) this being .59.

In Table 7.2 those items deemed to be inadequate by the application of the criteria outlined above are crossed through, with the table providing both the number of misfits and the rationale for item removal where misfits were less than 10 but more than 6. The table also includes the question and facet levels under item description and ID - See Appendix 7 for a comprehensive list items.

Table 7.2. Factor/facet/ items: misfit indices, items across all versions of the WOT questionnaire and rationale for removals, with reported alpha/IRT reliabilities – continues over the next 3 pages

Factor	Facet	Item Description and ID	Total misfit indices	Rationale for removal	Final facet reliabilities	
					α	MR*
Surgent	Persuasive	persuasively 3.9 F1.1	2			
		get others to change their minds 4.9 F1.1	2			
		influencing others 5.9 F1.1	1		0.863	0.89
		able to convince others 6.10 F1.1	2			
		express ideas convincingly 7.9 F1.1	5			
	Energetic	energetically 3.10 F1.2	8	physical observation		
		thoroughly thinking about things 6.11 F1.2	7	SD inconsistent for 3 pops*		
		alert in thinking 6.16 F1.2	5		0.703	0.75
		have an active mind 7.10 F1.2	6			
		driven 8.11 F1.2	8	value-loaded- but needed		
Questioning	Verbal	verbally 3.11 F1.3	4			
		express thoughts forcefully 4.10 F1.3	5			
		vocalize thoughts well 4.11 F1.3	3			
		being wordy 5.11 F1.3	8	reflects quantity not quality	0.722	0.86
		unable to communicate well with words 6.12 -F1.3	4			
	Confident	ably express in words what is meant 7.11 F1.3	6			
		audible 8.12 F1.3	6			
		in a self-assured way 3.12 F1.4	4			
		express thoughts confidently 4.12 F1.4	6		0.658	0.78
		own conclusions 5.12 F1.4	5			
Creative	Intuitive	intimidated by others ideas 6.13 -F1.4	4			
		be tentative in sharing thoughts 7.12 -F1.4	10	communication Implied		
		secure 8.13 F1.4	5			
		probing thoughts 3.13 F1.5	5			
		have an enquiring mind 4.13 F1.5	2			
	Imaginative	dislike investigating things 4.21 F1.5	5			
		asking penetrating questions 5.13 F1.5	1		0.826	0.87
		accepting of simple explanations 6.14 -1.5	10	misfit		
		think probingly 7.13 F1.5	3			
		questioning 8.14 F1.5	0			
Artistic	Cognitive	creatively 3.1 F2.1	7	higher order		
		invent new ideas for doing things 4.1 F2.1	1			
		dream up ingenious options 4.2 F2.1	7	confused meaning		
		diverge from straight thinking 4.5 F2.1	5			
		stimulating ideas 5.10 F2.1	6		0.852	0.88
	Aesthetic	thinking outside the square 6.1 F2.1	6			
		good at making educated guesses 6.22 F2.1	8	value-loaded - judgment		
		generate novel possibilities 7.1 F2.1	2			
		inspirational 8.10 F2.1	3			
		original 8.1 F2.1	4			
Aesthetic	Imaginative	imaginatively 3.2 F2.2	1			
		exploring alternatives with imagination 5.2 F2.2	4			
		picturing potential options 6.2 F2.2	6		0.836	0.85
		be versatile in finding solutions 7.2 F2.2	4			
		resourceful 8.2 F2.2	1			
	Aesthetic	poetically 3.3 F2.3	6	Need to recode?		
		design artistically 4.3 F2.3	0			
		talking in pictures 5.3 F2.3	5			
		sensitive to and aware of aesthetics 6.3 F2.3	4		0.696	0.91
		able to graphically describe things 6.4 F2.3	6			
Aesthetic	Aesthetic	be artistic 7.3 F2.3	0			
		bland 8.3 -F2.3	5			

Factor	Facet	Item Description and ID	Total misfit indices	Rationale for removal	Final facet reliabilities	
					α	MR*
Controlled	Erratic	erratically 3.8 F3.1	3			
		have flighty thoughts 4.8 F3.1	5			
		unguarded in thoughts 6.15 F3.1	5			
		thinking in unpredictable ways 6.9 F3.1	0		0.727	0.77
		be an irregular thinker 7.8 F3.1	1			
	Careful	inconsistent 8.9 F3.1	6			
		carefully 3.18 F3.2	5			
		look for the soft option 4.17 F3.2	5			
		take a slap-dash approach 4.18 -F3.2	4			
		to cautiously think before acting 5.19 F3.2	3		0.514	0.74
Plodding	Careful	think irresponsibly 7.18 -F3.2	5			
		sensible 8.18 F3.2	7	value-loaded		
		laboriously 3.19 F3.3	6			
		find thinking tedious 4.19 F3.3	4			
		needing time to think 6.17 F3.3	7	fit best elsewhere?		
	Plodding	plodding 8.19 F3.3	3		0.52	0.59
		show uninhibited thinking 4.14 F4.1	7	non-discrim-lang (n-d-l)*		
		come up with unconventional options 4.4 F4.1	0			
		doing things differently from the norm 5.1 F4.1	1			
		being contrary 6.5 F4.1	7	attitudinal	0.737	0.8
Intuitive	Alternative	using roundabout ways of doing things 6.6 F4.1	11			
		be an alternative thinker 7.4 F4.1	4			
		free 8.4 F4.1	7			
		differently from others 3.4 F4.2	5			
		laterally 3.5 F4.2	6			
	Lateral	think along a straight line 4.16 -F4.2	5			
		seeing things from different perspectives 5.5 F4.2	7		0.551	0.71
		generate unexpected solutions 7.5 F4.2	3			
		tangential 8.5 F4.2	8	Semantic meaning unclear		
		philosophically 3.6 F4.3	8	n-d-l		
Abstract	Lateral	communicate in abstract terms 4.6 F4.3	6			
		thinking in metaphors 5.6 F4.3	6			
		appreciating mystical discussions 6.7 F4.3	4			
		float vague ideas 7.6 F4.3	5		0.648	0.72
		form ideas about constructs 7.7 F4.3	7	n-d-l		
	Abstract	full of symbols 8.7 F4.3	8	n-d-l		
		focused on the here and now 8.8 F4.3	9	n-d-l		

Factor	Facet	Item Description and ID	Total misfit indices	Rationale for removal	Final facet reliabilities	
					α	MR*
Freethinking	Conceptual	conceptually 3.7 F4.4	4			
		understand complex ideas 4.7 F4.4	5			
		theorizing 5.7 F4.4	4		0.566	0.76
		thinking in generalizations 6.8 F4.4	5			
	Narrow	open-mindedly 3.14 F5.1	3			
		open-ended thoughts 5.14 F5.1	7		0.59	0.78
		remaining open to new suggestions 5.15 F5.1	4			
		seem close-minded 7.14 -F5.1	5			
	Rigid	positively 3.15 F5.2	1			
		like to look on the bright side 4.15 F5.2	2			
		thinking happy thoughts 5.16 F5.2	4		0.851	0.90
		experiencing pessimistic thoughts 6.16 -F5.2	4			
Positive	Open Minded	refuse to allow negative thoughts 7.15 F5.2	2			
		optimistic 8.15 F5.2	4			
		with blinkers on 3.16 F5.3	4			
		to be broad-minded 5.17 -F5.3	3		0.703	0.76
	Positive	limited in the way you think 6.17 F5.3	3			
		display tunnel-vision 7.16 F5.3	2			
		small-minded 8.16 F5.3	5			
		rigidly 3.17 F5.4	6			
	Technical	being adaptable 5.18 -F5.4	5			
		conforming 5.4 F5.4	7			
		to keep thoughts on track 5.8 F5.4	5		0.518	0.77
		getting stuck in thoughts 6.18 F5.4	7			
Sensate	Scientific	show fixated thinking 7.17 F5.4	5			
		inflexible 8.17 F5.4	6			
		technically 3.20 F6.1	0			
		need to know how things work 4.20 F6.1	1			
	Social	technical details 5.21 F6.1	0		0.859	0.91
		disliking technicalities 6.21 -F6.1	0			
		think technologically 7.20 F6.1	0			
		experimentally 3.21 F6.2	9	unacceptable in adult pop		
	Social	objectively 3.22 F6.2	5			
		to think scientifically 5.22 F6.2	1		0.822	0.87
		understand systems 7.21 F6.2	0			
		systematic 8.20 F6.2	1			
Emotional	Affective	logical 8.6 F6.2	5			
		appreciating others' thoughts 3.23 Fs	1			
		need to share thinking with others 4.22 Fs	4			
		engage with others' thoughts 4.23 Fs	0			
	Arousal	keeping thoughts to oneself 5.23 Fs	1		0.548	0.82
		understanding what people are thinking 6.23 Fs	1			
		be socially aware 7.22 Fs	0			

Note. *MR = IRT marginal reliabilities. Pop = populations. n - d - l = non-discriminating-language.

In summary of the item weeding process (Table 7.2), it would appear that 21 of the 22 facets offer a set of sufficiently reliable measures of their respective constructs. Of these 21 facets, seven facets were highly reliable, attaining Cronbach's alphas and marginal reliabilities greater than .8; five facets achieve very good reliability coefficients with both alpha and IRTs above .7. Nine facets achieved IRT MRs greater than .7 though alphas were slightly below .7 which, based on the rationale offered above that considers IRT the preferred criteria, we consider at this stage of instrument development and for the purposes of this research can be regarded as having acceptable reliabilities. This difference is not unexpected and is

considered acceptable, given IRT's greater flexibility to accommodate differing levels of difficulty and discrimination of individual response characteristics (DeVellis, 2012; Dimitrov, 2003).

The one remaining facet, Plodding, with alpha .52 and MR of .59 could not be further refined by dropping an item to improve reliability since only the necessary minimum of three items remained. There is clearly a need for further work in finding or modifying items that better reflect this particular thinking construct. However, for the purposes of the current research, all facets will be retained, with any problematic reliability fully acknowledged and taken into account in any interpretations. In considering the original SWOT modelling (Roodenburg, 2006), it is perhaps noteworthy that the Plodding facet was observed to be majorly disturbed by Social Desirability, more so in fact than any other facet. While of interest, a discussion on this is outside the scope and focus of this project.

Having confirmed the facet structure of the WOT, along with establishing a satisfactory set of items, we are now in a position to move on to mixed method considerations. Before this, however, in order to ascertain representativeness, we will reflect on the adequacy of construct representation among the participants. It remains important for the next chapter to review these quantitative results through the qualitative person-centred insights, with their potential to provide more meaningful explanations and interpretations.

Construct Representation and Differentiation of the Facet Structure among Participants

In order for participants to enlighten our understanding of any facet as a bipolar construct, the participant group needs to include individuals who differ significantly from one another on each facet, preferably as individuals who are strongly indicative of one or other polarities. In effect, this was to check whether the procedure of selecting participants, that is, using Holland's occupational types did deliver a sufficiently broad enough group in terms of differences in thinking. These will be reported on more fully in the following chapter, since that chapter gives an integration of findings from both qualitative and quantitative perspectives. Nonetheless, Table 7.3 summarizes the percentile ranking of each of the ten participants, numbered according to the order in which they were interviewed, and viewed here in the context of the larger cohort and their respective representations on each of the facets.

Table 7.3. Participant responses expressed as percentiles of norming sample on all WOT facets

Factor	Facet Id	10-ELI %ile	7-GLT %ile	8-MAC %ile	6-MRJ %ile	4-LO %ile	1-DJR %ile	9-JED %ile	5-DMJ %ile	3-CC %ile	2-DER %ile
Surgent	Persuasive	97 ++	26	50	1	1	81 +	19 -	4 --	59	50
	Energetic	76 +	9	61	61	45	93 ++	17 -	17 -	76 ++	45
	Verbal	91 ++	18	69	2	13	69	9 -	46 -	30	62
	Confident	94 ++	60	60	49	0	98 ---	86 +++	28 +	8 --	49
	Questions	75 +	6	43	23	51	66	36	23	9	51
Creative	Creative	92 ++	5	73	78	92	78 +	98 +	67 +++	20	25
	Imaginative	92 ++	3	46	84	89	84 +	95 +	78 ++	46	29
	Artistic	96 ++	35	81	100	98	89 ++	100 +	92 +++	70	85
Controlled	Erratic	48	39	78	84	84	1 +	64 +	92 ---	31	47
	Careful	22 -	9	81	35	59	88 +	88 +	47 +	71	59
	Plodding	77 +	94	18	46	9	9 -	87 -	77 +	98 ++	87 +
	Alternative	73	13	74	82	74	52 +	98 +++	74	13	52
Intuitive	Lateral	84 ++	3	69	80	80	88 +	97 +	69 ++	31	20
	Abstract	27	13	9	82	95	46 +	75 ++	46 +	13	66
	Conceptual	26 -	18	2	80	87	96 +	92 ++	37 ++	18	48
Free-thinking	Open-minded	70 -	16	16	96	92	65 ++	77 +	51 +	1	65
	Positive	97 ++	73	58	50	20	42 -	7 --	34 --	42	50
	Narrow	97 ++	93	24	24	59	10 -	24 -	70 -	100 ++	59
	Rigid	90 +	65	45	2	35	35 ---	93 ++	65 ++	99 +++	45
Sensate	Technical	59	31	20	37	12	91 -	99 ++	80 +++	16 +	20 -
	Scientific	47	18	47	55	24	98 -	91 ++	24 ++	47	47
	Social	92 ++	15	92	10	72	41 -	1 ---	31 --	6	62

Note. Each factor with facets derived quantitatively is considered in relation to each of the individual case percentile, in order to compare their results to the norming sample. Percentile (%ile) scores are marked according to their standard deviations above or below the mean: Very Low: %ile <2 marked (---); Low: 2-8 (--) ; Low Average 9 – 24 (-); Average i.e. within one standard deviation of the mean, 25 – 74, assumed to be unremarkable and therefore left unmarked; High Average 75 – 90 (+); High: 91 – 97 (++) ; Very High: 98 and above (+++).

In light of Table 7.3, the ten participants demonstrate a wide representation of every facet, with exemplars clearly discriminated by being above or below the average and to varying degrees on each of the facets and attributes. There are a number of individuals registering as very strong on facets, with +++ and --

- indicating a balanced bipolar representation of these facets: Confident and Rigid; almost as strong are the exemplars on Open-minded, Verbal, Conceptual, Erratic, and Persuasive facets. Reporting on a more **moderate** level of exemplars, with participants found at two standard deviations below *and* above the mean, we find the facets Creative, Imaginative, Lateral, and Positive. At a **lower** level, and with somewhat skewed representations much higher or lower on one polarity in comparison with the other, we find the facets Scientific, Technical, Narrow, Abstract, Alternative, Energetic, Artistic, Questioning, Careful, and also Plodding. This last one is particularly important in view of the quantitative results of the large sample **Table 5.1**, with the Plodding item fit the least reliable of all facets: yet within the participant group, all but one individual (Case 6) had scored very strongly on this facet, some negatively, others positively. We return to this phenomenon in Chapter 8, but at this stage, the fact that Plodding, along with all other facets, is represented by several participants, supports the view of a representative spread of participants at every facet level.

As mentioned earlier, the social facet was reintroduced in constructing the AWOT, social desirability having been removed in the development process of the SWOT but subsequently questioned when evidence appeared of a close association of Holland's RIASEC and the SWOT (Roodenburg & Roodenburg, 2009): importantly, the RIASEC includes a *social* occupational preference. It was thought best to include this strongly human characteristic in this research (for a further rationale, refer to Controlling for Image management). We can also see here quite an important representation on this facet, though as a facet strictly speaking it could be considered as lying outside the a-priori theoretical structure.

Summary

The item evaluations have confirmed and established the facets as well-formed measures of the SWOT model through an evaluation of the appropriateness of fit of the items. We can see an adequate instrument well on the way to measuring the construct of interest, that is, ways of thinking. Even more interesting is that a small participant group, being individually selected, with consideration of alternative criteria (Holland's occupational interests) but blind to the SWOT model, was subsequently found to have adequately covered the full range of facets of that model. This suggests that the information gathered from this group was appropriate for an innovative qualitative validation.

Given the facet structure was deemed to reliably cover the thinking style domain, it now remains for the WOT measure itself to be reviewed within the context of the qualitative findings. An integration of these findings occupies the next chapter, and in the process provides an illustration and an evaluation of how well a mixed methodology can effectively contribute to the emergent questionnaire, and potentially to a greater understanding of the ways individuals think.

Chapter 8 - Integration of mixed methods findings

- Phase 5

Chapter overview - mixed methods for scale construction

Being aware that individual uniqueness could be swallowed up by normative information, including a qualitative approach was considered desirable. Qualitative methods of data collection and analysis recognize aspects of individuality frequently observed only in individual case level understandings within real life situations. Such qualitative work may be able to ensure that a questionnaire is more able to discriminate idiosyncratic individual attributes that should not be lost.

Though in the past combining qualitative work with quantitative had often been seen as conflicting, a valid partnership is now regarded as possible, using what has become known as a mixed method approach (Teddlie & Tashakkori, 2012). The concurrent inclusion of idiographic case studies enables perspectives that in turn may add substantially to the development of a new measure, particularly providing greater understanding of those very individuals who would otherwise have been excluded by statistical rules as outliers. In addition, an integrative nexus of insights gained from both methodologies can assist in a meaningful interpretation of the numbers that otherwise might defy adequate explanations (Mertens, 2015).

After a brief review of the separate contributions of each of the methodologies employed, this chapter seeks to integrate their findings: **Part One** considers the interplay of the individual participant *attributes*, observed and codified phenomenologically, and these are presented in relation to the *facets* identified by statistical analyses. This section forms a rather detailed technical analysis, a necessary element to justify the mixed methods integration at the very ground level. **Part Two** moves more quickly through the quantitative perspectives gained to allow for the iterative overlapping of information, to enable a more rounded, person-centred view of particular ways of thinking.

Contributions of the qualitative approach

When reviewing the insights gathered from the mini narratives of just ten quite different individuals, it became clear just how much this methodology provides additional important insights for the new measure being created about individual differences. How to present this however became quite a complex challenge, a matter of how to avoid unnecessarily lengthening a seemingly interminable process that left nothing important out, yet at the same time one that met the criteria for developing an efficient and appropriately parsimonious measure (Barbaranelli & Caprara, 2002). Even when findings were somewhat abbreviated by considering cases from a phenomenological perspective, so that individuals found to hold certain characteristic ways of thinking in common were thematically codified and reported as cluster profiles, described as Realist and Idealist thinkers, the challenge remained: to maintain the essential elements of individual insights given, with authentic concern for the meaningful understandings gained from the personal data and those *meta inferences* (Teddlie & Tashakkori, 2009) that might eventually emerge from these interpretations, particularly when they were converged with those of the more nomothetic findings.

As reported in Phase 3 of the research, Table 6.2 summarizes the commonly expressed insights into distinct aspects of individual ways of thinking, presented as *general characteristics*, and included under what in quantitative terms are referred to as facets. These facets (see Quantitative phase, Chapter 4 for more details) now need to be reviewed case by case, to ascertain which of these are clearly evidenced in the qualitatively derived themes, while at the same time ascertaining which if any important characteristics may not have been included in these facets. As a final stage, the division between the Realists, Ideaists and the undifferentiated clusters of individuals will be viewed through the facet lens, to determine how well the quantitative typologies adequately or otherwise reflect the full breadth of personal characteristics discovered idiomorphically. But first, a brief recap of what was found by means of the questionnaire.

Contributions of the quantitative approach

Part of the validation process involves systematically comparing the earlier reports made of the qualitative findings with those obtained through the quantitative analysis. This process contributed to what Mahoney (2011, p. 228) postulates as needed: a 3-D view of the whole person that can “systematically typify how individuals and groups...appear to be similar or different”, though the specific meaning he attached to 3-D relates to the *how, what, and why* of individual difference dimensions, so is reconsidered from somewhat different perspectives in my model of Chapter 6 in Figure 6.2. In support of this conception, a number of graphs obtained quantitatively will be used to illustrate both the uniqueness of individuals and also some of the communalities they share with others.

Results obtained by statistical analysis have laid the foundations for the overall validity of the adult self-report measure (AWOT) and the resultant understanding of ways of thinking. These results suggest that the questionnaire does manifest adequate discriminant validity, with the retained items clearly measuring significantly different factors and their lower order facets. With poorly fitting items weeded out, a far stronger questionnaire is to be further validated in future research by the quantitative researchers on the WOT team; however, for the purposes of this project, it is fair to say we now have an adequate, concise and user-friendly measure.

Chapter 7 reported the quantitative work and results, including the fit of the individual participants within the general results obtained by the AWOT. These were presented in Table 7.1 which provides a rating classification based on typical Wechsler descriptors for positions on a normal distribution; this was deemed as the most appropriate here when discriminating individual differences from a person-centred perspective (J. Grice, 2010).

It is important to note here that within the collaborative WOT research team, there has been a shift away from the higher order SWOT factors to focusing on the facets. The original research involved a variable-centred approach. Subsequently, with a preferred understanding of a person-centred perspective facilitated by the qualitative analysis, and recognizing that the higher-order factors explain little more than half the variance captured by the facets, it has become clear that the facets, as lower-order facets, offer a more discriminant, appropriately fine-grained emphasis, particularly important with this study’s focus on

individuals. A people-centred approach is about seeing how such facets and attributes come together in different ways to form distinctive typologies. Arguably, these could potentially be obfuscated through the agglomeration of distinctives in individual differences in forming higher order factors, and therefore due respect in demonstrating both diversity and common characteristics was maintained, as recommended by Mertens who suggests any “aggregating across cases must be done cautiously and without loss of the uniqueness in the context of each case” (Mertens, 2015, p. 446).

Part 1: Integration of findings about individual attributes

The research questions of the quantitative stage of data analysis seem to parallel those identified for the qualitative analysis. In a prelude to progressing a comparative synthesis of the qualitative with the quantitative results, questions around the facets relating to qualitative aspects are considered:

- To what degree are the facets adequately reflected in and by the qualitative findings?
- Can the facets really be said to be meaningful when considered case by case?
- Do the quantitatively derived facets, when appropriately interpreted, provide feasible explanations of the individual differences discovered qualitatively?

The question concerning how well the groups identified phenomenologically may be said to mimic or reflect the *clusters* or *groupings* identified quantitatively will form **Part 2** of this chapter. But in seeking to answer these integrative questions, the following Table 8.1 presents the descriptive **facets** derived quantitatively alongside the participant (qualitative) **attributes**: these individual differences were discerned when case-by-case differences were highlighted by their extreme scores, both positive and negative. Though these more extreme examples are reported earlier in Chapter 7, here they are tabled differently, to demonstrate how these attributes may be observed through the quantitative facet lens.

Table 8.1. Participants and their facet scores viewed through their phenomenological attributes

Facet	Qualitative Attributes of ways of thinking									
	Adaptive	Implics	Thoughts	Focus	Ver/vis	Time	Mode	Purpose	Clarity	Driven by
Persuasive								1+9-		
								6---4---		
								10++5-		
Energetic		9-1++								
		7-10+								
		5-3++								
Verbal					6-4-9-					
					7-					
					10++					
Confident		1+++9+								
		4--10++3-								
Questions	3-7-10+									
Creative			7-3-							
			6+4++1+							
			9+++							
Imaginative				7-						
				5+6+4+						
				1+9++						
Artistic					1+4+++					
					6+++					
					9+++					
Erratic						8+1---				
						6+4+				
						5++				
Careful							8+1+9+		1+9+	
							!0-7-		8+10-7-	
Plodding						4-1-9+				
						2+5+				
						3+++				
						10+8-				
						7++				
Alternative			7-3-							
			6+9+++							
Lateral				6+4+2-						
				1+9++						
				7-10++						
Abstract					10-7-8-					
					6+4++					
					9+3					
Conceptual					1++4+6					
					+9+-7-					
					8--10-					
					3-					
Open-minded	3--7-8-									
	6++4++9									
	+									
Positive			10++							
			4-9--							
Narrow	7++8-		7++8-							
	10++		10++							
	3+++		3+++							
	1-9-6-		1-9-6-							
Rigid			3+++10+							
			6---9++							
Technical							2-3-5+8-			
							4-1++			
							9+++			
Scientific							4-7-5-			
							1+++			
Social							9++			
								6-7-9-		
								8++3-		
								10++		

Note. Facets derived quantitatively are here considered in relation to attributes that emerged, with numbered participants (colour-coded for profiles **Realists**, **Ideaists**, **Undifferentiated** Table 6.2 also see later) compared to the norming sample. Percentile (%ile) scores are marked according to their standard deviations above or below the mean: Very Low: 2< below (---); Low: 2-8 (--) ; Low Average 9 – 24 (-); High Average 75 – 90 (+); High: 91 – 97 (++) ; Very High: 98 and above (+++). Participants scoring Average: 25 – 74, i.e. within one SD are assumed to be unremarkable and therefore not reported.

Implics = implications; Vis/verbal = Visual/Verbal ways of thinking.

How well are facets seen from the perspective of case attributes?

The following section reports a necessarily detailed consideration of how the individual attributes or characteristic ways of thinking can be integrated with the facets that were revealed through participants' earlier responses to the AWOT questionnaire. In some cases, individuals are observed to have a number of different facet extreme scores, so that ostensive repetition across facets is unavoidable in the process of confirming any convergence or to explain any apparent contradiction. In quantitative approaches, classic test theory makes clear the need for a balanced, comprehensive mapping of any domain, with validity being threatened by bloated specificity or construct under-representation (R. B. Cattell, 1988; Messick, 1995b).

Accordingly, Table 8.1 reports a comparison of facets and attributes and as such gives a visual overview of the spread of one compared with the areas covered by the other. An examination of this table shows an even spread and comprehensive concordance between facets and attributes. The integration achieved here suggests an encouraging confirmation of the sufficiency of using ten case studies for a comprehensive picture. At the same time, the fact that the qualitative study did not find any gaps in the facets also provides a reassuring endorsement of the adequacy and balanced nature of this analytical process. It is also evident that all facets are represented on at least one of the attribute cells, with a discrimination that elicits a heart-warming acknowledgment that no one individual is identical to another in all respects. Furthermore, for each and every facet and attribute there are a number of participants, with a mix of cases reflecting negative or positive extremes, that mix validating the unique contribution made by each and thus justifying their place in the model.

Table 8.1 also demonstrates how these idiographic attributes can be seen to agglomerate under the two discriminating clusters, earlier defined as **Realists**, and **Ideaists**, and also includes the non-discriminating cluster, appositely named the **Undifferentiated** - see Chapter 6. Further reviews and explanations will be made of these clusters when later compared with the clusters found in the quantitative work that used cluster analyses on the same individuals. For the moment, however, each case will be considered case by case as to how each individual's attributes give *meaning* to the significant facets. To reflect on the meaning that is facilitated by what the respective ten attributes bring to each facet, these differences will be considered in the order they present in the table. This facilitates a person-centred perspective rather than a variable-focused one which would eventuate should the facets be the main filter. Some of the facets may merit closer scrutiny, to reflect on how well they fit as descriptors of how one thinks, but will be considered after this next section.

Adaptive: The Adaptive attribute seems to be suggestive of both the Questioning and Open-minded facets, with two of the Cases 3 and 7, both strongly though negatively present in both facets, and (consistently) are

also reflected positively in regard to the (opposite but distinct) Narrow facet. This suggests congruence with other facets that position the same cases with a lack of interest or confidence in deeper or more curious thinking beyond the immediate, and was also reflected in their respective interviews. The views held by Cases 1, 6, & 9 are consistent with other strong indicators of their being thinkers who do not want to be held to a narrow perspective but who enjoy a broad preference for thinking ‘outside the square’. The presence of Cases 8- and 10 +++ under Narrow and both seen (negatively) as *not* Open-minded is somewhat more difficult to explain; however, in both cases their interviews demonstrated an adaptability that was frequently admitted to, with neither of these individuals suggesting a Closed-minded pattern of thinking but rather a lesser interest in *initiating* alternative points of views other than those given. This matches with what both participants reported as ‘thinking only as required’, and compares starkly with the pure joy of thinking reported by Cases 1, 6, & 9, clearly represented in the *not* Narrow context, and also by Case 4 in the context of Open-minded.

Implications of thinking (Implics): This attribute was identified on the Energetic facet with extremes by six of the cases, with the same Cases 1 & 10 identifying a positive enthusiasm for thinking that fits well with both the Energetic and Confident facets supported by their conversations, in which they demonstrated increased confidence in thinking with age, maturity, and the opportunities their respective careers had provided. In contrast, Case 3 (CC) on the WOT questionnaire *claimed* an energy for thinking, but that was far from apparent during the interview, having stated in various contexts that she did ‘not really know how or why’ she thought the way she did, and admitted ‘avoiding tasks that were too stressful to think about’. The lack of energy was only evidenced when she admitted to ‘negative spiraling thinking’ that she frequently found herself in, at which stage she would pull herself out and simply do something, to stop the thinking. Her lack of self knowledge exemplified in answering the WOT questionnaire is one of the well-known potential problems of self report measures, for example, and perhaps also suggests a social desirability issue.

The fact that Case 9 (JED) self-reported strongly as Confident in his thinking yet not at all on the Energetic facet is not seen as incongruent, however, but can be explained by his being a very private person, an artist, who described himself as a recluse from society who normally shared very little with most people – even with his partner. Yet in his normal activities, clear evidence emerged of a strong self-belief; initially he was unable to reflect with words on his particular way of thinking, but shared much more about its implications, reflections on his activities, and his thoughtful and creative future planning. During his *long* conversation, he displayed unusual enjoyment in sharing many well-considered ideas and ideals, thoughts that clearly highlighted his creative interests, though these were usually kept to himself.

It is somewhat surprising that Case 4 (LO), who reportedly *loved* thinking, was *always* thinking, unless doing repetitive tasks, does not register as strong on the Energetic facet (and may suggest questions about the facet meaning); and her surprising very low Confident facet score may signify a self assessment often heard in her interview as quite self-deprecating. Her story shared briefly here may somewhat explain this discrepancy: Her mother was seen to be a strong and very capable academic, but who on the early death of her husband, the father of her four young children, had focused on survival, running a farm, and

consequently apparently was oblivious to the angst and feelings of abandonment experienced by her only daughter. The fact that Case 3 also presented strongly in this same (lack of) Confident thinking facet is explained by her own and important others' apparent lack of understanding about how she thought, reflected on during the interview as 'my odd way of thinking' which ultimately prevented her from finding a career that matched her interests and abilities. The reported low Energetic facet score for Case 7 also requires an explanation: Having happily accepted a nursing career with its authoritarian workplace philosophy, she freely admitted to a preference for doing rather than thinking, revealing she still often regrets later having quickly acted without thinking.

Thoughts: Thoughts were variously considered to be deep, wide, broad, shallow, narrow, or differently referred to as wandering ideas, contemplations, with four of the six cases being extremely positive in Creative, and with Cases 7 and 3 noted as *not* Creative also positioned strongly on the Narrow and Rigid facet scores. This negative association may say more about their thoughts being reflective of their lack of confidence, needing to keep their thoughts narrowly revolving around actions, and associated interest in getting things done, rather than on thinking per se, in contradistinction to the enjoyment expressed about thinking for itself by each of the 4 cases strongly positioned on the Creative facet.

It is important to note that the Thoughts attribute can also be considered under the Positive facet, where two of the four cases who had registered as strong in terms of Creative (4 & 9) now are seen to be *negatively* valenced against Positive thoughts, which again may reflect the impact of childhood experience previously referred to. Case 9 also perceives (by his facet scores) his thinking as Rigid, though interestingly not Narrow: His extremes may be explained (borne out by the interviews) as evidence of an honesty and self-awareness that reflects how singular his thinking mostly is, with few opportunities for challenges to his otherwise broadly thought out but rigidly maintained thinking.

As seen in Case 1, whose score on the Lateral facet is further confirmed by being clearly marked as *not* Narrow, there are two more cases whose Thoughts were clearly *not* Narrow or Rigid: Case 6 fits well here, consistent with her other extreme facet scores on Creative, Open-minded, Artistic, and Lateral. The other is Case 10, who with seeming integrity admits to an association between the Positive facet and Thoughts (note: this attribute can mean deep OR shallow, and he admitted to the latter). At the same time, high scores on both Narrow and Rigid facets bears out no contradiction with his strong Confident, Questioning, Energetic and Social facet scores within a relatively narrow educational focus: his reported enjoyment in a career in which he knew his strengths and weaknesses, but wisely adapted these (seen in his strong Lateral facet score) to incorporate other staff who, he averred, 'made up for' his own limitations.

Focus: Within the Focus of thinking attribute, which reflects on such differences as realistic compared with philosophical thinking, a relationship is observed with six different facets: Imaginative; Artistic; Alternative; Lateral; Abstract; and Conceptual, including the four cases already mentioned under other facets, these being 1, 4, 6, & 9, with additional cases that vary across two of these facets. For example Cases 7, 8, and 10 are negatively related to the Conceptual and Abstract facets, supported by an understanding gained through

interviews that these individuals consistently suggest a preference with a more factual focus, and a distinct dislike of Conceptual and Abstract thinking. This was also true of Case 3 but who significantly admitted *not* being good with details, and naturally seemed to think more in ideas but inevitably this thinking involved real life factual issues. This contradiction can be explained by her limited training and life experience, and her lacking in self-confidence, particularly with theoretical constructs, so that her ideas were always linked with very practical activities that she was at least comfortable with: drawing up garden plans, thinking about and exploring holiday options. Her inclusion in this facet makes intuitive sense, given her limited exposure to wider life experiences, and again reflected her reported lack of confidence to be herself from a very early age, with teachers, friends, with early memories of exam stressors particularly singled out as contributors to that very negative view of self and the way she thought, this often considered not factual enough to do well. It is noteworthy that she is not seen within the more Imaginative/Artistic facets, and her references in conversation tally with this: mentioning she frequently suffers from imagining many things, but having decided that is a weakness to be avoided, she has fought hard to quash those attributes, and was similarly reported within her WOT questionnaire responses. The fact that Case 10 is seen as strongly Imaginative makes sense too, but again is tied to practical matters that, as a school principal, often required him to imagine doing things differently, in dealing with seemingly intractable problems. This explanation may also fit the Imagination facet for Case 5, with an individual's thinking focus being able to adapt, to think in terms of alternative actions in real life scenarios, rather than being strictly and conceptually related to exploring the 'unreal' world of ideas.

It is important to note here that there appears to be a consistent appearance of all participants within the focus of thinking that can be seen as reflecting *how* they each think: clearly a commonality of a preference for ideas (for example with Cases 6, 4, 1 & 9 in facets Imaginative, Artistic, Conceptual) or alternatively NOT with ideas but rather about practical hard facts (for example with Cases 10, 7 & 8). Importantly, we can also see a lack of consistent clarity for Cases 5, 3 and 2, which will necessitate further explanation after this section.

Verbal/Visual (Ver/Vis): The negative attribute/facet scores of the three cases (4, 6, & 9) again makes intuitive sense when one considers their highly visual and artistic personalities, and also is understandable for the less confident Case 7, whose personality she declared to be like 'the quiet achiever', preferring to stay out of the lime-light. All of these four participants reported thinking 'inside their heads', preferring their own company to being sociable, and therefore more naturally were less inclined to share their thoughts, especially about complex ideas and concepts that were not so readily understood or so easily explained. In contrast, however, Case 7 who professed to being practical person, a 'doer' rather than a deep thinker, made statements that were always short and to the point, and her interview the briefest of all. It is important to refer back to the Implications here, as she, without any self disparagement but in a down to earth manner, reported her thinking to be 'only as long as was needed to achieve a quick, pragmatic solution' – a lifetime nursing career that had not demanded any great deviations from her preferred realistic characteristic way of thinking. Though all four participants self-reported being non-verbal, with little need to be expressive, Case

10 however was the opposite, evidencing strongly on the Verbal facet, with a concomitant fluency with words in the interview that reflected his satisfying lifetime within a public arena, stating ‘ I can confidently think well on my feet - I’m never stumped for words’.

Time: The facets seen to be most associated with the attribute of Time need some elucidation, not least because *all* of the participants are included. Cases 8, 6, 5, & 4 were all positive on the Erratic facet, suggesting in relation to the attribute of Time that planning, being organized and predictable were not part of their thinking, and for some suggested this was a lack that warranted self-criticism. On the other hand, the strong negative score of Case 1 on Erratic (that is, NOT Erratic) suggests he considered his measured way of thinking as systematic, necessitated by his covering a great array of ideas. From my more subjective researcher perspective, however, his thinking might have seemed erratic in the sense that every question (about thinking) inevitably included many asides that often were difficult to contextualize; listening for how these answers matched the question was often arduous, though with an extended time allowance, the expanded version always made very good though complex sense. This explanation also fits well with this participant’s own understanding that the lengthy time-frame needed for all his thinking was clearly understood to be *not* Plodding, but rather as analytical, logical, careful and purposeful, while often also quite Lateral, and therefore demanded more time. It is feasible to suggest this meaning of Plodding was also held by Case 4, being equally Lateral in her thinking, and consequently required a lengthened interview to fully explore her understanding of how she thinks.

In understanding the strongly negative connotations of the Plodding facet, Case 8’s score is congruent with her reported need to be efficient with time, with a preference always for quick, direct though Careful thinking. For the remaining 6 cases, however, Plodding was apparently considered to be aptly descriptive of their way of thinking: slow and labored – and their interviews had hints of this understanding, though none of these had suggested the extent to which this might potentially be associated with self-criticism. Perhaps the word itself lacks a clarity that may need revision if its real meaning and import is to be ascertained by a questionnaire alone.

Mode: as reflected in the facets of Creative, Careful, Alternative, this attribute also includes Narrow and Rigid, all helping differentiate one group of individuals from another. The Mode attribute was expected to indicate inherent differences in the way people think, so the fact that Careful is very different from Alternative is itself an interesting divide. If we consider the extreme scores on Careful, three cases are positive, two are negative, the latter being congruently explained in terms of a self-judgment that freely admitted to a preference for speed and spontaneity, and not thinking too long before choosing an action. Case 8, though similarly inclined to quick thinking, reported a preference for being careful, and may reflect having become more careful with the years of experience, and unlike the others of this profile, is still employed. It is also easy to understand the positive Careful facet scores related to the Mode of thinking by Cases 1 & 9, both admitting to being quietly Confident, yet always carefully committed to weighing up the best approach or options available.

In relating Mode to the Alternative facet, one can observe a definite divide *between cases* in relation to their thinking: understandable in that the two negatively valenced individuals (Cases 3 & 7) had consistently maintained their thinking to be simple, straightforward and not complex. Their reticence to acknowledge being different in the way they think was also matched by the conservative way in which they dressed. The positive cases (6 & 9) in contrast had been quite outspoken about their thinking as being different, and (congruently) personally proud to be thought of as Alternative: indeed, this alternative way of thinking was supported by their life-styles and manner of dress, and likewise in their reference to other non-alternative straight or black and white thinkers (such as Cases 3 & 7) as being uninteresting and ‘sometimes even boring’.

As already highlighted under Thoughts and Focus of thinking, Cases 1, 4, 6, & 9 demonstrate a consistent picture of their thinking being creative, standing in clear contrast to Cases 7 (*not* Alternative) & 10 (*not* Careful); Cases 7 & 3 (*not* Creative); 7, 10 & 3 (these being Narrow and Rigid). Case 4 is not distinguished by either low or high scores on these additional facets, but significantly is often found together with Cases 1, 6 & 9.

Purpose of thinking: Cases 1 and 10 appear in the Persuasive facet, with strongly positive views concerning their particular ways of thinking: Case 1 being concerned with the big picture, the world of ideas, and the relative unimportance of the details, while the opposite can be heard in Case 10’s enthusiastic sharing of detailed ‘down to earth’ descriptions, using further questioning only when needing to know or to clarify the practical implications of given facts. The cases voicing strong negative Purpose facet scores (9, 6, 4, and 5) suggest more of a concern with a view of self than with an understanding about their way of thinking, and therefore a reticence to think their thoughts could influence others. The self-doubt attributed to Cases 9, 6 & 4 reflects a view commonly expressed by those who are not so good with remembering facts and details: all three reported their earlier years as remembered for being told they were slow, too vague, and in turn each reported feeling inadequate by often being put down, and that it took many years before attaining confidence within their chosen careers. These same sentiments equally apply to Case 5, who in fact opted out of a career, and further demonstrated a current uncertainty about her way of thinking, seen with the same negativity on her Energy facet scores.

Clarity: Indicated by strong scores on a number of facets, Cases 1, 8 & 9 reflect the attribute of Clarity loading strongly also on the Careful attribute, with Cases 10 & 7 negatively so, and as already stated this logically is supported under the Mode attribute. Additional clarification may also be adduced when seeing Cases 4, 6 & 9 are represented strongly by the Abstract facet, linked with questions that reflect general and vague ideas; this makes sense semantically and intuitively given these same individuals are seen together in other facets such as Artistic, Imaginative and Conceptual and as with Cases 3, 7, 8 & 10, all clearly *do not* regard themselves as abstract thinkers.

Driven by: Various elements mentioned as driving their respective thinking are represented under the Social facet by six of the ten cases, with four of these having extreme negative scores. Of these four, Case 3

consistently demonstrated a lack of self-confidence, having reiterated a reticence to share her thoughts, driven by the need for time and privacy to form her thoughts, preferring to think inside her head. The other three cases likewise reported a preferred internal thinking style, but without the undercurrent of doubt about their respective thinking preferences and abilities, and perhaps suggests a quiet appreciation of their introverted personalities. The two cases strongly loading positively on the Social facet were Cases 8 & 10, whose respective interviews indicated a serious interest in people, both having had careers that supported and encouraged this personal attribute of needing to get things done, but usually in the context of caring for people.

This last attribute serves to highlight a perceived lack in the questionnaire, in that the commonly expressed idea by all Ideaist participants was that their thinking was driven by the need to understand, whereas for other more strongly Realist and in particular for ultra Realist thinkers, this was not so. For the latter there was simply a need to know just enough in order to get started on a necessary course of action. That such a strong aspect of thinking is not reported by the facets may indicate an area needing attention in the further development of the WOT questionnaire, to be achieved by including several related questions that may help distinguish this important qualitatively observed difference between thinkers.

This last attribute only hints at a number of related issues that may be associated with what drives why we think the way we do, with *motivation* considered by a large and important body of literature that alone could have dominated this current research. However, given that this was not ever mentioned in the qualitative interviews, and had also not been an a-priori factor, motivation is considered outside the scope of this research.

Summary of facets seen through participant attributes

It has been both enlightening and affirming of the qualitative analysis to meaningfully integrate the personal attributes with the lower-order facets: a reasonably balanced and inclusive spread of individual differences in ways of thinking is confirmed. This further confirms the findings of the foregoing quantitative analysis (Chapter 7) and those of the earlier qualitative analysis (Chapter 6), so that within a small sample of diverse individuals, clusters of attributes as facets were appropriately discriminated.

Before moving on, it may be helpful to summarize a number of conclusions that can be drawn about the synthesis of these facets and attributes, as viewed through the individual case studies.

1. The facets take on a clearer meaning when viewed in the light of the case attributes. This has further allowed for the questionnaire to be validated from a different perspective. Furthermore, this does support a conclusion that facets are adequately reflected in and by the qualitative findings.
2. Looking at the facets from a person-centred perspective has capitalized on the strengths inherent to using a qualitative methodology and its detailed individual findings, rather than working from the more common quantitative research methodology that would have begun with considering how individuals reflect the facets.

3. Unlike what can be expected from a psychometric quantitative only analysis, evaluation of the idiographic data indicates that the various characteristics need not be so discrete as to lose individual differences: attributes can be seen to overlap or blend, allowing the individual differences to combine differentially, and yet still be observed as important attributes that when combined, effect the richness of uniqueness that statistically would have been treated as unimportant.
4. As mentioned under the Driven attribute, the facets may not include all that the attributes discerned, which suggests that in the future refinement of the WOT questionnaire, additional items may be needed to identify the important defining thinking characteristic that relates to *a need to understand*.
5. A thorough evaluation of the integrated data does allow for meaningful interpretation of the individual stories, while facilitating a deeper understanding of the phenomenon of interest: This phenomenological aspect of the quantitative/qualitative synthesis also concerns how these integrated findings validate as well as value add to the initial WOT questionnaire, and is now reported in Part 2.

Part 2 - Integration of person-centred groupings

Having considered case by case how the personal attributes can be seen within the facets, it is time to move on to teasing out what was brought to the understanding of ways of thinking when considering the clusters of individuals, inductively developed from the observed categories of the ten case study characteristics. These were reported in Chapter 6 as Realists and Ideaists, with three participants identified as being unclear (or undifferentiated); here however these profiles are scrutinized as to how they fit with the people-centred groupings derived through a *quantitative* principal components analysis. The initial clusters focus on the participants, then move on to looking at the similarity of groupings found in the full data set of respondents.

Stage 1: Cluster analysis of participants across facets

The first stage involved considering whether grouping people on the basis of the facets leads to *clusters* that parallel those seen to emerge from the qualitative approach. This was achieved in part by a cluster analysis of the participants, plotted on a hierarchical Dendrogram, using Ward's Linkage. This method was selected as it most adequately identifies dissimilarities or deviations from data points of initial patterns observed in individuals until it was possible to fuse the most similar variations into a number of clusters, in order to find the best solution: this was decided on by when the within-cluster distances are smallest but the distances between the clusters are greatest (Henry, Tolan, & Gorman-Smith, 2005).

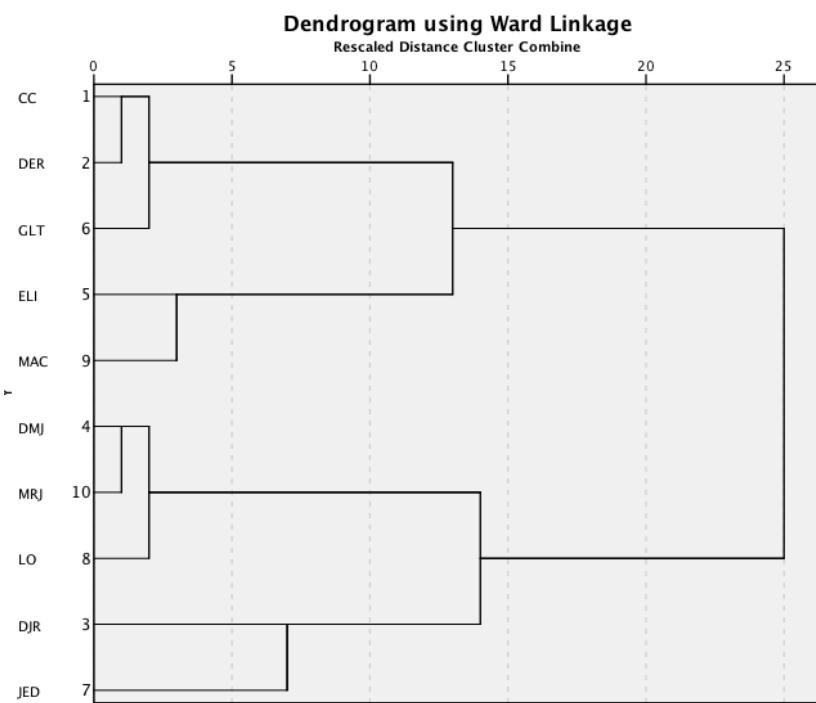


Figure 8.1. Cluster analysis of the ten participants

An initial inspection of this Dendrogram shows a remarkable reflection of the qualitative grouping of the participants. There seems to be a clear split into two groups at a rescaled distance of 25, with Realists CC down to MAC, and Ideaists DMJ down to JED. There is also an indication that at a reasonably high level the Ideaist group divides into two groups, as does the Realist group. Though such separation can be explained qualitatively, these divisions are difficult to explain without completing further analyses, both for the participant grouping and the groupings found in the entire normative sample. To this end, in an iterative process where, instead of establishing or validating higher-order factors, the data matrix was transformed (rotated 90 degrees) so that individuals rather than facets were factor analyzed. This innovative use of principal components analysis resulted from in-depth discussions with the colleague also concerned with important aspects needed for person-centred psychometric evaluations.

Using PCA Varimax rotation (SPSS version 21) a series of analyses was run on the transformed participant data set. Factoring of people rather than of variables enables the factoring within participant clusters at various levels to check the veracity of such participant only groupings. Results from this methodology provided an important comparison with the cluster-analysis groupings, the latter being the generally accepted method for grouping people. The evidence of such parallel results serves as justification of innovative use. The extra information available from such a PCA helps us to better understand and interpret any relationships in the Dendrogram, in which the component loadings are indicators of individuals' relationships to particular facet profiles. This is also an important validation when applied to the entire respondent set: that process is reported further in Stage 2.

A brief note is needed here in relation to the method of extraction: Rather than using oblique rotation as is often the case with a lexical approach to personality (Hofstee, 2002a), orthogonal Varimax rotation was

selected as this makes the most of the strongest loadings, at the same time as minimizing the weakest (B. G. Tabachnick & Fidell, 2013).

Initially a two component solution of all participants (Table 8.2) was sought on the basis that a Dendrogram showed an unambiguous distinction, and the Scree Plot (Figure 8.2) also appears to indicate two but certainly no more than three components.

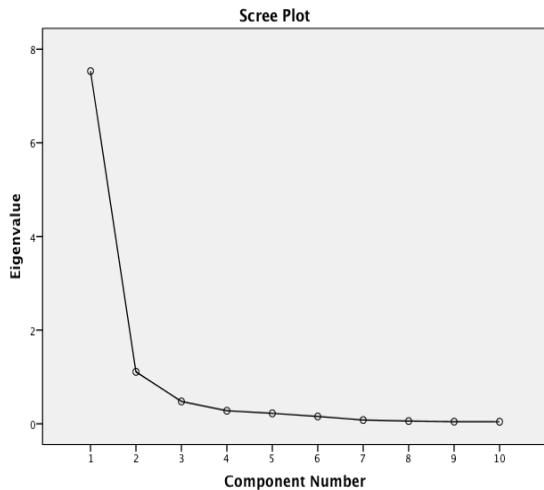


Figure 8.2. Scree plot

In terms of **a two component solution**, Component 1 appears to capture the Realist thinkers (as in the Dendrogram parallel, from GLT down to MAC), and is demonstrably quite different to the factors of Component 2, which largely resembles those attributes identified as those of the Ideaists (DMJ to JED). While some more conventional researchers could be critical of this as an unorthodox analytical procedure, the pleasing congruence of this person-centred analysis with the Dendrogram is confirming, and demonstrates a discriminative power that identifies and helps us further understand those individuals by the different magnitudes of component loadings.

Table 8.2. Degree of loadings of transformed person-centred cluster analysis: 2 components

Within Group		
Rotated Component Matrix ^a		
Participants	Component	
	1	2
GLT	.936	
CC	.864	.323
DeR	.809	.504
ELI	.779	.558
MAC	.774	.529
MRJ		.916
JED		.873
LO	.324	.864
DMJ	.506	.790
DJR	.564	.610

Note. Extraction Method: PCA

Rotation Method: Varimax with Kaiser

Normalization converged in 3 iterations

While a two component solution clearly distinguishes one group from the other, the fact that several participants register in both components however needs some explanation: in Cases CC, DeR, and DMJ, their reported understanding of their own thinking as being Realists may support my claims in relation to their unexplored self-knowledge, as maintained in Chapter 6. It is possible to argue that the undifferentiated individuals may well be undeveloped Ideaists, who believed for various reasons they should be Realists: further explication of this inference will be clearer in the quantitative graphs that follow. In regard to the two Ideaists, both reported a real love for doing some things, for example like building when they needed to relax, to give themselves a break from their normal intensity of deep thinking, translating their ideas into ‘wood and stone’; here again we see evidence for the explanatory benefits provided through the qualitative lens that otherwise would have remained a research conundrum.

In short, there is a high degree of consistency between the attributes (Table 8.1) and the cluster analysis (Figure 8.2), with the loadings of people on one or both components interpretable and consistent with my qualitative understanding of these individuals that will be further clarified when considering a 3-factor solution.

When PCA was completed with a Varimax rotation with five iterations, certain individuals did appear to join a subset in which **three components** seemed to provide an alternative more fine-grained account. Table 8.3 provides this solution.

Table 8.3. Degree of loadings of transformed person-centred cluster analysis: 3 components

Participants	Components		
	1	2	3
GLT	.931		
CC	.840		
DeR	.779	.442	.327
MAC	.762	.510	
ELI	.730	.450	.435
LO	.328	.886	
MRJ		.876	
DMJ	.494	.773	
JED		.682	.633
DJR	.442	.325	.808

Extraction Method: PCA

Rotation Method: Varimax with Kaiser.

a. Rotation converged in 5 iterations.

In comparing the two and three component solutions, we find Group 1 is still very clearly represented by the first component in both extractions, with those who reported a factual Realist thinking focus also including the two individuals who were deemed Undifferentiated (CC, DeR). Hinted at by the two component solution, the three component extraction clearly places DMJ, the third of the undifferentiated cases, in the second component, seeming to belong with those individuals considered to be Ideaists. This fits with my earlier explanation that when I had understood and interpreted her oft-contradictory statements, she really appeared to be more of an Ideaist, though the higher loading on the Technical facet here becomes attached to the Realist Component 1. Support for this view had been provided by her technically oriented partner who at the close of her interview indicated a very different perception of her way of thinking than what she had described to me, as already cited in Chapter 6. Her responses on the WOT questionnaire therefore point to a clearer understanding of herself when in written rather than verbal communications which, as mentioned earlier, was completed *after* her interview. Accordingly, this may advance an example of the benefit of a quantitative analysis to counter-balance the interview only perspective.

The third component identified by this rotated extraction includes cases JED and DJR. Whilst clearly Ideaists, as indicated by above mean scores on Lateral, Abstract, and similar facets seen with other Ideaists, their interest and ability as individuals with Technical and Scientific thinking was clearly indicated by their scores being as *high* on the Technical/Scientific facets as they were *low* on the Artistic, Imaginative and associated facets, while the *reverse* was evident for the other Ideaists who perhaps may best be regarded as *Artistic* Ideaists. This differentiation can be seen more graphically in Stage 2, when the entire respondent

data set is analyzed, with individual participants who loaded strongly on each facet being identified as the *markers*.

To this point at least, for this particular sample of participants, though it is small, there seems to be no argument about how well the qualitative findings relate to the quantitative results. Indeed, this process provides a clearer understanding of individual differences in thinking that validates the joint findings made about the participants by both methodologies. There *is* a clear and confirming discrimination of the Realists from the Ideaists, with an initial three component analysis providing further insights: firstly, with a number of participants scoring reasonably high on the two thinking styles, to form the Ideaist group, and secondly identifying from that group that two subgroups appear to emerge. Though these clusters have been considered by the qualitative findings of Chapter 6, a more detailed explanation may be helpful, with an investigation of these participant findings when considered in the larger cohort of respondents to the WOT questionnaire.

Stage 2: Individuals as markers of the 3 main clusters – all respondents

This second stage considered how clustering can be further understood when again innovatively applying a person-centred PCA but this time for the entire respondent set. A three factor solution was again deemed more meaningful than a two component one: this accounted for 94.6% of the people variance, though alternative two and up to six factor solutions importantly also found a range of communalities from .89 to .97.

The participants were used as markers in a Varimax rotation of the factors (Table 8.4) that when iteratively considered, point to an understanding of the groupings as evidence of the same qualitative profiles now being identified in the quantitative grouping analysis, the top ten or most extreme examples being used in each component.

Table 8.4. PCA entire respondent set, with participants identified within as Marker cases

Case	Component 1	Component 2	Component 3
158	0.78	0.49	0.29
110	0.77	0.38	0.46
173	0.76	0.47	0.36
205	0.75	0.47	0.41
219	0.74	0.50	0.41
210	0.74	0.52	0.38
203	0.74	0.41	0.49
122	0.73	0.46	0.43
200	0.73	0.51	0.37
GLT	0.73	0.44	0.43
199	0.43	0.77	0.42
220	0.48	0.76	0.38
131	0.42	0.75	0.42
DJR	0.56	0.75	0.31
151	0.53	0.73	0.39
102	0.47	0.73	0.44
124	0.44	0.73	0.48
JED	0.36	0.73	0.51
224	0.49	0.72	0.45
139	0.53	0.71	0.42
143	0.44	0.48	0.72
156	0.45	0.53	0.68
153	0.52	0.46	0.68
166	0.42	0.59	0.67
175	0.55	0.43	0.65
LO	0.33	0.64	0.65
DMJ	0.45	0.59	0.65
190	0.54	0.41	0.65
229	0.60	0.42	0.65
183	0.57	0.43	0.65

Note. PCA with Varimax rotation. $N = 102$.

A component represents communality among the variables, which in this transformed matrix means that each component represents a communality of facet scores among individuals. Each component thus captures a dominant characteristic profile of facets. Facets as with variables or factors are never singularly independent and un-related. Relationships evident initially by correlations can be of all sorts, from overlap through causal dependency to moderation and mediating effects, and such are now often disentangled and tested using regression analyses in various ways (Holmbeck, 2002). The point Hofstee (2002b) makes, however, as an early proponent of person-centred analyses, is that such congeniality often sees variables form into typical groupings, and when such groupings indicate a clustering of individuals, they can be regarded as typologies.

From Table 8.4 we can see how grouping individuals on the basis of their primary loadings leads to the same clustering as those suggested by my qualitative understanding of participants. Not only does it

point to the Realist-Ideaist distinction, but importantly again places the one Undifferentiated Case DMJ clearly within the top 10 of the Ideaist group. The components can be interpreted as capturing facet profiles that represent Realists and two types of Ideaists. This quantitative analysis then ratified my twofold picture of thinkers, and that conclusion will be demonstrated more clearly in the graphs that highlight the *means* of those groups in **Stage 3**. This conclusion also points to the second component as chiefly the Technical/Scientific Ideaist thinkers that includes DJR and JED, while the third in this rotation suggests a slightly less clear but equally distinct cluster of Artistic Ideaists, again with clearly identified participants amongst the top 10 exemplars.

Given that the participants divide into such similar groups to those found by the PCA of the entire data set demonstrates how the typologies of the small participant group is substantively that of the larger population and thereby is strong evidence for the validity and possible transferability of the qualitative findings. It also supports the strategy of selecting participants based on Holland's criteria as having been an effective means for ensuring breadth in qualitative sampling, encapsulating a broad range of individual differences in ways of thinking that seem to reflect similar patterns observed in a general population.

The fact that this PCA does not include five of the participants needs some consideration: CC and DeR (as previously identified as undifferentiated, and will be referred to again later); MAC and ELI (referred to as Realist thinkers) who both score relatively highly on both components though with a distinct preference for the Realist facets, and may provide a possible explanation of their being 'ambidextrous' thinkers, that is, capable of using both ways of thinking. This interpretation fits well with the interview perspectives gained for MAC and ELI, since both participants indicated a facility to be creative in the sense that they appreciated this in others, though they did not consider themselves to be particularly lateral, conceptual, nor as adventurous thinkers concerned with 'thinking outside the square'. At the same time they equally had reported not feeling as 'stuck with the facts' that other more extreme or ultra-Realist had admitted to. Both MAC and ELI had stated they knew the personal benefits of and an appreciation for the insights from other (Ideaist-like) thinkers, and were unlikely to think of such different thinkers as warranting anything other than the utmost respect. And although MRJ was also absent from this group, her scores were only just outside what were the quintessential top ten of Ideaists.

But now to Stage 3, which considers the authenticity of the facet profiling (as associated with each of the components) when viewed through the attributes of the marker participants.

Stage 3: Explaining groupings in terms of facet profiles - relating these to the Attributes of Marker cases

This third stage takes each of the person-centred phenomenological profile groupings, and considers the identified participants as markers of the whole data set ($N = 132$), using these groupings for interpretive purposes. Thus for each type, Realists and Ideaists, we will consider appropriate graphing that indicate:

(a) a mean facet profile for top ten – considering (i) where all scores are below or above the mean and (ii) where the group mean differs more than one standard deviation from the population mean.

(b) an example of a participant from each group in evaluating facets in relation to emerged attributes.

Following this discussion, a further discussion is needed about the group identified as undifferentiated thinkers, with graphs to illustrate possible explanations about whether this is a distinct group.

The Realist thinker

When looking at these profiles as clusters, using the top ten exemplars in each group as clearly identified by the factor structure of components, the most obvious participant in the Realist Component 1 group is GLT, seen on the first graph (Fig.8.3) plotted against the mean of all other Realists.

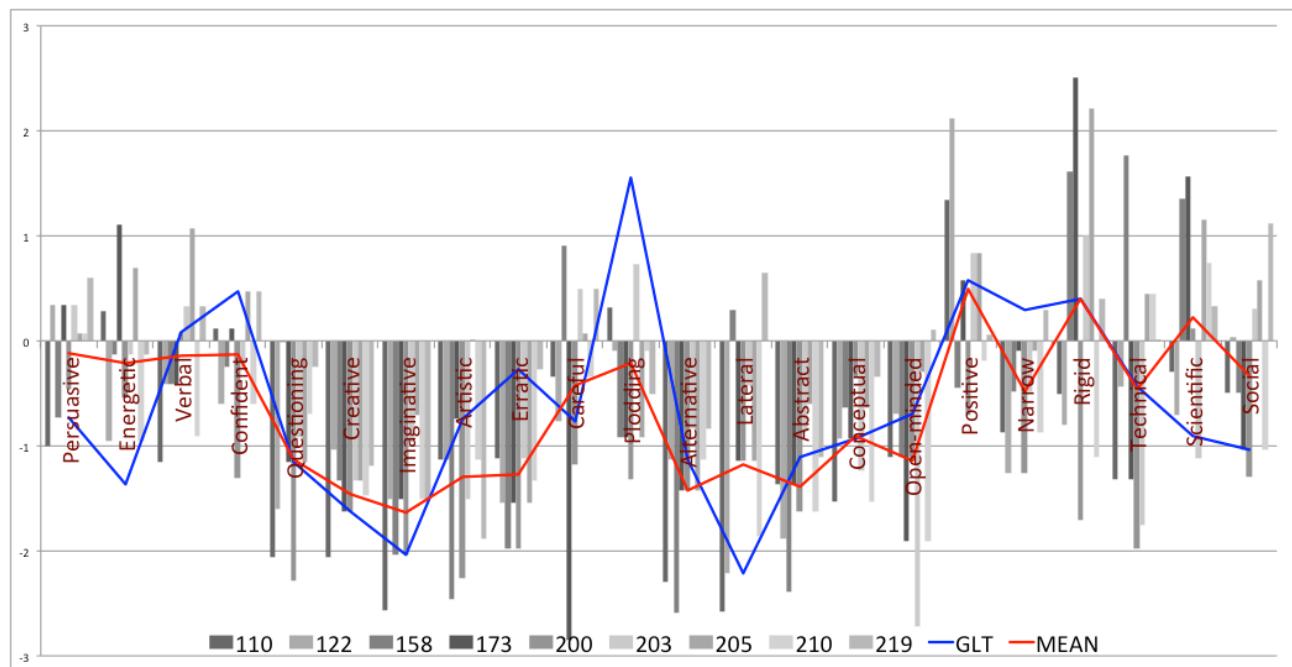


Figure 8.3. The top 10 standardized scores of Component 1/Realist Thinkers, standardization based on all (N= 132) respondents, with the mean of this group plotted alongside participant GLT.

Note how closely the plotted graph of this participant follows that of the mean, although she differs from all others on the high end of the Realist thinkers in her high score on Plodding and also somewhat on her Narrow thinking (specifically mentioned in her interview) – openly acknowledged and accepted about her very focused way of thinking. This pattern was also borne out by comments made by other Realist thinkers, reporting their thinking as being quick, precise and to the point, with little time given to thinking ‘outside the square’ nor with imagination. This very clear picture is powerfully reinforced by observing the cluster of facets that fall without exception *below* the mean: from Questioning through to Erratic, and again almost as obvious, with the low facets Alternative through to Open-minded scores, a significant feature,

particularly when compared with an equally clear but distinctly different picture of Component 2, to be reported with the next graph (Figure 8.4) as Ideaist thinkers.

The Ideaist thinker

The attributes expressive of the Ideaist thinker profile typically highlight their love of playing with ideas, in broad, lateral, and questioning thinking that is engaged *in essence* to satisfy their basic need to understand, the core consideration expressed by all of the Ideaist way of thinking. Some express this through their creative artistry while others apparently prefer to use that same lateral, abstract, and conceptual yet creative thinking more frequently reported with Scientific and Technical thinking. Though the mean scores on almost all facets are slightly above the mean of the total population, several participants highlight these characteristics with scores of *more* than one standard deviation (either above or below). A quantitative microanalysis was not possible with the small number of participants, yet the information thus gained is not disputed by the insights gathered of this potential separation of the Ideaists into two groups.

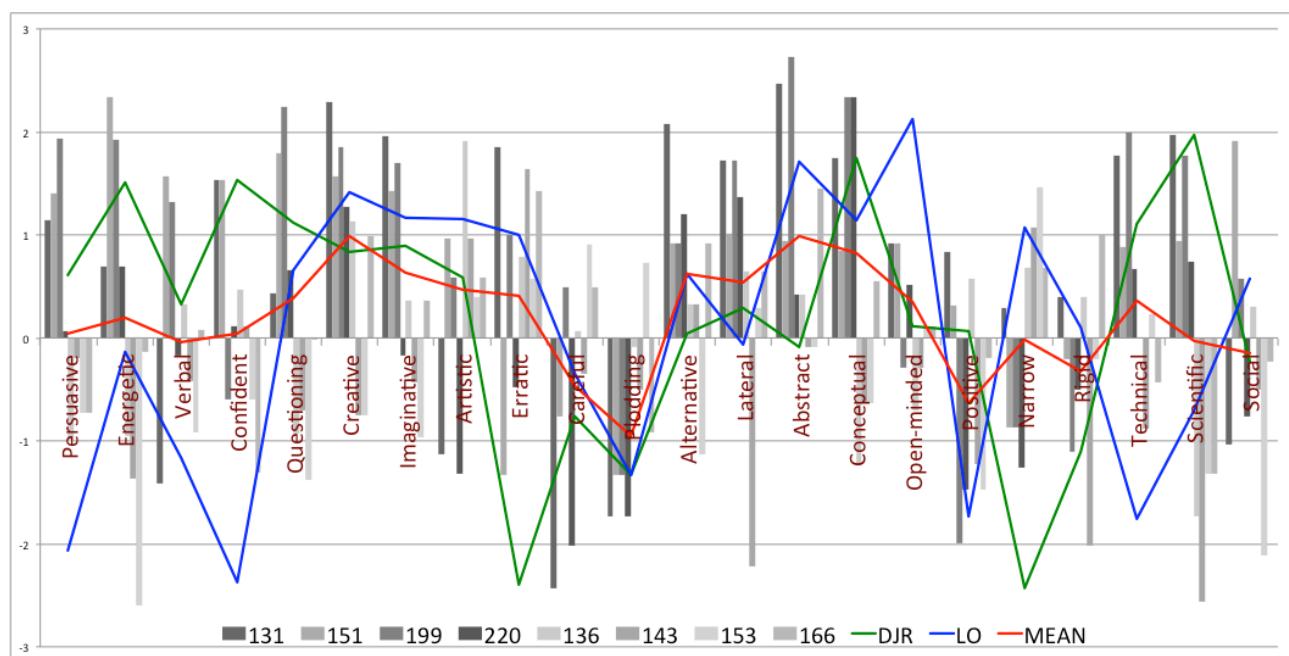


Figure 8.4. The top 10 standardized scores, 5 each of PCA Groups 2 and 3 here identified as Ideaist Thinkers, with one example each of Artistic (LO) and Technical/Scientific (DJR); standardization based on all ($N = 132$) respondents, plotted against the mean of all Ideaists.

In this second graph (Figure 8.4), the communalities of extracted Components 2 and 3 (Table 8.4) report those facets remarked on qualitatively as being Ideaist, though notably, the two participants demonstrate a creativity and lateral way of thinking score quite differently on the Narrow, Scientific, and Technical facets, supporting a potential *division* of Ideaists that justifies the later interpretation of there being two distinct groups. Though it makes good intuitive sense, it is not surprising, however, that this separation of Ideaists could not easily be made qualitatively, especially when so many of the attributes/facets remarkably were evident for *all* Ideaists, as shown in Table 8.1. This factor alone supports the relevance of a

mixed methods approach in determining what are indeed important indicators of both unique individual differences, as well as confirming some general tendencies found by my phenomenological analyses.

On the whole, Figure 8.4 shows all the Ideaist thinkers indicating a preference on facets Alternative through to Open-minded. Some individual exceptions however can be seen more clearly in the following analysis when the two who differ are graphed separately. Figure 8.5 Technical/Scientific Ideaist is strongly indicative of Component 2, with scores of more than one standard deviation on many facets. Subsequently Figure 8.6 reports the apparent Artistic Ideaists.

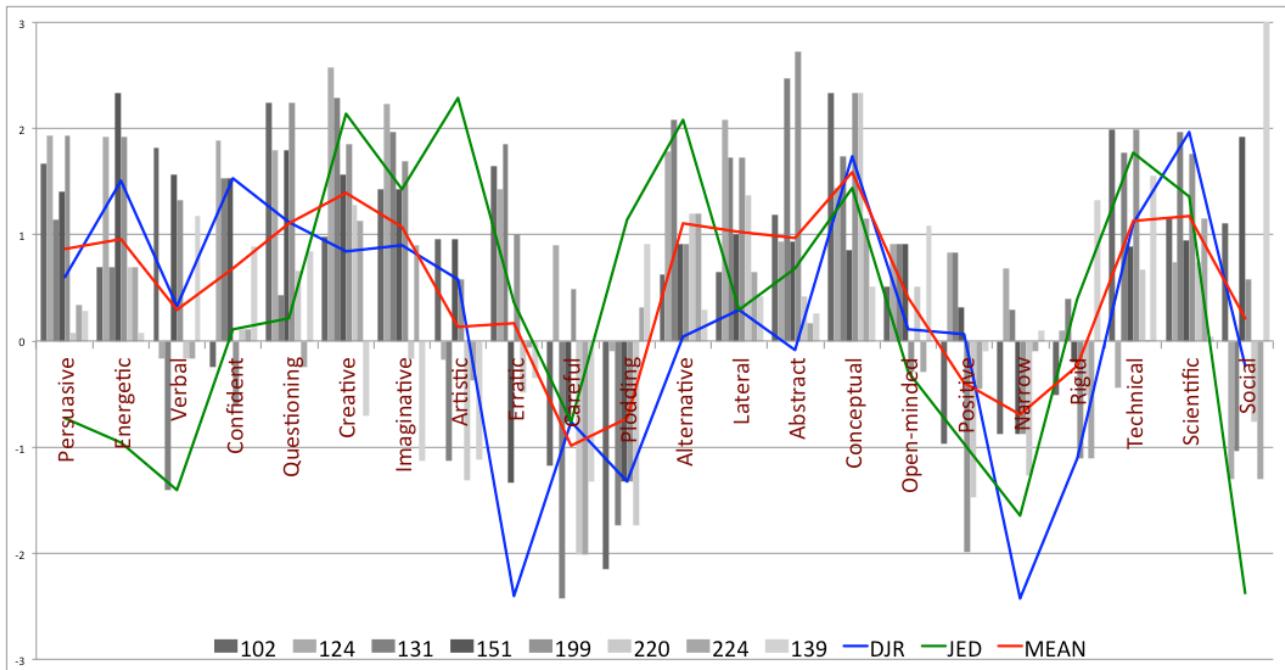


Figure 8.5. Mean raw scores of Technical/Scientific Ideaists with two participants DJR and JED

The individuality of the two participants in Figure 8.5 deemed Technical/Scientific Ideaists demonstrates again how unique we are as individuals, though we may share many attributes in common. For example, DJR scores a lot higher on Persuasive, Verbal and Social facets, and a much lower score on Artistic than his Technical counterpart: this was clearly confirmed by what had emerged in the interviews of both – one a high social, who enjoyed his teaching, while the other admitted to little personal interest outside his life that revolved around his lifestyle of creative artistry. Equally individual characteristics point to DJR as reporting *not* Narrow nor Erratic thinking, yet at the same time he scored strongly on both Technical and Scientific facets.

A closer consideration of the more fine-grained profiles also shows how this group of Ideaists is mostly marked by high facet scores for Persuasive, Energetic, Verbal, and Confident, with an exception being Case 131 (who we cannot really explain since qualitatively unknown), and also participant JED, a self-confessed loner, who chose to spend as little time as possible with people. As observed with JED, all these facets were largely non-existent for the Artistic Ideaists, and perhaps indicate his particular way of thinking

as being a strong blend of both the Technical/Scientific and Artistic Ideaist, as an artist who had also built his own beautiful, different, and complex home.

Some of the facets where scores are more than one standard deviation above the mean of Technical Ideaists also include many of those participants already noted as sharing communality with Artistic Ideaists – including correspondingly *low* scorers, suggesting their thinking was not seen as particularly careful, nor plodding, and again is almost that way without exception. These findings are supported and perhaps better explicated by the narratives of those participants, reportedly enthusiastic, often passionate thinkers, who loved exploring ideas, thinking for its own sake, and who were not so concerned about making things happen – thinking that could not be described as Plodding, though their *behaviours* were often commensurately perceived to be slow, needing time to be reflective, meditative, exploring meaning rather than action.

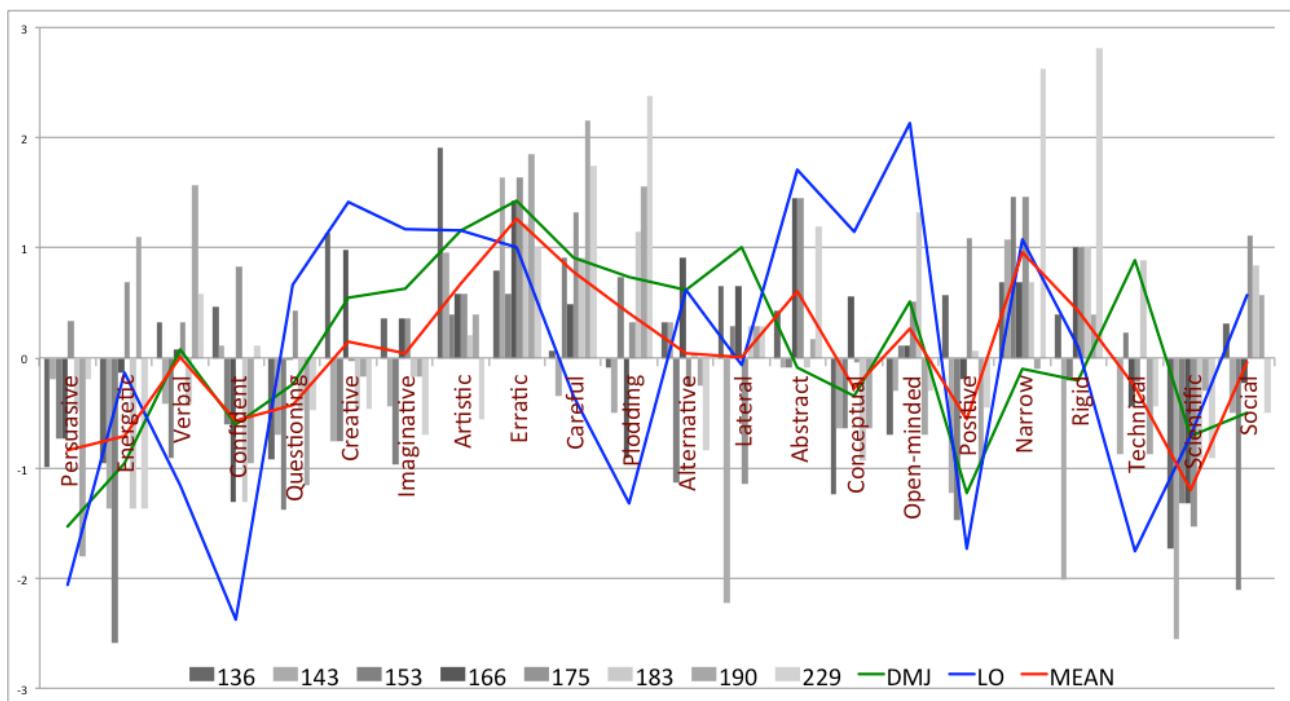


Figure 8.6. The Artistic Ideaists represented by two participants DMJ and LO

In considering the two participants described here (Figure 8.6) as Artistic Ideaists, it is also important to note the concordance with my other inferences made about them as Ideaists: the first one is LO's profile, supporting the Artistic Ideaist with similarities held by others of her type, whilst also discriminating those specific facets already identified by case study findings that highlighted how she differed from other Ideaists. For example, results support LO's lack of confidence in that she admitted to not thinking very highly of the way she thought, as well as her beliefs related to how her thinking was unlikely to influence others (Persuasive), in spite of being a much respected and appreciated social worker. The second participant MRJ, not shown on the graph, equally demonstrates support for the Artistic Ideaist PCA Component 3. Important in this discussion is the graph of DMJ: though she had verbally maintained her way of thinking to be that of a Realist, the graph clearly indicates she is not such a thinker; and though earlier

deemed undifferentiated in terms of my two-pronged model, she shares a profile that has much in common with high Artistic Ideaist scorers. In this instance, the quantitative analyses has helped clarify an apparent lack of self understanding, and as such supports my earlier explanation of DMJ as being a closet Ideaist.

Undifferentiated thinkers or simply less extreme?

Thus far, the findings from both qualitative and quantitative analyses have pointed to two specific groups of thinkers, the Realists and the Ideaists, with the possible further differentiation of Ideaists who are more Technical/Scientific than those who are more Artistic Ideaists. But the question remained: how do we account for those thinkers who seem to be neither one nor the other? Can it be that these are a large number of people who do not really know who they are? Or are they simply a blend of both? Or perhaps, is what complicates the distinguishing of one way of thinking from the other being muddled by other factors, such as personality factors, maturity of self-knowledge and self-confidence, and the impact of sociological factors? All of these and more were suggested by my model in Chapter 6 : The Interactive Ways of Thinking Model (IWOT) (Figure 6.2). The model postulated that *how* we think is variously impacted on by the *why*, *when*, and *what* aspects of thinking that may still remain part of the complexity that is now encapsulated by the dilemma posed by those individuals seemingly being undifferentiated.

For those three interviewed who *reported* being practical, realistic and quick thinkers but in many respects were identified as undifferentiated, (again see chapter 6 for more details), the quantitative analysis has been able to further investigate these participants, so that as already stated, DMJ can clearly be distinguished as thinking as an Artistic Ideaist (Figure 8.6). Her self-reporting on the WOT questionnaire also supports her conversational admissions concerning her interest in and the impact of the technical way of thinking that she had reported as gained from her engineer partner. This may also explain the comparatively low Narrow and Social facet scores, though not admitted to during her interview, and which largely distinguishes her from most other Artistic Ideaists, being seen more clearly with Technical Ideaists (in Figure 8.5). Her low score on Scientific may provide support for my early inferences made of her who, being unsure of her own way of thinking, was therefore grouped with the undifferentiated. The lack of clarity about how DMJ described verbally how she thinks may be another support for the explanation made, of a lack of formal education/career path and associated disinterest in being more Scientific, which again supports the inference of an underdeveloped self-appreciation; conversely, it *might* simply be a case who demonstrates the uniqueness of the individual, as is also a possible explanation of the non-Technical but Scientific thinking facet scores of Case 124, though the personal insights seem to suggest otherwise.

Further consideration of the undifferentiated thinkers reveal one example (CC) who stood out qualitatively, with her claims for being a practical, down to earth person frequently contradicted throughout her conversation, though her WOT responses suggest *some* support for her being a Realist thinker. Looking at the scores on at least Questioning, Creative, and Imaginative facets for example, these do resemble the mean of Realist thinkers, as they also do of the other undifferentiated thinkers. But further reflection on how inconsistent her responses were in relation to the mean Realist profile, and how in some respect these reflect

those of the Ideaist profile, whilst also being quite inconsistent with the mean Top 10 of those with an Artistic Ideaist, CC exemplifies an ‘all over the place’ view of self, best shown by Figure 8.7 - clearly a non-Realist profile. A similarly very mixed profile can be discerned with DeR, the other undifferentiated individual, but who has not been included here to simplify the graph display. Though the mean for the group is not very distinguished, with raw scores less than one standard deviation, scores for CC vary considerably from that mean.

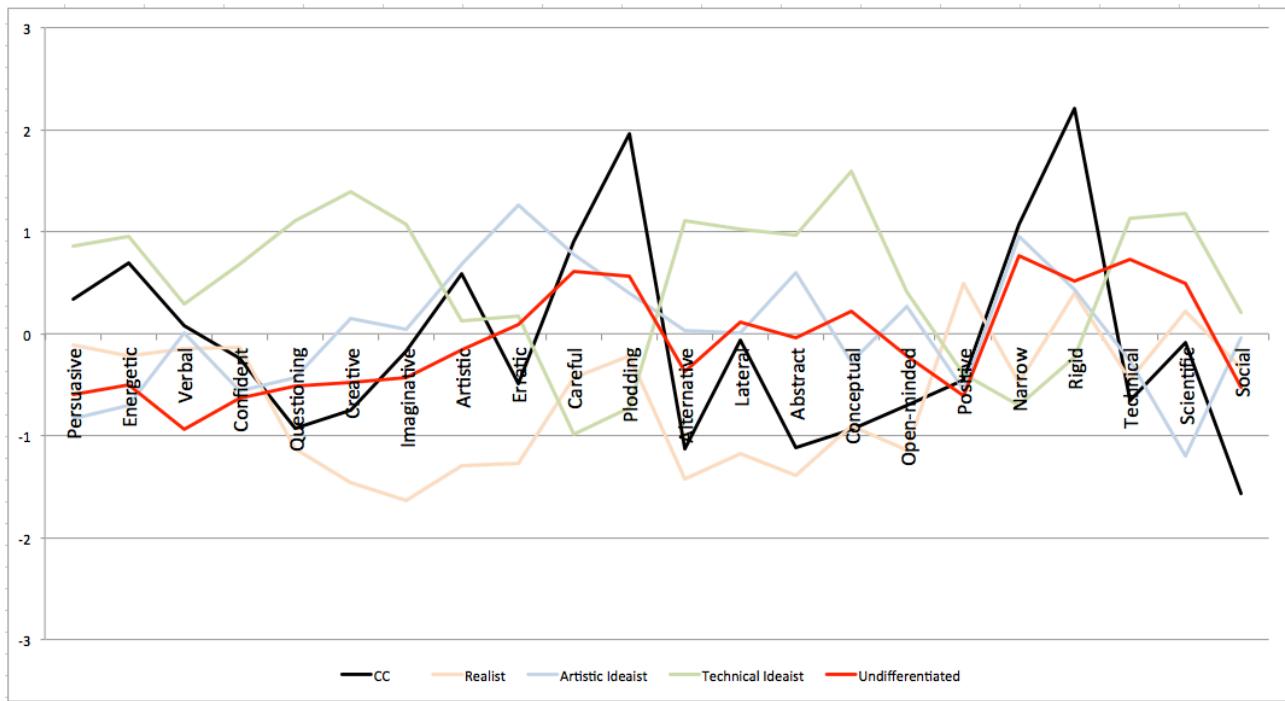


Figure 8.7. The mean of the Undifferentiated (in red) accentuates WOT responses of undifferentiated participant CC (black), with alternative Ideaist and Realist group means in muted colours.

While some feasible explanation has been made of some of the individual cases who did not ‘fit’ with any of the groups, a question remained about what makes best sense of those in the large group of the non-extreme profiles for whom I had not had the benefit of deeper understanding through more intimate qualitative insights. In collaboration with a colleague, all remaining cases not identified by the PCA within one of the *three* component groups (Table 8.4) were as a group subjected to another PCA, again using a Varimax rotation. The resulting *two* component solution ended up accounting for 84.9% of the variance in the remaining group of individuals, providing additional Components 4 and 5. Communalities ranged between .69 and .95, whilst the correlation matrix was able to confirm the factorability of the data. Table 8.5 provides details of the individuals who received the ten highest component loadings from one or other of the components.

Table 8.5. Marker Cases for Person-centred PCA Varimax Rotation

Case	Component 4	Component 5
132	0.929	0.239
202	0.866	0.402
116	0.846	0.445
170	0.843	0.491
244	0.834	0.425
129	0.831	0.320
137	0.83	0.420
148	0.822	0.415
242	0.807	0.494
ELI	0.802	0.470
121	0.200	0.886
174	0.473	0.805
165	0.514	0.799
228	0.292	0.775
157	0.539	0.773
141	0.347	0.766
196	0.479	0.753
155	0.567	0.738
133	0.522	0.734
CC	0.336	0.734

Note. N = 102 remaining cases

The two resulting groupings are now reported graphically in Figure 8.8, with each clearly distinct group ascertained on the basis of having a primary loading exceeding .65. The first group of 10 with the highest loading in Component 4 includes the marker ELI – and importantly we needed to consider how his scores might differentiate him from others who could either be regarded as Realists or undifferentiated. Apart from the understanding gauged from his interview that he was a Realist thinker, yet having a strong inclination to incorporate the creative and lateral thoughts generated by others, there are some clearly distinguishing characteristics that the quantitative analysis has revealed. For example, his positive and open-minded thinking, his confidence, as a persuasive, energetic and verbally able thinker, along with his lateral thinking, all are counterbalanced by his willingness to report himself to be a somewhat Plodding thinker, non-Conceptual, and not a particularly Careful thinker. Most of the other facets are little removed from the mean of all respondents. None of these characteristic attributes were in any way contradicted in his reflective interview with me.

My own perceptions were that here we have a person who is highly successful, seems balanced, *ambidextrous* as it were, and without any of the negativity suggested by the humorist who cynically defined ambidextrous as being one who is “able to pick a pocket with either hand” (Bierce, 1996, p. 21). Eli displayed a strong inclination to see things through a Realist thinker perspective, yet he was equally confident in using some facets seen more frequently with Artistic Ideaists. But by his own admissions concerning this apparent combination of profiles, his creativity was more about using others than generating his own, and was evidenced by his imagination being confined to those things that could be seen, touched

and handled. So we were left wondering if this Component 4 could be said to identify the *balanced or ambidextrous* thinkers, those able to know how they think and how to use others who think differently.

To summarize the facets for all top 10 in this category, we have a mean that basically registers *positive* loadings on those facets that may be more reflective of positive personality traits, rather than a specific thinking style. At the same time, individual identification of thinking preferences (such as slightly below on Scientific and Technical, and slightly above on Artistic, Imaginative and Creative facets) may indicate a general preference for one type of thinking but is not a strong preference, since all loadings are within one standard deviation of the mean. To this point, we seem to have a very positive self-concept that belies self-doubt or confusion. It may also suggest an impact of abilities that reflects much of the underlying constructs of cognitive style research, and though this has not been the focus of this study, it certainly suggests further research is warranted.

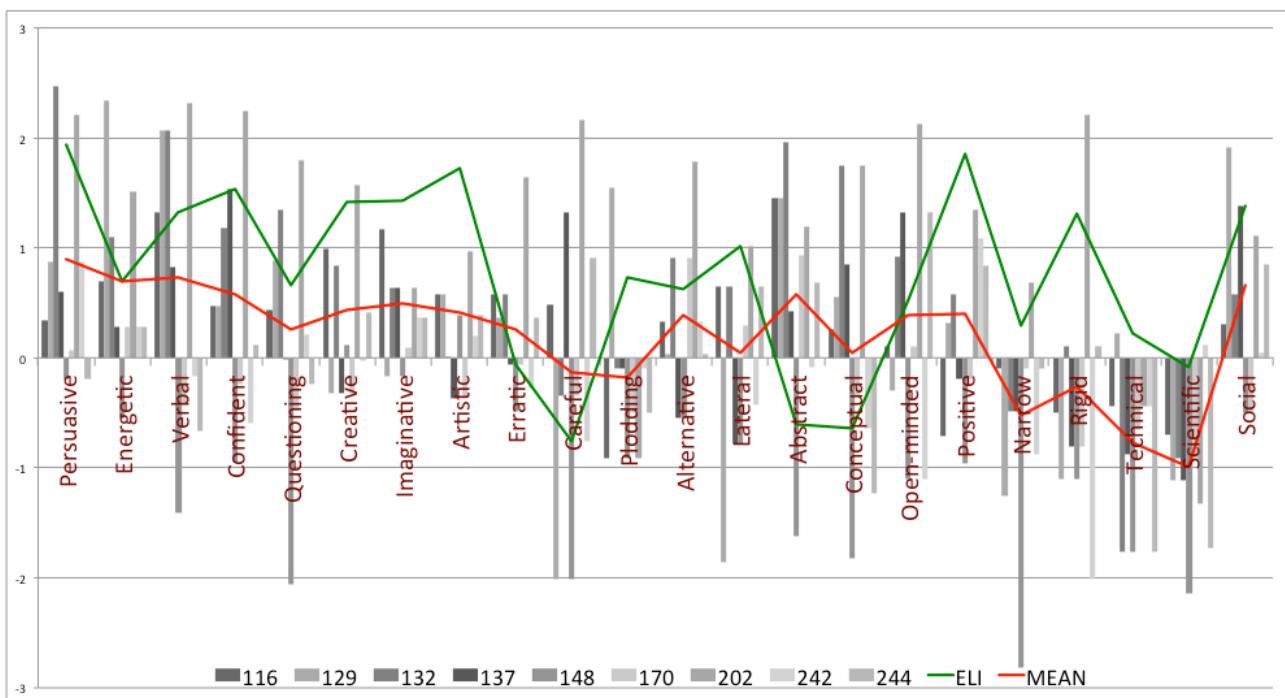


Figure 8.8. Marker cases as Z-scores with Mean Group Profile of Component 4

The ambidextrous profile just reviewed lies in clear, some might suggest in *stark*, contrast to the one already referred to as undifferentiated that was most exemplified in CC, and seen graphically in Figure 8.9: all the facets identified negatively are virtually the opposite to those positively associated with ELI (Figure 8.8). One strong inference can be made here, that these differences reflect CC's lack of confidence generally, with an associated anxiety which had prevented her from knowing how she thought, and a consequent inability to develop her preference for thinking, one way or the other. This perception was not gainsaid by the interview process, as researcher and participant together reflected on her doubting herself at so many levels.

The same conclusion can be drawn about the remainder of those whose loadings were similarly strongly negative and loading on Component 5. This view is supported by others in research, including those

who considered a duplex model of cognitive styles as predispositions that ultimately “develop as a result of a variety of factors, including age, gender, personality, ability, education and experience...”(Sadler-Smith, 2009, p. 13); His view of a two-fold aspect to a cognitive style is somewhat different in that it posits a disparity between the ‘intuitive’ mode, with its affect-impacted formation being associated with an unconsciously slow process, and the alternate ‘rational’ affect-free analytic mode that is consciously mediated. Though the two-fold elements of the rational versus affect were not discerned in this research, Sadler-Smith’s model is an important one for this context, however, in that at the very least it helps us reflect on the potentially onerous impact of affect and a negative self-belief system on the individual, particularly when not reviewed by conscious awareness (Wilson, 2002; Winkielman, 2010). Other research has similarly suggested that a lack of self-understanding contributes to negatively charged specific behaviours, including how one thinks (Ewen, 2010; P. Steel, Schmidt, & Schultz, 2008).

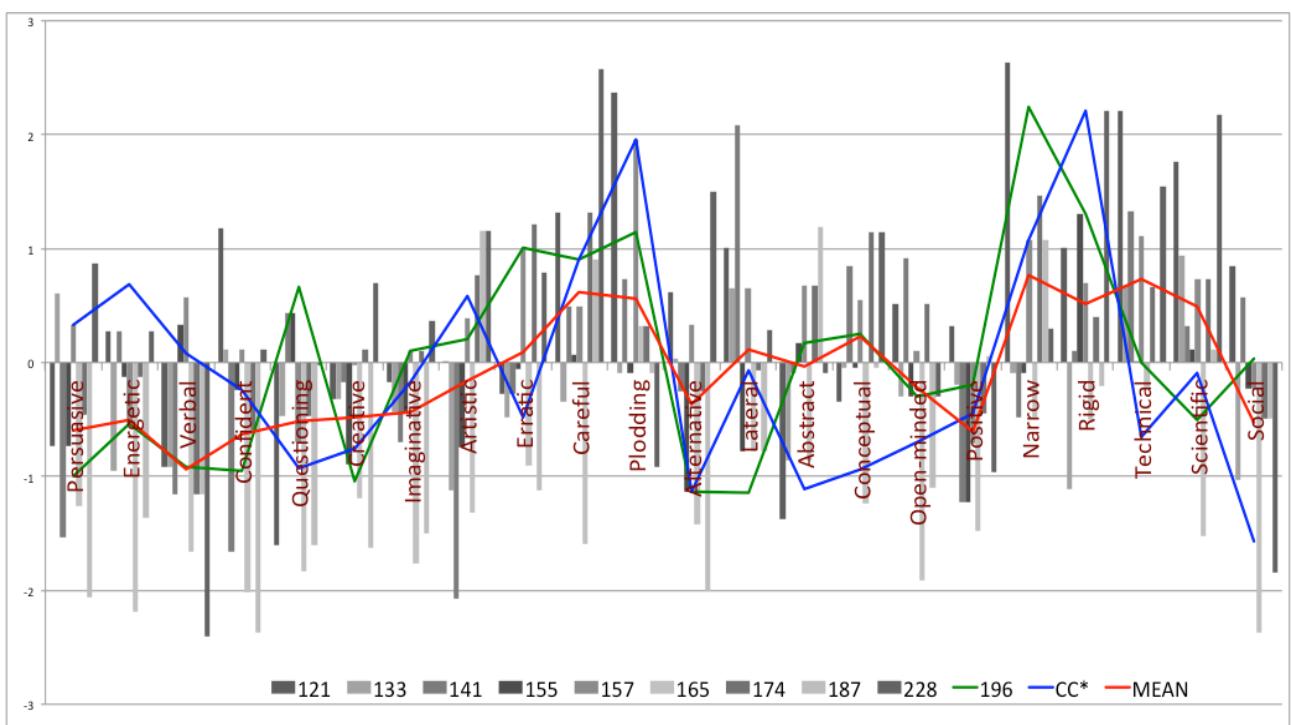


Figure 8.9. Marker cases for Component 5 - Undifferentiated, Mean Profile, highlighting Cases CC and 196

In the case of the data set of those identified both qualitatively as undifferentiated respondents and by quantitative analysis that identifies a separate Component 5, a negative self-report is apparent, with high scores on such facets as Careful, Plodding, Rigid and Narrow - which contrasts with Realist thinkers who usually have low scores on these - and alternatively, these characteristics are countered by low scores on some of the very facets observed as strong potentials indicative of being Ideaists, facets that otherwise might have been enjoyed if such characteristics had been developed: for example, Questioning, Creative, and Imaginative facets. The pattern of means of both groups are virtually opposite, almost mirroring each other, one positive and one negative: that in itself suggests a valid explanation, and one that also seems to fit those participants who were retained within their particular identified groups, regardless of which methodology was used.

Can we conclude then, that any differentiation is tenable for those thinkers who display very little variation from the overall mean? If no accounting for any of the facets can be made, for example about social desirability or image management, then maybe we are left with two smaller groups of individuals: firstly in Group 4 as identified by Component 4, representing those individuals whose profile of facets can basically be characterized as more balanced and ambidextrous, with positive views concerning themselves and the preference of how they think quite well-known, while having a capacity at times to utilize the alternate dominant way of thinking. The second group characterized by Component 5 are those individuals who perhaps may be said to not really know themselves very well, so are unsure of how they think, and may therefore be somewhat lacking in knowing how to use what has remained for them an unknown potential.

In order to allow for a direct comparison of these two groups, we have extracted the means of components 4 and 5 from Figures 8.8 and 8.9, generating Figure 8.10, with a magnified vertical axis. From this we gain an impression of how these two components somewhat mirror each other. No facet mean differed more than a SD from the total mean, although some came close. Particular note is needed of those facets where the means differ from one another by more than one SD. In this, the ambidextrous is markedly higher (SD) on Persuasive (1.49), Energetic (1.19), Verbal (1.66) Confident (1.21) Positive (1.00) and Social (1.18). Conversely the undifferentiated is clearly higher on Narrow (1.28), Technical (1.50), and Scientific (1.48)

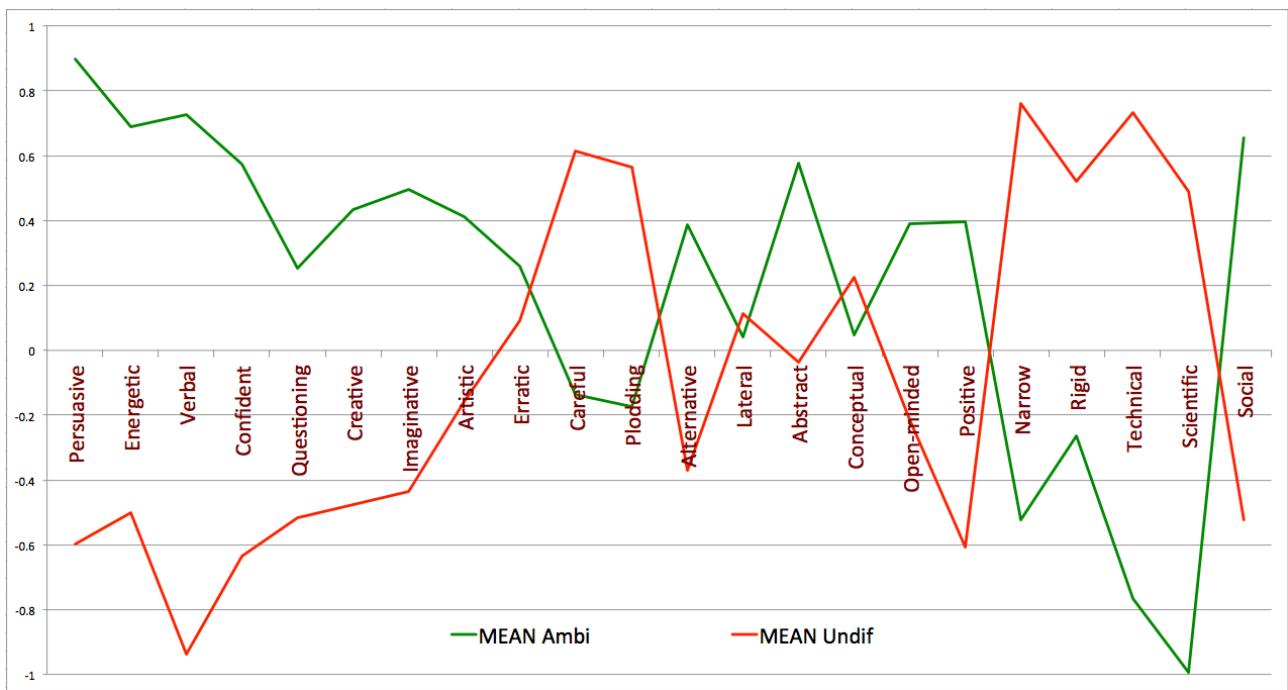


Figure 8.10. Means of all cases for Component 4 Ambidextrous and Component 5 Undifferentiated, as seen in Figures 8.8 and 8.9

Since the differentiation between Groups 4 and 5 rests largely on the few participants identified as either ambidextrous or still undifferentiated, it will certainly need a larger sample of participants to clarify whether in fact such knowledge can be further teased out through the necessary lenses that only a mixed method can provide. Part of what this may provide is suggested by ongoing research and innovative use of

sophisticated psychometrics, which may be better able to make distinctions between this erstwhile unknown mix of people, and about whom the qualitative phase of the current research has been able to only make informed inferences, based on a small though significant group of diverse and interesting individuals.

Summary of facet/group profiles

It is important here to reflect on the differences and nuances found in the process of integrating the findings, and how the insights and meanings resulting from this process seem to make sense. For example, some of the differences seem to suggest that the two major and distinctly different thinking styles typically demonstrate their differences in the sorts of questions such thinkers ask: The Realists, for example, with an ontological focus on the here and now, with questions about material things that are concrete, visible or at least tangibly engage their thinking. The Ideaists on the other hand are absorbed by their primary ideological interests, with their preferred focus on understanding, thinking about the meaning of life: Such patterns were observed consistently throughout participant conversations. The commonality of key facets also provided support to this interpretation.

From an epistemological perspective, regardless of whether the research gathers an emic (participant's) perspective or an interpreted etic perspective of the researcher, as similarly observed by Potter in his reference to Realists and *Idealists* (1996), the philosophical differences were clear. This was highlighted by the ultra-Realists for whom 'seeing is believing', and contrasted strongly with the Ideaists for whom the ontological and epistemological concerns are so entwined that typical questions of *how do I know anything about what really is...* becomes part of a bigger more complex question, and more especially so when trying to discover a joint understanding between participant and researcher. This partly explains why interviews with *all* Ideaists lasted much longer than for the Realists, for whom time itself was always an apparent and consciously measured awareness.

Though there may be a case for finding sub-groups for both the Realists and Ideaists, the numbers involved in this research make such conclusions less tenable. Of course, even as suggested earlier in the qualitative IWOT Model (Figure 6.2) of Chapter 6, the blend of many facets seen within each participant cannot possibly account for all distinct differences in the ways individuals think, otherwise we are left with what would be like "drawing a map as large as the world itself" (Hofstee, 2012, p. 30). I contend this would simply have replicated the cognitive style array of styles that do not simplify or add to our specific understanding of individual differences in ways of thinking that remained the focus of the current research. Rather, it seems reasonable to highlight those characteristics that do "apply to some individuals some of the time, but are nonetheless worth noting for everybody" (Hofstee, 2012, p. 30). The simple groups proposed here suggest the most parsimonious solution, without losing the individual through categorizing unnecessarily into smaller and less useful explanatory typologies.

The final chapter reviews these group profiles in relation to what other research has found, and in the light of these, seeks to draw further conclusions about the WOT measure and what it has to offer, with

recommendations about future research that would extend its applicability and usefulness to individuals of all ages.

Chapter 9 - Discussion and recommendations

Chapter overview

Where did this dissertation begin, and where has it ended? In respect to my own inimitable way of thinking, that of finding out as many facts as necessary and then tying them together in the most efficient way possible, I had expected the process to be a clear-cut time commitment, with a neat package at the end that others could see had involved a worthwhile process that offered something useful. However, from its outset, the process became less and less predictable, so that even the initial goal, that of creating an instrument that operationalized a model of the ways people think (Roodenburg, 2003), moved from being a straightforward ‘do this and then that’ to one that evolved into quite a complex process. I became aware that a simple solution was not going to meet the demands of creating a substantial and worthwhile measure. To achieve anything satisfying, a mixed model of research was warranted, which for me meant learning a whole new way of finding the ‘facts’ before starting to weave these together into something meaningful.

In this final chapter I attempt to tie certain threads together, but I do not claim to have the woven cloth I had expected to: here there is but a preview of what that cloth might look like, with certain strong recommendations that seem well-founded, and that suggest some positive indications of an emerging fabric that will hold up under scrutiny, particularly when further work enables a more refined product.

A brief discussion heads up this final chapter, as it reviews both the context and relevance of the findings in relation to the research goals, including a summation of reflections on how these findings relate to what other research has proposed. The final section includes some of the limitations of the research, and recommendations for future research, before highlighting the inferences and conclusions formed during the research journey. It is hoped that these may contribute something of value to others who might want to venture into this specific area of understanding, be it for self-knowledge or about others, in relation to how they think.

Discussion of findings

The aim of this research was not simply to develop yet another ‘tick the box,’ maximally economical questionnaire. Rather, the goal was to validate a model and the essential constructs underpinning such an associated instrument, facilitating a deeper understanding of individual differences in the ways people think. The benefit of such a model lies in what it may contribute to people gaining a greater understanding of themselves, particularly for those who might be considered to be more ‘extreme’ individuals and who may feel so different from others. In the need to operationalize this model, creating a reliable measure became one way by which other individuals might gain a positive appreciation of their peculiarities, where self-doubt is minimized so that in turn such individuals may develop a greater personal confidence in how they think.

The initial task of developing a questionnaire has at least in part been achieved – pilot work that has produced an on-line ways of thinking (WOT) questionnaire that has provided some valuable information, but

may yet need minimal refining. Using a shortened version, now possible since items have been appropriately weeded and refined, a larger sample is warranted to evaluate its reliability, generalizability, or transferability, and usefulness for a broad population. The WOT questionnaire however now offers a good starting block for the ensuing journey that continues the quest to better understand distinctive differences in how people think.

The findings from the integration of both methodologies suggest the WOT measure may have particular relevance to those who are more frequently challenged by their complex thinking styles, always complicated by having to find meaning and understanding: in other words, more likely to be useful to the Ideaists. The Realist thinkers are less likely to be concerned with the not knowing, strongly reflecting their personality characteristics in their way of thinking, a link also found by Entwistle and McCune (2009). This linkage is also significant in that their research suggested an openness to learning, identified as distinct from abilities, and it is this trait-like characteristic that was observed in the participants deemed to be Ideaist thinkers, always considering how they think within the context of understanding. The fact that the Realist thinkers are more likely to be epistemologically connected with what is, rather than what may be, may suggest the questionnaire itself is not so important to them; however, how they think may be very important to different others, affected by the seeming indifference of the Realist thinkers to the valued characteristics of the Ideaists. This aspect of knowing is supported by the research of others concerned for a deeper and wider exploration into individual differences, both in relation to impact on others (Burton, Heintzelman, & King, 2013), or on improved self-perceptions (Schlegel, Hicks, King, & Arndt, 2011).

The questionnaire itself was always assumed to simply be a tool – the adequacy and utility of which would only be known when explored one to one with individuals, as also was found by Lugo-Gil and Yoshikawa (2006). Having used other tools in the past as a practitioner, I had in a small though inadequate way sought to address the apparent need to understand differences in individuals; for example using the MBTI (Myers & McCaulley, 1985) and the children's version MMTIC (E. Murphy, 1992), both in personal and educational contexts. But issues around the need for interpretation of such results is well recognized (Stanovich & West, 2000), and consequently led to my considering the potential of personal, subjective insights gained directly from a variety of people, specifically about how they think.

The small sample of participants employed for the qualitative component of the project were selected either from their WOT responses on which they indicated an interest in knowing more about themselves, or by having been known to me as 'different', seemingly often extreme in how they expressed themselves. In addition, care was taken to select those who represented a broad range of occupations that mirrored Holland's occupational interests. Contrary to normal practice, it was decided not to use students but rather those of a *mature* age (55 – 75) who might be expected to be mature individuals, with a level of self-understanding beyond mid-life issues.

Although the WOT questionnaire was constructed and some data collected prior to commencing the qualitative phase, any quantitative analysis or refinement was put aside until all interviews were completed

and themes identified and inferences ascertained. With thoughtful evaluations made of the inferences evoked, both during and after each of the interviews, interesting insights gained from these ten participants suggested some commonalities about their thinking styles that presented some tentative though apparently tenable inferences about types of people and their ways of thinking.

To summarize the qualitative research, essential and contrasting distinctions emerged that suggested two distinct typological groupings. The first was characterized by those registering a preference for being Realist thinkers, that is, preferring to think in order to solve a task or a problem, a process that demanded their examining facts, dealing with matters they could see or touch, or ones they could simply think about that were associated with previously experienced day to day realities. The second typological group seemed to be more elusive, with ideas commonly expressed about various concerns that occupied their thinking. Commonly these individuals suggested thinking involved an in-depth analytical process that was far from constrained by practical life issues, but instead was engaged in as ideas; this latter group of individuals was each identified as being an Ideaist thinker. Sometimes these ideas related to their enjoyment with art, philosophy, and with creative thoughts that involved thinking about non-tangible concepts, complex thinking that demanded their complete attention in order to understand and a need to find meaning. This way of thinking was always reported as time-consuming, slowly enjoyed and for its own sake, so that any consequent action was deeply associated with how inspired these Ideaists were by their thoughts.

Some Ideaists were clearly interested in more scientific or technical ideas, in contrast to those more compelled by people interests and complexities; nonetheless, Ideaists were all people who played with the concepts and creative possibilities around ideas. Participants who indicated a greater intrinsic interest in and motivated by their artistic talents expressed enjoyment in actioning their ideas, but only after fully understanding them, applying their particular artistic ideas as painters, potters, weavers or quilters. Together, all Ideaists commonly shared a love of thinking, exploring their respective areas of interest, and were always surprised by how long any activity actually took to complete, since time for them was an intrusive constraint on the wonderful potentiality of their ideas.

When the qualitative data were integrated with the quantitative data, however, the coherence of characteristics that marked the two typological groupings did not appear to be universally relevant to all individuals, initially challenging the discriminant adequacy of there being just two groupings. Two of the participants were still considered as undifferentiated, with no distinctive characteristics that could be deemed adequate for discriminating their way of thinking. What was marked, however, was their anxiety about their way of thinking. While exploring their different and contradictory understanding of their own ways of thinking during interviews, these individuals expressed insights into having lived life with little confidence in their ways of thinking, unless dealing with non-demanding and routine tasks. Evidence of the impact of such uncertainty on their way of thinking has been reported in the literature (Swann et al., 2007), which supports an explanation that a lack of knowledge, appreciation, and confidence in their particular ways of thinking had led these two potentially Ideaist individuals to believe they should be quick, practically oriented thinkers, committed to getting things done: in other words, they should be Realists.

When the statistical analyses reviewed the large band of apparently undifferentiated people, it became a little clearer, suggesting some of these could best be regarded as *ambidextrous*, predominately being one type of thinker but reportedly well able to use the alternative, as seen with MAC and ELI. The second less confident thinkers form a group that I have called undifferentiated, who arguably may not have developed the confidence to form distinct ways of thinking. This may be explained by the impact of sociological or personality-related issues, reported by case studies, issues which had not been effectively confronted nor understood during their younger years. Previous studies that have attempted to explore cognitive differences do not seem to have demonstrated such clarity of distinctions. This may have been because they traditionally employed quantitative methods only, which lacked the benefits obtained by using both the emic and etic qualitative perspectives that have enlightened the current research.

Discussion: Implications from research findings

Before evaluating the results of the quantitative analyses, several questions are considered that in hindsight could be taken as limitations of the research. For example, did what I infer from these conversations simply reflect my own earlier perceptions? Perhaps the years of encounters with people, some as struggling individuals who within a psychological context predisposed me to perceiving there are two types of thinkers: one linked with down to earth, practical realism, and the other type more focused on esoteric, artistic concerns that often suggested such people as being ungrounded, individuals driven by ideas, often accused by others as being ‘off with the fairies’? If so, had these experiences simply prejudiced my *really* hearing individual perceptions that might contradict this impression? And could I justifiably refute possible empirical researchers who might consider my limited and interpretive use of a small number of interviews in my qualitative work as simply finding what I wanted to find? But then, what of the quantitative results: did these confirm or strongly dispute my tentative and potentially unconsciously preconceived findings? What had other research found that might differ from, or perhaps validate any of the suggested emergent themes?

Reflecting on these questions and now considering the confirming results of the quantitative analyses, I would like to point to my understanding that in using interviews, “everything depends upon how you analyze data” (Silverman, 2007, p. 56). Not only were these interviews reported and reflected on in detail (Chapter 6), but any interpretations were made as part of the researcher/participant interchange: constant checking that these contributions were not only considered within the specific analysis of each interview, but also reviewed within an enlarged understanding that informed each subsequent participant interview. Thus any inferences were reviewed by the individuals during their individual interviews in an atmosphere that encouraged openness, as well as later in discussions with colleagues. In this way, the necessary self-reflexive research advocated by Small (2011) was appropriated, so that any new insights were reviewed as potentially providing contradictory, complementary or confirmatory insights. This was also reflected in the sequencing of the particular data collection and analyses within the mixed methodology, to minimize any potential contaminants of personal viewpoints that might naturally have occurred throughout the study.

From my researcher perspective, these findings are submitted as veridical accounts of an iterative process that has sought a broader repertoire of thinking about thinking, as recommended by Sadler-Smith (2012). But with this perspective comes an honest admission that any verification is never perfectly attainable (Potter, 1996), and therefore inferences made are necessarily open to re-evaluation and re-interpretation in the light of future understandings (Yanchar & Hill, 2003).

The quantitative analysis initially had raised some concern about my tentatively formed profiles: did those individuals identified as belonging to a similarly thinking group by the quantitative analysis risk losing those very idiosyncrasies that importantly had characterized their uniqueness evident in the ten qualitative portraits? As an important evaluation that would guard against misinterpretations, all perceptions gained were reviewed within a mixed method approach: refer to Table 8.1, where facets were reviewed alongside attributes of the participants. This process provided me with a legitimate framework to check the veracity of the qualitative interpretive findings against numerical data that was less likely to be influenced by any personal perspectives. Using an established paradigm was needed, and this was reported in Chapter 6: Adopting a concurrent mixed method approach advocated by Creswell and others (Creswell & Plano Clark, 2011; Mertens, 2015) meant that quantitative and qualitative analyses were completed separately, before proceeding to integrate the findings and inferences resulting from the two methodologies. The quantitative analysis had simply considered relationships between numbers, and these were used to identify which individuals were linked by certain facets. The mixed method stage however involved an integration of data, in an iterative process, answering questions about whether the same clusters of individuals formed through communalities ascertained by analytical processes were the same individuals suggested by my qualitative analysis. Concordance between these two methodological lenses would also offer strong and important validation for the WOT measure itself.

In progressing the quantitative analysis, a relatively new use of clustering that gives a person-centred view was developed (Costello, 2014; Meyer et al., 2013), and this contrasts with traditional approaches where quantitative analysis is predominantly variable centric. As reported in Chapter 7, transformed data allowed individuals rather than variables to be factored using principle component analysis. This person-centred analysis confirmingly revealed very similar profiles to those arising from the qualitative data analysis: At the one end of a continuum were found individuals with the same attributes described as being those of *ultra* Realists (as the top 10 examples), and the opposite end revealing those individuals, again including the participant markers, whose facets/attributes were reported as *ultra* Ideaists. The fact that both these extremes included one participant at least was strong support of a person-centred typology that involves clustering or typing of people, in preference to higher order factors that posit communalities between variables. Of particular note was the observation that a higher order (that is, variable centric) set of factors in the WOT model explains some 60% of the communalities between facets, while factoring *people* resulted in people types explaining well over 90% of what the facets capture.

It was also important to consider clarifications at a finer grained level of the typological groupings, achievable with a detailed quantitative analysis available by using principal components analysis of the

Chapter 9 Discussion and recommendations

larger cohort of respondents. This work suggested a further possible division. Firstly, the Ideaists formed into two groups: those who commonly were clearly more Technical/Scientific thinkers, and those who were more Artistic thinkers – yet all still having a common love of thinking with ideas and abstractions as similarly observed within the qualitative process, but without the number of examples of participants who might typify such a division. But secondly, of those who were clearly differentiated as Realists, for whom thinking in facts was identified by a lack of concern for anything other than objective and tangible realities, a large number of individuals scored within the average or middle range of the continuum, seemingly with a mix of both Realist and Ideaist facets.

Such finer-grained analysis raised additional questions: Should these individuals be further distinguished as a separate group of thinkers, like those of the third group of “adaptables” in Sadler-Smith’s Duplex model (2009)? Were these people part of the undifferentiated group, *all* unsure individuals about how they think, perhaps anxious, and at risk of not being successfully engaged in a career of choice? Or rather, since clearly not all were negative thinkers but many scoring on more positive facets like Confidence and Persuasive, perhaps many of these were both Realists and Ideaists, with an ambidexterity that refused to be boxed as either type of thinker, though potentially able to use both types of thinking, as situationally demanded. This explanation somewhat reflects long-held questions about traits in general that are now being reconsidered (Mischel, 2009), with important awareness of within individual differences that can change. On the other hand, some studies have confirmed various levels of consistency of traits over the life span (Roberts & DelVecchio, 2000), and these add support to the appropriateness in the current research of enabling individuals to reflect on their own patterns of thinking, and what factors may have contributed to these.

In seeking to find answers to these and other questions, a number of issues need to be commented on. For example, the number of participants represented as marker cases in the larger group helped to demonstrate the benefit of the data gained through qualitative information, these being able to provide an important interpretive validity (Plowright, 2011) to the quantitative results. In further support of the qualitative value, I note that one participant (DMJ) who throughout the interview process was deemed Undifferentiated, with contradictions evident in many of her answers to questions, had been distinctly identified as an Ideaist by her WOT questionnaire responses. The fact that she, unlike all other participants, had completed the measure *after* the interview provides an important detail that may indicate one of the advantages of the one-to-one reflection between researcher and participant, enabling a greater personal confidence to “be herself”. In an incidental member check, some time after the interview, DMJ expressed appreciation of the fact that during the interview she had gained an enlightened understanding of herself. This confirms not only my own perception of her as a closet Ideaist but also that of her engineer partner, reported in Chapter 6 who suggested a similar understanding.

Though qualitative perceptions taken alone might well have been questionable, the integrated insights gained from different methodologies reinforce the concept of the power and appropriateness of an empowerment that interpretative research can achieve. The above example serves to highlight an educative

authenticity advocated by Guba and Lincoln (1994), also advocated by others (Creswell et al., 2006; Denzin, 2012; Holstein & Gubrium, 2005). But this example also repudiates an early expectation I had held, however, that by age 55 plus, an individual's way of thinking should be well known and confidently confirmed and appreciated. It may also suggest support for the idea that "individual realities (that) are always under construction" (Silverman, 2007, p. 91), though as an aside, personality research in many contexts suggests this view may be debatable (P. I. Armstrong, Su, & Rounds, 2011; Costa, Yang, & McCrae, 1998; Higgins & Scholer, 2010).

Two other participants (MAC and ELI) also fell in this middle ground in their questionnaire results, though had both shown distinct preferences throughout their interviews that marked them as Realist thinkers. Were they exemplars who helped to confirm the notion that many individuals have the capacity to use both ways of thinking, though also holding a preference of one type of thinking over another? My personal view is that this is a fair interpretation to make, having come to know both these individuals quite well, and knowing others who similarly *do* use both ways of thinking. Both participants demonstrate a confidence in expressing some creative and/or imaginative thinking, but for such Realist thinkers, that thinking consistently remained within a context of very physical things, rather than dealing with intangible, non-concretized ideas. At the same time, these two individuals report an appreciation of the expansion of their own worlds through the ideas and contributions of their different non-realist thinking friends and colleagues.

It might also be concluded that, though being analytical was a strong aspect observed in the Ideaists, such an adaptable attribute was also evident in this middle-ground Realist group, and deserves further investigation. It may represent a non-specialized or 'balanced' quality of thinking, one that is not over-developed or extreme, but perhaps suggests more of the ambidexterity of good pianists for example. On the other hand it may also indicate an ability component that was not explored in this study, but may warrant further investigation within the alternate focus on abilities usually explored in cognitive style research.

As suggested by the meanings implied from the above examples, such an interpretation seems to legitimately explain this large middle group of people. Further research is needed, and necessarily should include in-depth idiographic research, to review the many individuals of various ages who potentially lie within that undifferentiated middle group of thinkers, to understand them better in relation to this explanation.

It is also pertinent to note what had been confirmed by the participants: those identified in this research by a particular and distinctive thinking preference *had* experienced further education, and one that had also led to a career path considered to be both challenging and fulfilling. Of course, the old chicken and egg question arises, with the confidence level potentially interpretable as learned rather than related to inherent personality traits, and therefore this may have affected the development of their particular thinking style, rather than the reverse. However, reflection with specific individuals has only convinced me more of the real benefits of understanding that is linked with an acceptance and appreciation of self: that is, regardless of how different this self seemed to be from that of others around them, a resultant corollary was

possible, so that as a consequence of understanding and accepting themselves, they would be more able to love and accept others (Swann & Bosson, 2008).

How does this research relate to other research?

In reflection of other personality typology research, there have been a number of attempts to understand aspects of individual differences in the context of their cognitive style. Yet along with those many views that were mainly allied with abilities, rather than with personality traits, questions remained about what these actually mean in relation to how we think. For example, many previous attempts were ultimately considered to be about learning styles, like self-directed as opposed to non-self-directed learners (Thompson, 1999), with these being differently conceptualized from teaching styles (Zhang, 2008). One model of cognitive style considered earlier was the duplex model of Sadler-Smith (2009), though his later writings question the one mode (intuitive), suggesting the latter mode had perhaps more to do with superstitious and paranormal beliefs than about a thinking style as such (Sadler-Smith, 2011). Another example is seen in the thorough review of thirteen of the most influential models and their associated instruments (Coffield et al., 2004, p. 140), which concluded that only “three of these thirteen – those of Allinson and Hayes, Apter, and Vermunt – could be said to come close to meeting the criteria”, that criteria being concerned with their internal consistency, test-retest reliability, and construct and predictive validity. Other limitations they alluded to were the dominant focus on students, the use of self-report measures, and a lack of follow up validation of the measures.

There are certainly other questions being asked in other styles research, though again in learning, that suggest similar implications for the usefulness of researching ways of thinking, including coming to an understanding of there being two typological preferences (Vance, Groves, Paik, & Kindler, 2007). For example, research that reflect on how much our thinking effects our sense of well-being and views about life in general (Schwarz & Strack, 2007). In the current research, however, the specific concept of a band of undifferentiated thinkers, when compared with those who are ambidextrous, draws attention to the potential *benefit* in developing the two distinct ways of thinking. This insight is also seen in research in student preferences in education, for example, where a suggestion is made that we would do well to seek “to develop the ‘weaker’ sides of the learner” (Vermunt, 2011, p. 187). Similarly, an executive of an international aid organization is reported to have been asked to make comment on his responses to an alternative learning flexibility index (LFI): he reported difficulty in answering specific questions about how he learnt, because his past educational experiences had strengthened his different learning styles, resulting in his understanding of himself as “a well-balanced person” (Sharma & Kolb, 2011, p. 71). Again, in support of an individually discerned understanding, such insights were made possible by this post-test personal self reflection that enhanced the results of the measure itself. This example also provides support for both the mixed methods approach used and the inferences drawn in the current research.

The current research contrasts with the Myers-Briggs work, potentially one of the few other reasonable measures of personality oriented individual differences in cognition (Coffield et al., 2004). In

spite of the popularity of the MBTI (Myers & McCaulley, 1985) and its child version, the MMTIC (Parker & Mills, 1998) however, their lack of psychometric validity has always made their use questionable, and making sense of its results requires a great deal of interpretation (G. J. Boyle, 1995). Of concern has been the lack of research since being launched in the mid-eighties, other than from users as committed *believers* (Kelley, 2005). Few recent published articles leave us with unquestionable confidence in MBTI discriminatory powers and its claims for significance, other than what some have called its intuitive appeal (Pittenger, 2005). In contrast however, the construction of the WOT, while still yielding a typology, has involved more robust psychometrics based on those developed in establishing patterns that have now become accepted practice in personality trait research. This has included the psycholexical hypothesis, and with questions being constructed on the basis of Likert-type scales: the questionnaire thus presents as a dimensional measure, rather than a forced-choice alternative format (Simms & Watson, 2010). In addition, validation of the measure has been achieved through quantitative analyses that were subsequently informed by the qualitative phenomenological profiles. These enabled an interpretive understanding within an integrated methodology not normally possible with a quantitative only approach.

The Kirton Adaption-Innovation Inventory (KAI) (Kirton & de Ciantis, 1986), another bi-polar measure of cognitive style was found to be more concerned with problem-solving, with some correlations found with a small number of personality factors such as openness and feelings, but clearly does not have the well-defined construct domains articulated concerning thinking that formed the basis of the new WOT measure of individual differences. The same criticisms can be said of both the Rational-Experiential Inventory (Epstein, Pacini, Denes-Raj, & Heier, 1996) and the Cognitive-Style Index (Allinson & Hayes, 1996), with concerns made about the theoretical perspectives that purport to measure human information processing (Hodgkinson et al., 2009), and that leave important questions unanswered about the factor structure and constructs being measured.

As already stated, and though only a few are referenced here, one of the problems we find with past research in this area of psychology is that the various measures of thinking-related style have been largely psychometric and quantitative (Alise & Teddlie, 2010), with an inherent focus on variables. The qualitative aspect of this mixed method design therefore has encouraged the quantitative research to be person-centred and typological, achieving concordance through rotation/transformation of the data matrix. Having thus highlighted the person-centred approach that commends this research, this must be considered alongside its inherent weakness, clearly associated with time-consuming evaluations of individual accounts.

Specific limitations, strengths, and recommendations

Throughout the research, I have commented on certain limitations, but will summarize these here, along with a consideration of some associated offsetting strengths. Linked with these has been my overwhelming sense at times that such a small project can but provide a very small contribution to that which so many others have so eminently already done.

- Using a small sample of people, with Holland's RIASEC in mind when selecting participants, and additionally restricted by the decision to use a mature-age cohort (55 - 75) may have unnecessarily limited the conclusions and generalizations that can be drawn from their perspectives, especially when integrated with the diversity of ages of respondents to the WOT questionnaire – legitimation and transferability is thus limited, requiring at least a replication sample that could encompass a wider age range. However, it was confirming that the distinctions observed even in this small sample also appeared in the alternative quantitative methodological data set with a person-centred analysis.
- All qualitative inferences were those of one researcher only, with minimal co-researcher reflections, suggesting a potential risk of the *researcher-self* unconsciously getting in the way of describing what phenomenologists regard as the *essence* of each of the shared lived experiences (Wertz et al., 2011). In defense of myself as the sole researcher, however, I admit to my being a realist investigator, reflective of those identified by Wardell and Royce (1978), committed to clear thinking and rational analysis, and with a sensitivity to and acute awareness of participant emotional needs, whilst also intent on the accurate recording of individual descriptions (L. Cohen et al., 2007). At the same time, I have sought to remain alert to the need to effectively evaluate any participant negative self-evaluations that might distort potential inferences (Barrell et al., 1987). This process allowed for a consistent reviewing of the thinking phenomena across situations/contexts and across individual participants, enabling an inductive approach that considered the data being collected and also informed subsequent data collection, thus providing appropriate comparisons (Burnard et al., 2008). Completing this process with attention to detail has eventually contributed to what I consider forms a realistic assessment of the meaningfulness of the shared individual lived experiences about the common phenomena of thinking.
- Much as self-report measures themselves have been open to criticism (Paulhus & Vazire, 2007), so one can find similar concerns about case studies that depend on the capabilities of the qualitative researcher's subjective insights for meaningful interpretations. This draws attention to potential bias and inadequate research executed by untrained, naïve, or incompetent interviewers. Without checks to ensure none of these occur, such research findings are rightly judged to be dubious at best. However, I believe this research account can verify my unbiased approach as being authentic and trustworthy in a number of respects: firstly by reminding the reader of my effective work as a practitioner over many years, with ongoing training of self and others, and not the least by the systematic and rigorous process which entailed a collaborative interchange with a number of critical quantitative researchers. As such, an adherence to the legitimation process (Onwuegbuzie et al., 2011) has been employed throughout, having insisted on a mixed method dynamic approach that enabled what Teddlie and Tashakkori (2009) considered to be basic tenets of quality research.
- In spite of recent research that tried to find an adequate typology of people (Asendorpf, Caspi, & Hofstee, 2002), whether typology is of great usefulness and applicability seems to remain

contentious. In defense again of the current research however has been its different methodological approach from most other typology research that has traditionally depended solely on quantitative analyses (for example, Mischel et al., 2002). Valid findings about people profiles have been possible in this current research with an integration of different types of data gained by different approaches, as advocated by mixed methodologists (K. M. Collins, Onwuegbuzie, & Johnson, 2012), and thus may contribute to an acceptance by a wider audience (Yoshikawa et al., 2008).

- The mixed methods procedures used were relatively limited, with interviews only used as the method of choice for the qualitative perspectives. A more complete confirmation of the integration of the two methodologies *may* have been achieved for example by a return to the participants, for their feedback concerning the whole process, for their reflections on the questionnaire itself, and their views on how their thinking profile. However, some of the spontaneous comments at the end of interviews were incidentally reported, and suggest post-interview reflections may be worthwhile with another sample in the future, using a shortened version of the WOT, as part of a validation process that I believe also warrants a similar mixed methodology. As mentioned earlier (Chapter 6), however, the more formal member checking needs to be carefully debated before determination about its efficacy.
- The initial WOT questionnaire was released more as a pilot project, with limited time given to considering changes needed before the interview process had begun: some who had completed the questionnaire were selected as participants on the basis of their (strong, more extreme) responses, leaving it difficult to refine the questionnaire without risk of having to begin the whole process again. The WOT has developed into an adequate measure, but analysis has identified a number of items that need either to be removed or modified to simplify comprehension or contextual meaning. The questionnaire will also benefit from the inclusion of a number of items that specifically relate to meaning, needing to understand, as strongly presented by Ideaists during their interviews. This would help more clearly distinguish their different thinking characteristics from those reported by Realists, whose preference for focusing on the facts has already been included in the questionnaire.
- With further research already underway by other quantitative researchers with a revised questionnaire, the model's significance for delineating differences in thinking should become clearer, and with the established synergies seen via the lenses of two methodologies, further qualitative work should be expected to have a significant and complementary role.
- The quantitative analyses were quite complex, and more is needed to clarify and validate the appropriateness of the innovation where adapted procedures normally applied in a variable-centred approach are here applied in a people-centred manner. If the initial number of respondents had been larger, it would have been possible to split the respondents into a calibration and replication/confirmation group, and comparisons would have added a confirming veracity to this methodological shift, and offers a way ahead in further research.

- It is noteworthy that in the item weeding process of the quantitative contributions to this research, the items were considered in three contexts: the main self score, an alternative evaluation of others version, and a children's version where parents and teachers rated children well known to them. This at least goes some way to better ensuring interpretability and generalizable applicability of the item set used in determining the facets used in this analysis, and now forms the basis of further research.
- Another research limitation is reflected in the Interactive Ways of Thinking model I had formed (Chapter 6, figure 6.2). The model is only that, and may demonstrate that many of the facets taken from the original Roodenburg model (2003) reflect more about the *what*, *when* and *why* involved with individual thinking styles than strictly about *how* people think differently. This may suggest that the original model, being produced by lexical stem sentences as a means of defining the domain, had indiscriminately produced many types of items that were not clearly differentiated from each other in regard to the (what, when and why) interactive effects on thinking. These are important considerations, demonstrated previously by other styles research, referred to above and in the literature reviewed in Chapter 2. However, a lot more work is needed to confirm or otherwise dispute how well this interactive model may explain such relationships, reported by participants about various situational and lived experiences and their subsequent ways of thinking, regardless of their individual WOT profile. Implications for the future refinement of the WOT questionnaire itself may also need to reflect on this interactive model, so that for example it may need to include several more items that discriminate these interactive factors, some of which may be more important to some individuals than to others.
- Though the initial research produced a version of the questionnaire (CWOT) that could be used by parents about their child, it became clear that a more child-friendly version is needed, one that could be used interactively with a competent researcher/practitioner. This could also allow comparison with parent perspectives, and proffer much needed assistance to offset the inherent problems frequently observed with inadequate parental/teacher understanding of the “different” child. This important extension of the WOT questionnaire becomes an additional challenge for which realistic scoping warrants a separate project.
- There are still questions that need to be pondered, particularly in regard to the validity of a questionnaire which has ostensibly rested on the *how* of its construction, not having been able to compare it with extant trait-like measures, although it has been somewhat innovatively validated by participant representativeness. The eventual refinement of the measure, including certain item clarification or additions, along with its ability to demonstrate a predictive validity, has not as yet been possible.

Concluding Remarks

This research has opened but a very small window of understanding about differences in the ways people think. The new measure that focuses on specific ways people think has the potential to enable a new way for people to understand others, particularly when the final version becomes available with a necessary feedback facility to broaden the individual knowledge of what it means to prefer to be a Realist or Ideaist thinker. But I also believe it has provided a crucial break from a longstanding research tradition that has relied on questionnaires alone as providers of that knowledge. Equally important is that this research has facilitated the innovative development of a quantitative method of people-centred analysis: with the benefit of qualitative insights, it has been possible to explain communalities among fine-grained constructs that capture individual differences, generating people typologies, replacing variable-centric quantitative approaches that typically focus on higher order factors for explaining groupings of lower order constructs.

From the outset, this research has been motivated by seeking a deeper understanding of individuals, extending what can be gained by merely statistical insights where the pursuit of the nomothetic locks out the idiographic. This goal was always going to demand not just innovation, but other methods to validate and verify. The need for a methodology that reveals more of individual perceptions contributed to the decision to use semi-directed interviews, as an alternative to simply gathering more lexical-driven data, and to ensure that those who might not have been included through being treated as outliers might in effect significantly become markers cases, or cases of influence (Pek & MacCallum, 2011).

The subsequent journey has revealed the benefits of mixed methods. The focus on the individual, made possible by digging deep with qualitative phenomenological methods, has enabled a methodology that integrates the findings in a way that explains and validates the quantitative innovations, and in the process has given meaning to the numbers. Such an understanding would not have been possible without the insights gained idiographically.

The integration of information from both qualitative and quantitative approaches has encapsulated some important and surprisingly similar findings, with confirming results supporting and validating the original model with its same lower-order facets. These facets were found to be very similar to those attributes found descriptive of the ways individuals think, as demonstrated by the various graphs and tables. That the quantitative analysis was able to include the ultra-Ideaists, as well as the ultra-Realists, became an important confirmation for seeing these as cases of influence, rather than oddities that were not valued. The correspondence between the results from the questionnaire and the findings from a small but adequately sampled qualitative study suggests we *have* covered the relevant factors of the original model, with its selection sample also providing a more than adequate representative spread of occupations that reflect the concordance between Holland's occupational interests and the original SWOT model.

In addition to being a study that used different perspectives, gained through an integration of quantitative and qualitative methodologies, it has also been an important venture into creating a psychometrically reliable instrument that is concerned with trait-like personality-centred constructs, rather

than dealing with more traditional ability constructs. This process has also allowed for the development of a new measure that is not validated from a quantitative *variable-centric* perspective, but one that innovatively has taken and respects a *person-centred* typological approach, making a potentially important leap forward to responding to the cry to bring the person back into the study of personality and individual differences.

This research envisages the new WOT instrument might not simply be used for student populations, but one that could also identify the thinking styles of non-student adult populations, particularly to assist those who experience not feeling understood, either by themselves or others considered important to them. Such a questionnaire might also be used proactively: for example to identify and explicate the early development of potentially ill-formed or confused views of self, views perpetuated by a lack of understanding about how and why their individual way of thinking seemed so unacceptable. This would also prevent many who through lack of understanding of their *peculiar* thinking preferences inevitably end up like many other individuals, moving into occupations and even long-held careers, and eventually reporting they feel like *square pegs in round holes*.

By way of my personal reflections, this research journey has been an enjoyable and rewarding one, particularly in relation to the interchanges central to a qualitative approach. I have learnt much that has convinced me to encourage others towards research that involves a mixed methodology – not only for the interest and personal satisfaction, but more importantly for the possible contributions to the “objective” world of knowledge that so often disregards the value and insights of the individual. The methodological paradigm for research in personality, away from quantitative only constraints, offers an integrated perspective from both the qualitative and quantitative data and associated analyses, to gain a more complete understanding of individual ways of thinking. I believe it has facilitated the development of a sound and satisfying scale of individual differences highlighted by their ways of thinking, and one that strategically was enhanced by the input of the contributions of a small but significant group of individually unique and valued people.

From beginning to the end of this project, my ambition has remained aspirational: that as a result of my research findings and the resultant WOT measure, increased numbers of individuals may, with the aid of a guided reflection yet to be completed and made available in a written feedback to the measure, begin to better understand themselves and/or others. I suggest that an understanding at this personal level can provide a sense of self-acceptance, particularly about how one thinks, that may contribute a potentially important element that may reduce some of the pain experienced by some on their journey.

It is *good* to be unique, to think differently, to be able to confidently enjoy our individual differences. We need to recognize and appreciate the less visible and therefore the less understood ways in which we are different. Such recognition offers to bring choice, empowerment and acceptance, but even more, an appreciation that one is not alone. Even when an individual is quite *unusual*, highly divergent, there are always other similarly unusual people, somewhere. Understanding such differences, where it leads to better self-acceptance and a non-judgmental acceptance of others within a distinguishable framework of how one

thinks, should be both affirming and freeing. I dare to hope that those committed to caring for others may find the final WOT to be a good reliable tool, one that assists practitioners to make a difference, for individuals separately and thus for the larger community of individual and unique people whose way of thinking ought to be better understood.

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Appendices

Appendix 1 - Adjectives > items

1 Creative:

- Item 1. Thinks creatively
 2. Has original thoughts
 3. Invents new ideas for doing things
 4. Never thinks outside the square
 5. Generates novel possibilities
 6. Likes doing things differently from the norm

2 Imaginative:

- Item 1. Is an imaginative thinker
 2. Is resourceful
 3. Dreams up ingenious options
 4. Is versatile in finding solutions
 5. Pictures new potential ways of doing things
 6. Likes exploring alternatives with imagination

3 Artistic:

- Item 1. Is an artistic thinker
 2. Expresses oneself poetically
 3. Is sensitive to and aware of aesthetics
 4. Is able to graphically describe things
 5. Likes artistic design
 6. Dislikes talking in symbols

4 Alternative:

- Item 1. Is an alternative thinker
 2. Comes up with unconventional options
 3. Is a free-thinking explorer
 4. Likes conforming
 5. Is seen to be contrary
 6. Likes doing things differently from others

5 Lateral:

- Item 1. Has tangential thoughts
 2. Thinks laterally
 3. Uses roundabout ways of doing things
 4. Diverges from straight thinking
 5. Generates unexpected solutions
 6. Sees things from different perspectives
 7. Not restricted to logical thinking

6 Abstract:

- Item 1. Likes allegorical ideas
 2. Communicates in abstract terms
 3. Appreciates mystical discussions
 4. Enjoys speaking philosophically
 5. Expresses thoughts with concrete examples
 6. Floats ideas vaguely
 7. Likes symbols

7 Conceptual:

- Item 1. Is a conceptual thinker
 2. Enjoys theorizing
 3. Forms ideas about constructs
 4. Thinks in generalizations
 5. Understands complex ideas
 6. Thoughts focus on the present reality

8 Erratic:

- Item 1. Shows unpredictable way of thinking
 2. Ideas are inconsistent
 3. Has flighty thoughts
 4. Thoughts are kept on track

- 5. Thinks erratically
- 6. Irregular thinker

9 Persuasive:

- | | |
|------|---|
| Item | <ul style="list-style-type: none"> 1. Thinks persuasively 2. Demonstrates power to convince others 3. Can't influence others 4. Expresses ideas convincingly 5. Induces others to follow given ideas 6. Causes others to change their minds |
|------|---|

10 Energetic:

- | | |
|------|---|
| Item | <ul style="list-style-type: none"> 1. Has an active mind 2. Thinks energetically 3. Is not driven by thinking 4. Has stimulating ideas 5. Thoroughly involved in thinking about things 6. Expresses thoughts forcefully |
|------|---|

11 Verbal:

- | | |
|------|--|
| Item | <ul style="list-style-type: none"> 1. Is high verbal 2. Can ably express in words what is meant 3. Can't communicate well with words 4. Can vocalize thoughts well 5. Has good auditory awareness of spoken words 6. Is given to being wordy |
|------|--|

12 Confident:

- | | |
|------|--|
| Item | <ul style="list-style-type: none"> 1. Is secure about own thoughts 2. Expresses thoughts confidently 3. Is certain of own opinions 4. Thinks in a self-assured way 5. Is intimidated by others ideas 6. Is not tentative when sharing thoughts |
|------|--|

13 Questioning:

- | | |
|------|---|
| Item | <ul style="list-style-type: none"> 1. Has a probing mind 2. Asks penetrating questions 3. Has an enquiring mind 4. Curious to find answers 5. Is a probing thinker 6. Is accepting of simple explanations |
|------|---|

14 Open-minded:

- | | |
|------|--|
| Item | <ul style="list-style-type: none"> 1. Has open-ended thoughts 2. Shows uninhibited thinking 3. Remains open to new suggestions 4. Is close-minded 5. Is unguarded about thoughts 6. thinks open-mindedly |
|------|--|

15 Positive:

- | | |
|------|---|
| Item | <ul style="list-style-type: none"> 1. Thinks positively 2. Is an optimistic thinker 3. Thinks happy thoughts 4. Can experience pessimistic thoughts 5. Likes to look on the bright side 6. Refuses to allow negative thoughts |
|------|---|

16 Narrow:

- | | |
|------|--|
| Item | <ul style="list-style-type: none"> 1. Thinks along a straight line 2. Displays tunnel-vision 3. Is broad-minded 4. Thinks with blinkers on 5. Is small-minded 6. Thinks in a limited way |
|------|--|

17 Rigid:

- | | |
|------|---|
| Item | <ul style="list-style-type: none"> 1. Is an inflexible thinker 2. Thinks rigidly 3. Is not adaptable 4. Looks for the soft option |
|------|---|

5. Shows fixated thinking
6. Static thoughts get stuck

18 Careful:

- Item 1. Thinks carefully
 2. Remains alert in thinking
 3. Thinks irresponsibly
 4. Takes a slap-dash approach
 5. Cautiously thinks before acting
 6. Is a sensible thinker

19 Plodding:

- Item 1. Finds thinking tedious
 2. Thinking is painful
 3. Thinks laboriously
 4. Time taken to think is torturous
 5. Is a plodding thinker
 6. Thinking is pleasurable

20 Technical:

- Item 1. Thinks technically
 2. Is a technological thinker
 3. Does not like technicalities
 4. Enjoys technical details
 5. Likes systems
 6. Needs to know how things work

21 Scientific:

- Item 1. Dislikes investigating things
 2. Thinks experimentally
 3. Is a scientific thinker
 4. Thinks objectively
 5. Engages in heuristic thinking
 6. Needs to understand systematic exploration

22 Social:

- Item 1. Needs to share thinking with others
 2. Engages with others' thoughts
 3. Understands what people are thinking
 4. Is socially aware
 5. Likes keeping alone
 6. Wants to hear thoughts of others

Appendix 2 - Ethics approval



Standing Committee on Ethics in Research Involving Humans (SCERH)
Research Office

Human Ethics Certificate of Approval

Date: 22 May 2009

Project Number: CF09/1118 - 2009000576

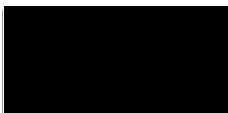
Project Title: Differences in ways of thinking

Chief Investigator: Mrs Esther Roodenburg

Approved: From: 22 May 2009 To: 22 May 2014

Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to SCERH before any data collection can occur at the specified organisation. Failure to provide permission letters to SCERH before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by SCERH.
4. You should notify SCERH immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must contain your project number.
6. **Amendments to the approved project (including changes in personnel):** Requires the submission of a Request for Amendment form to SCERH and must not begin without written approval from SCERH. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. SCERH should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by SCERH at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.



Professor Ben Canny
Chair, SCERH

cc: Dr John Roodenburg

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Building 3E, Room 111, Clayton Campus, Wellington Road, Clayton
Telephone +61 3 9905 1420
www.monash.edu/research/ethics/human/index.html
ABN 12 377 614 012 CRICOS Provider #00008C

Appendix 3 - Explanatory Statement of

Research project: towards a PhD

Topic: Differences in Ways of Thinking for

Interviewer: Esther Roodenburg, under the

Chief Investigator, Dr John Roodenburg, Faculty of Education, Monash University

Phone 9905 1295 or email: john.roodenburg@monash.edu

EXPLANATORY STATEMENT

In addition to the SurveyMonkey Questionnaire that you completed recently, you also indicated further interest in this study by your willingness to complete a follow up interview. For this more qualitative part of the research, we have selected a sample of those who so indicated interest, and will spend approximately 1 hour of an open-ended interview, to gather narrative data, seeking further indications for any relationship between personality and individuals' Ways of Thinking, which the WOT Questionnaire may not have covered. Adjustments may then be made to the WOT Survey Monkey, and you may be asked to complete this once more – on line, taking approximately 30 minutes. If you would like further feedback on the overall findings at the completion of the project, we will be available to speak with you, at your convenience. I will let you know by email when that time comes.

In this interview, I am really interested in finding out as much as possible about the very individual and potentially very different ways people think. So I will be asking you to try to describe your particular way of thinking, though you may not have given this much thought up to now. I hope you don't mind my recording our conversation, so that I can reflect on your responses later, and also so that I can give you a more accurate feedback later on of what I have gathered about your way of thinking. Then hopefully you'll be able to correct any misconceptions I may have made about your way of thinking – this will greatly aide my research.

Appendix 4 - Consent Form

CONSENT FORM

I understand what this research involves me in, and am aware that my privacy and confidentiality issues have clearly been attended to. I therefore agree to any information, gathered through both this interview and any subsequent rerun of the final questionnaire, to be used to further research in this area, though my identity will clearly be protected, with all personal details being anonymous when written up, including in any journal article or publication.

Even though I have volunteered for this research, I understand I have complete freedom to withdraw from the interview at any stage, and not to answer any question I do not want to answer. I also know that if I have any complaint about the procedures, or any aspect of this research, I can contact the chief investigator, or the Monash Ethics Committee.

Name of participant: _____

Signature: _____

Date: _____

Appendix 5 - Potential Interview Questions

1. How often do you enjoy taking time out from being active to just thinking?
2. What sort of things do you find yourself thinking about?
3. When you are thinking seriously, how would you describe what goes on inside your head?
4. How would you describe your thinking as compared to, say, your partner or best friend?
5. What sort of thinking do you appreciate about the other's thinking?
6. Tell me what you consider to be a pretty typical way others seem to use when thinking.
7. When someone is described as a very 'lateral' thinker, what does this mean to you?
8. What word(s) would you use to describe someone who is *not* a lateral thinker?
9. Do you find yourself thinking in specific details, or do you primarily prefer to generate ideas? How different is this for you within different contexts?
10. When you are at work, how would you describe the way you think?
11. How is this perhaps the same as or different from others you work with?
12. When in a different context, say dealing with family matters, how would you then describe your thinking?
13. Tell me about how you believe your thinking about an important issue may or may not be impacted on by how you are feeling about that matter.
14. When thinking about an upcoming event, what sorts of things come to mind as important considerations? Describe how these might differ from what you consider to be unimportant.
15. How might this way of thinking be different if you were say in a crisis?
16. If given all the time in the world to be creative, how would you like to be thinking about a potential creative project? Describe what might be going on in your head before you start.
17. How might this creative thinking be different if you were in a social context, having to think creatively with others?
18. In reflection about a situation or event just past, what fills your thinking?
19. How would you describe your thinking in terms of speed in the process of thinking?
20. If needing to solve a problem, can you explain to me what time-frame you might require, and why this is important to you.
21. I'd like you now to think about a past event that was disturbing, and to describe out loud what you are thinking as various things come to mind about that time or event.
22. Try to imagine a future event that you hope will be exciting or interesting, and then describe out loud what you are thinking about that potentially wonderful opportunity.

Appendix 6 - Short list of Observed Behaviours as in Dedoose

OBSERVED INTERVIEW BEHAVIOURS
- changed thinking
with age/experience
hand movement
smiling
pause - reflecting
laughing
speaks softly

Appendix 7 - Exemplars of adjectives to behavioural sentences

Adjectives: Behavioural Meaning, in relation to thinking ($n = 21$)

<u>Creative</u>	1. comes up with ideas outside the square 2. diverges away from the traditional, suggesting quite different & lateral options 3. uses her able imagination to come up with alternative notions that can't be easily seen by others 4. demonstrates original ways of exploring alternate options 5. her ideas seem inspired and ingenious, being quite alternate from what others come up with
<u>imaginative</u>	1. able to dream up ways of potentially doing things 2. is not stuck with doing things conventionally 3. has an artistic insight, seeing other potentials
<u>artistic</u>	1. Shows discriminating awareness of aesthetic issues 2. is able to picture how things could be changed 3. shows concern for more poetic aspects of self expression 4. able to describe ideas in pictures
<u>alternative</u>	1. expresses ideas that most others don't think of 2. non-conventional ideas that may surprise others 3. explores other than the norm way of doing things 4. free thinking mode of exploring options
<u>lateral</u>	1. explores options that are rather different 2. looks at things from a different perspective 3. considers views that others may not have imagined 4. generates innovative ideas that are somewhat offline
<u>abstract</u>	1. reflects about matters in ideas, rather than in real or concrete terms 2. floats options in vague terms 3. considers other alternatives in ungrounded terms 4. talks about things in general, rather than specifics

Addendum

This addendum is provided at the request of one of the examiners who asked for an inter-facet correlation table to give an indication of factorial independence. Chapter 7, in relation to which this request appears to have been made, was concerned with the internal consistency of facets, and the PCI conducted there was in order to check the internal consistency of facets as a single factor congeneric model.

Factorial independence had been accepted as having been accepted in the original a priori model, established on the basis of extensive SEM work. To address the examiner's concern, it was therefore considered appropriate to consider the factorial inter-correlations of the AWOT factors, and to compare these for similarity with those of the a priori SWOT model. As indicated in the thesis, reasonable correlations are typically accepted between personality factors, as correlations do not necessarily mean lack of discriminant semantics; they can exist for other reasons of co-variance.

Table 1. Addendum: Inter-factor correlations of AWOT and SWOT models.

Correlations between AWOT Factors (Based on factor scores)						
	SURGENT	CREATIVE	CONTROL	INTUITIVE	FREETHINK	SENSATE
SURGENT	1					
CREATIVE	.423**	1				
CONTROL	-0.047	.178*	1			
INTUITIVE	.420**	.805**	0.113	1		
FREETHINK	.238**	.340**	.456**	.334**	1	
SENSATE	.331**	.221*	-0.061	.315**	0.121	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Correlations between SWOT Factors (a priori model, excellent SEM fit- see thesis p.65)						
	SURGENT	CREATIVE	CONTROL	INTUITIVE	FREETHINK	SENSATE
SURGENT	1					
CREATIVE	0.569	1				
CONTROL	-0.638	-0.465	1			
INTUITIVE	0.439	0.755	-0.656	1		
FREETHINK	0.368	0.499	-0.159	0.46	1	
SENSATE	-0.317	-0.336	-0.057	-0.117	-0.483	1

Note. Comparative Fit (correlations between the sets of correlations): $r = 0.70, p < 0.05$, suggests that the models are appropriately similar, considering the differences in cohorts, questions and the process by which the correlations were achieved. The average correlation in terms of absolute values among the factors in the original SWOT model was 0.421 (17.7%), while in the AWOT model it was 0.294 (8.64%). This indicates that in the process of operationalization and item weeding, on average there has been an almost halving of shared variance between the factors, thereby suggesting this process has further significantly improved the model.