# THE DEVELOPMENT OF RESILIENCE – A MODEL

A thesis submitted for the degree

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**Abstract**

The impetus for this study grew from observations in clinical practice that many individuals survived all sorts of hardships with minimal distress, or with the ability to tolerate their distress, and move on with their lives in a positive manner. A review of the literature led to the conclusions that the research investigating resilience was making minimal inroads into understanding what made these people different, and that the richness of who they were was being lost in the scientific process. This dissatisfaction led to the decision to explore the construct from a phenomenological framework, and to try and discover the essential elements of resilience through analysis of the subjective experience of resilience. A qualitative study involving thirteen participants identified by their peers as resilient was undertaken and the underlying themes of their stories were analysed. This led to the development of a model of resilience that attempted to balance the need for parsimony with that of explanatory breadth, and which had the potential to tolerate the complexity and instability of the construct itself. The model developed identified three core elements that embraced the construct of resilience. These included the physiological capacity to be resilient, and from this basis the ability to be adaptive and the ability to maintain well-being emerge. Factors identified with these elements include individual reactivity to and recovery from adverse events, the ability to be effective and efficient in the management of adverse events, and the beliefs about the world and the self that promote well-being when exposed to adverse events. The model has a basis within neurobiology and is framed within the context of Dynamic Systems Theory. The theory itself is a culmination of clinical observations with what is known from within the current literature and the results of this study.

**Chapter 1 – Introduction**

The notion of resilience has been bandied about in recent years, often with little attention given to the meaning of the word by those using it, or the interpretation of it by those hearing it. As a construct it has been examined at length but there is a sense that it is not research compliant as researchers have struggled to deconstruct or understand it with ease. There has been some success in the identification of certain characteristics associated with resilient functioning but this has not led to a sense of confidence with regard to the prediction of who will be resilient when faced with adversity and when resilience might be displayed.

This has left the construct of resilience in a precarious position, its intractability leading to a degree of skepticism and despondency in the research world. Some researchers critical of resilience have reached the point of questioning if resilience should be abandoned as a construct of little worth (Luthar, Cicchetti and Becker, 2000). In contrast to this, resilience has retained a favoured position in the wider community in that it remains popular as a construct in the promotion of health and well-being. Resilience and resiliency have also retained prominence in the media as a description of those who preserve health and a sense of well-being in the face of adverse conditions and trauma. The advent of positive psychology shifted the tension yet again with another wave of research underway, and minimal ascertainment as to what the construct actually means.

This thesis addresses the difficulties encountered in determining the nature of resilience within the literature, and in response to reflections as to what resilience means when working with clients in clinical practice. To meet this end a qualitative study was designed to explore the subjective experience of resilience by individuals who have been identified as resilient by their peers. The study was phenomenological, and the stories the participants told about their experiences were analysed for common themes and deviations. This information was then drawn into a model explaining the development and maintenance of resilience over time. This required the model to have the potential to

accommodate the complexity and the instability of the construct, and the idiosyncrasy of human development.

To fully appreciate the construct of resilience, knowledge of its history can help one to understand why it is so admired on one hand and yet admonished on the other. This introductory chapter will purely comprise of a brief overview of resilience from a historical perspective before the literature review proper. The intent behind this is to provide a sense as to how resilience developed as a construct, not only within its own sphere but also across the field of psychology as a whole. More detailed discussion as to the research conducted on the construct will be left to Chapter 2 and the two chapters combined will provide a relatively comprehensive view of resilience from both a historical perspective and the current state of play.

Following on from the literature review, Chapter 3 will present the background to the study, and the study results. These results are then drawn into the model of resilience that has been put forward in Chapter 4 to explain the development and maintenance of resilience, including explanations as to how resilience can be impinged upon and enhanced over time. Chapter 5 will then discuss the meaning of the first three chapters by reviewing the fit between the literature and the study results, and the fit between the literature and the model. A critique of the study and the model is included in this discussion, as is comment as to future research directives. The thesis overall has a bias towards the practice of clinical psychology as over the years this has provided the opportunity to observe and reflect, and shape thinking about the nature of human behaviour.

**I - The history of the construct**
The history of resilience is such that it has been blessed with dedicated and professional researchers who have tried to determine what it is that makes one person more resilient to life's challenges than the next. The earlier writings on resilience were theoretical in nature and included musings as to the nature of healthy personality and development as compared to pathology (for example Maslow, 1950). Following on from this, research

explored resilience indirectly within the context of chronic stress such as extreme poverty (Elder, 1974, Long and Vaillant, 1984) or the holocaust (Frankl, 1946; Todorov, 1996), and animal studies identifying individual differences under varying conditions of stress (Anthony, 1987). This research included both quantitative studies and individual case studies, and was based within more psychodynamic models encompassing theories surrounding ego function (Anthony, 1987).

Research on epidemiology and risk were also part of the next phase, and there was considerable interest in the development of psychopathology and the outcome of children who had parents with mental illness (Anthony, 1987; Glantz and Sloboda, 1999; Luthar and Cicchetti, 2000; Luthar 2006). The discovery that many children of mothers with schizophrenia thrived, despite their high risk status, led researchers to try and understand the individual differences in response to adverse conditions (Luthar et al., 2000; Masten, 2001). Studies were conducted researching the impact of various adverse conditions on children including maltreatment, urban poverty and violence, chronic illness and catastrophic life events (Cicchetti and Garmezy, 1993; Garmezy, 1993; Luthar et al., 2000). These early studies were designed to identify contributing factors to the development of psychopathology, and in doing so the qualities of children that were resilient to stress also became evident (Luthar et al., 2000).

This work led to the conclusion that children who were better adjusted, despite the adversity of their living conditions, had special abilities and writers in the field began to refer to these children as being invincible or invulnerable to adversity (Anthony, 1987; Luthar, 2006; Masten, 2001;). Hypotheses as to the nature of invincibility or invulnerability to stress were proposed and studies were instigated to identify the personal characteristics that made these children different. Additional questions were asked as to whether or not some children had a natural "immunity" to stress and whether it developed gradually as a result of mastering difficulties, or whether the capacity for invulnerability was inherent and a genetic trait. The question as to whether or not invulnerability was universal or domain specific was also broached, as was the query of

invulnerability being a limited resource that could be used up if too many demands were placed upon it (Radke-Yarrow and Sherman, 1990).

In the years following, the notion of invulnerability was challenged as being too absolute and global, and misleading as to the nature of the construct being examined. The term invulnerable became obsolete and resilience was adopted (Cohler, Stott and Musick, 1995; Luthar et al., 2000; Rutter, 1993). Risk and vulnerability factors, along with protective factors, remained key terms to describe the different variables under examination and the construct of resilience began to be discussed from a process orientation (Rutter, 1993). Resilience was thought to involve a number of inherited characteristics that were intertwined with life experiences, and vulnerability was viewed as an inevitable part of life (Sameroff, 1989, as cited in Cohler et al., 1995). The relative temporal instability of resilience as a construct was acknowledged as was the need to be cautious about broad generalizations with regard to resilience across all domains (Luthar, 2006; Windle, 1999).

With these developments came a move away from viewing resilience in relation to purely individual differences. Biosocial processes, involving cultural and environmental influences, were recognized as important factors to be considered (Luthar, 2006; Rutter, 1993). Several extensive projects studying the nature of risk and vulnerability in the 1970's and 80's incorporated this, and established resilience as an important construct in the field of child developmental psychology. These studies identified different variables that appeared to be significant protective factors to children including personal resources such as attractiveness and intellectual capability, family resources such as good mothering and supervision, and community resources such as some form of support network (Masten and Coatsworth, 1995). The knowledge gained from these studies formed the basis of several intervention programmes aimed at mitigating the effect of adversity on children, and the catalyst for exploring the phenomena widely (Luthar, 2006).

Research in the field of stress and coping was also underway during these years, and the construct of competence and the characteristics of coping were explored in parallel with the construct of resilience (Earls, Beardslee and Garrison, 1987; Murphy, 1987; Moriarty, 1987). Attention has also been directed towards affect regulation as being a key to stability and wellness (Csikszentmihalyi, 1990; Fredrickson, 2001), and this has been substantiated by studies within the field of neuroscience as the development of new research tools have allowed for greater scope and specificity (Fonaghy, Gergely, Jurist and Target, 2002; Davidson, 2000; Schore, 2000, 2003a, 2003b). In recent years a further shift in the field of positive psychology has led to attention being directed towards the notion of thriving and the potential for growth following times of stress (Carver, 1998).

Over time, research in the area of resilience has essentially unfolded in five different directions, including resilience as an aspect of child development and response to adverse conditions, resilience as a theoretical construct of personality, the biological basis to resilience, resilience as a feature of positive coping in response to life stresses, and resilience in terms of enhanced coping following trauma. Each field of research has retained its own unique perspective on the nature of resilience and this has led to each of the five fields developing their own take on the construct of resilience with specific approaches to research and infrequent cross referencing. The result of this divergence is that each field seems disconnected from the others despite a significant convergence in recent years as to what is understood to be integral to the construct.

**Chapter 2 – Literature review**

The objective of this review is to provide an overview of the work and writings about resilience in a manner that is structured and gives clarity to the field as a whole without becoming enmeshed in the miniscule. Five key research areas will be reviewed in a quasi chronological order to provide a sense of how the construct has evolved over time. The first group to be explored will be the seminal studies in the field of child development and subsequent research, and this will be followed by a review of pertinent personality models that reflect aspects of resilience. Following this the biological underpinnings of resilience will be presented, and this will be followed by models falling under the rubric of positive psychology. Finally, a relatively recent view of resilience will be presented within the thriving or potential for growth approach.

**I - Resilience from the child development perspective**

As previously mentioned, the construct of resilience has evolved from its earlier starting point in the study of the development of psychopathology to being more generally applied to phenomena associated with child development. The construct of resilience has a strong appeal in that it is positive and intuitive, but in saying this it is also strongly connotative, subjective and frequently lacks explicit meaning.  Research in the area of child development and resilience has set itself apart through its attempts to define the construct more succinctly and to operationalise it (Glantz and Sloboda, 1999; Kumpfer, 1999).  The difficulties inherent in this have dominated much of the writing in the field as defining the construct requires clarity with regard to what constitutes a threat and what constitutes an "OK" response to that threat (Luther and Cushing, 1999; Masten, 2001; Masten and Reed, 2002). This part of the review will comment on resilience research in the field of child development, and will begin with a discussion as to the process of defining resilience, followed by what this has meant in terms of theoretical and research models, and ending with a brief summary on the work done thus far.

**- The defining of resilience**

Earlier definitions of resilience tended to be broad such as "being concerned with individual variations in response to risk factors" (Rutter, 1990, p183) or "referring to the

capacity to maintain feelings of personal integration and sense of competence when confronted by particular adversity" (Cohler, 1987, p 389). These types of definition permitted a wide range of risk factors to be incorporated into the research paradigm and confusion reigned as studies drew conclusions about resilience from an equally wide range of different variables such as maternal ill health and babies with low birth weight, to urban poverty and specific traumas including war (Luthar et al., 2000; Masten, 2001). Measurement of responses to the different risk factors also varied considerably to include physical health and well being to the measurement of competence through scholastic achievement and the absence of delinquent behaviour (Luthar et al., 2000; Masten 2001).

Following this, attempts were made to define resilience in terms of behavioural outcomes that could be more readily measured. A definition of resilience was proposed involving the measurement of behavioural success in terms of developmental tasks in the face of adversity (Luthar, 1993, 2006). This approach too was critiqued as there was no acknowledgement of the emotional impact of trauma and Marion Radke-Yarrow stated that "children cannot walk between the raindrops" without being affected at some level (as cited in Wolff, 1995, p 566). This critique led to research investigating both internalizing and externalizing responses to adversity, and questions as to what this might mean in terms of gender differences in response to adversity (Luthar, 1993). Researcher ethnocentricity was also cited as a concern with regard to defining what salient developmental tasks might be, particularly with regard to studies of children from sub cultures such as those of urban poverty (Luthar, 2006).

Discussion around the defining of resilience led to the conclusion that resilience is "the process of, capacity for, or outcome of successful adaptation despite serious challenging or threatening circumstance" (Masten, Best and Garmezy, 1990). Behavioural adaptation has been cited as including both internal well being and / or effective functioning in the environment (Masten et al., 1990). Further refining of the definition resulted in "a class of phenomenon characterized by good outcomes in spite of serious threats to adaptation or development" (Masten, 2001, p 228), and the acceptance of this definition of resilience is evident in it's adoption by numerous researchers (Buckner, Mezzacappa and Beardslee,

2003; Cicchetti and Rogosh, 1997; Glantz and Sloboda, 1999; Kumpfer, 1999; Masten, Hubbard, Gest, Tellegen, Garmezy and Ramirez, 1997;). With this definition resilience becomes a superordinate construct subsuming the dimensions of adversity and positive adaptation, and as such is not measured directly but inferred on the basis of measurements of these two dimensions (Luthar 2006).

Difficulties remain however as to how to determine competent or adaptive outcomes and how to determine threat or adversity. Masten (2001) has commented on this extensively, and suggested that with regard to good outcomes that this can be inferred by either the child meeting the major developmental tasks or expectations for the their age group in their culture or community, or the absence of psychopathology or impairments. Studies have attempted to infer the factor of good outcome through various measurements including the meeting of external criteria such as scholastic achievement or the absence of delinquency, or internal criteria such as psychological well being or low levels of distress (Luthar 1993; Luthar et al., 2000; Masten, 2001; Masten and Reed, 2002 ).

The nature of what is serious threat includes situations such as poverty and socio-economic stress, tabulations of the number of stressful life events in a given period or a lifetime, massive community trauma, low birth weight, divorce of parents, mental health of parents and maltreatment (Masten, 2001). With regard to multiple risks there has been a tendency to use a summative model but the validity of this has been questioned without clear guidelines as to how to remedy the situation (Luthar, 1993). The difficulties with a summative approach is that it is somewhat simplistic given the complexities of cumulative stress, and there is a lack of attention to the accepted fact within the field of trauma that early abuse frequently predicts vulnerability to on-going abuse throughout the life span (Allen, 2001).

Part of the process of operationalising of the construct has also been the intent of separating the construct of *resilience* as the maintaining of positive adjustment when challenged by life circumstances from *resilienc*y as a personality trait (Masten, as cited in Luthar et al., 2000). Viewing resilience as a personality trait implies that it is stable and

unchanging whereas Cicchetti and Rogosh (1997) stress the importance of conceiving resilience as a dynamic construct to help determine what happens when confronted with either acute or chronic adversity. There is an emphasis to move away from seeing resilience as a static trait, and encouragement to explore evidence of self righting tendencies throughout the life span (Cicchetti and Garmezy, 1993).

In addition to discussion as to the "true" operational definition of resilience, there has been discussion as to the confusion around associated terms such as protective and vulnerability factors, risk factors and competence. Luthar has stated that there is minimal utility in accepting resilience as an overarching term and that it would be preferable to address resilience in terms of specific coping domains (Luthar, 1993). She has proposed that greater differentiation of the salient facets of resilience be adopted as a means of reducing further error and confusion. Her suggestions include labeling attributes differently, and that protective factors could be further defined as "protective stabilizing", "protective enhancing" and "protective but reactive"; and that vulnerability factors could be split to include "vulnerable-stable" and "vulnerable and reactive" (Luthar et al., 2000). This has not, however, been accepted the research community as evident by an absence of comment in the literature let alone the adoption of this as a viable option.

Finally, challenges to this operational definition from a more semantic basis have come from Tarter and Vanyukov (1999). They suggest that the use of the term "resilience" is both inaccurate and superfluous given the formal definition of the word as "relating to the property of a material that enables it to resume its original shape or position after being bent, stretched or compressed" (American Heritage Dictionary, 1978, as cited in Tarter and Vanyukov, 1999, p 86). They suggest that if we were to apply this analogy to a person that it would imply a phenotype or underlying trait, and they question the process of epigenesis and the impact of this on the developmental trajectory. They also comment that the word resilience reflects the capacity (in terms of speed and recovery) of the material to return to its previous shape following the removal of a stressor. They suggest that if this were the case that we should be able to measure and predict the human capacity for recovery if the different variables were known.

Tarter and Vanyukov's objections to this analogy concerns the impossibility of being able to predict what an individual's psychological resilience might be given that so many of the variables interacting are either not measurable or simply not known. They also comment that the individual is not a passive participant like a piece of steel or carbon but is highly interactive with their environment and therefore their behaviour can be contingent on experience. Further to this, they make the important point that in the human realm the stressor may not be able to be removed quite so succinctly as in an experiment in the physical sciences, and cite the impact of cumulative stressors as a perfect example of this. Needless to say, even though a stressor might be removed this does not necessarily mean that the stress associated with it has also been removed and this can continue within the private realm of thoughts and feelings. Their challenge to the work on resilience is pertinent, but it is also pedantic, and belies the potential to use words and terms in an analogous manner that is abstract.

**- Theoretical models**

Earlier models explaining resilience within the child development field aimed to identify specific factors associated with resilient functioning at times of stress or adversity. With time, and the insight that external factors mediated many coping responses, the models began to explore interactive processes between personal attributes and stress, and associated variables. More complex transactional and developmental pathway models were developed, and these were followed by more detailed research designs (Kumpfer, 1999; Windle, 1999). Increases in complexity have not led to clarity though, and reports on methodology at times presents as impenetrable in their attempts to cover every variable and condition that could arise (see Appendix A for an example of this). Anne Masten, however, stands out in the field in terms of lucidity and she has effectively summarized the different theoretical models underlying the research on resilience into two groups.  The two groups identified by Masten are variable focused models and person focused models (Masten, 2001; Masten and Reed, 2002).

Variable focused approaches attempt to find out what accounts for positive outcomes through linkages between the individual, environment and different experiences. This method is well suited to identifying protective factors by drawing on the power of the whole sample from a risk group, and the use of multivariate statistics. Models based within this approach include additive models, interactive models and indirect models (Masten and Reed, 2002). The additive model is the simplest model in that it assesses how the various risks and assets contribute independently to the outcome variable. Assets can theoretically compensate for risks, and interventions attempt to boost assets whilst diminishing risks for the children at risk (Masten and Reed, 2002).

Risk/asset gradients are also part of this model in that the level of negative outcome is estimated from the number of risks and analysed within the context of the available assets. Interactive models on the other hand identify moderating effects in which one variable is identified to alter the impact of the risk variable, and these are generally referred to as vulnerability or protective factors. Two kinds of interaction are commonly discussed in the literature. The first identifies an enduring quality of the individual, or the environment, that alters the susceptibility of the individual whilst the second idenitifies temperament or personality as affecting the potency of a given threat (Masten and Reed, 2002). Indirect models of resilience are based on the power of the mediating effect of a variable, such as the quality of parenting, and it assumes that the mediator can offer protection and have a positive impact on the child's life (Masten and Reed, 2002).

Person focused approaches try to identify the resilient individual and then understand what makes that person more resilient than the next. This is essentially a configural approach in that it promotes the notion that the resilient individual is doing well in a number of different ways as opposed to just one, and is seen to have significant advantage in studying individuals' lives through time (Masten and Reed, 2002). Masten and Reed (2002) discuss three types of person focused models, the first of which is the simple case study. Although not a true model of resilience, case studies are purported to have heuristic value in terms of demonstrating natural phenomena. The second type is based on the identification of very high risk individuals who do well, whose

characteristics are then compared with those who do not display resilient characteristics. This approach has led to the development of the third type of model whereby comparisons are made between those children who are in a high risk group and resilient with those who are not, and those children who are in the low risk group and competent (Masten and Reed, 2002).

A third group of models has been recently promoted and gaining increasing standing through the recognition that complex developmental processes unfold throughout the life span (Cairns, Bergman and Kagan, 1998; Masten, 2001; Masten and Reed, 2002). Pathway models within the field of resilience examine patterns of behaviour over time in more dynamic and explicit ways (Masten and Reed, 2002). Three resilient pathways have been identified by Masten and Reed (2002). The first reflects a child in a high risk group who functions well in life, the second is a child who is doing well but has been diverted by adversity then recovers, and the third reflects a "late bloomer" such as a child in a high risk group who was not doing well recovering with input and positive opportunities. These patterns of development are not easy to study given the myriad influences upon the child as an open system but development of new statistical methods (such as growth curve modeling) has assisted with this type of investigation (Masten and Reed, 2002).

**- Current status of child development research on resilience**
In the early days of resilience research several longitudinal studies examining risk and vulnerability shed light on important protective factors for children growing up in adverse situations (Masten and Coatsworth, 1995). Many of these studies did not directly examine resilience per se but focused on factors relating to children's development in adverse conditions that might be predictive of future difficulties such as mental health problems or criminal behaviour. These studies generated interest in the protective factors identified and in the accrued evidence suggesting that adversity in childhood did not necessarily lead to negative outcomes. As previously mentioned, questions arose in response to these studies as to what exactly made these children seem to be invincible to the disadvantageous conditions during their childhood and enabled them to cheat fate of what seemed to be their lot in life (Anthony, 1987).

One of the first of these studies conducted by Werner and Smith, on Kauia Island in Hawaii, followed a group of 500 children born in 1955 for thirty years. During the study's earlier stages the study found that many of the children were being raised in conditions of poverty and adversity, and Werner and Smith discovered that a significant proportion of children in high risk situations were doing very well despite the adversities they faced (Werner and Smith, 1982, 2002). The personal factors identified as significant included being female, socially responsible, adaptable, tolerant, achievement oriented, good at communicating, and having good self esteem. Environmental factors believed to be important included a caring environment both inside and outside the family (Masten and Coatsworth, 1995). Socio-economic status was also found to be an important moderating factor when perinatal complications were involved (Masten and Coatsworth, 1995).

During school years the children in the group of those doing well despite adverse living conditions were identified as having better intellectual skills and reading ability. As adolescents they were found to be more positive about themselves with a greater sense of internal locus of control. It was also noted that these children came from more structured and rule governed households (Werner and Smith, 1982, 1992). A follow up of the high risk group in latter years (aged 30-31 years) also found that the resilient adolescents continued to do well in early adulthood, and that many of the others that had not been doing well in adolescence had improved over time (Werner and Smith, 2002). The resilient group of subjects did however show some signs of having been affected by their earlier adverse living conditions as compared to their peers in the low risk group. These signs included a higher level of stress related problems and a tendency to be more emotionally detached in interpersonal relationships when compared to their peers in the low risk group (Werner and Smith, 2002).

Findings from an epidemiological study by Rutter in the 1970s on the Isle of Wight and inner city London were similar to those of Werner and Smith. This study examined cumulative risk for psychiatric disorder and criminality, and it found that risk variables

did not always lead to psychiatric disorder if they occurred in isolation (Rutter, 1991). What the study did find was that the risk was increased if two or more risk variables were present at the same time, and that if the child's circumstances changed then so did the risk (Rutter, 1991). As a result of this study Rutter began to stress the importance of process when studying risk and vulnerability, and to acknowledge the significance of key turning points in an individual's life (Rutter, 1991). Among the resilient characteristics identified in children by Rutter were easy temperament, being female, good parent-child relationships, marital support, a positive school climate, self esteem and self efficacy in at least one domain of life, planning skills and a warm, close personal relationship with an adult (Richardson, 2002; Rutter, 1993).

The Rochester Longitudinal Study of the 1980s studied vulnerability to later mental health problems and the cumulative risk of children born to mothers suffering from schizophrenia. This study analysed risk in relation to intellectual and socio-emotional functioning at age 4, and found a linear relationship in terms of increased risk leading to intellectual and socio-emotional functioning decrease. They noted that the impact of maternal mental illness did not appear to be related to any particular type of mental illness, and that there was a striking similarity between the impact of maternal mental illness and that of poverty on the well being of children (Sameroff and Seifer, 1987). Subsequent follow up studies of these children as adolescents were made and several variables were identified relating to improved functioning, including fewer stressful life events, less depression in mothers, mothers expressing greater concern for their children and less dissatisfaction and criticism experienced by the mothers about the children (Seifer, Sameroff, Baldwin and Baldwin, 1992, as cited in Masten and Coatsworth, 1993).

Garmezy and his colleagues, when investigating the impact of parental schizophrenia in the 1980s, found that most offspring remained well and identified a number of significant factors including effectiveness in work, play and relationships, self discipline, good problem solving skills, critical thinking skills and humour. Garmezy identified a triad of resilient factors that included personality disposition, a supportive family environment

and an external support system (Richardson, 2002). A second 1980s study, the Newcastle Thousand Family Study, examining adversity and later criminality identified factors associated with good outcomes to include good mothering, good maternal health, an employed breadwinner, good health and the child's physical development, and being the eldest in the family. During school years additional factors were identified and included intellectual functioning, school achievement, good parental supervision and belonging to prosocial youth groups (Kolvin, Miller, Fleeting and Kolving, 1988, as cited in Masten and Coatsworth, 1995; Masten 2001).

A study by Moran and Eckenrode (1992) attempted to address individual differences in coping with maltreatment. Two personality characteristics were examined and these included locus of control and self esteem. The study explored what protective qualities these characteristics might have with regard to depression for girls (12-18 years) following maltreatment. The results suggested that high self esteem and internal locus of control for good events were protective factors, and that these characteristics were less evident if the child had been exposed to maltreatment at an earlier age. The type of maltreatment was not significant, and explanations relating to family relationships and dysfunction or the cumulative impact of maltreatment were suggested as potential reasons for the results. The authors suggested that maltreatment during preadolescence may interfere with the development of these characteristics as they are dependent upon the quality of the parent child relationship. Unfortunately, although this study identified some interesting factors with regard to self esteem and locus of control, the design of the research did not yield further insights.

Adding to the evidence on resilient functioning were the results of a longitudinal 18 year study involving high risk children and their families by Egeland, Carlson and Sroufe (1993). This study had a transactional basis that placed emphasis on "identifying and examining meaningful patterns of behaviour rather than specific outcomes" (Egeland et al., 1993, p 519). It involved gathering multiple measures from multiple sources over time and identified poverty as a significant risk factor, highlighting that the negative effects of poverty were cumulative over time. With regard to children who were able to

improve their level of adaptive functioning, the quality of the relationship that infants and toddlers had with their mothers was believed to be highly important and augmented by increased support / decreased stress in the family environment. Competent functioning in early childhood was found to be related to higher intellectual and language ability, a structured and responsive home environment, and a positive mother-child relationship. For girls, competence was enhanced by the mother's personal adjustment, and the role model of positive coping was inferred (Pianta, Egeland and Sroufe 1990, as cited in Egeland et al., 1993). The predominant finding of the study pointed to the importance of the attachment relationship, and that positive adaptation during childhood was mediated by the quality of the mother-child relationship. An organizational perspective of resilience was stressed in that resilience was viewed as a capacity that develops over time in the context of a facilitating environment (Egeland et al., 1993).

Studies following on from this initial wave of resilience research began to be more focused on addressing specific psychological aspects of resilience (Richardson, 2002). Luthar (1991) examined specific factors believed to be protective at times of stress with a youth population. Although her results found several factors (internality and social skills) to be consistent with previous research, there were also several inconsistencies. Surprisingly, she found that intellectual function indicated vulnerability as too did positive events occurring within the same year. Explanations for these results included that higher intellectual functioning might be related to higher levels of sensitivity that would thus lead to greater distress at times of stress; and that positive events might operate as a disturbing contrast when stress was experienced. Her study also found that children within the resilient group displayed more depression and anxiety than competent children from low stress backgrounds. She suggested that relying on the absence of externalizing behaviours as an indicator of resilience might be misleading. This study was one of the first to raise questions as to the conclusions of previous research, and to allude to the complexity of the construct overall.

Research studies in the later 1990s built on the insights gained from these earlier studies with further longitudinal studies continuing to report different variables associated with

resilient functioning of children and youths in high risk situations. Situational, temporal and domain instability was noted as inconsistent results refuted factors previously believed to be conclusive (Luthar 2006). The analysis of longitudinal data from a New Zealand study of children and adolescents illustrates this. This study found that resilient youths (identified by absence of externalizing behaviours) were distinguished from their less resilient cohorts through less exposure to family adversity, superior intellectual functioning, less contact with delinquent peers and less novelty seeking behaviour. However, it also found evidence suggesting that females were no more resilient than males, and that when IQ, peer affiliation and novelty seeking were allowed for, that children presenting as more adaptive at an earlier age were no more resilient than others at a later age. External activities and relationships were not found to be protective, and they found that measures indicating parental bonding and attachment were not related to resilience (Ferguson and Lynskey, 1996). With regard to this study it is important to note that it was not designed to study resilience per se, and that it used available data from a more extensive study to draw its conclusions.

Other studies also identified inconsistencies when their results compared to earlier results. Masten, Hubbard, Gest, Tellegen, Garmezy and Ramirez (1999) found anomalies with regard to prior research in terms of the need to incorporate indicators of psychological distress into appraisals of resilience. Masten et al. (1999) report on a 10 year longitudinal study focusing on the differences between resilient youth and their maladaptive peers, and competent peers who had not experienced adversity. This study reported that the group of resilient youths and their competent peers were alike in terms of the psychosocial resources studied (intellectual ability and parenting resources). They found that resilient youths had much in common with their competent peers, and that although they reported experiencing negative affect this was not at a level beyond the norms of the measurements used. The group of maladaptive youths, however, was reported as more at risk of psychological distress in that they responded to stressors with distress and negative emotion. This report concluded that the development of competence is related to psychosocial resources, and that good resources are less available to children

growing up within the context of adversity, but that if these resources are available then competence is likely to be evident (Masten et al., 1999; Masten and Reed, 2002).

Further inconsistencies were found in the results of a large epidemiological study by McGloin and Widom (2001). They operationalised the construct of resilience across eight domains of functioning to include employment, homelessness, education, social activity, psychiatric disorder, substance abuse and criminal activity in terms of official arrest and self reported violence. The study involved over a thousand subjects that had been victimized as children (as identified by official records) and a control group. Subjects were interviewed at a later stage in life during early – mid adulthood (18-41 years). This study found that 22% of the maltreated group met the criteria for resilience, with more females meeting the criteria for resilience and being successful across a greater number of domains than males. Analysis of the type of abuse experienced, and removing the two criminality domains, did not yield any significant explanations with regard to gender differences and the authors suggest that the results of the study may reflect that males are generally more vulnerable than females as evidenced by general mortality and morbidity rates. The analysis of type of abuse and domain success found sexual abuse and neglect to be significant negative predictors of resilience, and that physical abuse was not.

Masten, Burt, Roisman, Obradovic, Long and Tellegen (2004) reviewed a number of longitudinal studies that followed disadvantaged individuals into adulthood. They reported evidence suggesting the period of life named "emerging adulthood" by Arnnett (2000) may provide a window of opportunity for positive change. This group presented findings from a longitudinal study exploring continuity and change through this transitional period, and questioned if positive change for maladapted individuals is predictable. Reassessment of subjects that had been involved in a previous study found that competence was enduring for both resilient and competent individuals. Resources in childhood and adolescence believed to be important to on-going success included intellectual functioning, parenting quality and socioeconomic advantages. Adaptive resources identified as important included the ability to plan and motivation to succeed in the future, behavioural and emotional autonomy, the capacity to handle stressful

situations and access to supportive adults. A small number of maladapted subjects (one third, all female) did make significant improvement during the transition into adulthood, but the authors did not offer an explanation as to why this positive change had come about.

A study by Cicchetti and Rogosh (1997) involving children in their middle childhood years over a three year period attempted to identify the processes underlying successful adaptation despite adversity, and to identify any differences between maltreated children and a control group of nonmaltreated children with regard to self striving and adaptation. This study involved multiple measurements on an annual basis and included self report, peer ratings, counselor ratings, and school measurements that were combined to form an adaptive functioning indicator; and to provide several measurements reflecting proposed process variables relating to ego resiliency, intelligence, self esteem, maternal relationship and relationship with counselor. This study confirmed that maltreated children displayed less adaptive functioning, and that fewer of the maltreated children were considered resilient in their functioning. Factors identified as significant in resilient functioning involved relationship factors for the control group; and ego resilience, ego overcontrol and positive self esteem for the maltreated group. The authors concluded that for the children in the maltreated group self system processes (self reliance and confidence) and interpersonal reserve were important for resilience outcomes, and that children play an active role in constructing their ultimate adaptation.

A later study by Buckner et al. (2003) adds to these conclusions in relation to self regulatory skills and resilience. Their study differentiated resilient from non-resilient school age children (8-17 years), and looked for significant characteristics between the two groups. The factors that were explored included child centred resources (cognitive abilities, self esteem and self regulation in terms of executive function and emotional regulation capacities) and family / environment centred resources (social support and parental monitoring). Results found that children living in poverty are subjected to circumstances that are detrimental to their well-being but that 29% of their subject group did manifest resilience. The children who were classified as non-resilient were found to

have been exposed to significantly more adversity than their resilient peers. Self regulation skills were identified as a predictor of resilience, and no age or gender differences were found. In addition to this, parental monitoring was also found to be an independent predictor of resilience, and there was no association between social supports and resilience. Buckner et al. (2003) also comment that self regulation skills may reflect temperamental characteristics, and that although they suggested that this may have a genetic basis with links to the prefrontal cortex, they cautioned against the inference that self regulation is a static trait.

Additional work in the child development area lies in the application of resilience research (Luthar and Cicchetti, 2000). Various multifaceted interventions have been developed and implemented, and the results of these programmes have begun to be reported in the literature. Beardslee, Versage, Salt and Wright (1999, as cited in Luthar and Cicchetti, 2000) provide evidence of a programme to reduce the impact of parental depression on children based on research results about vulnerability and protective factors. This intervention provided both education and support to the child and family by a clinician, and analysis of pre and post intervention assessment data found that the clinician led intervention was superior to a control group. A second intervention reported by Luthar and Cicchetti (2000) by Cicchetti and his colleagues addressed the attachment deficits evident in the relationships between depressed mothers and toddlers, and results to date suggest that this has been an effective intervention to promote resilient adaptation as well as preventing maladaptation in terms of attachment styles and intellectual functioning. The third intervention reported by Luthar and Cicchetti (2000) addressed the needs of substance abusing mothers and their parenting style. This intervention was described as being integrated and psychotherapeutically oriented, and recipients of the programme reported lower levels of child maltreatment, greater mother-child involvement, and reduced substance use over a six month period. This latter intervention, whilst promoting the needs of the mothers and their children, is reported in such a manner that suggests that it's design is not as well based within the resilience literature when compared to the first two programmes.

**- Summary on child development research**

Research conducted within the child development arena has been extensive with regard to the construct of resilience, and the process of exploring resilience has raised a number of questions relating to the inherent difficulties in studying this construct (Luthar, 2006). Although inconsistent results have led to some critique of the field, these difficulties have also led to further discussion and cross examination of previously held assumptions. For example, the field has moved from assuming that stress and adversity invariably has negative impact on children living in impoverished conditions to the acceptance that resilience is the result of basic human adaptative systems and that it is "ordinary magic" (Masten 2001). The inconclusive results of fifty years of research in the field has also heightened awareness of the somewhat elusive nature of resilience in that variables identified as protective for some may not be protective for others, and this has in turn highlighted the need to be aware of the individual and their life pathway rather than assuming a "one size fits all forever" approach.  This in turn has challenged the past beliefs surrounding health promotion and the need to "fix" the problem for children living in adverse conditions, and the somewhat ethnocentric attitude that went with this. In saying this, knowledge is accruing as to what is important with regard to resilience in terms of the personal and social resources but it is imperative that these gains be examined critically to avoid misinterpretation of analyses of a complex construct (Luthar, 2006).

**II – Resilience and personality theory**

A review of earlier writings on invulnerability and resilience reveals that various Freudian terms such as ego were incorporated into theoretical modeling, and the style of writing suggests an implicit acceptance of their validity and role in understanding the psychology of the individual (Anthony, 1987). This approach has continued into more contemporary psychoanalytic writings on resilience, and models on resilience promote the constructs of ego and defense mechanisms as significant and stable aspects of personality contributing to adaptability. There is less emphasis on resilience as a process and there is a tendency to portray resilience as a characteristic of the individual that influences their perception, and response to stress and adversity. Two theoretical models

from a psychoanalytic perspective retain a presence in the literature, and these include Jack Block's model of ego resilience and George Vaillant's work on defense mechanisms. In addition to these two models, more contemporary models also discuss resilient functioning as being a trait or personality characteristic. These include the construct of optimism, Antonovosky's sense of coherence model and Kobasa's model of hardiness.

**- The model of ego resiliency**

Jack and Jeanne Block's research on ego function began in the 1950's and evolved in response to their attempt to integrate various aspects of psychoanalytic theory with dynamic motivational states in the individual. They questioned the more traditional notion that the organism is energized by impulses, and proposed that if an individual were to be adaptively tuned to his environment then these impulses must be modulated and monitored (Block and Block, 1980). They suggested that impulse control develops with "maturation and experientially derived construction of various personality structures" to bring the individual under the governance of the "reality principle" (Block and Block, 1980, p 41). These personality structures were deemed to be interrelated and programmed to maintain the viability of the individual through giving priority to threat avoidance, and within this constraint to gratify the individual (Block and Block, 1980; Block and Kremen, 1996). The constructs of ego-control and ego-resiliency became the terms that were used to describe the relatively enduring structural aspects of personality concerning motivational control and resourceful adaptation (Block and Turula, 1963; Block and Block, 1980; Block and Kremen, 1996).

Block and Block (1980) drew on Lewin's theory of boundary characteristics to formalize the properties of ego-control and ego-resiliency. With regard to ego control the property of permeability was thought to be significant, and this refers to the capacity of the ego's boundary to contain the various psychological tensions that it was exposed to over time. The viability of the personality structure was deemed to be dependent upon the construct of ego-control and the ability to maintain a tolerable anxiety level and impulse control (given the situational impingements). It was hypothesized that boundaries that were

relatively permeable would lead to overflow and the influence of neighbouring psychological subsystems (undercontrol), and boundaries that were excessively impermeable would result in the compartmentalization of psychological subsystems (overcontrol). Block and Block (1980) likened boundary permeability to impulse control, and proposed a continuum that placed ego undercontrol and overcontrol at opposite ends of this dimension.

Individuals displaying ego undercontrol were proposed to have a low threshold for response, to be expressive and spontaneous, to express their needs and emotions directly, to tend towards immediate gratification, to be distractable with many short lived interests and passions, to be overly inclusive in cognitive processing, to be more explorative and less conforming, and more comfortable with ambiguous situations. Ego overcontrol was characterized by a high modal threshold for response and to be both constrained and inhibited with undue delay of gratification, to manifest needs indirectly, to show minimal emotional expression, to process information in a manner that is highly categorical and overly exclusive, to be perseverative and less exploratory, to be conforming in nature with narrow interests, to be oriented towards planning and organization, and to feel uncomfortable in ambiguous situations. Placement at either end of this continuum implied a constant mode of responding and behaviour, and it was hypothesized that this could lead to both adaptive and maladaptive functioning (Block and Block, 1980). Socialisation practices were deemed to be highly significant with regard to the development of impulse control and ego control (Block, 1971).

The second personality dimension hypothesized was ego resiliency. The role of ego resiliency was proposed to maintain linkages between the ego structures, and to maintain the personality system within tenable adaptive bounds (Block and Block, 1980; Block and Kremen, 1996). The Block's drew on the second property of Lewin's theory of boundaries (elasticity) to describe the nature of ego-resiliency. This referred to the capacity of the boundary to respond to psychological forces by changing its characteristic level of permeability (to modulate ego-control) and then to return to its original modal level. Block and Block (1980) conceptualized this as "the dynamic capacity of an

individual to modify his / her modal level of ego-control, in either direction, as a function of the demand characteristics of the environmental context" (p 48). The implication of ego-resiliency concerned the individual's adaptive capabilities at times of environmental stress or uncertainty, and their ability to effectively manage anxiety (Block and Kremen, 1996).

When placed on a continuum, ego-resiliency at one end is characterized by "resourceful adaptation" to changing circumstances and demands, flexibility and the ability to appraise and respond appropriately to stressful circumstances. The other end of the continuum was described as ego-brittleness, and this was characterized by minimal adaptive flexibility, an inability to respond to the various demands of situations, the tendency to perseverate or become disorganised at times of stress, and difficulties recouping or returning to baseline following stressful experiences (Block and Block, 1980). The essence of ego-resiliency relates to adaptability, and the ability to equilibrate and re-equilibrate in responses to both internal changes and changes in the environment (Block and Kremen, 1996). Underlying Block and Block's theory was the assumption that high and low ego-control related to low ego-resiliency, and that high ego-resiliency related to intermediate ego-control. This infers a U shaped relationship between the two constructs and a two dimensional non linear model (Mervielde and Asendorpf, 2000).

Block and Block (1980) suggest that when the construct of ego-control is held constant that the ego-resilient individual is resourceful when faced with new challenges, that they can maintain an integrated performance under stress, can cope with competing stimuli if necessary, are able to resist illusions and to be engaged with the world but not subservient to it, and that their behaviour is adaptively organized. In contrast to this, when the construct of ego-control is held constant in the case of an ego-brittle individual there is less adaptability and the response tends to generally be fixed in an established pattern, there is an inability to respond to stress beyond a rigidly repetitive or behaviourally diffuse manner, there are higher levels of anxiety in the presence of competing demands and a slower recovery rate from stress, less accommodation to changes and difficulty in modifying preferred personal tempo in response to situations. Block and Block (1980)

propose that the antecedents to ego-resiliency that are observed early in life are likely to be genetic and constitutionally based. Following research observations of ego-brittle children they added the caveat that environmental influences are also important to the development of ego-resiliency.

Block and Block carried out extensive research on children throughout the 1960's and beyond to investigate the constructs of ego-control and ego-resiliency in relation to development, and the predictive utility of these two constructs with regard to personality, psychological and adaptive functioning later in life (Block and Turula, 1963; Block and Block, 1980; Block and Robins, 1993; Block and Kremen, 1996; Cramer and Block, 1998Funder and Block, 1989; Gjerde, Block and Block, 1986). Their original study involved children from the ages of 3-5 years who underwent extensive individual assessments in conjunction with parental and teacher ratings. The California Child Q Set was used to assess personality functioning, and to develop indices for ego-control and ego-resiliency. Analysis of the earlier data collected across time, and with multiple assessment methods, revealed construct validity for ego-control and ego-resiliency in children up to the age of 7 years. Gender differences were noted at age 7 years and the comment was made that it could not be assumed that children of this age did not display gender differentiation. It was also noted that ego-control, as tempered by ego-resiliency, influenced attention and memory function, and the self-world relationship, and the results overall supported the constructs of ego-control and ego-resiliency as personality variables (Mervielde and Asendorpf, 2000). Studies following this continued to be supportive in general although gender differences persistently presented without a convincing explanation (Block and Kremen, 1996; Gjerde, Block and Block, 1986).

Later studies exploring ego-resiliency as a personality structure have also reported supportive results confirming the utility of the Blocks' model as a personality measure and a predictive tool (Asendorpf and van Aken, 1999; Klohnen, 1996; Pulkkinen, 1996; Robins, John, Caspi, Moffitt and Stouthamer-Loeber, 1996; York and John, 1992). The study by Robins et al. (1996) of adolescent boys replicated earlier results by Block (1971) in that resilient boys tended to be intelligent, academically successful and free from

psychopathology, that overcontrolled boys were similar but tended to be prone to internalizing problems, and that undercontrolled boys showed patterns of emotional, academic and behavioural problems. Klohnen's study of women found that those displaying ego-resiliency were well adjusted and effective across domains, and that they displayed a confident optimism, interpersonal warmth and insight; that they were productive and autonomous in their activities; and that they were skilled at expressing themselves (Klohnen, 1996). Longitudinal studies in Finland (Pulkkinen, 1996) and Germany (Asendorpf and van Aken, 1996) have confirmed ego-resiliency as having high continuity across time and to be viable as a personality measure across cultures. Ego resiliency has also been positively associated with  the Five Factor Model of personality (York and John, 1992).

**- Vaillant's defense mechanisms**

Defense mechanisms have been integral to psychology since the time of Freud as a means of explaining how individuals responded and related to their worlds. With time theoretical developments within psychology have led to defense mechanisms being viewed less favourably, but even so they have retained their influence in a somewhat abstruse way and have never been completely abandoned. Cramer (2000) purports that defense mechanisms can be seen as an alternative type of adaptive strategy, and that as such it is critical that they are researched within the field of stress and coping. Cramer differentiates coping and defense mechanisms on the basis of their being conscious or unconscious processes, and intentional or non-intentional operations. This view has not been accepted without contention (Newman, 2000) but overall the notion that unconscious processes affect stress responses has been supported by key researchers in the field (Lazarus, 2000; Somerfield and McCrae, 2000).

The work in this arena that is consistently linked with the resilience literature is that of Vaillant (1994, 2000, 2002). He states that outcomes are not just determined by the stress that we encounter in life but also by the individual's response to that stress, and defense mechanisms are very much part of that response (Vaillant, 1994). Vaillant (1994, 2000) defines defense mechanisms as innate and involuntary regulatory processes that enable

the individual to reduce cognitive dissonance to changes in both the internal and external environment. This is achieved through altering how events are perceived, and can involve altered perception of the self or subject, the object or the other, ideas or feelings (Vaillant, 1994). He views defense mechanisms as restoring psychological homeostasis as a means of coping with conflict and cognitive dissonance (Vaillant, 2000). The five important properties of defense mechanisms identified by Freud, and endorsed by Vaillant (1994), include that defense mechanisms are the means of managing conflict and affect, they are relatively unconscious and discrete from one another, have the potential to be reversible, and that they can be adaptive as well pathological. He states that in essence "defenses reflect integrated dynamic psychological processes for coping with reality rather than a deficit state or a learned voluntary strategy" (Vaillant, 1994, p 45).

Vaillant's research involved a longitudinal study of 456 adolescent boys at junior high level that were followed for 35 years, and a control group of boys remanded to reform school. These subjects underwent a series of semi-structured interview and questionnaires, and the researchers had access to their medical, psychiatric and arrest records. Attrition was reported as minimal, and the independent raters assessed each subject's global adjustment, evidence for Diagnostic and Statiscal Manual III Axis II (personality) disorders, and the nature and maturity of predominant defense mechanisms (Vaillant, 1994). He found that mature defenses were a robust indicator of adult mental health, and good predictor of future adult mental health. He also found minimal association between maturity of defense style and socioeconomic status (Vaillant, 1994, 2000).  Vaillant (1994) concluded that ego defenses may be representative of an innate means with which to protect ones self. He likened defense mechanisms to creativity and intelligence, and stated that they reflect "integrated mental processes" that cannot be dissected into component parts. Vaillant (1994) also made the comment that separating immature and mature defenses in a dichotomous manner as either coping or defending was somewhat arbitrary and not helpful.

Part of Vaillant's research on defense mechanisms included a study on the nature of resilience, and from the results of the longitudinal study he examined more closely the

profiles of subjects who had been subjected to extremely deprived conditions during early childhood. He reported that the subjects at age 25 years continued to display difficulties but that this had self righted by middle age for 8 of the 11 subjects selected (Vaillant, 1993). Individual case studies were used to report each subject's pathway through life and although value judgements are evident in the transcripts they do highlight how each individual responded to their challenges, either functionally or non-functionally. As a result of his studies, Vaillant identified several potential sources of resilience and these included a positive attributional style, temperament, ability to internalize social supports, psychosocial maturity, hope and faith, social attractiveness, ego mechanisms of defense, absence of risk factors and presence of protective factors, luck, timing and/ or context, and self esteem and self efficacy (Vaillant, 1993).

Factors identified as significant in enabling the ego to mature and develop mature defenses included biological development and maturation (nature), environment (nurture), and the interaction of both the nature and nurture factors (Vaillant, 1993). Vaillant discusses this in terms of assimilation or an imprinting model, and that the ego is formed as a precipitate of early relationships, helping us to accommodate social experience and life (Vaillant, 1993). This enables the ego to internalize others and develop boundaries between the *I* and the *you*, to be self aware and have clarity of one's own emotional states (Vaillant, 1993). As a result of his work, Vaillant developed a hierarchical model of defense mechanisms ranging from psychotic and immature to mature defenses, and the notion that individuals generally deploy more than one defense mechanism from varying levels (Vaillant, 1994). The adaptive defense mechanisms identified by Vaillant include altruism, sublimation, suppression, anticipation and humour (Vaillant, 2000).

**- Optimism**

Optimists have been described simply as individuals who expect good things to happen to them as opposed to pessimists who expect bad things to happen to them (Carver and Scheier, 2002). Optimists are reported to have different expectancies in that they tend to believe that stress and adversity can be successfully managed and this is believed to have

a positive influence on their approach to coping with adversity, and their overall resilience. Strategies and behaviours that have been identified as characteristic to optimists include confidence and continued effort exerted in dealing with adversity, adopting a planful and problem focused approach (particularly if the stress is controllable), the use of positive reframing and searching for benefits (if the situation is uncontrollable), an acceptance of the reality of difficult situations, retaining self control and remaining self directed, and not focusing on distress and physical symptoms. In general optimists tend to be approach copers as compared to pessimists who tend to be avoidant copers (Carver and Scheier, 2002).

An extensive body of literature supports the view that optimists tend to experience less distress than those of a pessimistic nature, and that they maintain a healthier level of psychological well-being (Carver and Scheier, 2002; Schneider, 2001). It has been suggested by some theorists, however, that optimism may not be the most useful or adaptive strategy in particular situations (as reported by Peterson, 2000; Schneider, 2001; Carver and Scheier, 2002). Optimism can be seen as wishful thinking that distracts one from making plans and achieving goals, as ignoring or underestimating a threat, as precluding one from caution, reservation and the conservation of one's resources when necessary (Peterson, 2000). The response to this criticism has been to state that the art to optimism is to be a realistic optimist. This involves hope and aspiring towards positive experience whilst at the same time acknowledging what we do not, and cannot, know. In periods of uncertainty, the realistic optimist will hope and work towards desired outcomes, and focus on the potential within the situational constraints (Schneider, 2001).

Schneider suggests that if one is being a realistic optimist there needs to be an awareness of what is happening in terms of both the self and environment. He has identified three forms of realistic optimism that are grounded in reality. These are leniency for the past (the benefit of the doubt principle): appreciation of the present (appreciation of the moment principle); and opportunity seeking for the future (windows of opportunity principle) (Schneider, 2001). Alternatively, Seligman has suggested that a flexible or complex optimism is preferable. He defines this as a psychological strategy that can be

exercised when required as opposed to a reflex or habit over which one has no control (Peterson, 2000). In contrast to this approach, self deception is characterized by a lack of attention to the reality of the situation with an unconscious desire to distort reality as a means of reducing dissonance as in the case of defense mechanisms.

Reviews of optimism continue to reflect the belief that optimism has the greater benefit in terms of reducing distress and more effectively managing difficult situations at the time, and promoting a more proactive stance for the future (Carver and Scheier, 2002; Peterson, 2000; Schneider, 2001). It involves an active engagement with the environment, and taking responsibility for one's actions rather than remaining passive and blaming (Schneider, 2001). Optimists' ability to maintain positive expectancies about the future is viewed as a strength in that evidence suggests that this in turn influences behaviour and coping strategies at times of challenge (Carver and Scheier, 2002). Analysis of the benefits of optimism conforms to the recommendations included in models on the nature and treatment of clinical orders such as depression and anxiety (Segal, Williams and Teasdale, 2002), and various other positive psychology models.

**- Sense of coherence model**
Antonovosky developed the Sense of Coherence model following his observation that a significant number (29%) of women survivors from the concentration camps of World War II retained good emotional health (Frankenhoff, 1998; Tedeschi, Park and Calhoun, 1998). He identified health as being the capacity to adapt to stressful situations, and as having a dynamic nature on the continuum between ease and dis-ease. Antonovosky hypothesized that the changing position of a person's health status was determined by the capacity to manage the tension of ever-present stressors through the application of cognitive and emotional resources that involve both coping and social support (Frankenhoff, 1998). He recognized that stressors have the potential to lead to system chaos or entropy, and focused on the balanced management of the tension produced to prevent biopsychosocial burden (Frankehoff, 1998). Sense of coherence was viewed as a life development process that becomes "dynamically stabilized" during the first three

decades of life and as remaining relatively the same from this time on (Frankenhoff, 1998).

Sense of coherence, as defined by Antonovosky, is a "global orientation that expresses the extent to which one has a pervasive, enduring though dynamic sense of confidence" that (1) the stimuli we experience from both our internal and external worlds are structured, predictable and explicable, (2) that we have the resources available to meet the demands of these stimuli, and (3) that these demands are worthy of both the investment and the engagement (Antonovosky, 1987, p 19). Antonovosky developed his theory on the basis of research interviews involving 51 subjects who had all experienced major trauma and had been reported as coping remarkably well. Following analysis of the interviews he classified 16 of the subjects into a group with a strong sense of coherence and 11 with a low sense of coherence. He then searched the interview protocols for themes that were evident in one group and absent in the other. As a result he identified three themes that reflected a strong sense of coherence; comprehensibility, manageability and meaningfulness (Antonovosky, 1987; Frankenhoff, 1998).

Comprehensibility was defined by Antonovosky as being the extent to which one perceives the stimuli confronting one in the environment as making cognitive sense. This means that the information that confronts one is ordered, consistent, structured and clear as opposed to noise-chaotic, random, disordered, accidental or inexplicable. The individual who is high on this factor expects stimuli to be predictable, and if not that it can be ordered and explicable. The second component, manageability, is defined as the extent to which an individual perceives that they have the resources available to meet the demands as being under one's control, or under the legitimate control of others. An individual high on manageability will not feel as though they are victimized by others or that life is unfair. They accept that adverse events do occur but that one will be able to cope and that the consequences will be bearable. The third component of meaningfulness, the motivational element, relates to the position that certain areas of life are important in terms of both the cognitive and emotional sense. It relates to the sense that at least some of the demands of life are worth investing in and worthy of commitment. Challenges are

perceived as welcome as opposed to burdensome, and that engagement is worthwhile (Antonovosky, 1987).

Antonovosky suggests that all three components are interrelated and necessary but that there may also be unequal centrality. He deemed meaningfulness to be the most essential as without this the other two components are likely to be temporary. Following meaningfulness, Anotonvosky believed comprehensibility to be the next important with high manageability contingent to understanding the situation. In saying this however, Anotnovosky also believed manageability to be important given the hypothesis that if one does not believe that one has the necessary resources at one's disposal then meaningfulness will be lessened and coping efforts diminished (Antonovosky, 1987). The defining characteristic of a person with a high sense of coherence is the ability to choose what appears to be the most appropriate strategy amongst the resources available.

Generalised Resistance Resources (GRRs) were identified as the phenomena that help the individual maintain equilibrium amidst life stresses. GRRs can include a variety of factors to help manage stress and an individual's sense of coherence is viewed as the independent variable underpinning these. Antonovosky states that ones sense of coherence is a "generalized, long lasting way of seeing the world and one's life in it" (Antonovosky, 1987, p22). In saying this he does not claim that sense of coherence is infinite and reports that the individuals interviewed set boundaries and limits as to the spheres of life that were important to them. Sense of coherence is reportedly built up by life experiences that confirm the belief that life in general is comprehensible, manageable and meaningful, however, it can also be diminished if life experiences contradict this basic belief (Sammallahti, Holi, Komulainen and Aalberg, 1996).

Antonovosky also comments on the strong versus the rigid or inauthentic sense of coherence and likens a strong sense of coherence to Kohut's distinction between the sense of self and the sense of identity (Antononvosky, 1987). He relates the strong sense of coherence to the sense of self in that this refers to the basic layering of the personality, and as such provides a central purpose with continuity and coherence. He suggests that

this leads to a strong sense of identity but that identity is not dependent upon it. The person with a strong sense of coherence has a flexible sense of identity and can find alternative identities if the situation demands. The rigid or inauthentic sense of coherence is evident when the individual claims to have good understanding, has a solution for all problems, and is unable to tolerate doubt. He infers that a person with a rigid or inauthentic sense of coherence depends upon an explicit identity that might shatter if reality was imposed upon it.

Various studies and discussions on the nature of health and coping have referred to Antonovosky's Sense of Coherence model since it was first put forward. It has been found to be consistent across cultures (Almedon, 2005; Bowman, 1996), and to be implicated in successful coping with life's stresses and to moderate anxiety and depression (Flannery, Perry, Penk and Flannery, 1994). Almedon (2005) cites Anotonovosky's Sense of Coherence model as being one of the most influential to explore the impact of trauma, and the protective factors that may diminish or attenuate the impact of trauma on the individual. This belief is substantiated in that although the Sense of Coherence model it is not perceived as revolutionary to psychological theory it is persistently referred to in a wide range of literature. A number of studies also validate a measure of Sense of Coherence (Orientation to Life Questionnaire), and although the subscales of the three components have been seen as lacking (Frankenhoff, 1998) it has been sited as a good measure of general coping resources (Sammallahti et al., 1996).

**- Hardiness**

Hardiness was a construct developed by Kobasa in the 1970s as a means to explain psychosocial characteristics moderating the stress-illness relationship and stress resilience (Funk, 1992; Wiebe and Williams, 1992). It has been described as a motivating factor that enables the resolution of stressful situations and adapting to health problems (Pollock, 1989), and to be a distinct personality structure of those who experience high levels of stress but remain healthy (Jennings and Stagger, 1994). Two major premises from existential theory are pertinent to hardiness and underpin the nature of the construct. Firstly, personality is viewed as a dynamic actively constructed process and that although

life is always stressful this stress can be turned into positive opportunities for growth. Secondly, hardiness is believed to be an aggregate of three factors that comprise cognitive and behavioural processes that buffer stressful events and the way in which the individual perceives them (Tartasky, 1993; Wiebe and Williams, 1993).

The three factors alluded to above include commitment, control and challenge (Funk, 1992; Pollock, 1994; Tartasky, 1993; Wiebe and Williams, 1992). Commitment is related to the ability to believe in the importance and value of who one is, the activities one is involved with, and one's involvement in life in general. It is believed to provide a sense of purpose with which to face stressful life events, and to diminish the perceived threat in doing so. The control factor is related to the tendency to believe and to act as though one can influence events, and to seek explanations as to what has happened. It is proposed that this can allow people to believe that they can alter the course of events and manipulate stressors. The factor of challenge is based within the belief that the environment is forever changing and that this provides opportunities for personal growth as opposed to feelings of threat and insecurity. This allows hardy people to welcome challenge and use it as a resource to cope with stress (Tartasky, 1993). The construct infers that individuals identified as hardy experience the same number of stressful life events but that the presence of hardiness diminishes their impact (Wiebe and Williams, 1992). Hardiness is also believed to assist the coping response through eliciting appropriate social support (Funk, 1992).

A significant amount of research has been done on hardiness with various population groups with the construct of hardiness examined in relation to health concerns, physiological reactivity, optimism, mood symptoms, burn out, neuroticism and noise induced stress (Funk, 1992). Results have found that hardy individuals use more positive self statements than others (Allred and Smith, 1989, as cited in Tartasky, 1993); that hardiness is associated with reduced use of regressive coping, and that high hardy individuals make less threatening appraisals of stressors. However, there is no conclusive evidence that these responses result in reduced levels of arousal, that high hardy

individuals have (comparatively) smaller increases in sympathetic arousal during evaluative threat conditions or that hardiness does affect illness per se (Funk, 1992).

Difficulties in the research arena surrounding hardiness arise from challenges to the indistinct definition of the construct, confusion resulting from a range of poorly validated hardiness scales and inconsistency in differentiating the three factors, and the construct of hardiness being confounded by neuroticism (Funk, 1992). It has been recommended that future research needs to address these issues through a clear operationalisation of the construct, greater clarity of the scales used, and the use of more substantial research design and statistical analyses (Funk, 1992; Tartasky, 1993). Funk notes that despite the anomalies in the literature an interesting question to ask is "why the study of hardiness is so hardy" (Funk, 1992, p 344) as the construct displays a tenacity to generate research across disciplines and to be widely referenced. An explanation for this is that it appears to suffer the same effect as resilience in that it has connotative appeal and that is has been treated in a similar manner since its conception.

**- Summary of resilience and personality theory**
The five models discussed above view resilient functioning as being based within personality structure and individual differences. The models offer explanations as to the features of personality functioning that contribute to an individual's resilience with minimal attention to situational variables. Resilience is believed to be dynamic yet enduring over time, and there is potential within some of the models for the development of resilience to evolve with experience. These models address the adaptive aspects of personality as opposed to maladaptive, and psychopathology is not addressed to any degree. The impressions that one is left with is that resilience is viewed as both a stable and global attribute that permits the individual to respond similarly to whatever stressor that they are confronted with relative confidence and ease.

**III - Biological factors and resilience**
New research techniques available in the field of neuroscience have led to questions concerning the role of brain structure and function in the development of resilience. As a

result of prolific research in recent years, a huge quantity of reports are now available examining every aspect of brain structure and function, and the impact these have on human behaviour in general. These studies have been particularly important in extending the understanding of emotion function and trauma beyond the psychological, and in providing a biological basis for what has previously only been able to be hypothesized. In relation to resilience, five areas of research have opened up and these include the influence of genetic factors such as temperament on resilient functioning, the impact of environment on brain development and subsequent resilience, exploring protective factors and emotional / self regulation with regard to resilience, the impact of stress / trauma on resilience potential, and general cognitive processing and its relationship with coping.

**- Temperament and resilient functioning**

Temperament models attempt to understand individual differences in personality functioning during early development, particularly with regard to the experience and expression of emotions, and their regulation (Mervielde and Asendorpf, 2000; Molfese and Molfese, 2000; Rothbart, Ahadi and Evans, 2000). Derryberry, Reed and Pilkington-Taylor (2003) suggest that the approach to studying temperament is somewhat unique from other personality theories given the  underlying assumption that differences in temperament have a biological basis and focus on neural reactivity. Neural reactivity is believed to derive from the physiological parameters of the organism such as neural structure and function, and this influences the organism's ability to regulate arousal (Derryberry et al., 2003; Rothbart et al., 2000). Derryberry et al. (2003) further propose that temperamental systems can be viewed as coping mechanisms in terms of both voluntary and involuntary responses to stressful situations that include either fear or frustration. They suggest that vulnerabilities and heightened risk to pathology arise from inefficiencies in coping responses, and that this generally involves the interplay of multiple temperament systems. Many temperament systems have been discussed in the literature, including the work of Gray and the behavioural activation system; Panksepp and the expectancy foraging system; and Depue and Iacano and their behavioural facilitation system (Derryberry and Rothbart, 1997).

Apart from these, Derryberry et al. (2003) promote three further temperament systems as significant to resilience. These are the appetitive system, the defensive system and the attentional system involving both cortical and subcortical regions of the brain. The appetitive system, which relates to seeking and approaching rewards, involves the orbitofrontal and limbic systems. This renders the individual more sensitive to rewards as the reactivity in this system increases (Derryberry, et al., 2003). The individual with a strong appetitive system is more likely to experience emotions such as desire and hope, and to display approach behaviours. The defensive system, relating to the detecting and avoiding of danger, involves the orbitofrontal and limbic systems, and the brainstem. As the reactivity in this system increases, the individual is more sensitive to punishment and fearful / anxious emotions (Derryberry et al., 2003). The attentional system is responsible for the orientation of attention which can be involuntary and voluntary. With regard to the involuntary system the neural systems are hypothesized to include interconnecting circuits in the parietal cortex, the superior colliculus and the thalamus, while the voluntary system involves a set of frontal circuits and the anterior cingulate region. The voluntary system has been investigated extensively by Rothbart and colleagues, and labeled "effortful control" to denote the ability to suppress a dominant response in order to perform a subdominant response (Kochanska, Murray and Harlan, 2000). This ability is seen as very important with regard to self regulation in terms of inhibiting or initiating responses, and maintaining responses. It involves cognitive, motor, social, emotional and behavioural responses (Kochanska et al., 2000). Increases in the voluntary system allows for greater flexibility and control over dominant tendencies (Derryberry et al., 2003).

With regard to resilience, the appetitive and defensive systems are viewed by Derryberry et al. (2003) as relatively primitive "coping" systems. Whilst the defensive system can help the person to cope with situations perceived to be dangerous, the appetitive system helps the person to attain positive rewards when obstacles are present. These subcortical motivational systems can also access the cortical based attentional systems to increase the efficacy of the coping responses. It is proposed that as one moves from the subcortical structures to the cortex there is increasing precision and flexibility in controlling

behaviour and attention through delaying gratification to meet the immediate need. With biological maturation the capacity for representational and cognitive processes increases to provide new and more detailed inputs into the motivational systems. This allows for more complex appraisal and evaluative systems, planning and flexibility in terms of both attention and behaviour. Maladaptive or inefficient coping is deemed to result from limitations in the motivational system, attentional system or cognitive processing of stimuli (Derryberry et al., 2003).

The construct of effortful control appears to play a key role with regard to resilience and adjustment in that it is believed to be associated with emotional regulation, impulse control, empathy and the development of conscience (Derryberry and Rothbart, 1997). It emerges early in infancy at 6-12 months and has been associated with attachment theory as the mother child relationship is believed to be important in its development (Kochanska et al., 2000; Rothbart et al., 2000). Eisenberg, Spinrad, Fabes, Reiser, Cumberland, Shepard, Valiente et al. (2004) studied the nature of effortful control, impulsivity and resilience, and found that effortful control involves voluntary processes through which children can learn methods to modulate their attention and behaviour, and develop resilience. Rothbart et al. (2000) report that their research found children who exhibit high effortful control tend to display low negative affectivity, and that adults reporting high attentional control are also likely to report low negative affect. The research overall suggests that the significant aspects of temperament with regard to resilience concern the child's ability to regulate emotions (and behaviours) in conjunction with the ability to learn adaptive prosocial skills within the cultural context.

**- Environmental impact, brain development, and resilience**
Relatively recent studies in neuroscience have established that experience has an effect on the developing and more mature brain, and that certain types of experience can result in enduring physiological changes in the brain (Curtis and Cicchetti, 2003; Post and Weiss, 1997; Schore, 2002; Siegal, 1999, 2001). The concept of neural plasticity is an important factor with regard to this, and numerous studies report on the impact of the environment on developmental during infancy and early childhood as well as the impact

of trauma throughout the life span (Allen, 2001; Cozolino, 2006; Curtis and Cicchetti, 2003; Schore, 2002, 2003a, 2003b; Siegal, 1999, 2001; Teicher, 2002). This perspective argues that certain individuals may have increased ability to tolerate the effect of experience on the brain, or that that the brain of these individuals has enhanced capacity to recover from any damage incurred from that experience (Curtis and Cicchetti, 2003). Important to this concept is the continuous, dynamic relationship that exists between the brain and the environment, and the difficulties inherent in determining the exact nature of this interaction (Curtis and Cicchetti, 2003).

Two types of neural plasticity are believed to influence brain development throughout the life span (Curtis and Cicchetti, 2003; Siegal, 1999, 2001). The first type referred to as experience-expectant plasticity generally relates to the development of the infant brain. During these developmental periods the brain has (builds) an overabundance of synapses which is then followed by a pruning process of neurons that is dependent upon the environmental experience. It involves critical periods when the brain is primed to particular types of information from the environment and this determines the process of genetically encoded synapse formation that shapes brain development (Curtis and Cicchetti, 2003; Siegal, 2001). Experience-dependent plasticity, the second type of neural plasticity, is when new neural connections are established in response to experience. This process does not take place during critical periods of development, and involves the brain adapting to the environment and it is unique to the individual. This means that every individual's brain develops in a singular fashion and that individual variability results from existing differences in neural functioning impacting on the developmental process (Curtis and Cicchetti, 2003).

Many studies on infant development relate to these types of plasticity in terms of identifying processes and factors that promote healthy development, and those that are damaging to healthy development. With regard to experience-expectant plasticity, if the timing and quality of environmental input is appropriate then normal brain development is expected to follow. However, if the environmental input is not appropriate, as in abuse, neglect, deprivation or acute trauma, brain development will be affected through the

damaging effects on neurobiological and behavioural epigenesis (Curtis and Cicchetti, 2003; Teicher, 2002). Studies on attachment style and brain development suggest that early experience leads to structural changes in the brain, and that these in turn impinge coping mechanisms at times of stress (Schore, 2002; Siegal, 1999, 2001). Schore (2002) states that relational trauma, or traumatic attachment with infants and young children, leads to disruption in the development of the right hemisphere and limbic structure. This is significant in that the right hemisphere has a specialist function in terms of processing and expressing negative emotions, and impaired development can lead to an inhibited capacity to cope with uncertainty and stress in the future (Schore, 2002; Teicher, 2002). Schore (2002) concludes that this type of impaired sets a template for coping deficits that can lead to vulnerability and the development of PTSD if trauma is later experienced.

Examples of studies exploring these hypotheses include those examining genetic makeup and neurotransmitter function. Studies of genetic function have recently identified a specific gene that is believed to moderate the influence of stressful life events on neurostransmitter systems and to diminish the potential to develop depression or anti social tendencies in cases of childhood maltreatment (Caspi, McClay, Moffitt, Mill, Martin, Craig et al. 2002; Caspi, Sugden, Moffitt, Taylor, Craig, Harrington et al. 2003). Further studies examining neurotransmitter function have examined the cerebellar vermis located above the brainstem at the back of the brain, and its function of controlling the release of neurotransmitters associated with various psychiatric disorders and emotional well-being. This part of the brain continues to develop after birth and is considered to be susceptible to stress hormones during development. Initial results were based on Harlow's work with monkeys in the 1950s, but new technology has allowed this part of the brain to be examined with human subjects and studies of cerebral structure have found that the right cortex of subjects who experienced maltreatment as children is more developed than controls, with the temporal lobe being most affected (Schore, 2003a; Teicher, 2002).

**- Emotional / self regulation and resilience**

Emotional and self regulation has been increasingly recognized as an important protective factor with regard to resilience (Buckner et al., 2003; Masten, 2001; Curtis and Cicchetti, 2003). Emotional regulation has been identified as processes by which emotional arousal is moderated or controlled in emotionally arousing situations to allow the individual to adapt in a functional manner (Curtis and Cicchetti, 2003). Closely associated with emotional regulation is the slightly broader field of self regulation as defined by "the ability to modify and control behaviour to conform to social norms" (Beer, Shiamura and Knight, 2004, p 1091). Understanding the means of emotional / self regulation at a neural level has been the focus of several major research projects with the development of new technologies (Adolphs, 2004; Damasio, 1994, 1999; Davidson, 2000; Le Doux, 2002). The approaches that dominate the literature in addressing questions concerning emotional / self regulation include research into the neural substrates relating to emotion and self regulation, individual differences in emotional reactivity and the startle response, and hemispheric differences in the processing of emotions (Beer et al., 2004; Curtis and Cicchetti, 2003; Davidson, 2000; Schore 2003a, 2003b).

The neural substrates primarily relating to emotion and self regulation include the prefrontal cortex, the amygdala, the hippocampus and anterior cingulate cortex (Davidson, 2000). The prefrontal cortex plays an executive role in the inhibition and excitation control of diverse neural systems.  Its functions have been identified to include the filtering of information and the direction of attention to relevant stimuli, the regulation of behaviour through the synthesis of emotional and cognitive processes, self monitoring, and making inferences about the behaviour and mental states of others (Beer et al., 2004). The role of the amygdala concerns emotional learning and the establishment of conditioned fear (Davidson, 2000), and has been described as being specialized for emotional processing (Le Doux, 2002). Its role with regard to emotional regulation is related to its potential to influence cognition and awareness by modulating memory and attention or perception (Phelps, 2004). The role the hippocampus plays is important in emotional / self regulation through its capacity to learn context, and studies of individuals with lesions in the hippocampus report that context dependent memory can be lost (Davidson, 2000). The hippocampus is also receptive to the stress response and the

release of glucocorticoids (Davidson, 2000). The anterior cingulate cortex is hypothesised to activate in response to emotional situations and to possibly have a cognitive role when there is conflict (Davidson, 2000).

Davidson (2000) has suggested that individual differences in recovery from negative emotional events or arousal of the startle response may be critical in understanding what constitutes resilient functioning. His hypothesis suggests that resilient individuals do not experience persistent negative affect, and that they tend to maintain high levels of positive affect and well being in the face of adversity (Davidson, 2000). He suggests that resilient individuals also have the ability to learn from the experience (Curtis and Cicchetti, 2003; Davidson, 2000). It is hypothesised that the biological basis to this involves the several biological structures mentioned above, and that complex neural networks mediate perception, contextual evaluation and expression of emotions (Davidson, 2000). The startle response has been promoted as a means of investigating this hypothesis, and although some inconsistent results appear in the literature, accruing evidence suggests that this response is affected and modulated by underlying neural networks (Curtis and Cicchetti, 2003).

Individual differences in hemispheric processing and regulation of emotions has been identified as a further avenue for the study of resilience (Curtis and Cicchetti, 2003). Several studies have found that stimuli inducing negative affect increase relative right prefrontal activation, and the stimuli inducing positive affect increase left prefrontal activation (Curtis and Cicchetti, 2003). Further studies have found an association between dispositional affective style and baseline levels of prefrontal activation, and that those individuals who report more positive affect have greater left prefrontal activation and vice versa (Curtis and Cicchetti, 2003; Davidson, 2000). Studies examining the impact of positive versus negative stimulation of prefrontal activation have also confirmed that baseline activation levels determine the degree of influence of positive and negative stimulation (Curtis and Cicchetti, 2003). Various studies have confirmed that these results cross age groups, including infants, children and adolescents (Curtis and Cicchetti, 2003; Watson, 2002). Studies of individuals who have histories of trauma are reporting

significant differences in hemispheric functioning in terms of impeded development of the left side of the brain when compared with controls (Teicher, 2002).

**- The impact of stress and trauma on brain function**

The impact of stress and trauma on the brain derives from research in the area of stress and psychoimmunnology.  The work of Cannon and Selye last century provided a basis to the concept of stress physiology with the recognition that the stress response can be both adaptive and deleterious depending upon the chronicity of the stressor. The core of the stress response involves the activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis (HPA axis), and the secretion of various hormones that enable the individual to respond to the stressor with the fight, flight or freeze response. Severe or prolonged stress has been found to result in constant release of glucocorticoids, and extended exposure of the brain to glucocorticoids can lead to neurotoxicity and damage to brain structure and function (Curtis and Cicchetti, 2003; Sapolsky, 2004; Teicher, 2002).  Inconsistencies have been reported with regard to this effect however, and Curtis and Cicchetti (2003) comment that it is important to be mindful of the concept of multifinality in that the same exposure may lead to different outcomes in different organisms. Various factors, such as genetic make up, physical status, prior experience and developmental history all exert influence on the final outcome and individual response (Curtis and Cicchetti, 2003; Rutter and O'Connor, 2004).

Changes that have been identified in response to severe or prolonged stress have been found in the hippocampal and amygdala function, and the left side of the brain, particularly the temporal regions (Sapolsky, 2004; Teicher, 2002). Resilient functioning may be impinged upon as a result of severe or persistent stresses through the effect of these on brain functioning including impaired cognitive functioning and diminished attentional processes, long term depression, transient reduction of neuron excitability and plasiticty, stress induced neuronal atrophy and impaired hippocampal neurogenesis, hypersensitization of conditioned fear responses (Sapolksy, 2004). With regard to hippocampal function, the effect of severe acute stressors is believed to lead to

impairment of hippocampal-dependent cognition and declarative memory function (Sapolsky, 2004). The effect of stress on amygdala function results on the enhancement of amygdala cognition and conditioning of autonomic fear and anxiety (Phelps, 2004; Schafe and Le Doux, 2004; Saplosky, 2004).  This can lead to sensitization of autonomic conditioning and possible free floating anxiety (Sapolsky, 2004).

In addition to this, high levels of glucocorticoids have been reported to disturb frontal lobe function and to result in impaired filtering of irrelevant stimuli, decreased use of relevant cues, and disruption of consolidation and recall in memory function (Salposky, 2004). Frontocortical function is important for executive function including self regulation, and the adaptive control of behaviour requiring the integration of many emotional and cognitive processes (Beer et al. 2004). The impact of trauma on neural processes has been well established and can result in impaired academic, social and occupational functioning, and increased incidence of physical and psychopathology. This in turn can lead to mood and anxiety disorders, and post traumatic stress syndromes (Allen, 2001; Briere, 2001; Herman 1997; Teicher, 2002).

**- General cognitive processing and coping**

A number of developmental studies have found that higher intellectual functioning to be a protective factor when confronted with stress and adversity (Buckner et al., 2003; Luthar and Cicchetti, 2000; Masten, 2001; Masten and Coatsworth, 1995; Werner and Smith, 2002 etc). Measures of intellectual functioning in the past have tended to be general and the specific factor contributing to resilient functioning was not isolated (Curtis and Cicchetti, 2003). This has been redressed to a degree in recent years and further analysis of cognitive testing has revealed that skills associated with the frontal lobe and executive functioning are important. Specific skills identified include attention, planning and logic, and problem solving in the context of interpersonal relations (Curtis and Cicchetti, 2003). Although these findings can be considered advances, there is still much to be known given that executive functioning and frontal lobe function is incredibly complex. The findings reported above also report on findings implicating hippocampal and amygdala function with that of frontrocorticol function, and it is well established that brain function

involves integrated neural pathways (Curtis and Cicchetti, 2003; Damasio, 1999; Davidson, 2000).

Although studies have been unable to examine the direct relationship between brain function and intelligence, hypotheses have been made with regard to brain function, superior intellectual functioning and resilience in terms of neural efficiency (Curtis and Cicchetti, 2003). These findings report that those with superior intellectual functioning use only those areas of the brain required for certain tasks, and that they use these areas in a more concentrated fashion. This means that during problem solving fewer and more specific neural networks are called upon (Jausovec and Jausovec, 2000, 2001). Further evidence has suggested that this ability relates to frontal lobe function as mediating the different types of cognitive demands (Gray, Chabris and Braver, 2003). ERP research (event related potentials) monitoring neural activity associated with cognitive processing in real time has also discovered that individuals with superior intellectual ability process cognitive operations more rapidly (Jausovec and Jausovec, 2001).

**- Summary of biological factors and resilience**
The research on brain structure and function in recent years has been incredibly prolific and informative about brain processes that it was only possible to hypothesise about in the past. Previous theoretical models concerning the impact of trauma on brain development and function are now being substantiated with evidence that is difficult to refute given its biological basis and replicability, and this is providing a new perspective with which to understand resilience to stress and adversity. In saying this, it is important to remember that the research in the area remains relatively rudimentary with regard to the understanding the whole of brain function, and that although there is a perception of the results as being fact that they do remain hypothetical with regard to the bigger picture of human functioning. Uttal has suggested that the current focus on neuroscientific findings is the "new phrenology" and he comments on the dangers inherent in not remaining critical (Uttal, 2003, as cited in Sommers and Satel, 2005). In addition to this it is also important to be mindful of the difficulties facing this field of research, including

the on-going reliance of generalizing from animal studies to human function, and assumptions that might not prove correct.

## IV - Resilience and positive psychology

In contrast to the field of child development, the field of positive psychology is less concerned with regard to the definition and operationalisation of the construct of resilience. Positive psychology models of resilience tend to be more focused on the process of being resilient in the face of living well as opposed to in the face of adversity, and the outcome of maintaining well being is conceptualized in more subjective terms. The underlying themes evident in positive psychology papers on resilience and coping look at what it is that gives one individual the edge over another in achieving this end, the attributes that come in to play, and the psychological mechanisms that characterize this way of being. An extensive range of material within the positive psychology world refers to resilient functioning, or its associated aspects. Whilst it is not possible to review every reference to resilient functioning within this section a selection has been made of the material that presents as most significant to resilience in order to provide an overview of what holds the most explanatory power. The models examined include Personal Control, Self-Efficacy, Flow Theory, The Broaden and Build Model of Positive Emotions, and the Coping and Positive Emotion Model.

### - Personal control

Personal control has been identified as the perceived control to obtain desired outcomes and avoid undesirable outcomes as opposed to control over one's environment (Thompson, 2002). It is seen to be adaptive in that it helps the individual find meaning in difficult circumstances. One of the earliest commentaries on personal control was that of Viktor Frankl when he wrote about life as a prisoner in the concentration camps of World War II. Frankl commented on the ability of some prisoners to maintain a sense of personal control through controlling their attitude to the circumstances they were held in, even though they were held hostage in an environment that stripped them of any sense of autonomy or dignity (Frankl, 1959). Personal self control has been positively related to enhanced adaptive functioning, better coping in stressful situations, emotional well-being

and physical health (Thompson, 2002). It is believed that there is an evolutionary aspect to personal control in that those with personal control are more likely to approach problems and to determine the cause of problems in order to take action, and that in doing this their chances of survival will be increased. It also allows one to prepare for future stressors by minimizing the sense of uncontrollability, thus protecting oneself against compromised physical health as a result of the stress of uncertainty (Thompson, 2002).

Three strategies have been likened to maintaining control in difficult circumstances (Thomspon, 2002). The first strategy relates to goal setting and the ability to maintain a sense of progress being made. This may involve the need for flexibility in terms of goal disengagement and changing goals if necessary. This strategy can also include de-emphasizing goals that may be difficult to attain and focusing one's attention on those that are more tenable. The second strategy is to identify and cultivate areas of available control that remain when difficulties arise. This is important in terms of making salient the connection between what one has done and a desired outcome as a means of increasing perceived control. The third strategy is acceptance based on the distinction between primary and secondary control (Rothbaum, Weisz and Snyder, 1982, as cited in Thompson, 2002). Primary control relates to perceived control as discussed above where as secondary control relates to the acceptance of one's situation as is. It is believed that acceptance helps one to feel more in control and less like a victim as it decreases the discrepancy between desired and achieved outcomes (Thompson, 2002).

Personal control has been broken down into two parts and these include having an internal locus of control (that outcomes are influenced by our own personal actions) and self efficacy (the belief that we have the ability to enact the actions to achieve our goals). Perceived control has been differentiated from the desire for control, and limitations to the advantages of personal control have been identified. The limitations primarily relate to the problems associated with overestimating control and the impact that this might have on coping behaviour and general adaptability (Thompson, 2002). Overestimation of control may lead to inappropriate or perseverative responses that in turn lead to disappointments, or compound the initial problem. Realistic appraisals at critical

junctures is noted as being important in dealing with situations that might be beyond control, and  illusory control has also been found to be adaptive in that it helps people be more persistent in achieving their goals, and if necessary in finding alternative solutions (Taylor, as cited in Thompson, 2002).

The findings in social cognition literature show that people generally have three mild positive illusions as to the reality of their situation, namely self enhancement, unrealistic optimism and an exaggerated perception of personal control (Fine, 2006; Taylor, Kemeny, Reed, Bower and Gruenewalde, 2000). These illusions are believed to exert protective effects at a psychological level that can be significant at times of threat, and evidence suggests that they can also be protective of physical health at times of illness (Taylor et al., 2000). Taylor et al. (2000) suggest that the ability to maintain positive illusions provides the individual with reserve resources "that not only help people manage the ebb and flow of everyday life but that assume special significance in helping people cope with intensely stressful and life-threatening events" (Taylor et al., 2000, p 106). Resources associated with illusory control are purported to act as buffers at times of threat and stress, and that they might help the person to find meaning in what they are experiencing to enable them to later report positive change or growth (Taylor et al., 2000).

**- Self efficacy**
Self efficacy essentially relates to believing in what we can do, this belief being a vital ingredient for success in what we do (Bandura, 1982, 1990, 1997). The basic premise of the theory of self efficacy is "people's beliefs in their capabilities to produce desired effect by their own actions" (Bandura, 1997, p vii). It is not about skill per se but what one believes one can do with one's skills under certain conditions, beliefs about one's ability to co-ordinate these skills and beliefs about one's abilities in challenging situations (Maddux, 2002). Although self efficacy may contribute to self esteem it is not believed to be self esteem per se, nor is it believed to be about outcome, motivation or control of a situation. In addition to this, self efficacy, with its focus on beliefs, is not viewed as being

genetically based or a trait or personality dimension as other similar constructs, but to have been learnt over time and through experience throughout life (Maddux, 2002).

In promoting self efficacy as part of social cognitive theory Bandura assumes that we actively shape ourselves through our experience and the development of internal models of experience. These models develop as a result of self observation and the analysis of our thoughts, behaviour and emotions, a process that leads to self regulation. Integral to this is the capacity for symbolic thought and the understanding of causal relationships. It is believed that reciprocal interaction exists between the inner world of the individual and the environment, and that through cognition the individual exercises self control that in turn influences the environment and their own cognitive, affective and physiological state (Bandura, 1990; Maddux, 2000). It is also believed that self and personality are socially embedded in the perceptions of our own and others' cognitions, emotions and behaviours, and that these are mutually influential to create our sense of personality and self. Integral to both social cognition and self efficacy theory, is the belief in self regulation and that we choose goals and behaviours to achieve these goals by using our ability to anticipate and develop expectancies (Bandura, 1990; Maddux, 2002).

The development of self agency is important to the development of self efficacy in that children require an environment that is responsive to their attempts to experiment, manipulate and control aspects of it. Success at these behaviours leads to further exploration, and this in turn enhances the child's sense of self agency. If the environment is not responsive, or inconsistently responsive, then the development of self agency and self efficacy will be retarded. Five primary sources have been identified as leading to self agency and self efficacy The first and most powerful source of learning is from our own performance experiences, and the second source results from success at attempts to control our environment leading to the strengthening of self efficacy in that domain. Thirdly, self efficacy beliefs can be gained through observations of others' behaviours and the results of these (vicarious experiences) and imagining ourselves behaving in an effective manner in hypothetical situations (imaginal experiences). The remaining two learning sources are verbal persuasion by others' beliefs in one's abilities, and our

owntphysiological and emotional states from which we learn to associate poor performance and failure with unpleasant physiological arousal and negative emotions (Maddux, 2002; Bandura, 1990).

Self efficacy is associated with resilience as it has been found to be important with regard to psychological adjustment, self regulation and physical health (Maddux, 2002). It is believed that when we have a sense of control over our behaviour and emotions, and the world seems predictable, then we have a greater sense of well-being and happiness. This enables us to feel more confident to meet life's challenges, to feel confident in our interpersonal relationships, and achieve personal satisfaction (Bandura, 1990; Maddux, 2002). Individuals who are confident in their abilities have been found to perform and respond to difficult situations more calmly than those who lack confidence and approach situations with apprehension and fear. Low self efficacy is associated with mood and anxiety problems, and also to have a negative impact on the treatment of other clinical problems such as substance abuse and eating disorders (Bandura, 1997; Maddux, 2002).

**- Flow theory**

For many years Mihaly Csikszentmihalyi has been researching the concept of "flow" and what this means in terms of human activity and sense of well being. An extension of his initial theory also addresses the question of psychological resilience, and what is distinct about those individuals who can maintain a sense of well being in the face of adversity. Essentially, the concept of flow attempts to explain what contributes to variations in subjective experience and the relationship between experience and a large class of psychological phenomena such as talent, creative achievement and mental health (Moneta and Csikszentmihalyi, 1996). Flow theory, as discussed by Moneta and Csikszentmihalyi (1996), examines motivation systems and identifies three systems of significance – the genetic teleonomy (the pleasure seeking goals programmed into the individual's organism), the cultural teleonomy (concerning the seeking and maintaining of social and economical success) and the teleonomy of the self (relating to reorganization and growth in the order and complexity of consciousness). The theory of flow hypothesizes that optimal subjective experience, or flow in consciousness, occurs when the person is

primarily driven by the teleonomy of the self (Csikszentmihalyi and Nakamura, 2002; Moneta and Csikszentmihalyi, 1996).

Characteristics of the teleonomy of the self, and the quality of subjective experience, relate to the two variables of perceived challenge and perceived skill. It is hypothesized that when perceived challenge and perceived skill are low that the individual experiences apathy and the overall quality of experience is low. On the other hand, if the challenges are perceived to be greater than perceived skill then the individual experiences anxiety, or if the challenges are perceived to be less than the perceived skill then the individual experiences boredom. The ideal condition for flow in consciousness and optimal subjective experience is when both perceived challenge and skill level match, and the individual experiences the state of flow in terms of cognitive efficiency, motivation and happiness (Moneta and Csikszentmihalyi, 1996). Csikszentmihalyi and Nakamura (2002) describe this state as being one of dynamic equilibrium. It is important to note two distinctive features of Flow Theory in that the first is based entirely on the individual's perception of the challenge and their skill base, and that as such it is both phenomenological and existential. The second feature is that the "logic" of the teleonomy of the self is concerned with a continuous search for greater complexity and order of consciousness, and with this an effortless font of psychic energy arises (Csikszentimihalyi, 1990, 1993).

A more general model of experience, consciousness and self was developed in conjunction with the flow model that helps put the concept of flow into an overall context (Csikszentmihalyi and Csikszentmihalyi, as cited in Csikszentmihalyi and Nakamura, 2002). This model states that people in everyday life are confronted with an overwhelming amount of information and stimuli, and that consciousness is the system to manage this influx. The information that appears in consciousness has been selected via attention whereby it is processed. Processes involved in consciousness are cognitively, motivationally and affectively oriented, and stored in memory for retrieval later on. Csikszentmihalyi and Csikszentmihalyi suggest that subjective experience can be thought of as the content of consciousness, and that the self emerges at the point that

consciousness comes into existence and becomes aware of itself in terms of body, subjective states, past memories and the future. Csikszentmihalyi and Csikszentmihalyi suggest that consciousness can provide us a degree of control that liberates one from the dictates of genes and culture, and that it establishes a teleonomy of self (Csikszentmihalyi and Nakamura, 2002).

The experience of flow is reported as increasing the content and organization of consciousness, and this leads to more efficient and focused attention. The subjective experience of this is being "absorbed" by the activity and this is postulated as intrinsically rewarding and pleasurable. Csikszentmihalyi suggests that there are individual differences in terms of capacity to experience flow, and that some individuals develop an autotelic personality whereby the dynamic of flow characterizes their decision making and experiences. A fundamental implication of this is that they are primarily driven by the teleonomy of the self and with this they gain the potential to become talented and creative, and to develop a stronger and more confident sense of self (Moneta and Csikszentmihalyi, 1996; Csikszentmihalyi, 1990). Csikszentmihalyi suggests that when an individual has the capacity to organize their consciousness to experience flow as often as possible then a reiterative process ensues whereby they experience an improved quality of life which in turn adds to their overall order of consciousness (Csikszentmihalyi, 1990).

The autotelic self is promoted as having the capacity to transform negative experiences and to avoid psychic entropy (Csikszentmihalyi, 1990, 1993). The development of an autotelic self involves four skills. These include the ability to set goals, to become immersed in activity, to pay attention to what is happening and learning to enjoy immediate experience. To be able to set goals one must be able to recognize challenges and to make choices, to monitor one's actions and modify goals as necessary, and to appreciate that what one is doing is not random or controlled by outside forces. This sense of ownership can allow one to become deeply involved in the activity whilst learning to balance opportunities with the skills one possesses, a process that is hypothesized as being enhanced by the ability to concentrate. Being able to concentrate is

seen as being possible with constant input of attention as to what is happening. The autotelic self is seen as being able to sustain this involvement compared to self consciousness and preoccupation with progress and external judgements. The absence of self consciousness permits enjoyment of the moment but this must also occur within an awareness of the overall context in order to maintain coherence.

In recent years Csikszentmihalyi has extended his theory on flow to answer the question as to what allows people to achieve harmony and grow in complexity in the face of adversity. Collaborative research with Professor Fausto Massimini in Italy with young men who had become paraplegic, and individuals suffering from blindness, affirmed that those who were able to transform the tragedy of their accident or disability by identifying the positive aspects were able to master the challenges they faced and a clarity of purpose that had been lacking before (Csikszentmihalyi, 1990). Further research by Professor Massimini with homeless vagrants also revealed that many of these individuals were able to transform bleak conditions into lives characterized by flow experiences that were meaningful in the absence of material richness (Csikszentmihalyi, 1990). Csikszentmihalyi (1990) proposes that dissipative structures of the mind allow the individual to transform neutral or destructive events into positive events, and that it is this process that maintains the integrity of the self. He sees the development of this capacity as essential in that life is such that no one can escape events that confront, frustrate or challenge to some degree, and that learning to manage these events constructively with the help of social support is part of growing up as a child and young teenager.

Csikszentmihalyi (1990) identifies three main necessary steps in the ability to transform negative events into opportunities for flow to emerge, and to gain strength from the process. The first step is developing an attitude of unselfconscious self assurance as identified by Richard Logan when studying survivors. This attitude involves the seemingly paradoxical ability to believe that our destiny is in our own hands whilst maintaining a state whereby the ego is absent. The individual with unselfconscious self assurance is seen as not being determined on dominating their environment but as finding a way of harmoniously functioning within it. Csikszentmihalyi (1990) states that

essentially this level of self assurance requires that one must trust not only oneself but also the environment and one's place in it (as compared to paranoia). The second requisite step is the ability to focus attention away from one's self to the external world, and to maintain an open stance in order to be aware of alternative possibilities (as compared to anxiety). This position offers the possibility of achieving unity with one's surroundings without being distracted by frustrations when desires or goals are not being met. The third step involves the ability to find new solutions, and it is proposed that this is more likely to happen when one is operating with unselfconscious self assurance and remains open to the world, and available to recognizing the opportunities that arise.

**- The broaden and build theory of positive emotions**

Fredrickson states that she developed the Broaden and Build Theory of Positive Emotions to further understand the nature of positive emotions and their importance on well being (Fredrickson, 1998, 2001). It is based on the belief that positive emotions facilitate approach behaviour or continued action, and that they prompt the individual to engage in activities that are adaptive (Fredrickson, 1998, 2001). Fredrickson promotes the Broaden and Build Theory of Positive Emotions as a contrast to the more traditional concept of specific action tendencies of negative emotions. The Broaden and Build Theory states that positive and negative emotions have both complementary and adaptive functions in that negative emotions have an adaptive function at times of danger by heightening one's sympathetic nervous system arousal and narrowing one's attention. Positive emotions, on the other hand, have the potential to quell autonomic arousal and to broaden one's attention (Fredrickson, 1998, 2001; Tugade and Fredrickson, 2003). This process is cited as facilitating health and well being, resilience and general coping ability (Fredrickson, 2001).

The Broaden and Build Theory of Positive Emotions is essentially a two factor theory – the first factor positing that positive emotions broaden the individual's repertoire in terms of thought and action, and the second factor positing that positive emotions are regulative by correcting and undoing the effect of negative emotions. Positive emotions are mooted as having the capacity to broaden the scope of attention, cognition, action, intellectual

and physical resources, and social resources (Fredrickson, 1998). Evidence supporting the first broadening factor arises from research that demonstrates that positive emotions result in thought patterns that are flexible, creative, integrative, open and efficient in nature, and that they expand the range of behavioural options (Fredrickson, 1998, 2001; Tugade and Fredrickson, 2003). The evidence for the broadening of physical, intellectual and social resources is correlational,drawing on studies about the function of play, the impact of secure of attachment on cognitive functioning, and the role of positive emotions in social interaction (Fredrickson, 1998).

The second factor of this model relates to the incompatible nature of positive and negative emotions. It is suggested that one of the functions of positive emotions is to loosen the hold that a negative emotion may have on the person's mind and body and undo the preparation for the specific action demanded by the negative emotion (Fredrickson, 2001).  The effect of positive emotions on autonomic nervous system function has been demonstrated in terms of cardiovascular reactivity and regaining equilibrium (Tugade and Fredrickson, 2003; Tugade, Fredrickson and Barrett, 2004). Studies by Fredrickson and colleagues have confirmed individuals displaying positive emotions rebounded from physiological arousal faster than those who displayed less positive emotion (Tugade and Fredrickson, 2003). The underlying physiological and cognitive mechanisms have yet to be determined but the notion has been put forward that the broadening process at the cognitive level mediates the undoing at a physiological level (Fredrickson, 2001). The effect of positive emotion on cognitions has been linked with increases in dopamine levels on the anterior cingulate cortex (Tugade, et al. 2004), and the adaptive nature of positive emotions has been suggested in terms of facilitating the building of resources necessary for survival (Fredrickson, 1998).

References to the relationship between resilience and the Broaden and Build Theory have frequently been put forward by Fredrickson and her colleagues (Fredrickson, 1998, 2001; Fredrickson and Branigan, 2005; Fredrickson and Losado, 2005; Tugade and Fredrickson, 2003; Tugade et al., 2004). A recent study by Tugade et al. (2004) examined the relationship between resilience and positive emotions, and the construct of emotional

granularity. Differences in verbal reporting styles of affective experience has been labeled emotional granularity with higher granular individuals reporting affective experiences with differentiated terms and discrete emotion labels. Individuals with less granularity report affective experience with discrete emotion labels that indicate only core affect (Tugade et al. 2004). Tugade et al. (2004) found that individuals with high positive emotional granularity reported coping styles that encourage thorough and complex appraisal of information, and it is suggested that this allows for the development of new, or more effective, coping skills. It is surmised that as these individuals are able to represent the emotional responses of both themselves and others in a more complex manner, and that this leads to a more extensive repertoire of coping strategies and enhanced flexibility. The theory has been put forward that the ability of positive emotional granularity may be the mechanism through which resilient people develop effective coping abilities (Tugade et al., 2004).

**- Coping and Positive Emotion**

Coping research in the past has focused most of its attention on the regulation of distress with little attention given to the positive aspects that might arise in response to the coping response. Folkman and Moskowitz (2000, 2004) have redressed this to some degree by drawing attention to the advantages that can be experienced whilst coping. Their work, described as "ground breaking" by Lazarus (2000), argues that positive affect and distress can co-occur, that positive affect within a stressful context has an important adaptational significance, and that there are coping processes that in themselves generate and sustain positive affect and involve meaning (Folkman and Moskowitz, 2000, p 648). Their proposal is based within the suggestion that there may be a degree of independence between positive affect and distress, and that different coping strategies are associated with positive and negative affect regulation (Folkman and Moskowitz, 2004). Folkman and Moskowitz (2000, 2003, 2004) acknowledge that the adaptational significance of negative affect has been extensively discussed and relates to the motivational and attentional aspects, and that negative affect focuses the attention on the nature of the problem (such as problem solving) or dealing with it directly (such as anger). The functional role of positive affect has not been so clearly articulated, and they critique

earlier theories suggesting that positive affect served as a safety valve leading to less vigilance as being maladaptive.

Folkman and Moskowitz suggest that the function of positive affect might be more closely related to the notion put forward by Lazarus, Kanner and Folkman (1980, as cited in Folkman and Moskowitz, 2000). This suggests that positive emotions might provide respite and opportunity to replenish coping resources following depletion caused by stress. Adaptive functions of positive stress put forward for analysis include its role as a buffer to adverse physical responses to stress, as providing a protective element via the neuroendocrine system at times of stress, and its protective factor against clinical depression in terms of interrupting ruminative process that might lead to mood disturbance. The types of coping believed to generate positive affect include the role of positive appraisal; problem focused coping directed at managing the problem or cause of the distress, the ability to offset a negative event through infusing more ordinary events with positive elements; and the capacity to determine the personal significance of the situation in a congruent manner with beliefs, goals and values. These types of coping elicit meaning from the event in such a way that has spiritual or philosophical depth, and promotes a sense of controllability or mastery over the event. The focus on the more proximal situational elements in turn influences choice of coping strategy, and this possibly nurtures a reiterative feedback system that maintains the positive affect (Folkman and Moskowitz, 2000).

Research by Folkman and Moskowitz has found that coping strategies to regulate distress are different from those used to generate positive emotions, and that positive affect is increased through the process of positive reappraisal during which there is a focus on values, goals and beliefs elicited by the stressful situation (Folkman and Moskowtiz, 2003). They quote research with maternal caregivers that has found planning, positive reappraisal, respite and emotional expression to be positively correlated to positive (but not negative) emotions; and that distancing, self controlling and escape-avoidance strategies to be positively correlated with negative (but not positive) emotions (Folkman and Moskowitz, 2003). Prospective data from a second study of care giving partners to

men with AIDS has also found that both problem focused coping and positive reappraisal were consistently associated with increases in positive affect as compared to inconsistent associations with negative affect (Folkman and Moskowtiz, 2004). Their research has shown that caregivers under stress from caring for terminal partners actively generated opportunities for positive events to happen, and interpreted relatively trivial events in a positive manner (Lazarus, 2000). Folkman and Moskowitz (2003) observe that physiologically based emotion studies suggest the up regulation of positive emotion compared to the down regulation of negative emotions, and that these systems have minimal overlap.

**- Summary of resilience and positive psychology models**

The models proposed under the positive psychology rubric tend to be explanatory in their approach to resilience in that they outline processes and characteristics associated with resilient functioning in a manner that is not prescriptive. There is considerable overlap in what factors are believed to be important, and the difference between the theories is more about focus and weighting than totally disparate themes. The first two models exploring personal control and self-efficacy look at what an individual does when faced with adversity and how this impacts on the individual's emotional response. The latter three models operate somewhat in reverse to this and initially focus on the individual's emotional response to the adverse event and then address the impact this has on what the individual does. Situational variants and individual capabilities are not highlighted to any great degree. The models exude an air of lightness in that that adverse conditions need not be adverse, and that it is engagement with the problem that brings about well-being as opposed to avoidance or expecting there to be no problems at all. There is a range of research to support the different models to varying degrees, and taken together they add substantially to the construct of resilience.

**V - Trauma, recovery and post traumatic growth**

Recent studies have begun to report on individuals displaying "unexpected resilience" in response to both life threatening and violent events, and examples include motor vehicle accidents, the Los Angeles riots in 1992, the 1991 Gulf War and the Twin Towers

bombing in 2001 (Bonanno, 2004; Almedon, 2005). In addition to this, studies of military personnel at the 2004 Iraq war and those stationed in extreme conditions such as in the Antarctica, report that these experiences can lead to improved psychological health (Hacker Hughes, Cameron, Elridge, Devon, Wessely and Greenberg, 2005; Palinskas, 2003). Ozer, Best, Lipsey and Weiss (2003) completed a meta analysis of post traumatic stress disorder and its symptoms, and found that only 5%-10% of individuals exposed to trauma develop post traumatic stress disorder. Other studies report rates of chronic post traumatic stress as ranging from 6.6%-17.8% of those exposed to a range of different trauma types, and that delayed post traumatic stress disorder is relatively infrequent (Bonanno, 2004). The research on post trauma stress is helping to shift the misconception that trauma equals psychopathology, and to differentiate what it is that leads to traumatisation.

**- Recovery and resilience**

Bonanno (2004) and Carver (1998) both make a point at differentiating between the different responses an individual can display to threat or adversity. Bonanno (2004) differentiates between chronic and delayed post trauma responses to trauma, and also between recovery and resilient responses to trauma. The differentiation that he makes between the latter two concepts is that "recovery connotes a trajectory in which normal functioning temporarily gives way to threshold or subthreshold psychopathology" whereas "resilience reflects the ability to maintain a stable equilibrium" (Bonanno, 2004, p 20). Resilience is characterized by the maintenance of a relatively stable and healthy level of psychological and physical functioning. Transient disruptions to normal functioning may be experienced but an overall stability is maintained and there is a capacity for generative experiences as well as positive emotions. Bonnano (2004) stresses that resilience is a common phenomenon, and that the development of resilience comes about through multiple pathways.

Carver (1998) does not differentiate as such between recovery and resilience but states that there are two options that reflect resilience and the ability to return to a "former state of relative well being" following stressful period (p 248). He refers to this as being a

homeostatic phenomenon and the two options include becoming desensitized to the traumatic stressor or developing an enhanced capacity to recover from the traumatic stressor. He describes the process of desensitization as similar to the immunization process in that following one exposure to a stressor the individual develops a resistance to subsequent exposures to the same stressor. In essence this suggests that the stressor loses its potential to be disruptive. With regard to the second option, an enhanced capacity for recovery, Carver suggests that recovery is characterized by a faster return to baseline. The differentiation between the two options is that the stressor in the enhanced recovery model retains the same degree of disruptive potential but that the individual is more efficient at repairing the disruption.

**- Post traumatic growth and resilience**

An extension of this approach to resilience at times of stress and trauma is the concept of post traumatic growth (or thriving) and this concept is based on the notion that stress, adversity and trauma can in fact enhance functioning and well being. Carver (1998) suggests that thriving is a response to challenge as opposed to threat, and that by definition it is related to gain as opposed to loss. This is not a new concept and the essence of this is reflected in the quote by Haan that "stress benefits people, making them more tender, humble and hardy" (as cited in Holahan, Moos and Schaefer, 1996, p 32). Earlier work reported resilience to result from confronting and effectively coping with stressful experiences, and that this in turn promotes new coping skills and the development of personal and social resources (Schaefer and Moos, 1992, as cited in Holahan, Moos and Schaefer, 1996). A practical slant to this is Meichenbaum's therapy approach to stress inoculation in that it is based on the belief that individuals learn to deal with stress by having successfully dealt with previous (more benign) stressors (Tedeschi et al., 1998).

Thriving in recent years has focused on what happens at a personal level when people manage stressful situations. It is characterised by the individual displaying less reactivity when faced with stressors, and resulting in a faster recovery or consistently higher level of functioning. Psychological thriving has been defined as reflecting gains in skill and

knowledge, increased self confidence and a sense of security in relationships (Calhoun and Tedeschi, 1998; Carver, 1998; Park, 1998). Carver (1998) states that it does not depend on exposure to a discreet traumatic event or longer term stress but that these types of events may elicit it. Findings in the area suggest that thriving in the face of adversity and trauma has positive implications for the both the current and future well-being of the individual (Calhoun and Tedeschi, 1998). Models that have been put forward to explain thriving include transactional based models (Carver, 1998; Park, 1998), physiological models (Dienstbier and Zillag, 2002; Epel, McEwen and Ickovics, 1998), and models based on self transformation and the finding of meaning (Calhoun and Tedeschi, 1998; Saakvitne, Tennen and Affleck, 1998; Tennen and Affleck, 2002).

**- Transactional models**

The transactional model proposed by Park (1998) is based on the notion that personal characteristics are important factors to consider at times of adversity, and that these can influence the outcome for this individual. Park hypothesizes that personal characteristics mediate appraisal and coping processes, and personal characteristics that she identifies as pertinent include optimism and hope, the capacity to believe one has the ability to attain one's goals, extroversion, spirituality and religiosity (Park, 1998). It is proposed that the effects of these characteristics mediate the coping process in terms of appraisal, and appraisal biases are believed to then influence the selection of coping strategies. Factors believed to be important include the controllability of the event (whether or not the situation is perceived to be threatening or challenging), and the extent to which the event violates beliefs, expectations and goals. Secondary appraisals relating to one's own resources, such as self efficacy to manage the event are also important. Coping strategies believed to be significant include emotion focused coping with which to manage distress, problem focused coping to manage the situation and cognitive coping as a means of assimilating or making congruent the event with previously held beliefs. Park has researched stress related growth following stressful events in college students, and she found that acceptance and positive reinterpretation were related to thriving phenomena (cited Folkman and Moskowitz, 2004).

Carver developed a model for thriving that proposes stresses reorganize the self within the context of a wider systems theory. With regard to trauma, Carver (1998) suggests that individuals' responses to trauma are characterized by a reiterative feedback system that amplifies a deviation that can be either adaptive or maladaptive. In the case of thriving he suggests that those high in mastery cope with adversity through instrumental coping and that as a result of this they effectively manage the situation, appraise this in a positive manner, and in doing so increase their sense of mastery. Those with a lower sense of mastery may cope with avoidance and escapism, appraise the experience in a negative light and their sense of mastery is subsequently depleted. Carver (1998) suggests that there are two significant factors to this approach and that these include the individual's sense of confidence and their ability to be persistent as opposed to giving up. He proposes that on-going engagement in mastering a situation can be enhanced by the importance or salience of the situation to the individual, and that this might be influential with regard to tipping the balance and for change to occur at some level. He identified a number of different individual differences that might be significant, such as personality dimensions and coping styles, and situational variants but acknowledges that research in this field is limited at this time (Carver, 1998).

**- Physiological models**

The model promoted by Dienstbier has been labeled as a form of toughening. Toughening emphasizes how the body influences the mind as opposed to how the mind influences the body (Dienstbier and Zillig, 2002; Tedeschi, Park and Calhoun, 1998). Dienstbier and Zillig (2002) cite Bateson's work when discussing the toughness model in terms of observations that changes made to the environment force the system to adapt to its genetic potential. When this happens he observed that not only the original system is strained but also those that it interacts with. Toughness theory starts with the observation that there is a "training effect" for the neuroendocrine system, and that certain manipulations (intermittent challenges and threats that are taxing) lead to specific modifications in the neuroendocrine system. The modifications then mediate specific changes upon personality, performance and health (Dienstbier and Zillig, 2002). The

toughness model proposes that individuals with reduced pituitary-adrenal-cortisol response to stress function more capably through increased physiological sensitivity and responsivity within the neuroendocrine system, and exhibit a faster return to base rate levels once coping is no longer required (Dienstbier and Zillig, 2002; Tedeschi et al., 1998).

At a psychological level this in turn leads to increased performance in challenging tasks, enhanced learning abilities, emotional stability, resistance to lowered mood and more positive physical health (Dienstbier and Zillig, 2002). It is proposed that memory function and learning enhancement is increased indirectly through glucose availability, and that the effect of adrenalin on amygdala function decreases neurotoxic damage to the hippocampus (Dienstbier and Zillig, 2002). Coping and changes to emotional functioning following toughening are believed to be the result of changes to the perception of challenge versus threat, and the subsequent qualitative and quantitative differences in arousal. It is also suggested that the experience of success in the face of previous challenge of adversity leads to increased optimism, and that this is enhanced with the feeling of energy as opposed to tension. This is said to lead to more effective coping, less self focused attention and acceptance of challenges as opposed to avoidance (Dienstbier and Zillig, 2002). Both animal and human research studies have provided support for this model but the authors acknowledge that there are various facets that have not yet been studied and conclusive evidence has yet to be gained (Dienstbier and Zillig, 2002).

Epel et al. (1998) propose a health promotion model whereby psychological thriving can lead to physical thriving through the process of coping effectively with stressors. They suggest that the development of physical resilience requires exposure to stressors, and a toughening up process similar to that of muscle building. The evidence for their model is from psychoneuroendocrine research that shows that certain types of cognitive appraisals and perceived controllability have the potential to transform stress into a health enhancing opportunity. For their argument they apply the opponent process theory by Solomon that asserts that a strong negative state is followed by an opposing positive state (Epel et al., 1998, p 304). With regard to physical stress, Epel et al. (1998) suggest that

once the body has responded in a protective manner and adapted to the stress that it will then respond in a restorative manner. High stress levels lead to an increased release of catabolic hormones (arousal and tissue degrading), and this is followed by a return to anabolic functioning (growth and conservation of energy) before returning the body to a restorative state. The relation between anabolic and catabolic hormones is seen as being significant in predicting potential for growth and the allostatic load (the ability of the body to adapt to demands).

Epel et al. (1998) suggest three conditions that may promote physical thriving, and these include acute rather than chronic stressors, toughening through repeated exposure to acute stressors, and periods of reduced arousal below baseline. They do acknowledge that repetitive exposure to stressful situations may have a cumulative effect over time but they are not able to offer an explanation as to why. Research examining thriving and cortical adaptation was carried out in a laboratory setting, and this found that women who quickly adapted to laboratory stressors reported thriving responses to previous traumatic stress in terms of a greater appreciation of life and stronger religious faith (Epel et al., 1998). Although tentative, they suggested that the findings measured cortisol habituation, and that this is an index (measure) of thriving. They were not able to determine the underlying cause for this effect but they did suggest that the results might reflect either more efficient adaptation to the laboratory stressors, or that their subjects had undergone a "toughening up" from exposure to previous trauma (Epel et al., 1998).

**- Self transformation and the finding of meaning**
Calhoun and Tedeschi (1998) suggest that thriving occurs when the individual has to face circumstances that shake the foundations of their beliefs and assumptions, and that this results in high degrees of psychological dissonance. It is proposed that this leads to questioning and reevaluation of the old belief systems about the self and the world, and that this results in the co-occurance of distress and growth. Perceived growth is reported as occurring in three domains, and these include changes in the perception of the self, changes in interpersonal relationships and functioning, and changes in life philosophies (Calhoun and Tedeschi, 1998; Tedeschi, Park and Calhoun, 1998). Internal locus of

control has been cited as important in that individuals with this capacity are able to infuse meaning (and coherence) into threatening or traumatic circumstances and this is associated with growth (Saakvitne et al., 1998). Research in the area is reported as not yielding consistent results between adjustment and growth, and it has been concluded that well being and distress may not be dichotomous (Calhoun and Tedeschi, 1998).

The constructivist self development model by Saakvitne et al. (1998) is based within the belief that the response of an individual to trauma is determined by the meaning that they ascribe to it, and that this is dependent upon their "experience of self, age and developmental stage, biological and personal resources, interpersonal experiences and expectations, and his or her social, cultural and economic milieu" (Saakvitne et al., 1998, p 281). This model attempts to integrate personality and clinical theory with trauma theory, and the impact of trauma on self development. The psychological components believed to be most affected by trauma include one's frame of reference towards one's own self and the world; the self capacities such as the capacity to tolerate affect and manage this effectively; ego resources to meet one's own psychological needs in a mature way; the central psychological needs involving safety, trust, control, esteem and intimacy; and the perceptual and memory system (Saakvitne et al., 1998). Saakvitne et al. (1998) propose that these five areas organize experience, and that in the event of a traumatic incident that the individual must integrate the experience into their existing beliefs about the self and the world. It is proposed that the self constructs the frame of reference and that this sets the scene for changes in belief that are an important part of growth. The process of finding meaning following trauma is likely to affect the previous frame of reference, and that this leads to changes in self identity, the individual's worldview and their sense of spirituality.

The importance of finding meaning is also evident in the model put forward by Tennen and Affleck (2002). Research has found that "benefit finding" in the face of, or following adversity, has been linked to psychological and physical health (Baumeister and Vohs, 2002; Nolen-Hoeksema and Davis, 2002; Tennen and Affleck, 2002). Tennen and Affleck (2002) also report that the literature in this area concludes that benefit finding

predicts emotional and physical adaptation at a later date, and that "benefit reminding" has been found to be an effective pain management strategy for women with fibromyalgia. Hypotheses as to the nature and function of benefit finding include benefit finding as a personality characteristic (individuals that characteristically search for a positive aspect or outcome); benefit finding as a reflection of growth and/or change; benefit finding as a temperamental basis; benefit finding as a temporal comparison; and benefit finding as a process of as a means of understanding change (Tennen and Affleck, 2002). Difficulties in researching benefit finding are acknowledged in that measurement of this construct is particularly challenging but Tennen and Affleck (2002) stress that the relationship it has with health and well-being makes it worthy of further investigation.

**- Summary of recovery, post traumatic growth and resilience**

As with the child development literature, this section has paid greater attention to defining the constructs of recovery, resilience and post traumatic growth. The differences are subtle but important with regard to temporal changes in functioning at times of stress, and positive changes to functioning after stressful periods. Compared to the models put forward by positive psychology those put forward in the post traumatic growth arena draw upon a greater range of models to explain the ability of some individuals to thrive in the face of adversity. In addition to psychologically oriented models, physiology and systems theory are also drawn upon to explain individual differences. At times the models seem to lack distinction as so many factors are listed as important and as a result of this parsimony is forfeited. Research supporting the models is as this point limited as the area is relatively new, and it is fortunately well positioned to take advantage of the momentum generated in the recent past by the momentum of positive psychology.

**Chapter 3 – The Study**

This chapter reports on the study undertaken to explore the subjective experience of resilience by individuals identified by their peers as being resilient. The chapter will follow the steps involved in completing qualitative research outlined by Morrow (2005) and Silverstein, Auerbach and Levant (2005) as these steps follow a clear an comprehensive process. Included will be a discussion on the nature of the research problem, the theoretical framework, the research design and the research results.

**I – The nature of the problem -**

The construct of psychological resilience, as evidenced in the literature review, has over the past five decades been the focus of many research projects and analyses. Early in its evolution it attracted the interest of all disciplines within the health and social sciences, and with this the attention of the media and wider community. On one hand it gained an unconditional acceptance, and was adopted by health promotional advocates with zeal as the way to alleviate the ills of the world, and on the other hand some deep concerns were expressed as to the credibility and validity of the construct itself. At face value it presented well but close examination of the literature reveals that there was an absence of theory underlying and directing the research. This resulted in a diversity of research populations and absence of consistency across early research programmes. Few of the results were able to be generalized or replicated across population groups, and the most significant gain was the knowledge that resilience was not a simple construct that could be treated in a linear cause – effect fashion.

From this starting point models were developed incorporating moderating and mediating variables that were believed to impact on an individual's ability to adapt and cope with life demands, and the construct itself was operationalised more succinctly. Major research projects involving large samples of subjects and utilizing powerful statistical packages were undertaken, and these helped to more clearly identify consistent factors associated with resilience across population groups. The research focus eventually became more process oriented as researchers set their attention on life trajectories and significant points

of change. The advent of positive psychology also provided an alternative perspective on resilience with a shift in focus from disease to well-being, and the finding that resilience was more common than previously thought normalized the construct. Innovative brain imaging techniques added to this mix through access to insights as to how the brain functions, leading to even further gains as to what underlies resilient behaviour at a micro level.

With these gains, however, there has also been a loss in that the construct of resilience has been reduced to highly conceptualized models and the anonymity of numbers. The operationalisation of resilience has resulted in a sterile one size fits all type system, and subjects are selected according to the researchers' criteria and measured against the same criteria. This approach is vulnerable to researcher ethnocentricity when applied to subcultures, and though acknowledged this has not been truly addressed in the reports on contemporary research. In a similar vein, research reports discuss results in a clear scientific manner, and in doing so the subjects' lives are objectified as trauma, poverty and abuse are rendered as units of interest apart from the reality. This has led to a diminishment of the subject, and the nobility granted to them as compared to subjects involved in earlier research studies. In essence, it is as if hard science has taken the construct of resilience out of the context of the individuals' lives and imposed its own standards on the research process. The impression that the personal gets lost within the quantitative framework is not isolated, and this not an uncommon concern expressed by qualitative researchers (Denzin and Lincoln, 2005) and other theorists (Sternberg, 2003).

In contrast to research adopting this detached approach, the seminal study by Werner and Smith (1982) adopted a mixed methodology involving both psychological measurements and interviews with subjects. This study also determined the criteria of resilience but the reading of their work provides a richness and depth to the lives of the subjects both at the time of childhood and throughout their lives. The studies by Beardslee (1989) and Vaillant (1994, 2000) were also conducted along similar lines and their reports again revealed the humanity of those involved. The number of studies following this mixed research method in recent years is comparatively small (see Appendix B). Although there

is a persistent tendency by researchers to retain the right to determine the nature of resilience, the research reports reflect the sense of whom the subject is as compared to those studies involving large numbers of subjects and statistical power. Unfortunately the authority and influence of these reports remains limited as they are more difficult to access as they are published in minor journals or they are listed as dissertations.

**- The research question**

When reading the literature on and around resilience, a recurring question kept popping into my mind, and that was the simple question of "what is resilience?" Observations of real life and clinical work challenged the assumptions evident in the literature, and there was a quiet resistance to making judgements as to who was to be deemed resilient or not. Ideas such as resilience falling onto a continuum, or there being a taxonomy of resilient types flourished for a time, and internal dialogues raged as to what the differences were between resilience, adaptiveness, stoic acceptance and sheer survival. A small, and aborted, study interviewing clinicians as to their understanding of resilience added to the sense of disquiet as the responses given tended to mirror the literature in terms of taking a neutral outsider stance making observations of a phenomenon. It seemed as if it were easy to make statements and judgements about resilience when directed  towards no-one in particular, but it was not so easy when making comment about an individual when the nuances about their lives was known.

It was these observations that took this project one step further than the initial plan of presenting a theory of the development of resilience to include a qualitative study on the subjective experience of resilience. After reading the literature, and questioning what resilience was when working in a clinical role, the decision was made that it would be worthy to explore what the experience of resilience was by those deemed to be resilient by their peers. It seemed that before making further hypotheses about the development and nature of the construct that it would be vital to have a clear understanding and impression as to what the construct was at a very real level. The decision was made to not take an evaluative approach in any which way as this would once again be the research norm and determine the nature of the construct preemptively. This decision led to the

design of a small qualitative study that was purely exploratory with the intent to remain open to the stories told. Reflection on this decision during and after the data collection was reinforcing as one after another of the notions that had been held as potentially important factors were cast aside or remolded.  The remainder of this chapter reports on this study within the context of a discussion as to the virtues and vices of qualitative investigations.

## II –The theoretical framework

To appreciate the potential of and the reasons for doing qualitative research it is important to understand its philosophical basis and the parameters that define the different methods of study. Concerns have been expressed as to the confusion evident in some qualitative research reports with regard to this, particularly as contemporary psychology research is still heavily dominated by positive research paradigms (Haverkamp, Morrow and Ponterotto, 2005; Ponterotto, 2005). Ponterotto (2005) comments that although many researchers express an enthusiasm to adopt qualitative methods that it can be difficult for them to let go of positivist habits from the past and that they unwittingly "post positivise" qualitative methods. He believes that this is due to a lack of understanding as to the philosophical beliefs "undergirding different research paradigms" (Ponterotto, 2005, p127). Following is a brief review of the different contextual terms to define the philosophy of science and the different paradigms as presented by Joseph Ponterotto (2005).

## - Contextual definitions

The philosophy of science refers to what holds the search for knowledge in place. This includes the ontology or assumptions held with regard to what is believed to be the nature of reality, and the epistemology or the study and gaining of knowledge. Epistemology also refers to the type of relationship between the researcher and the subject of the research. Paradigms are defined as the set of interrelated assumptions about the (social) world that forms the basis of the conceptual and philosophical framework, and they direct the researcher with regard to research design. Methodology, on the other hand relates to the research process and procedures undertaken. In addition to this, the focus of inquiry is

defined through either an idiographic (referring to the individual) or nomothetic (referring to people in general) approach, and with either an etic (referring to universal laws) or emic (referring to the individual) distinction. Associated terms include axiology which refers to the role and place of values within the research process, and rhetorical structure as to how the research is presented in terms of language.

**- The paradigms of science**

The paradigms discussed by Ponterotto (2005) are based on the classification devised by Guba and Lincoln in the early 1990's and include the received or the traditional paradigms of positivism and post positivism, and the post modern paradigms of constructivism (interpretivist) and critical (ideological) theory. With regard to positivism, the ontology of this paradigm is based within the belief that there is "one true reality that is apprehendable, identifiable and measurable" (Ponterotto, 2005, p 130). The epistemology emphasizes dualism in that the subject and the researcher are independent of each other, and the subject is studied objectively without bias. Research is nomothetic, and attempts to verify a priori hypotheses that are generally stated in quantitative terms. The goal is to explain relationships among variables in a way that leads to etic laws, and control and prediction of phenomena. Values, and other subjective feelings are not believed to be part of the research process, and the objective process of science is reflected in the neutral, detached way that it is reported (Ponterotto, 2005).

Post positivism arose as dissatisfaction increased with the positivist position, and it accepts that there is an objective reality on the understanding that this cannot be perfectly measured and that it is only "probabilistically apprehendible" (Lincoln and Guba, 2005, p 193). Research design aims to falsify hypotheses as opposed to verify and the ultimate objective remains the intent to explain, control and predict phenomena. Objectivity remains important with the subject and the researcher remaining independent of each other, and it operates from a nomothetic and etic stance. Research methods and procedures are experimental in design with the intent to control and manipulate variables, and the intent of research is to uncover relationships from which basic laws can be

developed. Presentation of research findings follows the positivist tradition in terms of being detached and neutral with results being precise and scientific (Ponterotto, 2005).

The constructivist paradigm is portrayed as the alternative view to the positivist and post positivist paradigms. The ontology it holds is that there is not one single objective reality but that there can be many apprehendible realities, and that "reality is constructed in the mind of the individual" (Ponterotto, 2005, p 129). This is a relativist stance and the goal of research is to explore the lived (subjective) experiences of the research participants and there is no attempt to discern the single truth or establish outside verification. The epistemology is based within a transactional model, and the dynamic (and often lengthy) interaction between the researcher and the participant is acknowledged as legitimate and valuable to the process. The method is often naturalistic and can include observation of the participants in their daily lives, and the recording of interviews and conversations. It encourages inclusion of the values and biases of the researcher in the analyses, and it is believed that trying to eliminate this would render the research faulty. The presentation of the research, and the language used in the write up tends to be personalized with detailing of the researcher's own experience and expectations (Ponterotto, 2005).

The final paradigm is based within critical theory, and this paradigm encourages the researcher to be fully immersed in the process and their values to be central to the task and purpose of the research. It is described as being transformational and empowering, and the reality is believed to be constructed within a social and historical context. Power relationships within this context are emphasized and the objective of the research is frequently to emancipate groups that are oppressed. The epistemology is transactional, subjective and dialectical in nature, and the relationship between the researcher and the participants is both close and often collaborative. Methods are again frequently naturalistic in design whereby the researcher is involved in the day to day lives of the research participants, and close observations or recordings of these are taken. The rhetoric reflects the experience of the researcher and details as to the personal impact of the research process can legitimately be included (Ponterotto, 2005).

Lincoln and Guba (2005) have recently revised their initial classification system and included a fifth paradigm that they have labeled "participatory". This paradigm views reality as participatory and states that it is both subjective and objective and co-created as a living knowledge. The epistemology is characterized as being based within a participatory transaction model, and extended through the inclusion of experiential, propositional and practical knowing that leads to co-created findings. The methodology is grounded within a shared experiential context, and inquiries are embedded within the community through active engagement in the group or process under investigation. The roles and values are action oriented towards assisting the research participants on their path towards autonomy and flourishing, and there is often a political component to this. The presentation of research is through the primary voice that is self reflective, or through secondary voices to illuminate theory, or tell the story through narration or other theatrical mediums.

**- Differences in qualitative and quantitative methods**

Quantitative and qualitative research methods were in the recent past viewed as incompatible and incomparable. Quantitative research was held as the more credible paradigm as it was objective and the results could be generalized with authority. However, this status has been increasingly challenged as qualitative studies in health care have emerged as significant useful contributors to the knowledge base (Sandelowski, 2004). Rather than maintaining a dichotomous perspective, there is a growing awareness that the two paradigms can be complementary, and judged on their own merits in the face of the research question at hand.

Haverkamp, Morrow and Ponterotto (2005, p 124) provide an excellent analogy on the differences of the two paradigms –

> "Quantitative research is like photography, excels at producing images
> characterized by precision. Qualitiatve research, like portraiture, can offer a
> glimpse of "what resides beneath." Both photography and painting require great

skill, and both qualify as art; the analogy can be extended to quantitative and qualitative research in that both require skill, and both qualify as science."

Quantitative methodology is based within the belief that there is a single objective reality and that this can be measured and analysed without bias using experiments and analog methods (Ponterotto, 2005). The researcher is viewed as being a neutral and outside observer to the process, and they are not encouraged to include their own reflections, values or expectations on the research process. Research design is about hypothesis testing, and testing the relationship between independent variables. Sampling is random and representative of the research population in order to be able to generalize the results. Hard science methods are used, such as formal experiments and the use of standardized measures and instruments. Reliability and validity of research process is seen as important, as is the ability to replicate the results as a form of verification (Silverstein et al., 2005).

In contrast to quantitative methodology, qualitative methodology is based within the belief that there is not a single objective reality but multiple realities, and that biases are inherent as both the researcher and the participants "influence the construction of knowledge" (Silverstein et al., 2005, p 351). The objective of research is frequently hypothesis generating, and to explore and document the lived subjective experience of the researcher and participants. The researcher is in many ways an active participant in the research and there is a requirement that they are self reflexive as to the research process. As the research is in-depth the sample is necessarily comparatively small and tends not to be random, and the aim is to develop theories that are transferable. Elaboration of the theories is undertaken through research sampling across different groups with the objective of achieving greater clarity and density of the construct (Silverstein et al., 2005). Reliability and validity is not based on being able to replicate results but oriented towards the analysis of the data being transparent, communicable and coherent (Silverstein et al., 2005).

**- Quality and qualitative methods**

For many years the credibility of qualitative research was questioned by supporters of more traditional research methods as not being sufficiently rigorous to meet the standards of the positivist paradigm. The response to this criticism by purist qualitative researchers was to maintain the position that that truth is relative, and therefore the methodology was appropriate and in accordance with the underlying assumptions about the nature of reality (Maxwell, 2002). There has been a softening in this attitude in recent years, and second generation qualitative researchers have moderated their position with the acknowledgement that credibility and good research practice is important if the field is to progress (Morrow, 2005). There is continued debate as to how to achieve this and as to what standards apply, and there has been considerable discussion around the question of how to judge good qualitative research as compared to mediocre research (Denzin and Lincoln, 2005; Maxwell, 2002; Morrow, 2005; Stiles, 1993).

Validity is viewed as an important construct that Lincoln and Guba (2005) state researchers cannot dismiss as it asks the question as to whether or not the research is trustworthy and authentic, and can be acted upon. They list several forms of validity including crystalline validity (Richardson), authenticity validity (Guba and Lincoln), catalytic, rhizomatic and voluptuous validities (Lather), relational and ethics centred validity (Lincoln) and community centred determinants as means of establishing validity. The chapter by Maxwell (2002) is more prescriptive and offers suggestions as to meeting several different types of validity (descriptive, interpretive, theoretical and evaluative), as well as addressing issues pertaining to generalizability, and the discussion includes various processes to validate qualitative research. Other researchers use different terminology again, and Rubin and Rubin (1995, as cited in Silverstein et al., 2005) propose that qualitative research ideally should be transparent (can be checked by another as to what has been done), communicable (identifies categories that make sense to others) and coherent (that categories retain internal consistency whilst reflecting genuine inconsistencies and differences in the field).

The approach to validate qualitative research on the basis of quantitative measures has been proposed but not fully accepted as it is believed that applying parallel criteria

"creates logical inconsistencies" given the inherent differences between the paradigms (Morrow, 2005, p 252). Morrow (2005) recommends that it is preferable for qualitative researchers to adopt intrinsic standards that emerge more directly from qualitative research but as yet there is limited acceptance as to what this might mean. The notion of trustworthiness has taken hold as a concept that has value within this particular paradigm, and Stiles (1993) suggested that reliability refers to the trustworthiness of observation and data whereas validity refers to the trustworthiness of interpretation. In contrast to this Morrow (2005) discusses trustworthiness in terms of social validity, subjectivity and reflexivity, and representation. Trustworthiness has also been identified as referring to the validity of the data and its interpretation, and that this can assisted through the process of participant feedback (Silverstein et al., 2005)

**- How to proceed with quality control**

Difficulties encountered in determining what makes for good qualitative research concern the diversity and lack of coherence between the different articles and chapters discussing this. Confusion arises with the rejection of traditional standards (internal/external validity, reliability, generalisability) on one hand, and the appropriation of these terms in a qualitative context on the other. Further confusion arises with the use of different terminology referring to the same or similar processes, and considerable repetition occurs at various levels. To remediate the current state of confusion a clear and comprehensive system of evaluation that displays both a familiarity and breadth of understanding of qualitative research theory and process is required, and Huberman and Miles (2002) achieve this when listing the criteria they used for selecting studies to include in their book.

Huberman and Miles (2002) site confirmability, dependability, authenticity, transferability, applicability and attention to ethics as criteria to evaluate research studies and papers. Confirmability refers to the adequacy of the procedures within the study, and the question as to whether or not competing interpretations or conclusions were adequately considered; dependability refers to the reliability of data collections and whether or not the full range of settings, times and informants were covered; authenticity

refers to whether or not the account or interpretation rings true and plausible; transferability refers to how well the study allows comparisons with different samples and subjects; applicability refers to how useful the study is; and attention to ethics refers to whether or not the study has been respectful of the rights of the participants and responsive to any obligations inherent in the study (Huberman and Miles, 2002).

Huberman and Miles (2002) do not prescribe the process of evaluation beyond listing the above criteria, and it is believed that this gives their list the advantage in that the details of the evaluation process do not confound the intent of determining studies well done from those that are deficient. The details as to how to evaluate the above criteria can be drawn from the literature to meet the needs of the study under examination, and includes recommendations on how to gauge adequate reflexivity, representation and accuracy through the use of audit trails, self monitoring, peer review, data and participant checks (Eisenhardt, 2002; Lincoln and Guba, 2002; Haverkamp et al., 2005; Hoshmand, 2005; Maxwell, 2002; Morrow, 2005; Schofield, 2002; Stiles, 1993). Guidelines are also available with regard to the writing of reports that provide a further means of critiquing qualitative studies (Elliot, Fischer and Rennie, 1999; Morrow, 2005).

**- Triangulation**

In the past there was a tendency to view the triangulation process as supporting qualitative studies with quantitative studies to add weight to the conclusions drawn and the study itself (Bryman, 1988). This view has been challenged over the years and there has been fierce debate in the literature as to whether mixing the two methods adds to the research, or takes away, given the basic differences in world views and paradigms (see chapters in Bryman, 2006). More recently Morrow (2005) has made the cogent point in that as long as qualitative researchers are apologetic about their research methods, and continue to justify their work through quantitative means, that the belief that qualitative work is less rigorous and credible will be perpetuated.

There has also been a shift in the thinking about triangulation, and in the literature the concept triangulation is no longer about mixing qualitative and quantitative methods. The

process of triangulation is currently concerned with using multiple perceptions, or data sources, to clarify meaning and to verify observations and interpretations through repeatability or replication (Polkinghorne, 2005; Stake, 2005). These need not necessarily need to have a quantitative basis but may firmly stay within the qualitative paradigm and remain credible. Denzin and Lincoln (2005) state that "qualitative research is inherently multi-method in focus" (p 5) and that "triangulation is the simultaneous display of multiple, refracted realities" (p 6). They discuss this with analogies of qualitative research and the work of a quilt maker, bricoleur or the maker of montages and films, and that it is the collating of these different sources of data that strengthens the conclusions drawn.

## - The chosen theoretical framework

As indicated earlier in this chapter, the focus of this study was based within the question of "what is resilience". Of particular interest was the question of what is the subjective experience of resilience by those identified as resilient by their peers. This question arose from increasing concerns as to the approach being taken by researchers investigating resilience from within the positivist / post positivist framework, and the dehumanization of the essential elements of resilience and the subjects caught up in the process. These concerns were partly being driven by contact with clients from all walks of life displaying resilience in their day to day existence, and the disparity between knowing these clients and the conclusions being drawn about these clients from large scale research projects. Further concern related to the confusion evident in the research literature resulting from dense models and statistics not readily comprehendible, and frustration that the results of elaborate research projects did not seem to reflect the resources put into them.

The question "what is the experience of resilience" from a fresh perspective seemed to be worthy of investigation, particularly as the actual subjective experience of resilience has not previously been investigated. It lends itself very readily to qualitative research and the constructivist paradigm as the question is open to interpretation with no intent to prove or disprove any prior assumptions or theories. The objective of this research was to listen to what people said about their experience, and to try and hear what might be common themes from the stories being told. Given the complex nature of resilience, and the

multitude of factors impinging its potential, it was believed that questionnaires and standardized surveys would not draw out what was key to the actual experience of resilience. It was believed that listening carefully for clues and nuances, and being able to inquire more closely at these points, would add depth to the data and be more effective and appropriate as a means of investigating the nature of resilience. A further advantage to qualitative research was the closeness that the researcher has with the data when transcribing and analysing, and that this would offer the most opportunity to detect the subtleties of language through listening to the words that were used, and the words left out.

**- The chosen methodology**

The chosen method of data collection and analysis for this study is phenomenology as it provides a process whereby human experience and behaviour can be investigated. This method holds that the meanings and subjective processes of the psychological reality can be discovered and understood, and that they need not be constructed as they can intuited and described by the researcher. It is receptive and respectful of the research subject's own points of view, and imposing order is not called for as the method dictates different perspectives to be honoured. It has been described as "a low-hovering, in-dwelling, meditative philosophy that glories in the concreteness of person-world relations and accords lived experience, with all its indeterminacy and ambiguity, primacy over the known" (Wertz, 2005, p1 175).

To provide background, phenomenology is based on the ideas and work of Husserl earlier last century. He was a philosopher who was concerned about the "new scientific psychology" and the preoccupation with naturalism that dictates that reality consists of the physical being (Jennings, 1986). He was also concerned with the growing interest in the then world view philosophy that maintained that all knowledge is merely relative to its time, and he believed that philosophy should be concerned with comprehending and understanding the essence of reality. He believed that the essential nature of reality was not relative to its time but a universal fact or entity, unchanging and absolute (Jennings, 1986). Essences were believed to exist within the conscious experience, and that the

paradox of human subjectivity is that consciousness is "both in the world and before the world" (Jennings, 1986, p 1236). To explain this, he acknowledged that human beings exist in the natural world but argued that the world also existed only because of human consciousness that can behold and study that world.

Five concepts are important to phenomenology and they include two epochés (abstaining of scientific knowledge and naïve beliefs about the subject in order to attend to the subjective experience of the presenting problem), the intuition of essences in terms of descriptively delineating the characteristics and clarifying the meaning and structure of the subject matter (the eidetic reduction), undertaking intentional analysis through reflectively explicating the experiential processes of the lived situation, and maintaining a life-world perspective that recognizes that the world is socially shared but that individuals hold their own perspectives (Wertz, 2005). The core elements of phenomenological research are listed as setting aside (bracketing) previous scientific theories, securing descriptive access to the meanings of psychological life within a natural context, analyzing the complexities of these meanings through the use of reflection of the psychological processes, and the gaining of insight as to what is essential to the psychological processes under investigation (Wertz, 2005). It emphasizes approaching the subject to be studied with openness, and the capturing and analyzing of detailed descriptions of psychological life that are complex and rich at the time that it is concretely lived.

Hycner (1985) gives a detailed description as to the phenomenological analysis of interview data. His analysis of the process is comprehensive, and it provides a structure to the process, but he is keen to ensure that his guidelines are not taken as a recipe or instruction as to how to do phenomenological research. He states that his intention in presenting these guidelines is to sensitize the researcher to the issues inherent in phenomenological research. He concurs with Giorgi that the research method must be responsive to the phenomenon as opposed to forcing the phenomenon fit the method. The fifteen specific steps that he includes are transcribing the interview, bracketing and the phenomenological reduction, listening to the interview for the sense of the whole,

delineating units of meaning relevant to the research question, verification through independent judges, eliminating redundancies, clustering units of relevant meaning, determining themes from clusters of meaning, writing a summary for each individual interview, returning to the participant with summary and themes, modifying themes and summaries, identifying general and unique themes for all the interviews, contextualization of themes and creating a composite summary (Hycner, 1985).

**III – Research design**

**- Bracketing**

Phenomenology dictates that the starting point of research is to gain a familiarity with the subject matter through a review of the literature and other sources of information, and to then bracket what is known at both a scientific level and at the level of naïve beliefs (Wertz, 2005). With regard to this study, the literature review undertaken was based within a clinical psychology framework, and it delved into specific literature addressing resilience as well as associated topics such as the relatively new fields of neuroscience and positive psychology. The bracketing of scientific knowledge and the process of reviewing the literature raised a number of concerns that made bracketing easier as doubts were raised as to the how resilience was being studied and the conclusions drawn. The raising of doubts was in some ways akin to a raising of consciousness around scientific method and process, and an artifact of this was a sense of containment around the literature and the conclusions drawn.

The scientific knowledge that has accrued about resilience over the last fifty years also made more apparent some of the more general naïve beliefs about resilience. Common beliefs about resilience pertain to the belief that only extraordinary souls are resilient and that this is a both a stable and global trait. Researchers in the field have concluded that these beliefs are not absolute truths and have suggested that many people have the capacity to be resilient to difficulties that they are confronted with, and that resilience has neither temporal nor domain stability. This, in conjunction with the internal dialogue as to the nature of resilience mentioned previously, resulted in a process of setting aside different beliefs as to what resilience was not. Naïve beliefs were repetitively challenged

by this internal dialogue as discrepant aspects to the resilient persona came to mind and did not confirm to form. This again fed into the process of bracketing and putting aside some of the more commonly held beliefs by bringing into clarity assumptions as to the nature of resilience.

Bracketing thoughts and ideas that had evolved at a more personal level was not so readily achieved for various reasons. These thoughts and ideas had come about over time as a result of contact with people, both through clinical work and everyday life, who had shown remarkable courage and fortitude. There were also the observations of people who showed sheer tenacity and perseverance in keeping on in life conditions that for many of us would be despairing and non-sustainable. The difficulty in bracketing these thoughts and ideas was that they were not always formalized and explicit, and there was also a sense of ownership to ideas that had been percolating over some time. Beliefs that have emerged on personal contact with an individual are also more palpable than scientific knowledge reported in objective and detached language. Disengaging from beliefs of this nature required both insight as to their presence and then skilful excision to oust them from various perceptual and thought processes.

On reflection it is believed that complete bracketing of all beliefs and ideas associated with resilience was not achieved prior to the start of the data collection. During the transcription phase it was noted that earlier interviews with participants were contaminated with questions searching for answers to hidden assumptions. This was particularly obvious during the transcribing process when listening carefully to interview recordings and noting when participants did not connect with the question or when the question was out of synchrony with the general flow of the conversation. It was interesting to note, however, that as the interviews progressed that these contaminating questions became less evident and were eventually extinguished from the interviews completely. It were as if bracketing was taking place in vivo during the data collection, and bracketing as a process continued into the analysis phase as the contaminated parts of the interviews were deleted as not pertinent to the research process.

**- The sample**

Text books on qualitative research discuss various methods of choosing a sample of research subjects or participants, and often the method suggests that the sample is essentially selected in a purposeful way (Polkinghorne, 2005; Miles and Huberman, 1994). The method adopted in this study was criterion sampling (Polkinghorne, 2005) in that the objective was to develop an understanding of the subjective experience of people deemed to be resilient by their peers. To gather a sample of potential participants, a chaining process was instigated (Miles and Huberman, 1994). This involved the researcher approaching people known to the researcher, and who were observed to be resilient in their functioning, being asked if they knew of anyone who they believed was resilient that might be interested in being involved in the study. The age group targeted was 35-55 year old adults, and this group was targeted as it was believed that at this stage they would have had the opportunity to reflect on their lives and their skills at managing events in their lives. Minimal information was given at this point and the contact people were asked not to discuss the topic of the study in any detail with potential participants.

There was no initial attempt to select participants from any particular demographic group other than the broad age range, or on the basis of their having experienced a certain type of stressor or life experience. The only requisite was that the contact person believed that the potential participant was resilient and would be comfortable talking about themselves and experiences. Towards the end of the study there was an attempt to engage more male participants in the project but this proved to be difficult as men did not tend to be readily identified as being potential participants. When enquiries were made about this, responses reflected the tendency of people to view women coping with on-going psychosocial stressors as being resilient and that men did not tend to carry this load. The three men who were approached to join the study, and who were happy to participate, by contrast were all identified as resilient due to health and disability related stressors as opposed to psychosocial stressors. The one man who was invited to join the study with psychosocial stressors declined to be part of it, and stated that he did not feel that this was the right time for him to talk about these issues around as they were current at the time.

The final sample included 13 participants made up of 10 women and 3 men (see Table 1, p 111). The age range was from 35 – 57 years, and participants worked in a range of occupations. Education level ranged from minimal school requirements (school completed until 15 years) to completion of post graduate tertiary qualifications. Participants were not questioned directly as to the incident or stress that had led the contact person to identify them as resilient but all participants disclosed these details spontaneously during the interview. The type of stressors varied from on-going social stressors to events in the past that had resolved. The on-going psychosocial stressors included caring for dependents who had acquired brain injuries or who were developmentally disabled, family crises, grief, relationship problems and histories involving abusive relationships as an adult or child. The health and disability related stressors included one potentially terminal medical condition, and two accident related conditions leaving the participants permanently and significantly disabled, and past difficulties with infertility and pregancy.

**- The data collection process - interviews**

Potential participants were contacted by phone, or an interview time was arranged by the contact person, and given a brief description of what would be expected in terms of the focus of the study being resilience, the expected time involved and that the interview would be recorded. The first three participants were advised that there would be follow up interviews to check if the participant had more to say about resilience following the first interview. Following the third interview, however, it became apparent that this was redundant as a formal part of the process as the participants had nothing more to add and the conversations tended to be more general and directed to topics that were associated but not directly relevant. Arranging second interview times also proved to be very difficult as the participant's lives were busy and it felt as if expecting additional interview times was asking for too much with little gain to the participants. The remaining participants were asked to contact the researcher if they thought of anything further that would add to the research project, and two participants requested that second contact be made and the interview material discussed.

Interviews were held within two weeks of the initial telephone contact at a time that suited the participants and at a location that they felt comfortable in.  Nine of the participants chose their own home, three participants chose their work place and one participant chose a café. Prior to starting the interview participants were given an information sheet (Appendix C) and asked to sign the consent form (Appendix D). They were also verbally advised that they could withdraw at any time, and to ask for all documentation returned to them. The interviews took place between March 2006 and August 2006, and the length ranged from 35 minutes to 2 hours 10 minutes. One participant requested if their spouse could be part of the interview and she contributed at various times with comments about her perception of what factors were significant to her spouse's resilience. Three participants requested a copy of the interview transcript, five participants requested copies of the study. Two further subjects requested a second contact time to discuss the outcome of the study with the researcher.

The interviews were unstructured, and started with a question asking each participant as to what it was that they believed had led to the contact person identifying them as being resilient. From this point the questions asked were predominantly open and designed to elicit in depth responses as to the unique experience of the participant. At different times the researcher would take the role of the "naïve enquirer" to ask the participant to explain in different words a particular concept as a means of clarification or verification (eg "I'm not sure if I know what you mean, can you explain that again please"). Frequent follow up questions ("what happened then?"; "what was that about?") were also used to prompt the participant to discuss certain points to ensure saturation of specific concepts. Interview gateways (Shea, 1988) were used as a means of moving between significant points, and to return to significant points, if further elaboration was required. Intermittently throughout the interviews, the researcher would give a brief synopsis of their interpretation of what the participant had been discussing to aid clarification and to correct if necessary. This was also done at the end of the interview as a means of summarizing key points, and as a check point to gather additional data if something new had emerged for the participant during the interview process.

Two problems were encountered with the data collection. The first problem related to the digital recorder not set to the correct file and this meant that the first 15 minutes of one interview were lost. Notes were taken during this time, and the participant was accommodating in terms of reviewing the part of the interview that was lost (relating to the accident that led to his disability, and treatment in hospital). The second problem encountered was again related to technical difficulties with the digital recorder. This time the recorder was not set to recording and this was not detected as this interview was held in a café and there was considerable background noise. Fortunately this participant was very articulate and notes were able to be taken directly after the interview that captured the significant factors around her ability to cope with on-going social stressors. This unfortunately meant that direct quotes from this interview were not able to be incorporated into the results section.

**- The data collection – note taking**

Notes were taken during this period to record observations at the time of telephone contact or following the interviews. These were brief notations as to comments that the contact person had made about the participant, and observations made that were not able to be recorded as part of the interview. These included observations with regard to reticence or reservation about being part of the study (eg " I don't know why they think I am resilient"), affect and behaviour (heightened levels of emotion, becoming tearful at certain points), and interruptions to the flow of the interview.

**- The data management**

Transcripts were made of each interview by the researcher in the weeks following each interview. During this process, if listening to the recording prompted recall to a pertinent observation, then a notation was made within the transcript and highlighted as a means of ensuring that this remained separate to the actual interview. Following each transcription, a copy of the document was printed and read through to gain an increased sense of familiarity. The transcripts were also entered into the data management programme of NVivo, and coded into free nodes to increase the sense of familiarity with the material. This process separated the data into 29 free nodes, and 4 groups of nodes were identified

from this process. Analysis of the free codes led to the development of a prototypical model with groupings relating to pathways to resilience, coping strategies, belief systems and issues around the self. Free nodes outside of these 4 groups related to personality characteristics of the participants, comments pertaining to empathy and feeling loved, and comments that were noted to be paradoxical in nature.

Following this process, the transcripts were reviewed again using the NVivo programme. The thematic groups that had been detected during the first and second review were incorporated into a system involving tree nodes and this included seven main branches – pathways to resilience, belonging (to group), coping strategies (containing and chunking), paradoxes, personality characteristics, self beliefs and world view. Additional codes were then added to these main seven branches and this resulted in forty smaller branches. This process led to a heightened familiarity with the interview data, and also to some frustration that coding in this manner led to a forced choice scenario at times. Reflection on this process led to the conclusion that each case (interview transcript) was being coded to fit the researcher's model and in doing so losing some of the integrity of the data.

This led to the decision to review the data one further time and to revert back to a more traditional handling of the data through the process of delineation (Hycner, 1985). This was achieved through reading each transcript and using a cut and past system to pull out key passages in the transcript. The delineation process undertaken involved a two column system, and the pulling out of key phrases and comments from within the selected passages (see sample in Appendix E). This process was then followed by a review of the delineation section and noting by hand themes that emerged in each transcript. At this point brief summaries of each case were made by hand, noting repetitive themes and observations about the presentation of the participant, the interview and emerging themes. These notations were then re-grouped using the Microsoft Word Outline system, and this resulted into "clustering units of relevant meanings" case by case (see sample in Appendix F). This led to each transcript or case being assessed one by one, and the result that the emerging themes were unique to each case. At this point the delineation scripts

were reviewed by an independent judge and their comments incorporated into the overall analysis of the data.

## IV- Research Results

### - Thematic analysis

During the delineation process, similarities were observed in each case but it was felt that this process preserved the individuality and uniqueness of each interview. This resulted in an analysis of the data that was both more open to inspection and substantial in content overall. Reviewing the product of this process led to the drawing up of a matrix of themes (see Table 2, p 112), and the identification of themes that were consistent, dominant and intermittent. Themes that were consistent were evident to varying degrees in each case, and included similarities across world and self views, acceptance of what had happened and the responsibility to manage this, and personality style that displayed determination and endurance. Themes that were dominant were explicit across most cases and inferred on the basis of comments made by the participants during the interviews in the remainder of cases. Dominant themes included the importance of optimism and being positive, a sense of humility and selflessness, a non-judgemental appraisal style, valuing what one has above what one does not have, the importance of belonging and being part of a social group, the ability to remain open and flexible, and the qualities of empathy and a sense of humour. Intermittent themes were those that were evident in some cases only and these included presenting a coping persona to the world, issues relating to the concept of control, self reliance and intuition / gut reaction.

### - Consistent themes – world view

The interview transcripts of each participant revealed a consistent belief system pertaining to the world and their own self. The belief with regard to the world reflected an underlying philosophy that they did not expect the world to always be kind and benign, and an understanding that sometimes bad things do happen and that is a fact of life. Acceptance of events was an inherent element of this belief system, with participants displaying skill at determining aspects of stressful events that they could not control and accepting these, as compared to those aspects that they could influence and self manage.

One participant revealed this life philosophy several times throughout the interview with statements such as "I think about life challenges, umm, you know they are part of life and some people get more of it over a period of time, I don't think anyone escapes"  and "I guess, umm, I feel absolutely fine with people being flattened, its absolutely fine to be flattened, its normal".

This essential belief system was somewhat pragmatically put by a second participant as "I think it is just life experiences  …  shit happens, move on  …  just you know make the most of it". A third participant stated that following events in her life that deeply affected her family that she "lost (my) innocence" and she acknowledged the vagaries of life in that "there could be a catastrophe happening somewhere for either of us (at this moment), or for any of these people, that you can no longer take life for granted … ".  A fourth participant reflected on changes in her belief system in that "now I am a bit more like this – expect the unexpected, life is going to do that  …  and to expect anything else is just naïve and I suspect that I was just naïve (in the past) not to know".  Another participant reflected her belief through the joke about how to make God laugh (with the answer being to make plans), and the quiet laughter following this suggested her acceptance that higher powers may at times be at work against what one might desire.

**Consistent themes – self view**

The philosophy that the world may not always operate in a benign and kindly fashion was accompanied by a self belief system that reflected a sense of modesty and humility in participants, and the absence of ego centricity. Participants frequently made comments indicating that they perceived themselves to be very minor players in the wider universe and they described themselves as being "just a worker ant", "a drone bee", "just one of the threads", and other such terms that reflected a humble belief in their position in the wider scheme of things. The ability to remain resilient in the face of adversity that set them apart from their peers was not perceived by the participants as particularly special and their responses to having been selected by their peers for the study was frequently one of disbelief and self effacement. Many of the comments could be literally interpreted

as self denigration but these comments were generally accompanied by amusement and a quietly contained self confidence that discounted this judgement.

An example of this modesty was the participant who had been through a physically and emotionally draining experience involving infertility and the premature births of two children. She said "my experiences were particularly intense but I don't think that they were especially unusual when you look at everybody's lives over the whole of their lifespan". This was followed with the minimalist comment of "I survived, I think (laughter)" and no aggrandizement evident beyond this simple statement. Later comments made by this participant more poignantly revealed the harrowing nature of her experience through her commentary "I felt that a terrible experience, it kinda cleans you out, you know creates space where there was no space before, it burns you … internally, it changes your structure, the structure of the personality I think, the structure of the self because its so, it tears you apart … I did feel that I had sort of been through the fire and sort of hollowed out and that I was a bit of a shell, I felt like a shell afterwards, like my self was different".

The two participants who survived accidents resulting in major disabilities described these events as if they were mere everyday occurrences, and that their response to these events was nothing out of the ordinary. The first participant described how he responded to his accident in a matter of fact way "OK, this has happened, but there are plenty of ways to live your life", and the second participant described the process of rehabilitation as a "bit of a learning curve".  What is remarkable about how these participants responded to their severe injuries is that the first participant whose injuries resulted in tetraplegia recovered and was discharged from hospital within a record setting five month period, and the second participant who lost his leg and continues to suffer chronic pain taught himself to walk and returned to his previous truck / digger driving position after being told that he would never walk or work again. Neither applauded what they had achieved as extraordinary, and both minimized what they had endured during the process of rehabilitation. Seven weeks of traction from holding the head and neck still was

described as "great for personal growth" and excruciating pain from a crushed limb was reported as being "a bit of a tickle".

In a similar vein, the participants who had experienced sexual and emotional abuse during childhood described what had happened to them in terms that belied the reality of the experience. One participant stated that as a child "there has always been a lot to cope with from the beginning" and she later indicated that her early childhood was spent in a dysfunctional family with cumulative incidents of sexual abuse within a context of emotional neglect. Another participant spoke about "things that happened in my childhood which I would rather not have to look back and think about" and she later referred to her exposure to sexual abuse at the hands of her father and an invalidating home environment. Both participants referred to these experiences in a matter of fact manner that was accepting of the reality, and minimizing the courage required to find their way through these experiences in a manner that has left them relatively happy and whole.

**Consistent themes – non victim perspective**

Each and every one of the participants denied that they were victims of their experiences, and each maintained a belief that it was important to take responsibility for managing what had happened to them and to find the best way forward. With this non victim stance there was also a pervasive belief in taking responsibility for ones self and there was no real sense of entitlement that the world meet their needs. The participant who within a short space of time not only suffered a tragic loss in her family to then have to cope with undergoing treatment for cancer stated that "I have just been bobbing around in a sea of fate. I do feel a bit unlucky, fated that these things happen. Yeah, but I don't like to see myself as a victim … if I believe that I am a victim, if I believe that I am one of the flies getting my wings ripped off by fate then I am not going to get out of bed in the morning. And it may be that I am a victim, a fly, but if I tell myself that then that is what I am going to be. If I don't tell myself that then I am not.". This statement was followed by "if you consistently see the blackness then you will end up going down that road and by the time you get down that road it is not even a conscious choice … to see the good in them

(the little things) to keep you in a state that is strong and positive and so you are more likely to not go down that road".

A second participant who suffers from a serious medical condition stated that the situation is "there and you sort of accept it and you work out the best way to go on from there and get around it". From his comments it appeared that this belief system helped him to "do some problem solving and find a way, or the way, and get on as best you can" and "I don't say I wasn't looking after myself before but I am more aware … probably more aware of a lot of things within myself and where I am going and things like that". For this participant the path forward was to prepare himself mentally and physically for the forthcoming organ transplant operation through being clear about "what I can still do, and to make sure that I do it". There was no expectation that life should be any different from what it was, and there was an acceptance that if the organ transplant was not successful that he would have to accept the reality of home dialysis.

**Consistent themes – determination**

In addition to the non victim stance, all participants displayed aspects of determination as a key resource in helping them when faced with adversity. Some of the participants identified determination as a personality characteristic that they could draw on, and when determination was discussed in this manner it was reported as being a persistent character trait over time ("I was a stubborn boy, determined I suppose"). Determination was also frequently discussed directly, as in the comments like "determination, I keep trying until I do achieve a certain amount of success"; "determination to manage whatever life could throw at you"; and "you are more determined to get out and do those things that you can". Indirect references to the evidence of determination as a personality characteristic were made within the context of both beliefs and cognitions ("I believe anyone can do anything … anyone can achieve anything if they really put their mind to it") or within the context of behaviour ("push yourself through").

In other cases the participants described behaviour that reflected the capacity for endurance and at other times their comments reflected the capacity to be stoic. Comments

indicating the capacity for endurance suggested that the participant would persist through particularly difficult times by expending extra effort, such as in the comment "I haven't curled up and given up" and "I will persevere, I wouldn't like to think that I hadn't explored all the possibilities". Stoic behaviour was generally reported in terms of learnt behavior from family role models as in "very staunch Protestant Scots" and "I think both my parents are quite tough".

Will power was also identified as being important at times at helping participants to get through periods that were acutely stressful. Will power was not spontaneously commented on during the interviews but elias cited in response to prompts when the participant was describing keeping on going when there were few rewards or gains for them ("I would just talk myself out of it and get on with it I suppose … that is the word, will power isn't it … I just did it"). The participant that was advised that he would not walk or work following the accident that had crushed his leg reported undertaking his own rehabilitation with great fortitude and will power. Throughout the interview he referred to his belief at the time as "if you could do it before you can still do it now" and his confidence in what he believed he could achieve despite what he had been told by medical professionals ("you know you can").

**Consistent themes – chunking and containment strategies**

To varying degrees the participants also discussed strategies that they used to manage difficult times in terms of containing the situation. This might mean containing the situation in terms of breaking the whole situation into smaller chunks that were more manageable, and using goal setting and rewards as a means of maintaining motivation or containing negative affect to help focus attention and action. One participant reported containing problems through a decisive problem solving strategy, knowing that certain types of problems could be dealt with effectively if they were "doable and solvable". This participant reported that she had to learn however that the challenges she faced with her son's developmental disability were not "doable and solvable" and that the process of accepting this was important. In saying this however, she also reported finding out what she could do to help her son using her problem solving strategy and working

therapeutically with him. The participant whose leg was crushed and later amputated as a result of a work accident identified his approach to rehabilitation as being very goal oriented. He reported analyzing how best to proceed with different tasks such as learning how to make a cup of coffee to climbing back into the cab of his digger.

Frequently the strategies were problem focused and action oriented, but at other times they were described as having an emotional focus. The participant faced with family tragedy questioned if she had been in denial following this very difficult period in her life and reported that she "just put that stuff in a cupboard and jammed the door shut and didn't deal with it particularly". An explanation as to this avoidant coping response came shortly after this statement whereby she also stated that "I could only deal with so much and I have (had) to measure, eke it out somehow" and that six years later she was able to deal with the emotional demands that she has had to face over that time. Two participants that were facing current and on-going family demands also reported having strategies that contained emotional distress. The first described this process as " … the emotions? I think they are just contained until I am hanging out the washing and then I scream and shout", and the second reported "whatever you are feeling, you have got to put that under wraps, and then later on, having a good cry in the shower".

Chunking time as a means of coping was also evident from the commentary of three of the participants. The participant who spent seven weeks in traction said that he "would only focus on a very short distance in front … goal setting, but I set myself manageable chunks" In a similar vein, the participant who was coping with the on-going demands of caring for a sibling's developmentally delayed daughter stated that she will "take a deep breath, and (I will) take a deep breath and I say - you can do this, you will do this, and tomorrow morning will come very quickly and it will be over – ". The third participant reported that when on enforced bed rest during her pregnancy stated that "time becomes very small" and that "life becomes very simple … very reduced". A fourth participant also described a different dimension to the perception of time when her daughter was critically ill following a car accident in that life became automated and time irrelevant as she became "just so focused on getting on, doing the best by your kids".

These strategies were identified as either a part of a very conscious decision making process, or as a more subconscious response, to the challenge of coping. One participant very clearly articulated this when she stated "Never ever for very long look at it as a whole big awful thing … the main thing is to break everything down into steps …  I break off pieces as small as I need to be able to cope". She described this as "a very conscious process of doing research, creating a structure, backing that up with evidence that is a solid structure" when dealing with more concrete problems, and on reflection she acknowledged that this is what she does "unconsciously" at a social and emotional level as well. This process was summarized as "damage control …  don't let the debris spread too far and wide, you keep it as close as you can". A second participant described specific coping responses aimed to contain heightened levels of distress as "coping mechanisms that come into play …  making sure that I don't make any difficult work decisions on those days, those decisions get left for the next day".

**- Dominant themes – absence of blaming**

Many of the interviews with the participants were striking in that their comments did not reflect resentment or bitterness when discussing the negative events that had major impacts upon their lives and well-being. Their explanations as to what happened at the time of these events did not lead to comments that were blaming other than an owning of self responsibility. A striking example of this came from the participant who fell when rock climbing and became a tetraplegic. He stated that his companion "had made three fundamental mistakes and ah, umm, from the very beginning I just took responsibility for the whole thing, never had any anger or blame towards him, it was just a mistake and essentially I always, I think, I take responsibility for my life and my decisions." In making this statement he also acknowledged that he had things on his mind the morning of the accident and that he may not have been concentrating on what he was doing 100 percent. He also took responsibility for himself after the accident and stated that he had choices, and that he "could choose to be miserable or he could choose to do the best I could and have a really good life …  that it was up to me". The participant whose leg was crushed at work, leading to its amputation and chronic pain, stated that "it was just

one of those days at work" and "you can't put it on anyone". During the interview he stated that there was no-one and nothing to blame, and throughout the interview he referred to what he has now as opposed to what he has lost.

Further evidence of this ability to not blame and judge came from the two participants who had been the victims of childhood sexual abuse. The first participant acknowledged that her father had been abusive to her, and that this violation had imposed limitations on her self development, but she was also able to acknowledge that she had gained in terms of becoming a survivor and knowing that she can be strong and resourceful. The second participant who had been exposed to childhood sexual abuse and later physical abuse in her marriage stated that following a life changing experience as an adult that she completely changed her view of the world and herself. She stated that "one of the wonderful effects of not having judgement and letting go is that you give other people permission to mess up as much as you do" and that it "just frees everything up". Her comments about her marriage were also forgiving in that she was able to acknowledge her contribution to the dynamics of the relationship in a manner that suggested realistic appraisal.

**Dominant themes – optimism and hope**

Optimism and hope, and a positive attitude to life, were evident throughout the interviews to varying degrees. This personal style and attitude presented in direct statements made by the participants, and indirectly through the use of humour and laughter. One of the participants stated that " having a positive outlook on life" and being "essentially a positive person" helps get through the difficult times, as does having a "faith in life". A second participant reported the importance in faith in maintaining optimism and hope, and stated that "having a basic faith in life (at times of stress) means that emotionally this is hard but that it is going to get better". Many of the participants also expressed gratitude as to what they have as opposed to what they don't have, and one reported "celebrating the ordinary" as a means of coping with the difficult. A second participant stated that she had learnt that it was important to "to notice the very simple things in the life I live … to see the good in them … to keep you in a state that is strong and positive".

The attitude one had at times of stress was recognized as being an important asset during stressful times. The participant who lost his leg in the work accident stated that it is important to appreciate "there is always a smiley bit somewhere" and "there is always a positive side to something. It is just the way you look at it … turn right instead of left, you can always deal with stuff it you think … you know that you can get through it". The participant that is facing an organ transplant expressed a positive attitude to his condition and stated that he was "lucky" that it was an inherited disease - "I knew what was happening and what was going to happen, and what the outlook was". He stressed a number of times that "there are too many good things in life to do, things to get on with" and that "moping and feeling sad for yourself don't help". These two participants, and the participant who became a tetraplegic, reported on the observations that they had made of others with similar conditions that were not optimistic and positive in their attitude, and they expressed concern as to how this would impede their ability to cope with their illness.

**Dominant themes – gratitude**

The interview transcripts of the participants also revealed a deep sense of gratitude for what they had gained from the difficulties they had faced. One participant spoke of her appreciation of what it means to be alive "I am really grateful to be alive … I think life is fantastic … you do value life differently". A second participant reported that he believed he was a "bit stronger in mental attitude and things" and that he was "more aware of a lot of things in myself … where I am going and things like that … more aware of who I am and where I am at in life". He also reported that he was more conscious that "how precious life is to preserve it" and the impression was gained that this acted as a motivator to enjoy life. A further participant whose life was endangered commented that "I wake up every morning smiling because I have woken up … I just woke up this morning happy, its fun … if you get home for tea, well that's great". Other participants commented that the small things in life become more meaningful ("celebrate what you can"), and that this shift in mental attitude has had a heartening effect on their lives.

**Dominant themes – humour**

During the interviews, the humour and laughter was frequently part of the process and reported as a key coping strategy employed by the participants in their daily lives. Humour was acknowledged directly as an important part of life by (n =10) of the participants with comments such as the importance of "an acute sense of humour", the need to "be positive, you've got to be able to stay in gear, and laugh", and the belief that "I think you need to have a sense of humour" to get by. The participant that became a tetraplegic following the climbing accident stated that he and the other disabled people he works with use humour to confront the reality of their disabilities on an everyday basis, and that in coping he believes that it is important looking "for ways to make fun of what had happened". As mentioned previously, much of the humour exhibited by the participants was self effacing, and attuned to minimizing the negativity of the events without minimizing the event.

**Dominant themes – openness and flexibility**

Several of the participants described coping with the traumatic and demanding events in their lives with a remarkable degree of openness and flexibility. The participant that taught himself to walk again following the amputation of his leg and the on-going medical complications described approaching his rehabilitation in a methodical and determined manner that revealed a capacity to be analytical and remain open to all possibilities. He described his approach as (before you have a major accident) as "Plan A, which is what you used to do, so you can't do that so you come up with Plan B. Plan B you can guarantee is going to fail so you actually have to sit back and come up with another way of doing it that suits your ability to deal with your physical problems or whatever, and you have always got to have three plans if not four to look at things". Understating the reality he concluded that his self directed rehabilitation was "all a learning thing" based on the belief that "there is always a way around it".

The ability to be analytical and open to solutions was also very evident in the story of the participant who had been in a physically abusive relationship when she described leaving

this relationship and establishing a new life for herself and her children. Her description of how she coped with this emphasized deconstructing the problem into manageable units ("break everything down into chunks"), exploring the possibilities ("doing research"), choosing an option ("creating a structure"), checking ("backing it up with evidence") and re-checking the option ("fine tuning it") before acting ("having the freedom to work within it"). She acknowledged that she works through this process in a very independent manner but that she also consults with others to hear what their opinion is to the chosen solution. Consulting others, however, is not seeking approval as the participant clearly stated that she remains responsible for her own decision making – "I need to take responsibility for it but at the same time I depend on them to help me work through the glitches in my thinking". This process is a classic problem solving strategy and allows the participant to both actively and creatively find solutions to what others might experience as overwhelming.

Other participants also revealed a flexible and open approach to their individual life crises when describing what happened and how they responded to the challenge. The participant whose daughter was critically injured in a car accident developed an individual rehabilitation plan involving the purchase of a business that her daughter could operate even though cognitively impaired. The participant who cared for her son with a developmental disability did not accept remaining passive but reported searching for information that could help her therapeutically work with her son. Being open to new ideas to help her son was an important part of the process of learning to accept his disability whilst helping her to remain empowered and to feel as though she were actively managing their situation. A third participant referred to her general approach to problems as being characterized as one of persistence but she also described an openness and flexibility within this in that she "wouldn't like to think that I hadn't explored all the possibilities … that I hadn't done my best".

**Dominant themes – empathy and belonging**
The transcripts of many of the participants also revealed their empathy towards others, and the importance of belonging to their family and social group. Empathy was

frequently expressed for others in more difficult positions – "I could be a poor women with more children", "sure there are things that I don't have but there are far more things that I do have", "there are always people with hugely more difficult problems", "I was one of the lucky ones";   "(compared to X) I was in the privileged position of having a partner and actually having family …"). One participant revealed that her own difficulties has made her so much more aware of what it means to have emotional problems when she said "it has changed me hugely in that I am a lot more compassionate, it sounds like blowing your own trumpet but a lot more compassionate. It's a whole different world opened up  …  like I would have known that life is harder for them but I wouldn't have felt it so much".

The three male participants expressed their empathy for others from a different perspective in that they were aware of what was missing in others and how this added to their suffering. The participant with a serious physical condition who was facing an organ transplant made the observation that fellow patients who expressed anger and resentment about their condition were not only experiencing negative emotions but also missing out on opportunities to do the good things ("there are too many good things to do, things to get on with, moping and feeling sorry for yourself don't help"). The participant who lost his leg expressed both empathy and frustration with a fellow patient who had merely broken his leg and lost the opportunity to go skiing that season ("he is not going very far in life with an attitude like that"). The third male participant who became a paraplegic made a general comment on the suffering of others in that "people just get so stressed out about silly things and so the whole stress thing is very contextual really". The tone of these comments was not critical or demeaning, and they were stated as mere observations of the world around with a touch of humour thrown in.

A sense of belonging to family or a social group was also very important to the participants, and at times this was stated explicitly as an important part of life.  The belonging to a supportive social group was for some participants an important part of the coping process. One participant clearly identified herself as part of the family and that consulting with her family is a strategy she actively employs to "partly get their views"

but that also "its joint decision making … I am not alone". The participant who faced a family tragedy followed closely by her own ill health reported that "I go to work, it's a safe place … it is a world that makes me feel good about myself … worthwhile and productive … it is a community for me". A third participant identified himself as being part of a family and that this provided motivation to keep going in that "you are part of the family but you have to be there to keep things coming in so everyone can, they can grow …".

One participant commented that belonging to a family and social group was very significant when coping with the crisis she faced in that "even when you are really frightened and you feel alone … at another level I didn't feel alone, I felt a lot of other people's love around". Another participant who cared for her daughter following a serious car accident commented on belonging in her own community "I know that I am loved … that I am respected" and the help she received to keep on going throughout. She stated that her understanding of the help she received forms the basis of her philosophy of what God is "people were so caring … it was like a cocoon … through that terrible time was like a focused goodness from other people, and to me that is what God is". Of note was that this participant had heightened awareness of, and expressed gratitude for what she had received but at the same time was seemingly not cognizant of her own ability to give generously of herself to others.

**- Intermittent themes – control**
The participants all discussed the importance of managing the difficulties and situations they found themselves in, and the word control was often used within this context. A difference was noted however in the transcripts as to the weighting that was given to the word control as opposed to concepts of self management (internal locus of control) and acceptance of events. The need to maintain control was evident in the transcripts of two of the female participants, both of whom had a history of family dysfunction and abusive relationships during their childhood. The first of these participants spoke about having to be in control to be able to monitor what was happening, and her descriptions of managing her own affect during times of stress were control oriented with references to "pushing"

and "forcing" herself not to become emotional.  The second participant clearly identified control as being important but presented as more insightful as to what this meant to her. This was evident with statements such as "I am in control of me" and "I have to be in control". When asked what the importance of being control meant she was able to identify that this was a protective strategy, "not being hurt, not letting people get to me".

In contrast to these transcripts a third participant, also with a past history of family dysfunction and abuse, referred to the need to be in control as a previous coping strategy. She expressed an awareness of the subtle differences between being a controlled person as opposed to a controlling person. Her comments suggested that in response to a significant life / death event her life she had gained insight and been able to change how she responded to the general vagaries of life. She reported that prior to the significant event that she had "tried to stage manage everything" and that this had felt as if she "had been on the edge of a cliff for my whole life". Following this event she "stepped out and … has been floating ever since", and that she made a choice to learn what happens happens … just letting go". She reported that now she is "not trying to make anything happen … the most simple approach imaginable was just doing it" and that the gains have been "mental energy" as "before I was completely worn out".

**Intermittent themes – "persona"**

Five of the female participants referred to the feeling that they present a false persona to the world or bemusement as to how they perceive themselves differently from the rest of the world. Comments made by two participants that had experienced abusive relationships during their childhood included "I've always felt that people seem to think that I am a person that copes … but yet I have always been afraid that I will not cope"; "that view other people have of me is not necessarily the view that I have of myself in that situation";  "I give the impression that I am OK … its not always what you see is what you get"; "I am probably really good at putting out what I would like other people to see".  These comments within the context of the whole interview suggested that these two participants felt that this presentation might crumble at any time and that the underlying truth would be revealed.

In contrast to this, the comments of the other three participants suggested that they did believe that they had the capacity to cope but that there was not a constancy to this and that at some times it felt more fragile than others. These participants were stoic in their presentation, and they gave the impression that their capacity for endurance was a core feature of their resilience. The comments they made about presenting a false persona included "I am very good at adopting a façade", "I feel like a fraud" and "I think I possibly present a fairly positive outlook … that is why I feel a bit of a fraud". Beyond these comments however, these three participants presented as confident and resourceful, and were able to acknowledge their strengths in the interview. In addition to this, their comments about having a persona played less of a role than the first two participants.

**Intermittent themes – self reliance**

Self reliance was reported as important to the two participants from dysfunctional backgrounds who also reported fears that their persona as someone who copes might crumple. One of the participants revealed a sense of isolation in her comments that "you just have to pick yourself up and get on with it because no-one else is going to do it for you". This statement, amongst others about her family, reveals more about the role the participant learnt within the family as the one who protects and takes care of everyone. The second participant also reported taking on a similar role in the family in the past in terms of "taking it all on my own shoulders" and "that I have always found it hard to ask for help". Once again this type of response is more than likely to reflect the impact of past family dysfunctional relationships as it is not an uncommon response to observe in those with this type of background.

The other participants also gave the impression of being independent and self reliant but there was a lesser sense that the majority of participants were rigid in their adherence to this. In contrast many of the other participants reported actively seeking the input and support of others, and saw this as a healthy thing to do. This was identified by one participant as "interdependence", and their comments did not suggest that seeking the support of others negated one's own self responsibility ("I believe strongly in taking

responsibility, you always have to start with yourself first don't you?"). Their commentaries suggested an ease in their relationships with others, and that they did not experience anxiety that others were overly dependent on them or that others might fail them ("I have always had … people fairly close to me, family or partner, friends, so that is really helpful").

### Intermittent themes – intuition and gut knowing

Several participants reported that they frequently made decisions based on intuition and "gut knowing". When asked to explain what this meant in more detail they were unable to do so other than this form of response being "instinctive" or "knowing". The participant who taught himself to walk again reported that his motivation to keep pushing himself was on the basis of "just knowing" that he could, and the participant who faced the challenge of rehabilitating her daughter with a traumatic brain injury stated that she just "knew" what she had to do and did it. This participant also reported experiencing prescience whereby she knew prior to the accident that it was about to happen. Another participant commented that she "always knew" that the relationship she was in was not healthy as her sleep was disturbed when with her ex partner, and she explained that she had ignored this intuition as she desperately wanted to have a family. She reported that later on, after exploring all possibilities, she had accepted the knowledge that the relationship was unhealthy and ended it.

### - Gender differences

An interesting pattern that emerged during the process of data collection and analysis was the fact that all the female participants acknowledged that their ability to be resilient and cope was not constant over time. Some of the female participants (n=5) reported suffering from specific mental health problems, such as depressive disorders or anxiety disorders, and others referred to periods of heightened emotional distress. For some of the female participants their ability to cope fluctuated over relatively short periods during periods of stress ("it depends on which day of the week. I think that some days it is a huge façade, other days I think it is genuine, what is really there" and "I had to fight the fear that I had every time that (the lawyer) rang me up on the phone, I would be so bad …" ). Other

female participants reported periods of persistent low mood ("I have felt at times that I am really down, as if I just don't want to go on … I did go on medication, um, and then I had another six month stint that I went back on it …" "I was depressed for um, well it was a good year afterwards, and I did go on anti depressants") or heightened levels of anxiety ("I have had two panic attacks and that is a totally humbling experience as you kinda stand outside of yourself and watch everything fall to bits and I am almost powerless to stop it" and "I do suffer from anxiety, my father does too"). The female participants spoke about their periods of emotional distress with ease, and in doing so acknowledging that the emotional ups and downs were just part of the experience and life in general.

The male participants, on the other hand, described their experiences in a manner that was very matter of fact and any discussion of emotions was less verbose and more subdued. The impression was gained that the male participants did not experience the same degree of variation in their ability to cope with the demands that life presented them with, and that with this there was less richness and depth in the experience. The participant that lost a leg as a result of a work accident spoke of feeling "just insecure" the first two weeks out of hospital and that at times he gets "frustrated, not as in self pity" at what he can no longer do. Prompting to discuss these experiences in more detail did not elicit further depth, and his partner who was present at the interview stated that he generally did not elaborate on his feelings or emotional state. The participant that became a paraplegic following the climbing accident spoke that "when negative emotions come up, I can just about see how I can go on a different path, and so I drag myself back … it never really gets to a stage where it is a problem". The third male participant who was facing an organ transplant never referred to emotions other than feeling " a bit overwhelmed" by the fact that his brother had offered to donate a kidney.

**- Pathways to resilience**

Three pathways to the development of resilience became evident on reading the transcripts. The first pathway related to probable genetic and temperamental factors in that the participants identified the characteristic of determination as being an innate facet

of their personality (as discussed above). In addition to this, the participants also described coping with life demands with other personality factors including being open to novelty, flexible, analytical and methodical, and to be "doers" rather than passive or avoidant in their approach style. They displayed a propensity to being externally focused in that they had a keenness to look outside of themselves and an interest in the world around them. Many of the participants also explicitly stated the importance of laughter and humour in their daily life, and in coping with stressful events. The statement was made by one participant that "humour is important … when you choose to cry all you are going to get is more to cry about".

The second pathway that was identified by some of the participants pertained to the role models and belief systems they had been exposed to during their childhood. Role models were clearly identified by some participants, such as "she was a strong female role model, I think some of that stuff rubbed off" and "I think both my parents are quite tough". Comments were made that "being a victim is quite contrary to the Protestant conservative thing" and that the family approach to life was to "make the most of what you have got and see if you can, see if you can do a wee bit better at the same time". Other participants commented on being actively encouraged, or even forced, into coping as a child by their parents comments depicting this include "conditioned, right from the start you are responsible" and "she (mother) was too busy making sure that I was capable of looking after everybody else". Participants also stated that they believe that they have become resilient as they have had the opportunity to practice coping, and they described this as "just practice or repetitive exposure to, maybe too much exposure to these situations. I think it is just practice. I think so, developed some sort of coping behaviour". One participant believed that he had developed his resilience through physical training and the skills learnt through endurance competitions and activities in challenging environments.

The third pathway identified by participants was the development of particular insights in response to a significant event. One participant described the insight she had gained when being rushed to hospital when suffering from an anaphylactic reaction – "an event that

happened, it completely changed my view of the world … I saw how mean I had been to myself and that's really strong message you know, just go with it. Just go with it because its all going to be fine". She reported that following this event there was a significant change in how she appraised and responded to the different problems that she had been facing in life, and that life was much easier ("so after all those years of struggles, the most simple process imaginable was just doing it"). A second participant made the comment that as a result of the family crisis that she faced that "you can no longer take life for granted or a sense of security" and a third made the comment that "I think I was always a goody miss two shoes, calm and rational … whereas now I am a bit more like this, expect the unexpected". These shifts in perception appeared to offer the participants a new perspective and approach to the problems that life has thrown them, and life in general.

**- A note on qualitative differences to resilience**

All the participants invited to join the study had been identified by the peers as being resilient in their functioning, and each had stories to tell that revealed a capacity to endure difficult times in their lives. For some of these participants, the difficult times had occurred earlier in their lives and the crisis was over, for others the difficult times had passed but they had been left with the impact of these times to cope with on a daily basis, and others were still in the process of having to cope with and endure difficult times on an on-going basis. The type of difficult times also differed in that some participants reported single incidents as compared to other participants who reported single incidents that had on-going impact, and then other participants reporting on-going and cumulative social stressors that ebbed and flowed in intensity but remained constant.

Actively listening to the participants during all stages of the data collection and analysis led to the observation that the experience of resilience differed across participants. The experiences of all participants were in their own way extraordinary, but the telling of the story by some of the participants was exquisite. The differences noted were subtle in how they described and explained what had happened, and their accounts of what had passed in their lives often held a simple curiosity about all that had happened. The voices of

these participants held vigor and there was spontaneity in their laughter, and an absence of self consciousness in their manner when telling their stories. Bitterness, anger and other negative emotions were talked about as part of the experience, and these emotions had clearly been felt but they did not linger and continue into the present. The impression gained was that these participants were responding to the moment yet retaining coherence across time, and that neither ego nor identity held much sway.

The stories of another group of participants held a different quality. They too were able to relay their experiences with ease and without rancor but the palpability of the experience did not impress in the same way. Their stories brought forth admiration and amazement, and often amusement in the way the stories were told, but the words were often weighted with the reality of the experience. There was a stolidity to the story, a pedantic need to not stray too far from the stating what happened, and a duty to take responsibility. With this group of story tellers affect was sometimes present and sometimes not, and the impression was gained that for these participants emotions were more burdensome. Bitterness and resentment were commented on as emotions that may have been experienced in the past but not held on to. Self consciousness was more prominent with this group, and although their self view remained humble it seemed to be more self effacing than with the group described above.

The stories of the remaining group of participants was different yet again in that the stories were characterized by stoicism and endurance was very much felt every step of the way. Their resilience was characterized by stamina, and the will power to keep going forth even though high levels of anxiety might be exerting a pull to stay back. The stories told displayed affect but this was very much contained, and the impression was gained that emotions were deemed to be potentially dangerous and uncontrollable. With these participants, self consciousness was again evident and humility presented as self negation in terms of the self deemed unworthy of any praise or recognition. Inconsistencies in the stories of the past were noted at times, and one transcription revealed a pattern whereby the words leading towards distressing experiences were not actually uttered. Interestingly, the stories of this group of participants did not meet the categories in Grices's

Cooperative Principle of conversation (quality, quantity, relation and manner) (Grice, 1989).

The intention of this study was to research the subjective experience of resilience as opposed to identifying different types of resilience, and it was interesting to note that patterns were observed across the data that gave resonance as to the experience of resilience for all of the subjects. However, other patterns were also noted (as above) relating to the quality of the experience of resilience in the story telling but this study did not allow for linguistic analysis to explore this in depth. Searching for basic patterns that might explain this phenomenon in the interview data did not yield any distinctive characteristic in terms of frequency or type of stressor, education, spiritual beliefs, mental health or general well being, and this study offers no answers as to what this might mean. It is anticipated that further research specifically addressing this would be fascinating and enlightening as to what this might add to the understanding of the subjective experience of resilience.

| Participant | Age group | Education | Work place | Stressor | Time frame |
|---|---|---|---|---|---|
| F1 | 45-50 | Tertiary | Health | Health | Past |
| F2 | 45-50 | Secondary | Business | Psychosocial | Ongoing |
| F3 | 50-55 | Tertiary | Health | Psychosocial | Ongoing |
| F4 | 50-55 | Secondary | Business | Psychosocial | Past |
| F5 | 35-40 | Tertiary | Education | Psychosocial | Past |
| M1 | 40-45 | Secondary | Manual | Health | Ongoing |
| M2 | 35-40 | Secondary | Manual | Trauma, disability | Ongoing |
| F6 | 45-50 | Tertiary | Business | Psychosocial | Past |
| F7 | 45-50 | Tertiary | Business | Psychosocial | Past |
| F8 | 50-55 | Tertiary | Education | Trauma, health | Past |
| M3 | 40-45 | Tertiary | Education | Trauma, disability | Ongoing |
| F9 | 55-60 | Tertiary | Health | Psychosocial | Past |
| F10 | 50-55 | Tertiary | Health | Psychosocial | Past |

**Table 1: Participant basic demographic details and type of stressor (F = female; M = male).**

| Participant | World view | Self view | Non victim stance | Determi-nation | Chunk and contain | No blaming | Optimism and belong | Gratitude | Humour | Open and flexible | Empathy and belong | No control needs | Persona (not reported) | No need self reliance | Intuition and knowing |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F1 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| F2 | x | x | x | x | x | x |  |  | x | x | x |  |  |  | x |
| F3 | x | x | x | x | x | x | x | x | x | x | x | x |  | x | x |
| F4 | x | x | x | x | x | x | x | x | x | x | x |  |  |  | x |
| F5 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| M1 | x | x | x | x | x | x | x | x |  | x |  | x | x | x | x |
| M2 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| F6 | x | x | x | x | x | x | x | x | x | x | x | x |  | x | x |
| F7 | x | x | x | x | x | x | x | x | x | x | x | x |  | x |  |
| F8 | x | x | x | x | x |  | x | x | x |  | x | x | x | x |  |
| M3 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| F9 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| F10 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

**Table 2: Theme matrix of participants' transcripts (F = female; M = male)**

**Chapter 4 – A Model of Resilience**

**I - Introduction**

In proposing a model of resilience a number of different areas of research will be called upon to play their part. Many of the areas belong to the broad field of neuroscience, but in saying this, more psychologically oriented theories will also be drawn in to explain specific aspects of the model. Wilson (1998, 2001) discusses this in terms of consilience and he refers to an emerging unity of knowledge between the natural and human sciences. This reflects the trend of integrating what is known at a biological level with models derived from a psychological perspective, and a mutual appreciation of their common ground (Damasio, Harrington, Kagan, McEwan, Moss and Shaikh, 2001). With regard to the construct of resilience, recent research in both neurobiology and psychology is reaching the point whereby coherence between the disciplines of neurobiology and psychology is invited. To not attend to both fields would lead to a reduced account and the credibility of the model would be seriously challenged.

The backdrop to this model will draw on the work of Antonio Damasio and his theory on the nature of neural function. Damasio bases much of his work on meticulous observation of individuals who have suffered from localized lesions in the brain, and he has developed a theory emphasizing the role emotions play in homeostasis and decision making (the somatic marker hypothesis). In doing this he has boldly stepped away from conventional approaches in discussing neural function in trying to explain the rapid, dynamic and momentary processes that are constantly responding to stimuli within an open system. In outlining his theory, Damasio (1994, 1999) has deliberately adopted a conversational approach in his writing and this in some ways parallels the capriciousness of the phenomena he is attempting to explain. As such it is not always easy to feel as if one has a firm grasp on the model he puts forward but it is believed that his work is a forerunner for the future and that it provides a platform from which to develop a model of resilience.

The different aspects of this model will by necessity be presented in a linear fashion but it is emphasized that the reality of the human brain and functioning is a dynamic process

with numerous systems operating simultaneously and in synchrony. Constant feedback processes maintain the developing organism in a state of flux until a point of equilibrity is reached, and the product of this interaction over time, and through time, sets the scene for the infant's later development and functioning. To accommodate this constant state of flux, and apparent disorder within the functioning of the human brain, the Dynamic Systems Theory (DST) will be drawn on to extend Damasio's model. This meta-theoretical model is deemed to be the most appropriate as the development of individuals is believed to involve considerable complexity, and to occur within an open system, whereby feedback between the organism and its environment is of vital importance. This model also allows for new structures to emerge over time and this helps explain the instability of resilience that has previously confounded researchers in the area.

An underlying premise to this model is that there are certain "givens" in human development that are derived from the neurobiological basis of the organism. These "givens" do not pre-determine development but they contain a range of potentials for the individual that are activated by experience. This recognizes the inherent variability in human development due to the characteristics of open systems and it is believed this is best explained by DST in terms of self organizing principles. These are defined as "the interaction among system elements, where each element adjusts to other elements, can promote the emergence of highly coherent structures that provide co-ordination for the system elements" (Vallacher, Read and Nowak, 2002, p 266). Understanding self organization and neural development helps to explain how resilience emerges as a characteristic of an individual's functioning, either as part of their early development or later in life, and its temporal instability.

Under girding this model are three further premises that have emerged from the study exploring the subjective experience of resilience. The first premise relates to the capacity individuals have at an innate physiological level to tolerate challenging circumstances and negative events. Resilience is not viewed in terms of a skill that can be learnt and applied when the situation demands, but as an underlying physiological capacity with regard to reactivity to stressful events and speed of recovery when faced with stressful

events. It is believed that these capacities are largely constrained through genetic programming, and that although experience can modify and enhance this to some degree this is only to the point that the inherent biological determinants allow. Experience influences this capacity through the role that it plays in neural development, particularly during the first years of life when the brain goes through critical phases with regard to the development of emotional regulatory function.

This biological constraint is believed to lay the foundation for the second premise relating to the capacity to be adaptive displayed by the individual when faced with challenging circumstances. Being adaptive involves the ability to appraise and respond to situations in a manner that is not merely accommodating or adjusting to the circumstance but functional to the demands of this situation. This ability is not believed to be separate from affect regulation but working along side it in a seamless fashion. This capacity to be adaptive is determined to some degree by the underlying genetic make up of the individual but it is proposed that there is greater potential for the individual to learn these skills both directly and indirectly through experience. This premise concerns the question of whether or not the behavioural response of the individual is effective and efficient in the circumstances as opposed to prescribing potential coping and emotional regulatory strategies.

The third premise relates to belief systems or schemas that facilitate a sense of well-being in spite of the presence of adversity or the impact of adversity in one's life. This model proposes that resilient individuals are buffeted from their experience by the presence of metacognitive scaffolding that attenuates levels of reactivity and promotes recovery whilst at the same time generating adaptive behaviour. With regard to this model, it is believed that this metacognitive scaffolding has a genetic bias in terms of an underlying temperamental disposition but it is also believed that this can be modified as a result of learning during development in childhood, or distinct experiences during the life span. The schemas comprising of this scaffolding pertain to beliefs about self and the world, and although they display relative temporal stability severe or persistent stressors have the potential to threaten their integrity.

In order to present this model with some coherency, a review of pertinent components of Antonio Damasio's work will be presented in the first instance. Following this there will be a brief review of Dynamic Systems Theory and its application to neural development. The model will then be developed using a framework exploring the three premises discussed above, drawing on the work of Damasio and DST. Impingements to resilience and the enhancement of resilient functioning will also be briefly addressed, and the model will be supported by comments made by the research participants and the use of hypothetical case studies. Explaining this type of system on paper, however, is inherently frustrating as the written word remains doggedly sequential and stolid as compared to the fluid function and processes of the brain. To try and counter this, the different aspects will be presented as components but there will be frequent referencing to the dynamic nature of brain function in an attempt to portray the both the immediacy and continuity of what is happening in the brain at any one time.

## II – Damasio's model

Damasio bases his model on the primacy of the body and states that the embodied mind evolved as a means of adaptation and survival (Damasio, 1994). He states that the development of mind gave the organism new opportunities to adapt to the external environment, initially through constructed images of the body proper as it responded to both internal and external stimuli, and then through representations of the outside world in response to changes in the body proper. The body and brain are viewed as "indissociable" and together they act on the environment as an "ensemble" (Damasio, 1994). The overall function of the brain is about being well informed about what is happening in the rest of the body, what is happening within itself and what is happening in the environment so that it can respond appropriately for survival (Damasio, 1994).

### - Homeostasis and adaptive functioning

Inherent in Damasio's model is the need of the organism to maintain biological regulation, or homeostasis. Damasio states that the brain is composed of two different types of neural circuits. The first type of neural circuit is innate, and in tandem with

biochemical processes, its role is to control reflexes, drives and instincts (Damasio, 1994). These neural circuits are genetically preset and maintained in the brain stem and hypothalamus, and some can also be found in the limbic system. The hypothalamus, with the help of the brain stem and the limbic system, regulates the internal milieu through neural and chemical signals arising from the different body systems within the set parameters for survival (Damasio, 1994).

Damasio states that in addition to the preset innate circuits necessary for survival, the human brain also has a second set of systems that are more open to modification. These circuits represent what is learnt as the organism develops from infancy throughout adulthood and they are located in the neocortex and in the limbic system. The process of learning is not independent of the basic bioregulatory systems but a result of neural sculpting in response to interaction of the organism with its environment and the lower brain (brain stem and hypothalamus). Some of these neural circuits will be relatively stable and impervious to change whilst others will be more receptive to new experiences and pliable. Damasio does not discuss the developmental processes that take place in great detail but his comments concur with the concepts of experience-expectant and experience-dependent neural development evident at different phases during development (Curtis and Cicchetti, 2003).

The knowledge, or learning that has taken place, presents in the mind in the form of images. Images are mental patterns and constructions of the brain based directly on neural representations which occur in the early sensory cortices (perceptual) or under the direction of dispositional neural patterns activated elsewhere in the brain (Damasio, 1994). Images can be conscious or unconscious, and Damasio frequently reminds us that it is impossible to attend to all the images being generated at any one time. The flow of images that we are conscious of, and which we denote as our own, are what Damasio identifies as thoughts (Damasio, 1999). Damasio suggests that images are momentarily constructed under the direction of dispositional neural patterns to form memories when required. He defines dispositional representations as "potential patterns of neuron

activity" (Damasio, 1994, p102) that form small ensembles of neurons in convergence zones, and they make up the full respository of both innate and acquired knowledge.

Survival (or adaptation)  depends on the brain having "a balance between circuits whose firing allegiances may change like quicksilver, and circuits that are resistant though not necessarily impervious to change" (Damasio, 1994, p 113). Damasio states that this is necessary in that there is no one brain region that integrates all the different representations activated at one time, and that what seems to happen is that the brain maintains focused activity at the different sites for as long as necessary to make meaningful combinations and decisions (Damasio, 1994). This is called time binding, and for this to occur attention and working memory are essential. The different sensory systems are equipped with local attention and working memory devices, and the prefrontal cortex and some limbic structures are responsible for global attention and working memory (Damasio, 1994). These processes are not only dependent on the neocortex but also lower brain regions responsible for bioregulation.

Damasio (1999) states that over time conditioning or learning takes place that connects virtually every object and experience with a basic affective response. Emotions, and the feelings generated by emotions, are reported as a pervasive element in life, as part of the natural human condition, and fundamental to homeostasis (Damasio, 1999). This is important as the conditioning of the individual to emotional experiences as they go through life compose dispositional representations and convergence zones that will make up part of their responses to similar stimuli in the future. Damasio states that awareness of emotional experiences, through the experience of feelings, empowers the individual with the ability to reflect and plan, and reason. This is significant with regard to resilient functioning and the management of stressors. The common thread throughout Damasio's theory is the interaction between the body, the cortical and subcortical regions of the brain, and the organisms drive to maintain homeostasis and survive. Evidence for this model us currently being accrued (Damasio, Grabowski, Bechara, Damasio, Ponto, Parvizi and Hichwa, 2000).

**- The Somatic Marker Hypothesis**

To facilitate survival and adaptation Damasio has proposed that individuals draw on the input from somatic markers with which to make decisions (Damasio, 1994). Damasio (1994) states that somatic markers are not inherent but are acquired under the control of an internal preference system that consists of innate regulatory dispositions that is oriented to ensure survival. The bias is to avoid pain and to seek pleasure whilst maintaining a functionally balanced biological state. An external set of circumstances also influences the acquisition of somatic markers, and these include situational demands, social norms and conventions. If this process is marred at either a cerebral or experiential level then the somatic markers are not likely to be adaptive, and examples include developmental psychopaths (maladaptive somatic markers) and cases of cerebral injury (the loss of adaptive somatic markers).

The neural network necessary for the acquisition of somatic markers is identified as being situated in the prefrontal cortices. The positioning of the prefrontal cortices means that they receive information about all activities within the mind and body, and factual information from the outside world. An important role of the prefrontal cortices involves receiving signals from the sensory regions (whereby the images that make up thoughts are formed and where body states are continuously represented), and from neuro-transmitter nuclei situated in the subcortical regions. The function of the prefrontal cortices is to make representations of real life experiences, and to establish dispositional networks of these representations. These dispositional representations are deposited in convergence zones, and this enables categorization of life experience from a personal perspective to be utilized during decision making. In addition to the above functions the prefrontal cortices are also directly connected to motor and chemical response avenues (Damasio, 1994).

Damasio (1994) discusses the importance of the somatic marker mechanism operating covertly outside of consciousness. When the somatic marker mechanism operates outside of consciousness that rather than a perceptible body state being produced that an 'as if' process occurs. In response to this the regulatory neural circuits located in the brain are

inhibited, and that this in turn mediates appetitive or approach behaviours. This is hypothesized as not only reducing the chances of making a poor decision but also offering the individual the opportunity of making a more appropriate decision. Damasio suggests that this process is what is called intuition, "the mysterious mechanism by which we arrive at the solution of a problem *without* reasoning toward it" (Damasio, 1994, p 188). He suggests that this forms the basis of creativity and invention, and instinctual behaviour evident in the natural world. He also adds that somatic marker mechanisms are useful in the personal and social worlds to cope with uncertainties and complexities of problems that we face everyday of our lives.

Damasio acknowledges that although emotions are necessary to decision making that they are not sufficient, and that they can be "benefical and pernicious" at the same time (Damasio, 1994, p 194). Good decision making, albeit via somatic markers or rational thought processes, require the input of both basic attention and basic working memory for a conclusion to be drawn. This requires the sifting through the knowledge about the problem at hand, and the processing, categorizing and classing of factual knowledge with potential options and outcomes, and the ranking of these to some particular value. Damasio (1994) suggests that the somatic markers are part of the process of setting values by assigning preferences to the different options, and that they also influence the direction of attention and working memory. He suggests that automated somatic states, attention and memory all interact and are involved in the creating of order from the range of possibilities. This is believed to be essential given the brain's limited capacity to attend to a range of stimuli at the one time (Damasio, 1994).

**III – Dynamic Systems Theory**

DST has led to a specific set of technical terms that define the structures and processes of open systems. It aims to explain what is happening between the different elements of a nonlinear open system and the changes that come about over time (Vallacher et al., 2002). The process of change occurs through feedback, also known as reiterative processes that take the output of the system as the new input, produce new output which it then takes as input, continuing ad infinitum (Van Geert, 1994). With time coupling

between elements occurs leading to entrainment, co-operation or co-ordination as the elements continually adjust and adapt to each other. Elements may become more congruent and fit together more readily, and elements can form ensembles (and ensembles of ensembles) leading to increasing orderliness and system complexity (Lewis, 2000; Lewis and Granic, 2000).

Coupling can occur in micro development time (real time) when there is a convergence of behaviour in seconds or minutes, or it can occur in macro development time over months and years and leading to a crystallization (or learning) of behaviour. Constraints within the system modify this process through providing information to the system as to the setting of boundaries or parameters for behaviour. Parameters can include both order and control parameters. Order parameters (also known as collective variables) are created from the co-operation of individual components of the system, and in turn they act as a constraint on the individual components (Kelso, 1995). Order parameters also describe the macroscopic state of the system, and the values they hold are decisive in determining the future values within the system (Vallacher and Nowak, 1997). Control parameters can be either internal or external variables that influence the behaviour of the system, and they lead the system through a range of potential patterns or states (Kelso, 1995; Vallacher and Nowak, 1997).

In developmental psychology, parameters are believed to be the force that shapes new behaviour (Clarke, 1997). However, in saying this not all parameters or constraints surrounding the system will be considered developmentally relevant. Behaviour can fluctuate but this tends to remain within limits, and the organism can be flexible in the face of tasks yet remain within the constraints of the system. Behavioural states that have a degree of continuity over time have been labeled as fixed-point attractor states in recognition that the system has an affinity for that particular state. There are different types of attractor states that enable behaviour to be both stable and variable dependent upon the specific characteristics of the attractor. Certain developmental phases can require attractors to destabilize and become more variable and this can result in a sudden shift or discontinuity in behavioral patterns between stable states, and these are identified

as discrete phase transitions (Thelen, 1993). Generally as higher order complexity arises behaviour becomes more skilled and constrained.

Phase transitions have been labeled as bifurcations whereby an order parameter can jump into two or more discreet stable models giving rise to new forms and multiple states (Thelen, 1993). At these points of change, behaviour change results from the co-operativity of the system under synergy (Thelen, 1993). During phase shifts not all elements drive the system into a new phase but the scaling on only one or a few of the control parameters can shift the entire system. This is because systems are holistic and change beyond a critical point results in reverberations and a system wide re-organisation (Thelen, 1993). System continuity is maintained as the components of the system do not materially change, and discontinuity occurs because the components begin to relate to one another in a different fashion.

This results in their collective behaviour undergoing a qualitative shift and can appear as pieces of behaviour that are out of sequence or inappropriate to the functional context as the components mature at different rates (Thelen, 1993). Components are believed to develop in parallel, in a hetrarchial system as opposed to hierachial, and behaviour to be the compression of these components during a specific context (Thelen, 1993). The relation between any two variables can depend on the value of these variables as well as any other in the system at that time, and this results in a nonlinear system that is not additive and cannot be broken down into its component parts (Vallacher and Nowak, 1997). Changes in any one variable may influence changes in the other variables within the system, and repeated observation of one variable in real time can lead to understanding of the structure of the system as a whole (Vallacher and Nowak, 1997).

**- DST and the brain**

This model of resilience is based on the premise that there are certain "givens" in human development in terms of the neurobiological basis of the organism. However, it is believed that these "givens" do not pre-determine development but contain a range of potentialities for the individual (Lewis, 2005a). This recognizes the variability inherent in

human development due to the characteristic of open systems. DST explains this in terms of self organizing principles, and this is defined as "the interaction among system elements, where each element adjusts to other elements, can promote the emergence of highly coherent structures that provide co-ordination for the system elements" (Vallacher et al., 2002, p 266). In order to explain the development of resilience it is necessary to review pertinent self organizing principles that are believed to determine brain structure and function.

The specific trajectory that a self organizing system takes reflects the process the system goes through to satisfy the constraints embedded in its initial state (Vallacher et al., 2002). The constraints include the initial states of the elements of the system, the nature of the different elements of the system and any external influence on the system (Vallacher et al., 2002). Brain development and experience have been accepted as mutually influencing (Cicchetti and Curtis, 2006), and micro or real time processes lead to the emergence of certain patterns that lay down the traces to facilitate that pattern emerging in the future. These patterns or trajectories then facilitate the emergence of patterns that permanently alter the structure of the system over time or in macro time (Lewis, 2005a). This developmental structure, also known as the state space, determines the system's propensities, what it can and is likely to do and what it cannot do on each occasion (Lewis, 2005a).

Neural development and self organization over time leads to increasing specification with increased efficiency, complexity and stability (Cicchetti and Curtis, 2006). This involves a process whereby neuronal structures that were initially indeterminate undergo change and reorganization of neuronal connections in real time in order to evolve and stabilize on the basis of their own activity over time (Lewis, 2005a). With this process the developing brain also loses degrees of freedom through synaptic sculpting and pruning. Synaptic sculpting increases the stabilization of the brain structure through synaptic proliferation and strengthening, and this self perpetuating process becomes increasingly determinate (Lewis, 2005a). Synaptic pruning, on the other hand, consolidates developmental stability by wasting the vast number of under used neuronal fibres that initially provided the

potential in the first place (Lewis, 2005a). Lewis states that "pruning stamps a special kind of permanence on the synapses that remain" (Lewis, 2005a, p 255).

A related self organizing principle in neural development has been labeled by Lewis as "cascading constraints". This principle refers to emergence of one structure constraining the emergence of the characteristics of the next structure. He states that this makes sense of developmental trajectories in that structures that appear early in development place limits on the range of possible features of structures that emerge at a later date, and so on (Lewis, 2005a). He states that they are "self organizing in their own right, constitute a set of markers along the developmental trajectory, and each plays its part in fashioning and refining that trajectory" (Lewis, 2005a, p 255). Finally, neural self organization also relates to developmental transitions whereby behaviours become free from the entrenched habits, temporarily increasing the degrees of freedom, until stabilization arises for the next developmental stage.

The brain can be seen as an incredibly powerful force made of a massive number of interconnecting neurons and networks. This in itself means that there is a huge potential for "noise" given the number of neuronal connections and interacting subsystems in a state of on-going flux. Despite this, there is a high degree of co-operation across subsystems that take the form of phase synchrony whereby excitation in one part of the brain falls into step with excitation in another part of the brain. For example a relatively simple act may call for linkage between sensory, motor and executive systems and the engagement of working memory. Research has discovered that there is spontaneous coupling or synchrony throughout the brain structure in real time, and the assumption has been made that this neural self organization leads to the coupling of brain regions to give coherency to the whole (Lewis, 2005a).

The mechanism of neural change in real time calls on the principle of vertical integration to explain the co-operation, co-ordination and coherency within the brain (Derryberry and Tucker, 2006; Lewis, 2005a). Vertical integration involves messages from the cortex being sent down to the lower brain structures, and this then being reciprocated by an

upward flow of neuronal activation and neurotransmitters. The neurotransmitters released by the lower brain act as modulators and their effects are global rather than local. Feedback loops ensure that neurons send back information across brain regions and in doing so recruiting more elements until a state of stabilization has been reached (Lewis, 2005a). This process is mediated by phase synchrony and hypothesized to occur whenever there are significant changes in internal or external events that trigger emotion (Lewis, 2005a, 2005b; Tucker, Derryberry and Luu, 2000).

Neural change in developmental time can be either highly universal to all humans (such as the changes to the prefrontal cortex during adolescence) or highly individualistic. Lewis (2005a) describes the latter as the "eerie manner in which developing humans become increasingly crystallized versions of themselves" (p 262). Synaptic sculpting and pruning have been identified by Lewis (2005a) as the two forces contributing to this, and that learning occurs within the context of long term potentiation (LTP). The basis to learning and the LTP process is characterized by certain frequencies and firing of pre synaptic neurons to produce long term chemical changes in the post synaptic neuron. This process potentiates transmission in the future through alteration of the structure of the synapse and eventually leading to coupling and the emergence of attractor states (Lewis 2005a). For this to occur, it is believed that activation needs to occur a number of times but that at the same time less activation is required to produce the same reaction (Lewis, 2005a).

Personality is thus seen as emerging as relatively stable and orderly as a result of recurring emotional interpretations and the self organization of different lower level components. Nowak, Vallacher and Zochowski (2005) extend this model further and state that social interactions are pertinent to the development and maintenance of internal states, and that these internal states in turn function as attractors to thoughts, emotions and behaviour (Nowak et al., 2005). This process however, is not dependent on the occurrence of social experience as individuals are capable of reflecting upon social experiences long after the event. They state that this process occurs within the context of self relevant information, and that this capacity allows the individual to interpret,

integrate and the potential to develop a more sophisticated understanding of one's own behaviour (Nowak et al., 2005). However, they also state that this capacity, and the self organization that results from it, does not necessarily lead to a perfect match or accurate integration between attractor states and social behaviour (Nowak et al., 2005). They acknowledge that there is much that is unknown, and given the range of independent variables that may impact on a system at any one time, and that many of the developmental processes are not readily observable, there is still much to be discovered.

## IV – A developmental model of resilience

The intent of this model is to understand what it is that enables an individual to be resilient and function adaptively during times of adversity. The intent is not to identify what a resilient person does but to go one level deeper and to offer an explanation as to what it is about the individual that means they can draw on functional coping behaviours and emotional regulation strategies at times of duress. The intent of the model is to bring into the foreground what it is that makes up the seam of resilience within all of us, as opposed to producing a dichotomous model with which to judge one another's capacity to be resilient. There is an acceptance that emotional health and well-being may be impacted upon during times of adversity but the focus of the model is on what it is that allows an individual to move beyond these moments of human frailty and regain strength to continue to live life well. The model, as mentioned above is based on three premises, and each of these premises contains two factors.

## - Premise number one

As stated earlier, the first premise of this model of resilience refers to the physiological capacity of resilient individuals to modulate their level of reactivity, and recover from stressful events with relative ease. On the basis of Damasio's work, it is believed that when internal processes associated with homeostasis are finely attuned that resilience is enhanced, and that the individual will be less reactive and more adept at reestablishing homeostasis if the system is disrupted. This results in the individual experiencing relative equanimity that allows them to then go on to respond to the situation without the limitations imposed by a heightened state of arousal and agitation. Damasio does not

discuss resilience per se but he does make a brief comment that aligns with this premise. He discusses individuals that have "personalities that are most harmonious and mature" (Damasio, 1999, p 223) as being blessed with multiple control sites that are interconnected in such a way that responses can be organized with varying degrees of complexity.

The earlier discussion on Damasio's work on emotions and feelings details the process of monitoring what is happening and the restoration of homeostasis when there is a disruption. His theory does include a brief comment as to genetic predisposition but this is not discussed at length and his theory is more focused on explaining neural mechanisms as opposed to individual differences. The findings of research in the areas of temperamental motivational systems and attachment theory offer more depth with regard to this, and combined provide a framework for extending Damasio's comments about learning and conditioning. Temperament is described as "constitutionally based individual differences in reactivity and self regulation" (Rothbart and Posner, 2006, p 466), and attachment theory explains the impact of early relationship experience and environment on neural development. Following is a brief discussion outlining what this might mean with regard to how an individual might react, and the intensity of that reaction, at times of adversity.

The temperament systems identified by Derryberry et al. (2003) as significant to the development of resilience include the appetitive system that is involved in seeking and approaching rewards and the defensive system that is involved in detecting and avoiding dangers. The appetitive system is associated with positive emotionality (positive affect and anticipation), and involves the orbitofrontal and the limbic systems. The defensive system is associated with negative emotionality or distress proneness, and involves the orbitofrontal and limbic systems, and the brainstem (Derryberry et al., 2003). In addition to these two key systems, a third temperament system is also believed to be important to resilience with regard to the engagement of social support. This system has been identified as the affectional system by MacDonald (1992, as cited in Derryberry and Rothbart, 1997) and it is believed to be related to the personality dimension of

agreeableness (Derryberry and Rothbart, 1997; Derryberry et al., 2003). Agreeableness is related to prosocial emotions and behaviours, and affiliative tendencies (Derryberry and Rothbart, 1997).

Attentional systems important in the regulation of the temperament systems include the alerting and orienting attention systems. The alerting system involves the frontal and parietal regions of the brain's right hemisphere, and this is believed to be important in focusing attention to significant stimuli and preventing distraction (Derryberry and Rothbart, 1997). The posterior attentional system includes the parietal cortex, the superior colliculus and the thalamus, and its role is to orient attention to a pertinent location, such as the smell of food or loud sounds. These involuntary responses can be inhibited however by the anterior attentional system as this is a higher level system that operates on more highly processed information. The neural mechanisms involved include the frontal circuits and the anterior cingulate region, and learning allows the individual to gain more control over the posterior system and inhibit dominant response tendencies (Derryberry et al., 2003). This has been conceptualised by Rothbart as effortful control and is believed to be important in the modulation of temperamental reactivity and the modification of cognitions and behaviour that is not emotionally charged (Eisenberg et al., 2004).

Attachment theory adds further depth to understanding the impact of early experience and environment on individual differences in neural development. A review of the pertinent literature by Vaughn and Bost (1999) revealed that both temperament and attachment are modestly related factors and that the relationship between the two is reflective of the interaction history of the child. The function of attachment is adaptive for very young children as it is oriented towards establishing physical proximity to the care giver and provides a secure base from which to explore (Allen, 2001; Fonaghy et al., 2002). Secure attachment relationships formed during infancy are hypothesized as contributing to the development of resilient functioning in that it helps the child develop neural patterns that contain distress and permit reflective function of the self and other to develop. Internal working models formed by the end of the first year of life underpin expectations about future relationships, and about our position within the world (Allen, 2001; Bretherton and

Mulholland, 1999). If the attachment relationship is secure then the working model of self is one of value and competence.

With regard to neurobiological evidence for attachment, attachment processes are believed to play an important role in brain development during the first two years of life, particularly the right hemisphere as it goes through a growth (experience expectant) period. The prefrontal cortex is involved in that descending neural projections from this region to the subcortical structures mature during infancy, and the reciprocal interconnections between these two brain regions are more dense on the right side of the brain during early infancy. These connections, involving the neuroendocrine system, are believed to account for homeostasis regulation and the moderation of the physiological state through both internal and external feedback (Schore, 2000). Visceral and somatic representations, the result of critical learning interactions, are primarily under the control of the right hemisphere through connections to the right ventromedial region, and the vagus nerve is also part of this regulatory system (Schore, 2000).

The principles of self organization have been proposed as a useful framework to explain the interaction between temperament and environmental influence during the early stages of development. Developmental constraints include both the temperamental genetic make up of the child and its environment, and the interaction between these two constraining systems will lead to the emergence of characteristic neural patterns through repetitive neural activation in real time. These patterns, or couplings, in turn facilitate the emergence of future patterns that constrain the development of the system and this will lead to increasing specificity, complexity and efficiency within the system. Over time neuronal connections are stabilized through synaptic sculpting and pruning, and as this process ensues the system gains increasing stability. The development of attractor states whereby characteristic responses will be elicited via internal or external triggers concurs with Damsio's model that virtually all objects and situations will be connected with a basic affective state.

The patterns that emerge as a result of the interaction between the temperamental motivational systems and experience in early childhood are believed to be the basis of neural ensembles that influence the individual's response to stressors. Presuming a healthy and caring environment during early development, the temperamental style that we are born with strongly influences on-going affect and belief systems that either promote or diminish our capacity to experience positive affect. A child with a strong appetitive system will be predisposed to displaying less reactivity to novelty, and he will further gain from increased learning opportunities if he develops a secure attachment relationship with his care giver. These can be likened to Damasio's concept of dispositional representations, and these early experiences will provide the child with a range of dispositional representations available to appraise novel situations as not threatening as they arise. Groups of dispositional representations will form convergence zones supporting exploration and novelty as opposed to heightened reactivity.

As development proceeds, further learning will enable the attentional system to play a part in that an individual with a strong attentional system will seek out support and be more likely to engage in prosocial behaviour when confronted with an adverse event. Further to this, effortful control will influence the capacity to persevere and maintain focus when there are few immediate rewards. If the child is born with a strong attentional system, and has the benefit of a secure attachment relationship, dispositional representations will be developed supporting persistence and discouraging impulsivity. At an affective level, this is likely to mean that the child will experience less reactivity to frustration, and in DST terminology this will lead to coupling in real time and the emergence of fixed attractor states with on-going development. A similar process will occur if the child is born with a strong affectional system in that attractor states encouraging affiliation and support seeking if confronted with adversity are likely to emerge. This response style will not be easily perturbed and the individual with genetic and experiential history are likely to display resilience if challenged.

**- Comments by participants**

The affective style reported by participants in the study frequently fell within two broad categories. The first category included descriptions involving determination, endurance, stoicism and forbearance that reflected low levels of reactivity and prompt recovery rates. Comments reflecting low reactivity included responses that were less oriented towards the experience of heightened states of emotion and more oriented towards what needed to be done (given the stressor). Examples of this included "just so focused on getting, doing the best by your kids"; "shit happens, move on … just you know make the most of it"; "OK this has happened but there are plenty of ways to live your life". Chunking and containment of negative affect were evident in terms of "focus on a very short distance in front"; "take a deep breath and I say – you can do this, you will do this"; and "never ever for very long look at it as a whole big awful thing". Effective recovery was evident in these comments in that an event happened and the objective was to get back on track as quickly as possible, not to become mired in the distress that it could potentially elicit – as with "damage control – don't let the debris spread too far and wide, you keep it as close as you can".

The second category included descriptions involving optimism, hope, positivity, self responsibility and confidence. The comments of the participants suggested that these characteristic responses to stressors and trauma helped minimize the negative affect at the time and over time, and that this in turn helped their recovery return to a state of low arousal. Comments suggesting optimism, hope and positivity included "there are too many good things in life, things to get on with"; "having a basic faith in life"; "essentially being a positive person"; be positive, you've got to be able to stay in gear, and laugh" and "I wake up every morning smiling because I have woken up". Self responsibility and confidence were evident in the non victim perspective that participants took, such as the participant who believed that he could "choose to be miserable or choose to do the best I could and have a really good life".

The comments of the participants suggested that this more effervescent bias to the affective experience also contributed, and helped to maintain, their sense of determination and endurance. Comments reflecting this include "determination, I keep trying until I do

achieve a certain amount of success" and "determination to manage whatever life could throw at you". In addition to this, for many of the participants family and being part of a sense of community was important and this appeared to be both sustaining and energizing for them. The participants displayed a capacity for both empathy and a preference for belonging, evident in comments such as "there are always people with more difficult problems", "it has changed me hugely in that I am more compassionate", "I am part of a family", "it is a community for me" and "I felt a lot of other people's love around" and "people were so caring … it was like a cocoon".

**- Premise number 2**

The second premise concerns the ability that an individual displays to be adaptive in the face of adversity. Being adaptive involves the ability to appraise and respond to situations in a manner that is not merely accommodating to the circumstances but functional to the demands of the situation. The range of responses available to the individual at times of adversity is enormous, and it is believed that the ability to be skilful in the selection and execution of their response contributes to resilient functioning. Appraisal, planning and organization skills draw upon past learning and higher cortical function, and these skills are made more available if arousal is reduced. These processes are also aided by effortful control through the ability to sustain attention, or shift attention as required, and to inhibit impulsive responses. The important factors are to not only respond in a manner that is appropriate (effective) but that it is also timely (efficient). Effective and efficient responding in turn attenuates reactivity and enhances recovery.

It is hypothesized that the process of conceptualizing and responding to adverse events can be understood in terms of Damasio's somatic marker hypothesis and what appears to be an intuitive response style. Damasio's somatic marker hypothesis is based on the premise that reasoning and decision making is not all about cost / benefit analysis and that a significant part of this process occurs at the level of the body landscape (Damasio, 1994, 1999). This process marks a response option with a positive or negative valence, and leads the decision making process toward or away from that specific response. He describes this as an automated signal and that its function is to protect the organism from

future losses and enhance the decision making process by eliminating potentially dangerous options. He states that more formal reasoning and decision making may also take place but that somatic markers (when no deficits disrupt this process) enable more effective and accurate decision making by offering fewer choices to select from (Damasio, 1994).

Damasio's modeling of intuitive processes explains what happens when an individual responds to a situation without becoming enmeshed in the minutiae of decision making. It is proposed that resilient individuals draw on somatic markers at an intuitive level when responding to adverse events. Their response style often contains their perception of the problem and this in turn contains the affective reaction to the event and allows for a more detached approach to dealing with the problem. This is advantageous as it allows the individual to draw on the higher cortical functions when necessary to appraise and problem solve without heightened arousal limiting the process. Damasio's somatic marker hypothesis also accommodates deliberate decision making processes. These processes are made more efficient as they do not need to explore the total range of possibilities, just those preferred by somatic markers. With regard to resilient functioning, it is hypothesized that this level of reasoning and decision making is also efficient with minimal prevarication in the selection of what is the preferred choice. The characteristic coping style is proactive and responsive as opposed to reactive and impulsive, and hence more effective overall.

With regard to dynamic systems theory, the patterns that emerged in response to the interaction of temperament and attachment style will continue to determine the connections that will be used by the somatic marker system. Synaptic sculpting and pruning will direct future neuronal development and learning through LTP processes with the event of coupling and the emergence of additional attractor states. Conditioning of emotional states and the connections with past learning will lead to the increasing congruency and the formation of ensembles, and increased orderliness and complexity. Vertical integration involving cortex driven neuronal activity and subcortical neuronal activation and release of neurotransmitters will maintain feedback loops and enhance the

recruitment of elements and system stabilization. Attractor states that are well established will be easily accessed by the somatic marker process, and a degree of automaticity will ensue. Exposure to new experiences will lead to modification of dispositional representations, and in DST terminology this will involve phase shifts through the destabilization of old attractor states and the emergence of new attractor states. The range and responsivity of available attractor states will influence the ability of the individual to respond flexibly, creatively and promptly to the demands of the situation.

**- Comments from the participants**

An impression gained during the interviews was the sense of confidence that participants exhibited with regard to their responses to the adversity that they had to deal with. Their reports indicated that they frequently responded to events with decisiveness and there did not appear to be a need to weigh up the pros and cons of the actions that they took. The general approach to the adverse events faced was to do what you have to do, and this implied a sense of responding as opposed to reactivity in terms of avoidance or impulsivity. The process of reasoning and decision making was not prominent in discussions pertaining to responding to events, but yet at the same it was not absent, and it seemed as if this process was part and parcel of approaching and dealing with the problem. Two of the participants referred to the word "intuition" but more frequently the participants referred to a "knowing" of what they had to do. When asked to explain these feelings further, the participants were not able to expand beyond the word "knowing" and than stating this "knowing" felt in the body such as in the gut or in the heart.

Participants also displayed an openness and flexibility in dealing with the problems they were faced with. Again this did not present as applying a formal problem solving approach to the situation but more as an automated response of scanning the options and selecting what intuitively felt right. One participant discussed using a structured problem solving approach but her description of how she applied this process was fluid and instinctive as opposed to a pedantic examination of all the possibilities. The participants did not display a tendency towards rigidity or perseverative responding, nor did they display a propensity towards impulsivity or inconstancy with a changing response style.

Once a response was selected they were purposeful in their approach, and able to be stoic and endure the process without immediate rewards. Optimism and hope was a characteristic of this, and all in all this imbued their descriptions of how they had coped with a sense of confidence[1]. Alongside optimism and hope was a sense of gratitude of what life had given them, an appreciation of what they had as opposed to what they did not have.

Oddly the process of reasoning and decision making was not dominant in the transcripts of the participants, and when it was evident it was described in such a way as to be incorporated into a more creative and intuitive style of responding. Actions that were taken were often just done, spontaneously as opposed to impulsively, as with the participant helping her daughter rehabilitate from a severe head injury. She stated that "I needed something for (my daughter) … so I started a business" and when asked to explain this there was a clear process of selecting a business that would accommodate the needs of her daughter in terms of social contact, cognitive retraining and work experience with minimal overheads. The impression was gained that this decision was made relatively spontaneously and without extensive reasoning or deliberation, and from the participant's perspective this decision was very appropriate and timely with regard to her daughter's rehabilitation needs. Another participant approached the problem as if it were a challenge and he gave the impression that tackling the problem was somewhat like a game ("stand back … have a think … think I can do this … there has to be a way"). `

**- Premise number 3**

The third premise relates to the schemas the individual holds that facilitate well being in the face of adversity. Beliefs about the self and the world are proposed to play a significant role in providing the individual with a philosophical base that enables them to accept what has happened without the perception of being a victim of the events, and at the same time to initiate self responsibility and a proactive stance. Specifically the world

[1]The comments of one participant did not reflect self confidence to such a great degree as her counterparts, and her transcript reflected high levels of anxiety about her ability to perform and cope. This may relate to the fact that she was coping with significant stressors on a daily and on-going basis more so than the other participants.

view pertains to the belief that the world is neither necessarily benign nor controllable, and that one is not always able to exert control over these events. Alongside this is the self belief that we are responsible for what happens to us, and that it is auspicious to respond in a manner that brings about the most positive outcome. With this belief there is an absence of entitlement as to how things should be, or what should be done to correct or ameliorate the situation for the individual.

These beliefs present as paradoxical at face value but for the resilient individual there is a coherency in terms of acceptance of what has happened and cannot be changed, and acceptance about what can be done at the same time. This leads to a further paradox whereby one accepts one's place in the world (humility) and at the same time a sense of remaining in control and self efficacy (confidence). It is hypothesized that these belief systems dampen affective reactivity whilst at the same time enhancing one's motivation to take responsibility and actively manage the situation as able. This leads to the resilient individual presenting as detached from, or containing the affect, whilst at the same time actively engaging in the management of what has happened. Despite the seeming paradoxical nature of the beliefs, the resilient individual operates within their world with coherency and in a highly effective manner.

From a DST perspective it is believed that attractor states promoting resilient functioning start to develop during childhood and adolescence. Cognitive emotional states during childhood years and adolescence lead to neural sculpting, and this in turn leads to parameters and constraints set in place for subsequent development. Over time attractor states containing beliefs about the self and the world are established and these attractor states become relatively fixed and impervious to perturbations. Beliefs about the self as capable, and the world as not necessarily benign but manageable, become amalgamated with an affective style that is not highly reactive and able to endure hardship. These beliefs coalesce to form stable traits that exude a sense of competence as the individual forms an appreciation of their own potency and ability. As time goes on, and success is experienced, this response style becomes characteristic and attractor states become stable and deepen. Challenges to the sense of self are not likely to cause perturbations that result

in instability unless highly significant or persistent over time, and they result in a phase shift.

Alongside this process, belief systems about others and the world also become established as part of this dynamic neural system. As mentioned above, belief systems about the world evolve early on in response to the attachment relationship, and continue to evolve through development with on-going experience. It is proposed that the individual who is resilient develops a perception of the world that supports their ability to function well in it. Coupling in real time leads to the establishment of attractor states that involve adaptive appraisal and response strategies. As with beliefs about the self, challenges to these beliefs are not likely to result in significant phase shifts unless they are highly significant to the individual or persistent over time. Stressors that are significant or persistent will affect the scaling on the control parameters (for example beliefs about the self or world) and changes beyond a certain point will lead to a system wide re-oganisation. New dispositional learning reflecting these changes will ensue and maintain coherence within the system.

**- Comments from the participants**

Beliefs about the self and the world were frequently stated simply and succinctly. The participants were all self effacing and the terms they used to describe themselves inferred an understanding as to their role in the wider scheme of the universe and included roles such as "worker ant",  "drone bee", "an electron"  and "just a thread".  The participants tended to compare the events they had been through as not significant compared to others ("my experiences were particularly intense but I don't think they were especially unusual when you look at everybody's lives over the whole of their lifespan"). The negative events were framed within the context of a philosophy of non-blaming and absent of searching for reasons or justifications, yet paradoxically none of the participants saw themselves as victims of the events in their lives. Comments included "I think it is just life experiences"  and "life challenges, umm, you know they are part of life" and "there could be a catastrophe happening anywhere". Acceptance of negative events was part of this, as was the belief that one had to take responsibility for oneself ("you sort of accept

them and you work out the best way to go on from there and get around it" and "I was just bobbing around in a sea of fate"). For some participants this had been part on an on-going philosophy developed about life and for others it had come about in response to the adverse events in their lives ("lost innocence", "(learning to) expect the unexpected").

**- Impingements to resilient functioning**

Masten (2001) discusses resilience in terms of "ordinary magic", and from the first it has been evident that despite impoverished or abusive home environments that children can and do develop resilience. However, there is also considerable evidence that suggests that this "ordinary magic" can be impinged upon and that events in an individual's life can disrupt the development of adaptive and resilient functioning. Insecure attachment and trauma have been identified clear impingements on the neural development and the subsequent development, or disruption, of resilience (discussed below). Impingements to resilience are not isolated to these two types of events, and can include a range of neurological, psychiatric and psychological problems.

**- An aside on insecure attachment**

Attachment has been discussed above in terms of the impact of secure attachment on resilient functioning, and the work of Schore (2002, 2003a, 2003b) has provided considerable evidence as to underlying neural development that results from early attachment relationships. What has not been discussed above is the impact of traumatic attachment relationships in terms of both neural development and the later ability to be resilient. The impact of traumatic attachment relationships is reported as being two fold in that they "not only generate extreme distress, but also, more importantly, *undermine the development of mental and interpersonal capacities to regulate that distress*" (Allen, 2001, p 10). Insecure attachment relationships during early developmental phases are likely to have an on-going impact throughout the lifespan, and there is also evidence that these patterns endure beyond the individual and to be intergenerational (Bretherton and Mulholland, 1999; Siegel, 1999).

Characteristic affect regulation irregularities have been identified and minimization of affect has been associated with avoidant insecure attachment whereas heightening of affect has been associated with ambivalent attachment (Cassidy, as cited in Fonaghy et al., 2002). This research suggests that the individual with insecure attachment does not have the capacity to regulate affect well and that as a result of this that their general affective reactivity is disturbed. This in turn disrupts the coping response in terms of both perception and appraisal of problems, and the ability to respond. The internal working models of insecurely attached individuals are also disturbed in that the self is perceived as devalued or incompetent, and the attachment figure perceived as rejecting, ignoring or interfering with regard to exploratory behaviour (Bretherton and Mulholland, 1999). Disturbed internal working models disrupt the coping response in terms of how the other or the world is perceived, and the ability of the self to respond is impaired. The third insecure attachment style (disorganized) presents a confusing and contradictory array of behaviours that leads to cognitive and social impairment, and profoundly disturbed affect (Allen, 2001).

**- An aside on the impact of trauma and stress**

In addition to temperament and attachment style, neurobiological structure and function can be further impinged upon through exposure to significant trauma and prolonged stress. Prolonged or excessive exposure to trauma can impact on the individual's reactivity and capacity to tolerate / regulate negative affect through changes to the hippocampal and amygdala functions (Allen, 2001; Le Doux, 2002; Sapolsky, 2004; Siegel, 1999; Teicher, 2002). The effect this has on brain function, amongst other functions, includes hypersensitization of conditioned fear responses and many individuals presenting with complex trauma display heightened reactivity and affect disturbance on an on-going basis. Heightened glucocorticoid levels, as a response to prolonged stress, have also been reported as affecting frontocortical function and this is believed to impact on self regulation and adaptive behaviour within a social context through the disruption of both emotional and cognitive processes (Beer et al. 2004).

Research on the impact of attachment relationships and trauma on later neural and psychological functioning indicates that both affect regulation and cognitive emotional functioning are affected. This is significant with regard to resilient functioning, particularly from the perspective of this model as it promotes the notion that both affect regulation and cognitive emotional functioning are highly significant factors in determining how we cope and respond to adverse events. The impact of attachment relationships and trauma can be persistent, but this is not always the case, and this instability can be explained through DST. DST discusses perturbations to the system as resulting in system fluctuations that can lead to bifurcations and shifts in functioning. Just as a significant trauma can result in a resilient individual displaying vulnerability, the vulnerable individual can also display shifts and exhibit resilient or robust behaviour. This may come about as a result of a consistent environmental input over time (therapy) or from a significant event that disrupts the phase state of the system. Recent findings in the field of neuroscience have revealed that the neural system is capable of repair (to varying degrees) following injury, and the DST provides a framework to understand this process from a psychological perspective.

**- Hypothetical case studies**

The development of individual differences with regard to reactivity and affect style is proposed to be the result of the impact of environmental experience on temperamental motivational systems. For example a child who has a strong appetitive system may be bold and exploratory in his behaviour but this may be modified by a care giver sensitive to their needs in providing assistance in directing attention and learning to inhibit impulsive behaviour.  This in turn would engender a sense of competence and enhance the underlying positive affect. They will experience the world as challenging but not overwhelming, and develop a sense of self that is appropriately entitled. When exposed to stressful events or trauma, it is anticipated that they would acknowledge it whilst managing the heightened state of arousal, and actively problem solve to resolve the issue at hand. Without attention directed towards moderating their behaviour, the child with a strong appetitive system may be bold but without focus and unable to persist when necessary. Their experience of the world may be that it is challenging but they might not

feel competent in their ability to meet the challenge, and they may have difficulty in determining an appropriate sense of entitlement. Exposure to a stressful event or trauma may lead to an impingement on their sense of self and an approach style that reflects impulsivity with short term gratification to dampen the heightened state of arousal as opposed to managing the stressor directly. The affectional system will further moderate development in terms of the child's experience of interpersonal relationships.

In contrast to this, a child with a strong defensive system may be timid and display a strong preference to things familiar, but with the input of a care giver sensitive to their needs the child may learn to tolerate discomfort when entering new situations and to be more open and exploratory in their behaviour. As with the child who has a strong appetitive system, this child will experience pleasure with growing self competence, and this will in turn encourage further explorative behaviour and decreased discomfort associated with this. Their perception of the world might be that it can be challenging but they will know they have confidence to manage what comes and the competence to do what needs to be done. Significant stressors or traumas may be experienced with a greater state of arousal than those with a less potent defensive system but it is anticipated that this would be managed with the intent of lowering the state of arousal and proactively dealing with the stressor. The child with a strong defensive system whose care giver is not attuned to their needs may experience heightened levels of anxiety and display avoidant or distressed behaviour when faced with novelty or challenge. Their experience of the world would be that it is overwhelming, and in turn they would experience high levels of anxiety that acts as an impediment to effective coping. At times of significant stress or trauma, the experience of heightened anxiety is likely to persist for a longer period of time as compared to the child that had the opportunity to develop confidence in their own ability to cope. In addition to this, it is anticipated that there will be less capacity to actively approach and deal with the problem, and that there is likely to be an external locus of control and self perception of being the victim of events. Once again, the affectional systems will further moderate development.

**- Enhancement of resilience**

Several therapy models are available to address difficulties that frequently arise when individuals struggle to display resilient behaviour at times of crises. These models generally address problems associated with emotional dysregulation and the treatment modalities are oriented towards acceptance and mindfulness based skills, cognitive therapy and behavioural interventions (Haidt, 2006). Dialectical Behavioural Therapy is one of the most prominent of these treatment modalities and it was developed to treat clients with Borderline Personality Disorder. Clients with this disorder present as suffering from affective instability, impulsivity and self harming behaviours, interpersonal difficulties and poor self identity. Dialectic Behavioural Therapy is oriented towards modifying emotional regulation deficits and increasing adaptive behavioural skills (Linehan, 1993). Several research studies have found DBT to be an effective treatment for clients with Borderline Personality Disorder as well with clients suffering from eating disorders, depressed mood, alcohol and substance abuse and forensic populations (Lynch, Chapman, Rosenthal, Kuo and Linehan, 2006; Robins and Chapman. 2004). Additional treatment approaches with similar approaches found to be effective in this manner include Acceptance and Commitment Therapy (Baer, 2006; Hayes, 2002) and Mindfulness Based Cognitive Therapy (Segal, Williams and Teasdale, 2002).

**- The model in brief**

In conclusion, this model essentially explains resilience as evolving from within a neurobiological framework that is dynamic and ever changing in response to exposure to environmental inputs. A genetic basis underlies this framework, and both temperamental systems and attachment relationships are believed to direct development, and determine the nature of individual differences. Three underlying premises compromising of six factors are believed to be significant with regard to resilient functioning - the first being the ability to modulate reactivity and recover from stressful events, the second being able to respond to the situation effectively and efficiently, and the third relating to the resilient individual's world and self belief systems leading to acceptance of what has happened whilst at the same time engaging in self responsibility. Resilience is believed to be relatively stable but it is acknowledged that resilient function can be impinged upon if the individual is exposed to significant trauma or cumulative stress over time. Conversely,

resilient functioning can be enhanced with input or experience that addresses any one of the factors listed above. Damasio's model on neural functioning has been adopted to provide a backdrop for the model as it is believed that his focus on homeostasis, emotional regulation and decision making underpin resilient functioning. Damasio's model with regard to the development and maintenance of resilient functioning over time has been supplemented by DST and the principles of self organisation.

**Chapter 5 – Discussion**

> **"You become what you become in life, and you don't**
> **sit and think about it."**
> **Clint Eastwood, Time Magazine, March 7, 2005.**

This quote from an interview with Clint Eastwood's crossed my path just after I started interviewing the participants for the study. It struck me at the time that this simple statement reflected the essence of how the participants that I had spoken to approached life. This impression stayed firm throughout the remainder of the data collection process and analysis, and the writing up of the model outlining the development and nature of resilience. The overall impression given by the participants in this study was their propensity to just live their life as it unfolded, and they exhibited clarity in dealing with what challenges came their way. The participants spoke about the difficulties that they faced in life, and although many participants referred to periods of emotional distress and impaired function, these episodes were seamlessly drawn into the tapestry of their existence and there was no sense of self defeat. The emphasis was on doing as opposed to introspection, and when there was introspection it lacked the self indulgence and rumination that can often rob one of volition.

Further confirmation that this simple "doing" approach to life is important to living life well has come about from a wide range of sources including reading about the life and work of Goethe (Armstrong, 2006), eastern and western philosophical traditions (Batchelor, 1998; Cleary, 2000; Epictetus, as cited in Lebell, 1995; Russell, 1930) and Abraham Maslow's original reports from 1950 on the nature of psychologically healthy people (reprinted in Lowry, 1973). Many of the models reviewed earlier in Chapter 2 also endorsed this capacity to approach life in this manner, particularly those based within the positive psychology framework and those oriented towards health as opposed to illness. The structure of this chapter will initially explore support for this model in terms of the concordance between the results of this study and the models reviewed in Chapter 2. The model itself will then be reviewed in the light of this discussion, and

evidence supporting the model will be put forward. Following this the study and the model will be critiqued, exposing detractions and weaknesses as apparent. Concluding comments will be directed towards the future and offering research questions that have the potential to extend what has been achieved so far.

**I - The fit between the study results and resilience literature**

Chapter 2 began with a discussion from the child development perspective and it reviewed a number of key studies undertaken over the years and provided information on the conclusions drawn. These conclusions are not directly relevant to the study as the material was derived from a child and adolescent population base as compared to an adult population but even so there are a number of similarities that are significant across the two groups. Masten (1999, as cited in Ryff and Singer, 2003) drew up a short list of protective factors that characterize and promote resilience in children, and the list included parenting quality, intellectual functioning and positive self perceptions (such as esteem, confidence, efficacy). The results of the studies discussed in Chapter 2 reiterate this list, and add to it the characteristics of easy temperament, humour, internal locus of control and interpersonal reserve. With regard to this study, all of these characteristics are evident across the participant group with participants displaying a range of positive self perceptions, a strong sense of self responsibility and resourcefulness, and an emphasis on the importance of humour in their lives.

The next section of Chapter 2 addresses personality models and resilience. Block and Block's theory outlining the of role ego control / ego resiliency on personality functioning delineates factors that contribute to an individual's capacity to manage the stressors and challenges of daily life. This theory states that maintaining tolerable levels of anxiety and effective impulse control (ego control) is modulated by the individual's capacity to alter boundary permeability at times of stress before returning to baseline (ego resiliency) (Block and Block, 1980). The participants in this study displayed the capacity to respond flexibly, and to be persistent and effective when faced with challenges. Their responses were characterized by clear decision making and action, and openness in searching for solutions to the situational demands. They also reported a relatively quick

recovery from the negative events whereby they remained engaged in the world around them and were able to enjoy their lives. During the interviews the participants spoke of emotional difficulties frankly but there was no sense of their having been marred by the experience. In fact, the opposite was frequently reported whereby all the participants described positive effects as a result of the experience. In general the participants displayed characteristics reflective of ego resiliency as opposed to ego brittleness, and their histories suggested this was a relatively enduring trait.

The second personality theory reviewed was Vaillant's study of defense mechanisms. He identified five adaptive defense mechanisms, and these included altruism, sublimation, suppression, anticipation and humour (Vaillant, 1994, 2000). Analysis of the interview transcripts in this study revealed numerous examples of the use of adaptive mechanisms by the participants, either at a conscious or unconscious level. The most obvious defense mechanism was the use of self effacing humour at the time of the interview as a means of describing and coping with the stressors or traumas that the participants had faced. Several of the participants followed an altruistic life style, either in terms of their work or in their general way of being towards family and friends. Suppression was evident when participants were describing the different chunking and containing strategies to actively manage negative affect at the time they were under duress. Anticipation was also present to some degree as the participants tended to be proactive at managing adverse events but in doing so they remained within the bounds of realism as opposed to worrying. Finally, sublimative defenses were evident in the participants' ability to spin straw into gold, and to find means to gain from their experience.

Optimism was included in this section and the expectancies of optimists involve the belief that stress and adversity can be effectively managed. Characteristic strategies include confidence and continued effort, being planful and problem focused, and to use positive reframing to search for benefits. Optimists also accept the reality of the situation whilst retaining self control and remaining self directed, and they do not focus on distress or physical symptoms (Carver and Scheier, 2002; Schneider, 2001). The study participants displayed all the different facets of optimism to varying degrees. Their

reports of their behaviour indicated that it was planful and problem focused, and that they were able to maintain self control and remain self directed when dealing with the negative events in their lives. The use of positive reframing of the problem was also particularly evident but this was not at the expense of authenticity and reality. The interviews revealed the use of humour as a strategy to reframe the situation in such a way as to assist with the accepting of reality.

The last two models under the heading of personality included the sense of coherence model by Antonovosky and hardiness by Kobasa. The sense of coherence model refers to the factors of comprehensibility (the situation makes cognitive sense), manageability (having the resources available to meet the demands of the situation) and meaningfulness (the demands of the situation are worthy of engagement and commitment). Challenges in this model are perceived as welcome and engagement in the challenge worthwhile.  High sense of coherence was defined as the ability to choose the most appropriate strategy amongst those available (Antonovosky, 1987). Kobasa's model delineating the trait of hardiness on the other hand refers to commitment (to have a sense of purpose with which to face the adverse event), control (the belief that one can influence events) and challenge (that change provides opportunities for personal growth). Challenge again is welcome and this in itself is viewed as a resource to cope with stress (Funk, 1992; Tartasky, 1993).

The participants in this study in general displayed all of these characteristics to varying degrees. All the participants tended to actively work toward making sense of their experience and to find meaning in what had happened to them. In doing this they appeared to attenuate the sense of being a victim. This helped them to take control of the situation and to make the commitment to actively manage it. They generally all displayed a confidence in their ability, and even though one participant reported that she did not always feel confident she behaved in a confident manner. With regard to Kobasa's factor of challenge, some participants made very clear statements as to how they had transformed devastating events into challenges for personal growth and recovery. For others the factor of challenge was retrospective in that they reported that it was only after

the event, and they were able to reflect on what they had come through, that they were able to appreciate what the adversity had provided in terms of personal growth.

The third section of Chapter 2 reviewed biological factors believed to be influential to resilient function. This section began with a review of temperament models, and three motivational systems were identified as significant (Derryberry et al., 2003). The motivational systems identified included the appetitive, defensive and attentional systems (effortful control). The temperamental style of the participants was not directly measured in this study but many of the participants commented on aspects of their personalities that are associated with a strong appetitive system (optimism and approach behaviour) and to display tendencies characteristic of high effortful control (ability to persevere, high attentional control, low negative affectivity). Mixed evidence was available with regard to the defensive system in terms of detecting threat and avoiding danger. Some of the participants displayed remarkably little anxiety given the challenges they faced whereas others acknowledged experiencing heightened levels of anxiety when under stress. Those that experienced elevated anxiety reported strategies whereby they observed their reaction but that they consciously put their anxiety aside to respond to the situation at hand. Their reports indicate that despite heightened arousal states that their behaviour did not disintegrate and become disordered or rigidly perseverative.

Neural development was also identified as important in determining resilient functioning. The studies in this area explore the relationship between experience-expectant brain development and environmental input, particularly the role of attachment relationships on right hemisphere development (Schore, 2003a, 2003b). The early attachment relationships of the participants were not investigated directly but participants did refer to their family backgrounds, and both secure and insecure attachment relationships were inferred from their comments. The participants who reported early histories indicating secure attachment relationships appeared very much at ease with who they were, and confident in their ability to manage what happened and live life well. Those that described insecure attachment relationships during childhood (n=3) did not present consistently. Two of these participants reported frequently experiencing heightened

anxiety and feeling less confident in their ability to cope compared to the other participants. They presented as more stoic in their response to difficulties, as needing to maintain control of both their inner and outer realities. The third participant reported a similar way of being during her early adult years but that following a significant event in her life that this changed. She reported gaining insight as to the differences between being in control and being controlling.

Studies reviewing emotional / self regulation studies and brain function focus on explaining why some individuals are more able to self regulate more effectively than others from a neural perspective. Davidson (2000) hypothesized that resilient individuals do not experience the same degree of negative affect as others when faced with adversity, and that they recover more rapidly and easily. Research has explored this hypothesis through the startle response and hemispheric differences, and associations have been found between dispositional affective style and baseline levels of prefrontal activation (left sided for positive affect). The study for this thesis did not examine the participants neural functioning and cannot comment beyond what might be termed behavioural correlates in that the participants in general displayed positive affect and reported low levels of reactivity when faced with stressors. With regard to prefrontal cortex function, the participants displayed the ability to make efficient and realistic appraisals, to respond appropriately, and to be insightful as to both their own response and the response of others.

Studies investigating the impact of severe or prolonged stress on the brain have found changes occurring in hippocampal and amygdala function, and the left side of the brain. The effect of these changes is believed to impinge upon resilient functioning including disturbance in attention, affective instability, and hypersensitized conditioning to fear (Sapolsky, 2004; Teicher, 2002). The participants in this study were all exposed to significant or cumulative stressors yet they did not present as suffering from the associated signs and symptoms listed above. Screening for Post Traumatic Stress Disorder was not a formal part of the interview process, however none of the participants who had faced significant traumas reported any symptoms associated with this when they

described the impact of their ordeal on their lives. An explanation for this may relate to the hypotheses put forward by Derryberry et al. (2003) and Davidson (2000) suggesting that the participants are less vulnerable from the impact of stress due to their underlying genetic make up and temperamental styles.

The final group of studies of biological factors contributing to resilience relates to the finding that higher intellectual functioning acts as a protective function in stressful situations. Studies have found that attention skills are important, as are executive function skills (planning and logic, problem solving and interpersonal skills). Research in this area has found that individuals with superior intellectual functioning display efficiency in their neural functioning in that they use only the brain regions necessary to complete the task in the process, and that this is done in a concentrated and rapid fashion (Jausovec and Jausovec, 2000, 2001). The study for this thesis did not measure intellectual function but all the participants reported instances whereby they were able to focus their attention on the problem at hand, and they were able to sustain their attention even when this was not immediately rewarding. When describing their approach to the problems they faced, the impression was gained that the appraisal and analysis of the problem was both prompt and efficient with little expenditure wasted on deliberating minor details.

The models put forward under the banner of positive psychology fall into two groups. The first group includes the constructs of personal control and self efficacy. Each of these constructs examines how we perceive and respond to stressors within the context of self oriented belief systems (Maddux, 2002; Thompson, 2002). The participants in the study for this thesis displayed many of the facets of personal control and self efficacy. Although all of the participants had experienced negative events in their lives they responded to these events from a position of strength that was derived from believing they could respond to the situation and actively manage it. Planning and problem focused goal setting was prominent in their approach to their adversities, and many reported setting goals in such a way that they could mark points of achievement along the way. Retaining control of their situation was important, and when they were not able to significantly change the situation itself they addressed their own internal response and feelings about

it. The appraisals they made of the situations they found themselves in were incisive, clearly differentiating from what they could do from that which could not be changed. They accepted the situation they were in but at the same time displayed the propensity to look for the positive in their experience as opposed to dwell on the negative. Attempts to control did not overflow into attempting to control the external world to minimize their own distress. Their presentation overall was one of confidence in their own abilities, personal satisfaction and well being.

The third model in this section is the construct of flow by Csikszentmihalyi. This model is put forward within the context of a wider theoretical perspective on subjective experience. In his model on the experience of flow he discusses the teleonomy of self, and the search for greater complexity and order of consciousness. This experience is hypothesized to lead to the development of an autotelic self that is believed to have the capacity to transform negative experiences and for flow to emerge, and for strength to be gained from the process (Csikszentmihalyi, 1990; Csikszentmihalyi and Nakamura, 2002). In the study for this thesis, some of the participants commented that their perception of time altered but they did not describe this experience as being in a state of flow. They did display (to varying degrees) the skills characteristic of an autotelic self in terms of setting goals, immersion in what they were doing, paying attention to what is happening and enjoying the immediate experience. Some participants described these skills as being enduring aspects of their personality whilst others reported that they had developed these skills after negative life experiences and as part of what they had gained from their experience. The participants in general displayed characteristics redolent of the concept of unselfconscious self awareness in that ego was not central to their self identity. They were self effacing in their manner, and they tended to accept that life was unpredictable whilst being self responsible for whom they were and what they did, and they certainly maintained an open problem solving approach to challenges.

The last two models in this group address the role of positive emotions. Fredrickson's broaden and build theory of positive emotions has two factors, the first positing that positive emotions have the effect of broadening one's thought and action and the second

positing that positive emotions correct and undo the effect of negative emotions. Positive emotions are also believed to impact on the autonomic nervous system and to help the individual regain equilibrium (Fredrickson, 2001). Recent research has introduced the concept of emotional granularity (the ability to differentiate emotions) and found that those with high emotional granularity have a more extensive repertoire of coping skills and enhanced flexibility (Tugade et al., 2004). The second model by Folkman and Moskowitz proposes that positive emotions are adaptive and that they provide respite, and the opportunity to replenish following depletion as a result of stress. The types of coping that generate positive emotions as cited include positive appraisal, problem focused coping, infusing ordinary events with positive meaning, and finding personal meaning in the stressor (Folkman and Moskowitz, 2003).

The study for this thesis did not examine if positive emotions brought about a positive effect at the time of adversity for the participants, and cannot comment if the positive emotions reported by the participants helped them to remain open and creative in their thinking, or re-equilibrate / replenish following the passing of the stressor. As mentioned previously, the participants consistently reported experiencing positive emotions and this aspect of their personality certainly seemed to be a significant factor in their overall resilience. With regard to emotional granularity, some of the participants were very articulate in describing affect but this ability did not appear to be related to their coping ability. Participants with less ability to articulate their affective experience presented as able and flexible to cope with adversity as those more articulate. With regard to the coping styles described by Folkman and Moskowitz, the participants displayed positive appraisal, problem focused coping and finding personal meaning. Not all participants reported incidents of infusing ordinary events with positive meaning but what was reported by most participants was the tendency to value and appreciate what they had as opposed to regretting and ruminating on what they had lost. Several reported consciously being mindful of the moment to moment pleasures in the day, and perceiving their situations as "lucky" as compared to others in a more difficult position.

Recent research has begun explore the concept of post traumatic growth or thriving, and it suggests that trauma or adversity can lead to enhanced functioning and well-being. Models that have been proposed to explain this include transactional models, models based on self transformation and the finding of meaning, and models based within physiology. Transactional models suggest that personal characteristics mediate appraisal and coping responses, and factors believed to be important include perception of controllability of the event and the extent to which this violates beliefs, expectations and goals (Park, 1998). Carver (1998) proposes that post traumatic growth results from the self being transformed through a reiterative feedback system whereby mastery leads to positive appraisal and enhanced mastery. Factors considered important include personality and coping styles, and situational variants.

The perception of controllability was discussed by the study participants, and a consistent theme throughout the study was the belief held by participants that the world was neither predictable nor controllable. The participants all reported coming to terms with this fact and had managed to find means whereby they paradoxically accepted adversity as a fact of life but also that they were self responsible for how they managed it. The juxtaposition of these beliefs was seamless, often both beliefs would be expressed within the same sentence and this presented as significant in their rejection of being placed in the role of victim. Achieving mastery was also evident in their comments, and this was evident in their problem solving and goal oriented approach to problems. Whether or not this was directly resulting from the negative events or trauma they had faced cannot be drawn from the results, and it is likely that the confidence exuded by many of the participants may have developed in response to a life time of positive experiences.

Self transformation models focus more on the belief systems of the individual and subsequent psychological dissonance post trauma (Calhoun and Tedeschi, 1998). Internal locus of control is believed to be important as this leads to coherence and growth in three domains including perception of the self, interpersonal relationships and functioning, and changes in life philosophies.  The model of "benefit finding" in the face of adversity is also part of this group, and it has been suggested that "benefit finding" is an aspect of

personality or temperament, a reflection of growth or change, a means of understanding change or related to temporal change (Tennen and Affleck, 2002). Commenting on the fit between the models proposed and the results of this study is difficult as the variants proposed by the different models are either not specific or they have far reaching consequences. The participants did display a strong preference for an internal locus of control mode of being, and "benefit finding" was evident in their approach to dealing with and resolving what they had faced in life.

The last two models in this section have been drawn from physiological models detailing the toughening process (Dienstbier and Zillig, 2002; Epel et al., 1998). The first model by Dienstbier and Zillig (2002) is based on the observation that changes in the environment force the system to adapt to its genetic potential, and it is suggested that there is a training effect for the neuroendocrine system that leads to modifications of this system. This mediates specific changes to personality, performance and health through reduced autonomic arousal when faced with a stressor, and more effective coping. The second model by Epel et al. (1998) refers to the opponent process theory by Solomon. They suggest that once the individual has responded to a stressor in a protective manner that they will then move into a restorative phase. Certain conditions preclude this from occurring and these include chronic stressors, single events and an inability to return to a state below baseline arousal.

Toughening models have intuitive appeal, and a process of toughening or conditioning was identified by nearly half of the participants as being key to their ability to be resilient. The difficulty with accepting this argument is the question as to what it was that provided these participants with the ability to endure the toughening process as for some their histories suggested it was a case of "baptism by fire" and there was no opportunity for training as such. Many of the participants did not have the opportunity to go through the restorative phase as the adversity they face either has been or is on-going and cumulative. Some of the participants (particularly the male participants) presented as not responding to stressors with heightened arousal states but whether or not this presentation is the result of an on-going toughening process or not is equivocal. Without measurement of

neuroendocrine function at the time of the stressor it is also difficult to determine if their apparent lack of arousal is caused by reduced neuroendocrine reactivity or a function of some other factor such as diminished emotional expressivity.

## II – Fit between the model and the literature

The intention of the model was to identify core elements essential to the development and maintenance of resilience, and to do this in such a way that accommodated the tension that lies between parsimony and explanatory breadth. In response to a review of the literature on resilience, and the study results, a model of resilience based within the body and the neural system was proposed. Three premises were proposed; the first premise oriented towards the affective and physiological response to adversity, the second premise referring to the individual's response to adversity and adaptability, and the third relating to belief systems contributing to a sense of well being. Factors identified as important included the capacity to modulate one's reactivity at times of stress and to recover with relative ease, the ability to respond to the stressor effectively and efficiently, and to be able to make sense of what happens and what this means with regard to self responsibility. The model was placed in dynamic system framework whereby the factors were differentiated and separate from each other on one hand but integrated and working together through a reiterative feedback system on the other.

Throughout the literature on resilience there is considerable support for the three factors identified. The first premise identifies reactivity and recovery factors, and posits that these have an underlying genetic basis (temperament) that acts as a constraint on the system. Research supporting this has found the neural basis for motivation, reward and hedonic tone (via mesolimbic pathways) to be heritable and that serotonin release affecting the stress response has a genetic basis (Charney, 2004). Gender differences have also been found in HPA activation in response to certain types of stressors, and oestrogen (mediated by the serotonin system) has been implicated in women reporting more post trauma symptoms than men (Charney, 2004). Davidson (2000) reviewed studies investigating affective style, neural functioning and resilience and he concluded that resilient individuals experience negative emotions (as we all do) but that they also have

the ability to recover more readily and to learn from the experience. Significant patterns have found left hemisphere dominance to be important with regard to positive affectivity and response to adverse events (Curtis and Cicchetti, 2003).

Other studies addressing individual reactivity to stressors, such as those examining attachment, early experience and trauma in neural functioning, also report results supportive of the first premise. Secure attachment relationships have been identified as significant with regard to the neural development of the right hemisphere, and this has been clearly identified as determining the capacity to cope with uncertainty and stress and the processing of negative emotions (Schore, 2002, 2003a). In addition to this, neurochemical studies have found that serotonin release processes can be impacted upon by early life stresses (Charnery, 2004). Conversely, studies have found that individuals exposed to on-going or severe trauma display disruption to brain function and structure in terms of activation of the sympathetic nervous system and the HPA axis, and changes to amygdala function (Allen, 2001; Le Doux, 2002). This can lead to increased reactivity (fight, flight) or dampened reactivity (freeze), both response styles affecting the individual's ability to respond to stressful events in an adaptive manner (Allen, 2001).

The studies in the field of child development that identified self regulation to be an important factor included those by Werner and Smith (2002), Rutter (1991) and Buckner et al. (2003). Buckner et al. (2003) specifically addressed the question of affect regulation and explained this in terms of executive (neural) function and temperament. Other researchers within the child development area reported results referring to reactivity in more broad terms and these studies identified tolerance (Werner and Smith, 2002) and having an easy temperament (Rutter, 1991). These studies, and others within this field, tended to be more oriented towards identifying psychosocial factors that were protective (or impingements) as opposed to individual physiological responses to the adverse events or conditions. Although not directly providing support to the first premise, they are reporting behaviours that are indicative of an affect style that is not highly reactive.

With regard to personality theories, Block and Block's model on ego resiliency proposes that the capacity to modulate levels of boundary permeability (ego control) at times of stress helps to maintain the system within tenable adaptive bounds and to effectively manage anxiety (Block and Block, 1980). This model refers to elasticity and the ability to recoup and return to baseline following stressful experiences, and this can be likened to the notion of reactivity in terms of the ability to equilibrate and re-equilibrate in response to both internal and external changes. A number of studies have confirmed ego resiliency as significant to resilient functioning, and having high continuity across time, domain and culture (Asendorpf and van Aken, 1996; Klohnen, 1996; Pulkkinen, 1996). The different characteristics identifying ego resiliency are psychologically oriented and although research has explored this construct extensively it has not as yet used physiological measures.

Csikszentmihalyi (1990) when discussing the concept of flow suggests that dissipative structures of the mind assist the individual to transform neutral or destructive events into positive events, thus leading to less distress and increased tolerance of negative events. He has determined three steps to be necessary and these are the capacity to accept what is happening without the need to change it, the capacity to focus attention away from one's self and the ability to remain open to new solutions. The first two steps are implicated in the containment of distress (reactivity) and what this means with regard to responsive action. Further limited support comes from the Broaden and Build Theory of Positive Emotions in the finding that individuals with positive emotions rebound from physiological arousal faster than those displaying less positive emotion (Tugade and Fredrickson, 2004). Positive emotions, as characteristic of a strong appetitive temperamental motivation system, have also been linked with increases in dopamine levels in the anterior cingulate cortex (Tugade et al., 2004).

Post traumatic growth models provide additional perspectives as to how the ability to modulate one's level of reactivity can enhance resilient functioning. Biologically oriented models propose adjustment to levels of reactivity (and increased resilience) through "toughening" and "muscle building" of the neuroendocrine system. The first model

suggests that the neuroendocrine system undergoes a "training effect" when exposed to stressors and that this leads to increased physiological sensitivity, responsivity and recovery (Dienstbier and Zillig, 2002). The second model states that the body response to stressors results in a protective phase followed by a restorative phase, and that this leads to an increase in the body's abilities to adapt to demands or allostatic load (Epel et al., 1998). Carver (1998) proposes two further mechanisms that might explain resilience and the restoration of homeostasis from a physiological perspective using broad brushstrokes. The first suggests that a desensitization process occurs with exposure to a stressor and that a resistance is developed with subsequent exposures. The second process suggests that subsequent exposures retain the same potential to disrupt but that the individual becomes more efficient at repairing the disruption (Carver, 1998). Other models within the post traumatic growth literature also refer to emotional regulatory functions but with less specificity (Park, 1998; Saakvitne, 1998).

Support from the wider literature for this premise comes from the work on emotional regulation and emotional intelligence. Studies investigating personality and emotional regulation have reported that individuals who are low in neuroticism are less prone to experience negative affect. As such it is posited that these individuals may find it easier to regulate negative affect earlier in the process of generating emotions, and emotional regulation has been found to be easier at this point as opposed to after the emotions have been generated (John and Gross, 2004). A further suggestion is that these individuals may find it easier to use reappraisal as a means to regulate negative emotions, and that reappraisal as a strategy is healthier than other strategies such as emotional suppression (John and Gross, 2004; Gross, 1998, 2002). Additional studies have also shown that family coaching of emotional regulation leads to children experiencing less stress as measured by physiological activation (Gottman, Katz and Hooven, 1996, as cited in John and Gross, 2004) and this may be an important factor to consider with regard to the role of attachment relationships during early development, and their impact on later resilience.

With regard to emotional intelligence, this model views emotions as useful sources of information to make sense of and navigate the world (Salovey and Grewal, 2005).

Emotional intelligence is defined as a set of skills or competencies that helps us to perceive, use, understand and manage emotions (Salovey and Grewal, 2005; Salovey, Mayer and Caruso, 2002), and it is hypothesized that emotional intelligence may contribute to reduced reactivity through more effective perception and management of emotions. Support for the first premise is also available from the opposite end of the spectrum and in the realm of clinical disorders. Considerable evidence is available as to the difficulties experienced by individuals assessed with low emotional intelligence and the impact this has in terms of general adaptive functioning (Goleman, 1995). At the far end of the spectrum, evidence is also available on the effect of high affective reactivity on adaptive functioning, and the destructive path that can be taken by individuals diagnosed with Borderline Personality Disorder (Fertuck, Lerzenweger, Clarkin, Hoermann and Stanley, 2006; Linehan, 1993; Spradlin, 2001).

As mentioned previously, the intent of this model was not to be prescriptive of coping behaviours or characteristic responses to adversity. It was believed that it was more important to identify underlying principles that oriented the individual's behaviour as opposed to directed their behaviour. To meet this objective Damasio's somatic marker hypothesis was drawn into the model to explain the second factor concerning the ability of resilient individuals to respond adaptively to adverse events. The second factor proposes that Damasio's somatic marker hypothesis enables resilient individuals to respond effectively by directing the individual to the less risky or more appropriate choice, thereby side stepping time consuming deliberation of each and every choice available. The somatic marker hypothesis is based on the assumption that decision making is based on many different neural levels that might be conscious or non conscious, and it helps to explain the underlying intuitive response style reported by the participants in the study.

With regard to the literature in general, support for the somatic marker hypothesis is accruing and there is increasing confidence that this hypothesis helps explain intuition and "gut feelings" phenomenon (Bar-On, Tranel, Denburg and Bechara, 2003; Bechara, Damasio and Damasio, Koenigs, 2000; Carter and Smith Pasqualini, 2004; Naqvi, Shiv

and Bechara, 2006; Nielson and Kazniak, 2006; Young, Adolphs, Tranel, Cushman, Hauser and Damasio, 2007;). Research has not yet directly explored whether or not the somatic marker hypothesis has a role to play in resilient functioning but studies of brain functioning have found some support with regard to the neural efficacy aspect of the somatic marker hypothesis. These studies suggest that those with superior intelligence use only the brain regions required when solving problems and that they do this more efficiently and rapidly (Jausovec and Jausovec, 2001). It is believed that this ability relates to the frontal lobe mediating cognitive demands (Gray et al., 2003). As with the earlier studies reporting on brain function, these studies have examined brain function apart from the body and the role of the body in neural processes has not been included in the research design.

Beyond studies that have directly assessed the utility of the somatic marker hypothesis there lie a range of reports addressing similar concepts to the somatic marker hypothesis that provide limited support to this hypothesis. The first of these, the Affect-as-Information model states that information embodied in affective feelings directly influences judgements (Clore and Tamir, 2002). A second report on emotional intelligence suggests that affect constitutes a unique source of information about the social environment, and that emotionally intelligent people are skilful in the management of this information (Deitweler-Bedell and Salovey, 2001). Thirdly, Sternberg (1988) discusses practical intelligence and wisdom as being based on tacit knowledge. Similar to Damasio's somatic markers, tacit knowledge is procedural, goal oriented and knowledge learnt over time. Finally, Lowenstein, Weber, Hsee and Welch (2001) proposed a risk-as-feelings hypothesis that states when cognitive and emotional appraisals of risky situations diverge, that emotional reactions often drive the behaviour.

The third premise identified factors relating to one's beliefs about world, and one's place in it. The beliefs about the world proposed as important with regard to resilience pertain to an acceptance that bad things can happen and that the world is not necessarily benign or a safe place. The beliefs about self concern taking responsibility for one's self and not falling into the trap of perceiving one's self a victim despite having had bad things

happen. These factors were not addressed by most of the research reviewed, the exception being Antonovosky's sense of coherence model and Kobasa's hardiness model. Both these models specifically addressed the question of finding meaning in what happens, and the need to actively manage what happens. There were slight differences between the two theories but both promoted the notion that commitment and engagement in life's challenges were important, and that by doing this we are more likely to respond in a manner that is adaptive and less distressing.

Aspects of these belief systems in relation to resilience are evident elsewhere in the literature. Personal control and self efficacy models do not discuss beliefs about the world but they do comment on the importance of maintaining a sense of being able to respond to a situation that runs counter to perceiving one's self as a victim. A similar position is taken with Csikszentimihalyi's model on the concept of flow, and the need to believe that we have responsibility for our own destiny. Finding meaning in events was also considered important to the models discussing thriving and benefit finding, and that this in turn can change our world and self view and enhance well-being (Calhoun and Tesdeschi, 1999; Saakvitne et al., 1998; Tennen and Affleck, 2002). Escape avoidance coping mechanism (non acceptance of self responsibility) has been found to negatively correlated with positive emotions and well-being (Folkman and Moskowitz, 2003).

Support for this third premise is also evident in the wider clinical literature, and cognitive behavioual models have for many years described challenging dysfunctional beliefs as a core therapeutic strategy (for example Albert Ellis's list of irrational ideas). There is also considerable research on the psychological impact of trauma challenging the individual's belief systems about self and the world, and the importance of finding meaning for what has happened as being an important to recovery (Allen, 2001; Rothbaum and Foa, 1998). In addition to this, the practice of mindfulness based strategies, and learning to accept the present moment, has been found to be particularly helpful in the treatment of borderline personality disorder (Linehan, 1993; Spradlin, 2001). This technique has been incorporated into many more conventional cognitive behavioural treatment programmes for depression and anxiety (Hayes, 2002; Segal, Williams and Teasdale, 2002). The

benefit of accepting difficulties, as opposed to judging them, has also been promoted as a technique to manage chronic pain, and other health related problems (Baer, 2006; Kabat-Zinn, 1991).

With regard to the model overall, whilst the support for the model remains oriented towards one premise or another, there is support for the structure of the model as a whole from a recent model explaining identity and personality functioning. The life story model of identity (McAdams, 2001) proposes that personality functioning has three levels not dissimilar to this model of resilience. The three levels that McAdams (2001) proposes includes a first level consisting of dispositional traits that describe general tendencies across situations and over time, a second level of characteristic adaptations that describes how the person confronts and adapts to the tasks set before them, and a third level of integrative life stories that constructs the self. Personality is viewed as "a complex patterning of traits, adaptations, and stories" (McAdams, 2001, p 112). This approach to personality reflects the makeup of what has been identified as core elements to resilience, and the resemblance between the two models is heartening.

Similar support for the model can be found by what might considered the counterpart of resilience in the recent model that has been put forward to explain the experience of demoralization (Clarke and Kissane, 2002), This model has been based on the work of Jerome Frank and posits that on facing a situation whereby the future becomes uncertain or unknowable symptoms of demoralization can emerge. Symptoms that might initially present include apprehension, panic and threat, and these lead on to feelings of helplessness, incompetence and impotence. In addition to these the individual might suffer from a sense of loss of mastery and control over life, diminished esteem, helplessness and feelings of shame and isolation. This process of demoralization leads to the final symptoms involving existential despair and a sense of meaningless about life (Clarke and Kissane, 2002). The symptoms of demoralization lie at the opposite end of the spectrum to what resilient individuals report as their experience when facing challenging times and adversity. An essay exploring the key elements of demoralization by Wein (2005) proposed courage, meaning and hope as important (courage + meaning +

hope = morale), and these three elements were very much evident in a positive sense in the interviews with the participants in this study.

**III – Issues relating to trustworthiness**

Chapter 3 discussed in some detail a number of issues relating to qualitative research, and it listed criteria that might be useful in gauging the trustworthiness of a piece of research. As discussed in Chapter 3, numerous models have been put forward and there is considerable overlap and confusion around the process of determining how good a piece of work is. At the simplest end of the spectrum Rubin and Rubin (1995, as cited in Silverstein et al., 2006) propose that qualitative research should be transparent, communicable and coherent. It is believed that this piece of research meets these criteria on all three counts in that that there is clarity with regard to the methodology and process of data analysis, and participants have reported that the study results to be easily understood, meaningful and pertinent to their own experiences.

More stringent criteria have been listed by Huberman and Miles (2002), and certain deficits do emerge in this study when set against what they believe qualifies as good research. Huberman and Miles (2002) site confirmability, dependability, authenticity, transferability, applicability and attention to ethics as criteria with which to evaluate qualitative studies. It is believed that the study does meet these criteria on the counts of authenticity, applicability and attention to ethics. The study met the criteria for authenticity as the interpretation of the data makes sense with what is known in the literature about resilient functioning, and the study is applicable in that it provides a basis for further investigations to explore different facets of resilient functioning across various population groups. The study's attention to ethics criteria was met in that ethical guidelines were followed and participants were treated respectfully throughout.

With regard to the criteria of confirmability, dependability and transferability, the study does display some deficits. It is believed that the study followed good procedures but it is also believed that the results could be interpreted differently if one elected to follow a different model. The model chosen was one firmly based within contemporary

neuroscience and clinical psychology, and it is believed that there were sound reasons for this, but that does not preclude the development of a model from a different perspective. In addition to this, the selection of participants was not random in that each participant was identified on the basis on their perceived resilience, and it could be countered that this led to a bias in the study and that the study was not truly reflective of the resilient population. A more exacting process with regard to the selection of participants might avoid this bias, for example having the participants identified by their peers with regard to ability to be resilient and substantiating this with quantitative measures.

Further criticism could be directed at the participant sample in that the participant group displayed considerable homogeneity as they were all Caucasian subjects of a certain age group and cultural diversity was limited. The study also suffered from a gender bias in that more women were identified as displaying resilience and were more willing to be engaged in the process. On the other hand, the participant group was heterogeneous as the type of adverse experience was not delineated prior to inviting the participants to join the study and a range of adverse experiences were reported. This is significant as the experience of resilience reported across the group was comparable in spite of the diversity of the challenges faced. In addition to this, the sample size was small as the demands of qualitative research are high. Although it was believed that a point of satiation had been reached with the data collected it could be argued that the study might be more convincing if a larger sample of participants had been involved.

The study's defense in not meeting the criterion of dependability and transferability is that the intent of the study was to be explorative and investigative of the subject experience of resilience, and it is believed that it has met this objective. The number of participants in the study was necessarily limited, and the utility of the study will become apparent on the advent of future work in this area and replication studies confirming or diminishing the results. Transferring the findings from this study to other population groups is cautioned at this point as the evidence may not be readily applied to other groups, such as children or different cultural / religious groups. Exploring the ideas generated from this study with more diverse populations, or with more diverse methods,

will be important before the results can be generalized beyond what has been found out from this study alone. The concept that science is a process, and this study is only part of this process, exempts it from undue criticism on these counts.

## IV – Critique of the model

This model stands apart from many of the other models explaining resilience as it could be perceived as deterministic, and thus limiting potential for change and development. This is particularly pertinent to the first premise and the capacity of individuals to modulate their levels of reactivity.  It is also pertinent to the second and third premise in that throughout the model the genetic basis of the individual sets the scene for their later development. This criticism can be countered on two fronts. The first is the reminder that the role genes play is as a constraint on the developing system. With regard to this it is important to remember that what the model specifies is that genes (or more correctly genomes) contain a range of potentials that are activated by experience, and that experience itself is also a constraint upon the system. System development results from the constant interaction of these two constraints and through this process patterns emerge that further constrain the development of the system. The nature / nurture debate is not perceived as the domination of one side over the other but as the two sides working alongside each other as in a team.

The second counter to this criticism is that within dynamic systems change is possible, and likely to occur, if alterations to the scaling of control parameters moves beyond a certain point. Thus a significant trauma may result in changes to the scaling of a control parameter (for example shifting the belief that the world is safe to a belief that the world is unsafe), and this would lead to reverberations throughout the entire system. The reverberations of a change in belief system about how safe the world is would impact on not only the belief system but also cognition (attention and appraisal), affect (reactivity) and behaviour (hypervigilance), and a post trauma pattern would emerge. Alternatively, a series of cumulative stressors may eventually lead to a shift in belief systems (I am competent to I am not competent), and this would lead to a phase shift that reflected the different signs and symptoms of demoralization (heightened anxiety, helplessness,

impotence, hopelessness and existential despair). The input of therapy also has the potential to alter the scaling of the control parameters again and the functioning of the system could return to its former state, or a new and enhanced state.

Further criticism could be directed at the difficulties in researching this model as the neural processes inherent in the model are not readily measurable, let alone in relation to a construct that does not lend itself to laboratory work where different conditions can be applied in a standardized manner. Although there are sound practical and ethical reasons as to why resilience cannot be investigated in a tightly controlled and experimental manner, it is believed that future studies could explore this model indirectly through the use of qualitative studies augmented by quantitative measures. This would involve a series of research projects to firstly confirm the study results through replication, and then a further series of studies specifically investigating the different factors of the model. These factors have the potential to be operationalised and this lends itself to experimental designs to check the factor validity and weighting within the model. The opportunity to develop mathematical models is also available, and with this the potential to explore the dynamic systems aspect of the model more exactly.

Criticism of the model could also question what is different about this model when compared to all the other work that has been undertaken in the field of resilience over the years. This model is different in that it has drawn together the component parts of resilience (affect, beliefs and behaviour) into a coherent whole. This model attempts to explain resilient functioning in a manner that is parsimonious by searching for what it is that underlies resilience. Formulating a model of resilience at this level identifies the potential for resilience in all of us, and what it is that allows individuals to exhibit resilience during challenging times. In doing this it has avoided falling into the trap of describing resilience and the diverse range of potential coping mechanisms that might present in response to a vast number of potential stressors. Limitations are evident in that this is the starting point, and the intent of a thesis is to present a contained piece of work, but there is the potential for this model to be explored at length and to prove its worth over time.

Finally, explicating a model on resilience with a genetic basis in contemporary society has the potential to be shocking with accusations of judgements and labeling being cast forth. It is believed that there is potential for this model to garner such a response and it is interesting to note that if this were the case that it would not be the model that is making the judgement but those interpreting the model. The model itself is merely describing certain potentials and there is no judgement as to what is better or worse, and the intent of the model was to remediate the tendency towards dichotomous thinking. The model itself offers diversity, and what is made available is the opportunity to understand individual propensities to be resilient and to appreciate that each of us respond differently to adverse events in a manner that is specific to the person and the situation. The defense of the model with regard to this criticism is that it is our own need as humans to compare and categorise that generates judgements not the model per se.

## V- Concluding comments

As mentioned above the thesis was not intended to be either definitive or conclusive, and the potential for future work in this area is open in all directions. The study was exploratory and evolved from frustration borne from two quarters – the first an empathy and respect for resilient clients and not so resilient clients that continued to face their daily battles despite having limited resources to start with, and secondly the ethnocentric and confounding research methodology that dictated what resilience was and how it was to be measured. The study challenged many previously held convictions, and helped to give a fresh perspective with which to understand what it is that resilient individuals have that enables them to confront and manage adverse events. In addition to this, the study has revealed various themes that are believed to underlie resilient functioning, and from these three premises were proposed to explain the presence of resilience. Six factors were extracted from these, and they included reduced reactivity and recovery rates to stressors, effective and efficient responses to stressors, and beliefs about self and world explanatory of the stressors.

To remedy the deficits pertaining to the two criteria of dependability and transferability it is hoped that future research will begin to explore what has been started in this project and to extend if further. Replicating the results would be an important starting point, and this could be followed be research designed to examine more closely the six factors identified in the model. The six factors have the potential to be operationalised, and this would permit development of a mathematical equation and the use of computer modeling to measure the dynamic systems component, the relationships between each of the factors and the validity of the construct of resilience as a whole. Beyond specific studies of resilience, the field opens widely to investigating comparisons between similar constructs such as emotional regulation and emotional intelligence, and more divergent constructs such as the recently identified syndromes of demoralization and affluenza.

It is acknowledged that this study has left many questions unanswered but it has achieved what it set out to do, and is merely part of a process in extending understanding of a complex construct. The study was executed with good intent and honesty, and with respect and admiration for the people who display fortitude in their lives. It is hoped that the approach taken might shift the perspective of research in this area to explore the myriad facets of resilience and attenuate the propensity for resilience to be viewed in a linear and dichotomous fashion, and to start to appreciate that it is the whole person as an open system that is resilient. The process of completing this piece of work has challenged previous assumptions that romanticize resilience, and in doing so confirmed other assumptions that we need to be more open to understanding an individual's capacity for resilience as coming from a dynamic system that is set in both the past and the present. Finally, a concluding comment that concurs with Clint Eastwood on the nature of doing that reflects the essence of resilience –

> **"The strength of courage is that it entails an action. No more filibustering, nor rationalizing, nor excuse making. Courage is to act."**
> **Simon Wein, 2005.**

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## Appendix A  -  Comment on methodology in resilience research

"In point of fact, these and other designs vary along a number of dimensions. First, they may be regarded as single of multiple cause models. The multiple cause models may exert independent effects that are all positive, all negative, or mixed with regard to their positive or negative effect on the outcome. The causal effects of the positive or negative (or sole) causal factor(s) may specify mediating variables or not. The more or less direct positive or negative effect(s) on any specified outcome variable may or may not be moderated by specified variables. The specified moderating variables may well reduce the negative effects or increase the positive effect of the independent variables on the outcome, all the moderating variables may be specified as reducing the adverse effects or reduce the ameliorative effects of the independent variables on the outcome, or some moderating variables may be specified as reducing the adverse effects or increasing the positive effects of the independent variables, while other moderating variables are specified as exacerbating the negative effects or reducing the positive effects of the independent variables of the dependent variable. Where moderating variables are specified (whether positive, negative, or mixed in their moderating influence) the variables may be specified as having their own causes and operating through specified mechanisms or not. The variables specified as distal or proximal risk or resource (compensatory) factors, protective or vulnerability factors, and more or less benign outcomes at an earlier point in a model may or may not be specified as the same and / or different kinds of variables at a later point in the model (an earlier risk factor or outcome variable may later be specified as a protective factor, and earlier protective factor may later be specified as an outcome variable etc)."

Kaplan (1999, p 70).

In M.D. Glantz and J.L. Johnson (Eds.). **Resilience and Development: Positive Life Adaptations.** NY: Plenum Publishers.

**Appendix B  -  Comment on the number of qualitative studies**

- A 2005-2006 literature search under Psychinfo, and using the keyword "resilience" had 839 hits as opposed to using the keywords "resilience' and "qualitative" with 74 hits. Of these 74 hits, 32 were described as dissertations.

- Luther (2000) reviewed five decades of work on resilience and less than half of a page (two paragraphs) was devoted to completed qualitative studies and the potential of qualitative studies. The review was 43 pages long.

**Appendix C**

<div align="center">

**INFORMATION SHEET -**
**STUDY ON THE NATURE OF RESILIENCE**

</div>

This study is part of my doctoral research with the Department of Psychology at the University of Canterbury. The aim of this study is to develop a better understanding as to the development and nature of psychological resilience.

The objective of this part of my study is to explore the subjective experience of resilience with individuals who have been identified as displaying resilient functioning by their peers. It will involve an initial interview asking the participant to think back to a stressful or demanding time in their lives and to describe what their psychological experience was at that time. This will not be a structured interview and the participant will be encouraged to comment on their own observations as to the nature of resilience.

A second interview will be scheduled to review the responses of the first interview and to record any thoughts the participant might have had since this time. Following this a third interview will be scheduled to once again review the previous answers and record any further thoughts. This process will continue until "point of saturation" has been reached and the participant does not believe that they have anything further to add. The participants will be advised that they can make further comments beyond this point, and a contact telephone number will be provided.

It is expected that the first interview will take approximately 45-60 minutes, and that the follow-up interviews somewhat less time. The interviews will be recorded and transcribed, and confidentiality will be maintained by the use of pseudonyms. Following transcription, the tapes will be wiped clean and the transcription will be kept in secure storage. The only people to have access to this material will be myself and my supervisors. At any stage of the study, up to the point of publication, you can withdraw your participation and have any related material given to you.

On completion of the transcription of the tapes, the interviews will be analysed for any common themes between participants. The material and conclusions gained from this part of the study will be used in the development of a theoretical model that will hopefully provide further insight as to the nature of psychological resilience. In reporting the study, the material will be presented to protect the identity of all participants. Small parts of interviews may be quoted directly but care will be taken to ensure anonymity.

If you have any questions as to the objectives or process of the study please feel free to contact either myself, or my principal supervisor (Professor Ken Strongman, College of Arts, University of Canterbury, ph 366 7001).


Ali Maginness                                                                    Ph 021 673 433

This study has been reviewed and approved by the Human Ethics Committee at the University of Canterbury.

**Appendix D**

## STUDY ON THE NATURE OF RESILIENCE
## - CONSENT FORM

I have read and understand the information sheet provided as to the nature of this study and what will be expected of participants.

I have been able to discuss the study and I am satisfied with the answers I have been given.

I understand that my participation in the study is confidential and that no material that could identify me will be reported by the study.

I understand that confidentiality will comply within the standard parameters of safety and serious harm.

I am aware of who I can contact if I have any questions or concerns about the study and my involvement in it.

I understand that I can withdraw from this study at any time and that all material pertaining to myself will be returned.

I wish to receive a copy of the study (Y/N).

I, _____, hereby consent to take part in this study.

Date:

Signature:

**Appendix E – Delineating meaning sample**

| | |
|---|---|
| or maybe a couple of years where my experiences were particularly intense but I don't think that they were especially unusual when you look at everybody's lives over the whole of their lifespan. | my experiences were particularly intense not especially unusual not compared to everybody's lives over the life span |
| I mean I think about life challenges, umm, you know they are a part of life and some people get more of it over a period of time I don't think anybody escapes. | I think about life challenges They are part of life I don't think anybody escapes |
| - I survived I think (laughter) sometimes I think you have to get down to basics don't you? | I survived I think You have to get down to basics |
| because where there is life there is hope, | because where there is life there is hope, |
| . It was terrible I absolutely couldn't bear it so I was sort of pushing for the doctors to give him extra | I couldn't bear it so I was pushing (the doctors) |
| its one of lifes strange mysteries | its one of lifes strange mysteries |
| and fortunately we got home help , | we got help |
| disability allowance which was fantastic and we also had both grandmothers and friends and umm, one of my sisters and John's brother. | was fantastic also had both grandmothers and friends, one of my sisters and john's brother |
| So that was quite stressful, it was very stressful. Yeah, and we tried all this massage and music and kind of special techniques for holding | we tried all this massage and music and kinds of special techniques |
| we just basically lived day to day | we just basically lived day to day |
| it wasn't as worrying for them, and it was very worrying for me | it was very worrying for me (no animosity) |

**Appendix F   -   Clustering units of relevant meaning**

*Life's challenges*

**You do need to have faith in life**

**It will unfold in a way that you can handle it**

**My understanding of life and suffering**

**I feel absolutely comfortable with people being flattened, its normal**

*Acceptance*

**(fear) doesn't respond to strategies**

**I couldn't get away**

**Trust (in life)**

**I feel there were forces at play stronger than me**

**That things were meant to unfold in a certain way**

**If you are just in your mind with this there you are very brittle**

**Like resilience, you are a grass in the wind or a storm**

**You need to bend right to the ground (be crushed, flattened) let it carry on its way**

**In the eye of the storm you shouldn't be upright**

*Gratitude*

**You are essentially grateful for what you have got**

**When you are really frightened and feel alone, you aren't alone**

**At the end (of severe depression) I felt surprisingly invigorated to be alive**

**(pathways) we were lucky too**

**(pathways) a good life compared to a lot of other people**

**I am really pleased to be alive**