Subjective Wellbeing in Children

By

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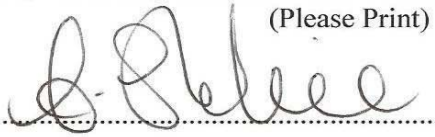
Signed 

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Childhood is measured out by sounds and smells and sights,
before the dark hour of reason grows.

John Betjeman

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EXECUTIVE SUMMARY

The Subjective Wellbeing (SWB) of adults has been investigated and reported for several decades. However research reporting children's own perceptions of their wellbeing is astonishingly scarce and it remains unclear whether the pattern of results found for SWB in adults, also holds for children. Research has demonstrated that for adults, population mean scores for SWB are both positive, and stable. A theory of homeostasis has been proposed to explain this. However, the stability and positivity of SWB in children has been unreported, and the age at which children are able to reliably report their SWB has not been clear. This thesis reports three studies which examine SWB in two samples of children. A developmentally appropriate research methodology for the assessment of child SWB is proposed and utilised. Response effects in children's self-reports of SWB are described. Finally, the applicability of the theory of SWB Homeostasis to children is investigated, and life domains and affective adjectives able to predict child SWB, are considered.

Study 1 investigates the self-reported SWB of 8-12 year old children. A response bias is apparent, with children tending to respond using the extreme positive end of the response continuum. This inflates the mean for child SWB above the normative adult range. Questionnaire items which include abstract words attract significant error variance and their common endorsement of *Don't know* responses to such items suggest children find them difficult. The results also reveal that when children are provided with motivational instructions to respond, they provide a response whether they understand the question or not, thereby contributing error to the data set. For this reason, it is essential that a *Don't know* option is always provided to child respondents, to cater for the possible event of non-comprehension.

Although response bias is evident, Study 1 demonstrates that 8-12 year old children can provide valid self-reports of SWB when developmentally appropriate research methodology is used. The confirmation that children, like adults, self-report positive levels of SWB, leads to Study 2 which investigates life domains which may be relevant to children's wellbeing. The results demonstrate that not all the domains which predict adult SWB, predict child SWB. It is proposed that primary caregivers actively moderate children's experience of life domains, and this moderation, combined with extreme response bias, saturates the domains with satisfaction responses. The variance able to be carried by those domains is thereby limited to individual differences in HPMood.

For adults, HPMood is defined by pleasant (*content* and *happy*) and activated (*excited*) affective adjectives. Study 2 investigates the predictive ability of these same adjectives in children. The results reveal that although these same affects are strongly related to both global life satisfaction (GLS) and SWB in 8-12 year old children, only *happy* and *content* contribute significant unique variance. Moreover, the predictive ability of these affects is poor, with *happy* accounting for just 8.64% and 6.25% of the variance in GLS and SWB respectively, and *content* accounting

for only 2.56% and 5.86%. These results are in contrast to findings for adults. A developmental explanation is proposed, with a sound understanding of the adjectives, and the affective experiences they represent, still forming in 8-12 year old children. Furthermore, and commensurate with findings for adults, once the variance in GLS and SWB contributed by affect is accounted for, the personality variables extraversion and neuroticism are unable to contribute additional variance. The predictive ability of personality is thus driven strongly by HPMood.

Study 2 also tests the relationships between SWB and the cognitive buffer variables of SWB Homeostasis (self-esteem, optimism and perceived control). Unlike the findings for adults, only self-esteem predicts SWB in 8-12 year old children, and the cognitive strategies of optimism, and perceived control, appear undeveloped. High response variance indicates that children find questionnaire items assessing these variables confusing. Furthermore, the cognitive buffer variables are unable to contribute additional variance to the prediction of SWB, once the variance contributed by HPMood is accounted for.

The results of Studies 1 and 2 raise the question of whether children younger than 8 years can similarly self-report their SWB. In Study 3, qualitative and quantitative data are gathered from 6-8 year old children. The same extreme response bias evident in 8-12 year olds, also affects the responses of these younger children. Furthermore, and commensurate with the results of Study 1, not all the PWI domains able to predict adult GLS and SWB, do so in 6-8 year olds. The great importance of personal relationships to the sense of wellbeing experienced by young children emerges clearly from the data.

Study 3 also demonstrates that, as for adults and older children, pleasant and activated affects are most strongly related to GLS and SWB in 6-8 year olds. However the predictive ability of these affects in young children is poor, explaining just 15% of the variance in SWB, and 18% in GLS. Furthermore, immature vocabulary prevents all the affective adjectives tested in adults and older children, from being tested in younger children.

The suitability of an end defined, numerical response format, as opposed to a visual analogue scale (VAS) is also investigated in Study 3. VAS are often used with young respondents on the basis that no reading ability is required. The results show that data obtained with each measure are equivalent; however greater response variance is evident in the VAS data. Furthermore, and consistent with the literature, children prefer the concrete response options provided by the numerical response format, over the abstract VAS. The results confirm that younger children can reliably self-report their SWB using an end defined response scale; the first time this has been demonstrated.

In summary, this thesis confirms that 6-12 year old children can provide valid self-reports of subjective experience. However, children's understanding of questionnaire items which assess subjective variables is affected by cognitive immaturity, and their responses are affected by response bias.

CHAPTER 1: MEASURING VARIABLES IN CHILDREN

In the first two decades of life, humans journey through childhood from helpless infant to competent adult. Today, historical views of children as miniature adults have given way to modern thinking which recognises childhood as a distinct stage of life. Centuries of change in philosophical thinking, culture and science, have culminated in the scientific method being applied rigorously to questions about children and childhood.

A vast body of contemporary scientific theories describe the development of the human child. In recent years, these theories have increasingly guided the proposal and implementation of public policies aimed at solving some of the most prevalent social problems encountered by children. To formulate these policies, an accurate understanding of the quality of life experienced by children is required. Data which accurately report both children's objective and subjective wellbeing are therefore essential. Obtaining objective data about children is straightforward. However obtaining subjective data from children is distinctly problematic. What are the best methods for collecting these data from child samples? What are the factors which may undermine the accuracy of the data and thereby nullify research findings? To explore these questions, the following literature review considers the issues pertinent to Subjective Wellbeing (SWB) research in children.

THE SCIENTIFIC STUDY OF CHILDREN

Whilst an impressive array of literature describes the SWB of adults throughout the world, much less is known about children's SWB. Moreover, it is unclear whether findings from adult populations are able to be extrapolated downwards. In order to understand current methods of SWB research in children, it is useful to review the history of the scientific study of children in general. The following section reviews early child research methods before elaborating on the challenges facing investigators in the study of children.

Early Influences in the Scientific Study of Children

The writings of two philosophers, John Locke (1632-1704) and Jean-Jacques Rousseau (1712-1778), preceded the advent of systematic research into children, yet provided innovative and enlightened conceptions of childhood as a discrete period of development. Locke emphasised the importance of nurture and believed children to be passive in their own destiny. He viewed the child as a blank slate, *tabula rasa*, with character being shaped by parenting, and determined gradually through interaction with the environment. In contrast Rousseau emphasised nature, and believed that children were active in determining their own destinies, possessing an innate plan for healthy development. While aspects of both Locke and Rousseau's ideas permeate modern theories about child development and behaviour, theirs were philosophical, not scientific, conceptions of childhood.

A century later, the writings of Charles Darwin (1809-1882) provided the impetus for researchers to begin observing and documenting children's behaviour scientifically. Previously, humans had considered themselves above the laws of nature. Darwin's assertions in *Origin of Species* (1859) and *The Descent of Man* (1871), that human beings evolved in the same way as other species, meant that for the first time it was acceptable to study, analyse, and understand humans through science. Throughout the late nineteenth and early twentieth century the nascent field of child psychology grew rapidly, and questions about children began to be investigated scientifically.

Systematic Observation

Early scientific investigations of children involved theorists observing individual children. Lacking articulated research questions and formal methods of record keeping, the authors of these baby biographies anecdotally recorded day to day aspects of the child's behaviour. By modern standards many of these accounts have been deemed biased or invalid; however they were the prototypical form of the modern research method of systematic observation.

In the early twentieth century, behaviourism, a theory led by John B. Watson (1878-1958), and expanded by B.F. Skinner (1904-1990), began to influence the field of child study. The behaviourists believed that directly observable and measurable behaviour was the only worthwhile subject for psychologists. To this end, investigators began to systematically observe and measure children's behaviour in naturally occurring and laboratory settings, and to methodically record what they saw. In his now infamous experiment with child subject Albert (Watson & Rayner, 1920), Watson systematically observed and measured Albert's response to a white rat paired with an aversive sound, to see if classical conditioning could be effectively applied to children's behaviour. Whilst Watson's study would not meet modern ethical standards, it does provide an early example of the use of systematic observation within the field of child study.

Throughout the late twentieth century, evidence based theories of child development emerged and became more refined, as investigators such as prominent social learning theorist Albert Bandura and his colleagues advanced from Watson and Skinner's behaviourist precepts, and continued the systematic observation of children. Bandura's early research revealed that children learn behaviours through the observation and imitation of others, also known as modelling (Bandura, 1977). His more recent research has emphasised the role of cognition in children's behavioural development (Bandura, 1992). Research utilising systematic observation as a method of data collection has provided foundational evidence for many contemporary child theories, and it remains popular with researchers dealing with children. However systematic observation is not well suited to the search for answers regarding children's objective or subjective wellbeing, and has not been used for this purpose.

Self-report

It is intuitive that the most effective way to evaluate SWB is to ask people about it. Indeed within adult populations, subjective quality of life is most commonly assessed on a self-report basis. It is not known however, whether this accepted method of assessing SWB in adults, is equally valid and reliable when investigating the SWB of young children.

Children began to participate in research through self-reports towards the end of the nineteenth century, when child psychologists commenced the assembly of a reliable body of facts about children (Stanley Hall, 1904, 1906; Gesell & Thompson, 1936; Gesell, Ilg, & Ames, 1956). Led by influential American psychologist G. Stanley Hall (1844-1924), and his student Arnold Gesell (1880-1961), investigators began to use comprehensive questionnaires to measure children's behaviour. From these data, norms representing the typical child were calculated. At the same time, French psychologist Alfred Binet (1857-1911) developed a test containing age-graded items, designed to directly assess intelligence. For the first time children's role in research was an active one, reporting their behaviour in comprehensive questionnaires, and their abilities in formalised tests

The remarkable work of two significant theorists, Viennese physician Sigmund Freud (1856-1939), and Swiss cognitive theorist Jean Piaget (1896-1980), was also beginning to influence the field of child psychology at that time. Collecting data from children through in-depth and unstructured clinical interviews, Freud formulated complex child development theories emphasising the unique nature of each child's experience, while Piaget devised a theory of cognitive development emphasising children's active construction of their knowledge. Freud and Piaget's ideas continue to influence the modern discipline of child psychology (eg. Berk, 2006) and it is notable that both theorists relied primarily on children's self-report as the data source.

While self-report is an intuitively appealing method of data collection, several factors complicate the task of obtaining reliable, valid and accurate self-reports from children. These include the child's level of cognitive and linguistic development, the child's capacity to attend to the interviewer or questionnaire, and the possible effects of response bias. These factors have the potential to distort research findings based on children's self-reports, and warrant consideration in the context of effectively determining the SWB of children.

CHALLENGES TO ASSESSMENT IN CHILD SAMPLES

The valid assessment of subjective variables in child samples presents some major methodological problems for researchers. These problems are primarily due to children's cognitive immaturity. Depending on their developmental level, children may have difficulty comprehending the questions used, formulating a judgement,

and then communicating their own views in the format required by the researcher. This is a problem also encountered, and widely commented on, in the area of disability research (eg; Cummins, 2002). Researchers wishing to determine the quality of life of these populations have often resorted to the use of knowledgeable others to respond on behalf of the person with the disability, in a practice known as proxy responding.

Proxy Responding

The use of proxy responses has been common practice in research with populations assumed to be physically or cognitively unable to respond for themselves, including people who are elderly (Bassett, Magaziner, & Hebel, 1990), people who are disabled (McVilley, Burton-Smith, & Davidson, 2000) and children (Dunifon, Kalil, & Bajracharya, 2005). Indeed in reports of children's wellbeing (Bethell, Read, & Blumberg, 2005), the use of proxy data is ubiquitous, despite an absence of empirical support for the validity of this method. Using a proxy response in the place of an individual's self-report, assumes that the proxy data and the self-report data will be the same. However incongruence has been demonstrated between data from each source, and in particular, studies have highlighted discordance between responses from the individual and the proxy on measures of subjective or affective variables (Cummins, 2002; Stancliffe, 2000).

Researchers investigating the reliability of proxy data in the assessment of mental health in elderly people found higher correlations for concrete objective items ("*Could the respondent tell me today's date?*") as opposed to subjective items ("*Do you think the respondent, in the past two weeks, has ever felt depressed or very unhappy*?) (Bassett, Magaziner, & Hebel, 1990). Similarly, researchers investigating parent-child agreement in health related quality of life, found that parent and child reports were moderately correlated on ratings of observable physical wellbeing such as respiratory and digestive symptoms. In contrast, their reports of psychosocial variables such as body image, emotional functioning and treatment burden, substantially differed (Havermans, Vreys, Proesmans, & De Boeck, 2006). These findings are consistent with a compelling body of evidence which has established that proxy responses for subjective states cannot be validly substituted for self-report data.

The proxy's reliance on inference has been cited as the basis of the unreliability of their reports. In the absence of direct knowledge of another person's thoughts, feelings or beliefs, the proxy must surmise the subjective state of another, on the basis of objective and observable factors (Cummins, 2002). This conjecture is a poor representation of the subjective information which logically forms the basis of an individual's self-report. Additionally, the conjecture has been shown to be influenced by factors including the relationship of the proxy to the individual, as well as the proxy's age, sex and socio-economic status (Langraf & Abetz, 1998; Bassett, Magaziner, & Hebel, 1990). In the light of these findings, it is clear that proxy ratings of a child's SWB are very likely to be unreliable.

Since proxy data cannot be validly substituted for children's self-report, it is necessary to address the distinctly problematic task of obtaining a reliable, valid and accurate self-report from a child. Currently, the processes which underlie children's responses to survey instruments appear to be poorly understood. Consequently, the age and means by which a valid and reliable self-report may be elicited directly from a child, is essentially, and surprisingly, unknown.

A child's level of cognitive and linguistic development will undoubtedly mediate their ability to provide a self-report, through their capacity to comprehend the questions used, and to respond in the format required. Furthermore, there is a clear potential for response biases to confound data obtained through children's self-report. Before examining developmental issues in relation to obtaining self-reports from children, the response biases of suggestibility, social desirability and acquiescent responding will be considered.

Response Bias

The potential for response bias to affect the veridicality of a child's self-report is real. Response bias occurs when survey respondents select a response which does not accurately reflect their views, thereby corrupting the survey data. In child samples, this can occur when the concepts presented in the survey questions are not understood (Crocker & Algina, 1986), or when child respondents have no interest in, or are unconcerned by the topic they are being questioned about (Vaillancourt, 1973). When responding to questions or survey items, children may therefore choose a response which is suggested by the question itself, they may respond randomly, respond affirmatively to all questions, or respond in a manner consistent with what they perceive to be the belief or wish of an authoritative adult, or in what they believe to be a socially acceptable way. These forms of response bias will now be considered.

Suggestibility and the Expectation to Respond

An extensive, and principally forensic literature, reports on children's susceptibility to suggestion when responding to questions (for reviews see Goodman, 2006, 1984; Bruck & Melnyk, 2004; Ceci & Friedman, 2000). Much of the research addresses fundamental concerns over the reliability of children's testimonies, particularly with regard to crimes witnessed by or committed against them. From this research it is apparent that the accuracy of children's reports can be compromised by suggestive questioning techniques, and that these techniques are particularly powerful when used by biased interviewers, or when used in combination (Ceci & Friedman, 2000).

A frequently cited study, which provided very early evidence of children's suggestibility, is that of Varendonck (1911; cited by Goodman, 1984) in which 7 year old children were questioned about the colour of a teacher's beard. The majority of children responded that the teacher's beard was black; however the teacher actually had no beard at all. It was the researcher's question that suggested

an answer to the children. Similar evidence was reported in a study in which 5 and 7 year old children were asked bizarre questions such as *"Is red heavier than yellow?"* (Hughes & Grieve, 1980). The majority of children obligingly provided answers, despite the conceptually nonsensical nature of the questions.

This evidence, that when questioned, children will usually provide a response, even when the question is essentially unanswerable, is consistent with research reporting the effects of lexical complexity on children's responses (Carter, Bottoms, & Levine, 1996; Saywitz, Snyder, & Nathanson, 1999). US elementary school children aged 6 and 8 years attempted to answer lexically complex questions, even when it was unlikely that they understood them (Saywitz et al., 1999). Of these children, those who were provided with instruction on strategies for coping with non-comprehension of questions, indicated that they did not understand, or asked for the question to be rephrased, 73% of the time when faced with difficult questions. This was in contrast to children who were provided with motivational instructions such as *"Try your hardest"* or *"Do your best"* who rarely indicated that they did not understand, and attempted to answer difficult questions 71% of the time (Saywitz, et al., 1999). Similarly, clarification was sought less than 1% of the time, by a representative sample of US children aged between 5 and 7 years, who were asked lexically complex questions (Carter, Bottoms, & Levine, 1996).

Young children are known to understand the implicit communicative requirement to take turns in a conversation, and that questions require a response (Owens, 1988). In responding to adults' questions, the literature clearly indicates that when children do not understand, they are likely to respond by attempting to answer, rather than by requesting clarification of the question's meaning (Van Hekken & Roelofsen, 1982; Garvey, 1975). When posed with bizarre questions, some children in the Hughes and Grieve (1980) study did respond *"I don't know."* However classifiable answers were required by the researchers, so those responses were not accepted and the children were questioned again. It is clear that these children were expected to provide a response, and did so, perhaps regardless of their degree of confidence in the accuracy of that response.

In the context of survey questions, the potential even for adult respondents to feel pressured to respond has been highlighted. For example Converse (1964) posited that in the measurement of attitudes, adult respondents may conform to what they perceive to be the expectations of the researcher, that is, the provision of a response, even though that response may be simply a random selection from the response choices offered. This potential for error in the assessment of children by survey questionnaire is magnified, since children learn early that they must perform as directed by parents and teachers, who are indisputable figures of authority in children's lives.

Obedience to authority, and the desire to conform to the wishes of a respected adult, have been widely cited as explanations for children's vulnerability to suggestion, with younger children more likely to attempt to meet the wishes of an

adult than older children (Meyer & Jesilow, 1996; Ceci, Ross & Toglia 1987). Furthermore, children's conversations with adults often involve the adult testing whether the child has specific knowledge, which the adult already possesses (Lamb & Brown, 2006). In this way adults may be perceived by children as experts, possessing both superior knowledge and authority. When they accede to this adult authority, children become vulnerable to the suggestion of adults.

Empirical evidence also illustrates that both children and adults are more susceptible to suggestion, when they are interviewed by a high status or intimidating person (Loftus, 1979). Specifically, children interviewed in a supportive socio-emotional context have been shown to be less susceptible to suggestion, than children interviewed in an intimidating context (Carter, Bottoms, & Levine, 1996). Similarly, children questioned by a warm and encouraging person, have been shown to provide fewer inaccurate responses during interview (Goodman, Bottoms, Schwartz-Kenney, & Rudy, 1991). The provision of a supportive socio-emotional environment may well facilitate accurate report in young respondents, by ameliorating the status imbalance inherent in adult/child interactions.

As might be expected, there are age differences in children's vulnerability to suggestion. Younger preschoolers have been shown to be more trusting of adult statements than older preschoolers (Clement, Koenig, & Harris, 2004) and also more susceptible to suggestive interviewing techniques (Ceci, Huffman, Smith, & Loftus, 1994). This age related vulnerability to suggestion has been explained by the combined effects of cognitive, social, and meta-cognitive factors, all of which mature developmentally resulting in decreases in suggestibility with increased age (Brainerd, Rayna, & Ceci, 2008).

In summary, young children are more prone to inaccurate reporting than older children, although enormous variability exists even within age groups (Chae & Ceci, 2005). Explanations for these individual differences include characteristics such as intelligence, temperament, compliance, and self-perception (Chae & Ceci, 2005; Bruck, Ceci, & Melnyk, 1997). It is clear however, that suggestibility is complex, and single cognitive or psycho-social factors cannot be shown to be responsible for suggestibility in any individual child (Bruck & Melnyk, 2004).

Careful questioning of children is necessary to reduce the potential for suggestibility. Leading questions, which suggest an answer such as *"Is the teacher's beard black or white?"* or *"Do you feel happy or sad today?"* lead the child to a particular response, rather than a true and considered response. Leading questions should therefore never be used. Furthermore, research has shown that children interviewed in a supportive context, are less prone to inaccurate reporting in response to misleading questions, than children interviewed in an intimidating context (Carter, Bottoms, & Levine, 1996). Therefore a supportive socio-emotional context should be established between the researcher and the child, to minimise the potential for children to perform according to what they perceive to be the expectation of an authority figure.

Repeated Questions

A further feature of questioning which has been shown to influence the reliability of children's responses is that of repeated questioning. With a sample of children (mean age 6.3 years) Rose and Blank (1974) used a Piagetian conservation task, to demonstrate the impact of repeated questions on children's responses. The standard procedure for a conservation task involves asking the child to make two judgements, one before and one after the rearrangement of objects placed before them. Rose and Blank (1974) included an altered version of the task in which the child witnessed the rearrangement, but was only required to comment on the objects after their position had been altered. It was hypothesised that asking a child to make a second judgement, when significant change to the objects had not occurred, would act as a contextual cue to the child that they should change their first response. The results supported this hypothesis, with the single question task eliciting less than half the conservation errors of the double question task.

Further evidence that children deliberately change their replies in response to repeated questions was provided by Moston (1987). Representative samples of 6, 8, and 10 year old children, were questioned (for example on the presence of a badge) in relation to a man who addressed them at their morning school assembly. Moston (1987) asked the children 16 questions. Eight were a direct repetition of the same question, and eight consisted of a pair of similar questions. For example; *"Did you see a badge on the man's jacket?"* and *"What colour badge was he wearing?"* (Moston, 1987, p72). This was to enable an assessment of the effect of repeated questions in the context of an interview, where repetition through rephrasing, is more likely to occur than word for word repetition of a question.

The results demonstrated an age related increase in the mean number of correct responses. This was expected due to the effect of age related cognitive development. The results also revealed a significantly greater percentage of correct responses to first questioning (68.9%) than to second questioning (53.8%). This was true under both the exact repetition, and the rephrasing conditions. Comparable findings have recently been reported by Krahenbuhl, Blades and Eiser (2009), in interview questioning with a sample of 4 to 9 year old children, where children changed over a quarter of their responses after a repeated question. Similar effects have also been reported in studies with intellectually disabled people. Here, interviewer attempts to elicit a more acceptable or plausible response through question repetition or reformulation, have resulted in participants changing their initial response, believing it to be either wrong or not acceptable (Antaki & Rapley, 1996; Rapley & Antaki, 1995).

Clear evidence now supports the claim that children will respond to a first question with what they believe to be the correct answer, however if the question is asked a second time, or if the question is rephrased, a child is very likely to change their original response, perhaps on the mistaken assumption that their first response was wrong. Since repeated questions have a negative effect on the accuracy and consistency of children's responses, researchers must be prepared to accept a

child's first response to a question. Furthermore, research methodology should make this an explicit requirement of the questioning protocol in research with children.

Social Desirability

Another form of response bias, social desirability, can also influence data obtained through interview and self-report questionnaires. This response bias occurs when respondents answer in a manner they consider will be viewed favourably, rather than reporting their true feelings or actual experience (Crowne & Marlowe, 1960; Paulhus 1991). This can result in respondents under reporting some behaviours or feelings, and over reporting others.

SWB research is susceptible to the effects of social desirability through its reliance on self-report data. For example someone may report they are more satisfied with their life than they actually are. Concerns have been raised over the potential impact of social desirability on reports of life satisfaction (Gilman & Huebner, 2003; Diener, 1994). However there has been little research to date investigating the relationship between the subjective perception of life quality, and socially desirable responding in the young, and only modest effects have so far been reported (*r*s of between .05 and .32) (Huebner, Gilman, & Suldo, 2007).

Three techniques to control for socially desirable responding have been described by Paulhus and Vazire (2007). These are rational techniques, demand reduction, and covariate techniques. Rational techniques are used during test construction. For example the response alternatives available may be limited, to prevent the choice of a socially desirable option. Demand reduction involves asking non threatening questions, and reassuring respondents prior to test administration, of the confidentiality and anonymity of their responses. In this way respondents may feel less inclined to provide a socially desirable response. Covariate techniques involve the administration of a scale, such as the Marlowe-Crowne social desirability scale (Crowne & Marlowe, 1960) which measures socially desirable responding, alongside the measure of the construct of interest, for example life satisfaction. The score on the social desirability measure would then be partialed out of the score of life satisfaction, in an attempt to remove the contaminating effects of social desirability, thereby achieving a pure measure of life satisfaction. It has been argued however, that covariate techniques reduce the validity of the measure of the construct of interest, because they remove valid variance (Reis & Judd, 2000) and for this reason covariate techniques are not recommended (Paulhus & Vazire, 2007).

Certain contexts increase the likelihood of socially desirable responding occurring, for example job interviews. However, it is thought that research conducted with samples of volunteers, whether child or adult, involves little risk of data contamination due to socially desirable responding, when the questions are perceived by participants as non intrusive (Paulhus & Vazire, 2007). Furthermore, the literature does not indicate that child populations are at increased risk of this

form of response bias over adult populations. An emphasis on anonymity and confidentiality in the collection of children's SWB data is recommended, to minimise the likelihood of data contamination due to socially desirable responding.

Acquiescent Responding

Acquiescent responding, the tendency to respond affirmatively to questions regardless of their content, is a further possible source of response bias with the potential to affect the validity of children's self-report data. It has been shown that acquiescence is more likely to occur when respondents are uncertain of their response (Jackman, 1973), or when an item is ambiguous (McBride & Moran, 1967). Additionally, item complexity has been shown to increase the extent to which acquiescent responding occurs (Finlay & Lyons, 2002).

It has been widely argued that the potential for acquiescence should be considered and accounted for in the design of test instruments, through the inclusion of both positively and negatively phrased items (Paulhus & Vazire, 2007; Ray, 1983; McCrae & Costa, 1997). In this way, on a response scale, a positively phrased item such as "*I have lots of friends,"* would require an affirmative response for a high score on the construct being investigated. In contrast, a negatively phrased item such as "*I do not have many friends*," would require a negative response for a high score on the same construct. The effect of acquiescent response bias on the validity of data gathered would thus be supposedly controlled, by the inclusion of both positively and negatively phrased items.

The effect of item phrasing, on the validity of data obtained from primary school children via Likert scales, was directly assessed by Benson and Hocevar (1985). They constructed three separate 15 item scales with similar content. The items on the first scale were all worded positively. The items on the second scale were worded negatively by the inclusion of the words *not* or *do not*. The third scale had a balance of both positively and negatively worded items. A large sample of students in grades 4 to 6 (N = 522), responded to one of the three questionnaires (n = 174 per form). Each item was scored from *1 = strongly agree* to *5 = strongly disagree*. To strongly endorse the positively phrased item *I like riding on the bus*, participants would respond with a 1. To indicate the same attitude on the negatively phrased item *I do not like riding on the bus*, would require a response of 5. Therefore to enable comparison of item means, scoring was reversed for the negatively phrased items.

The authors reported significant differences in the scale means, variances and reliabilities, despite the apparent similarity of the content of the scales. Furthermore, the children were more likely to indicate agreement by agreeing to positively worded items, and less likely to indicate agreement by disagreeing with negatively worded items. For example children were more likely to select "*agree*" to the item "*I like riding on the bus*," than they were to select "*disagree*" to the item "*I do not like riding on the bus*," even though both presumably represent the

same point of view. The higher response variance evident in the negatively phrased items, suggest that as expected, children found the negatively phrased items confusing.

From a developmental perspective, it has been proposed that primary school children find negatively phrased items difficult to comprehend (Benson & Hocevar, 1985), and that the ability to respond appropriately to negative items, requires sophisticated verbal reasoning, beyond the developmental level of most primary school children. For example, in order to indicate that they like riding on the bus, the child must disagree to the item "*I do not like riding on the bus*." This is confusing and requires complex logic which if not properly grasped, could easily result in a child responding in a manner opposite to that which they intended (Marsh, 1986).

If acquiescence is more likely to occur when a respondent is uncertain, or when a questionnaire item is ambiguous or lexically complex, then eliciting a bias free response from a child requires questionnaire items that are simple and free of ambiguity. It is clear that negative phrasing increases the lexical and logical complexity of questionnaire items, possibly rendering them incomprehensible to young children. In this way, the inclusion of negatively worded items may actually increase the likelihood of obtaining invalid data, rather than controlling for acquiescent response bias as proposed by some authors. Thus the inclusion of negatively worded items in questionnaires for children is not recommended.

Summary

Empirical evidence shows clearly that young children are susceptible to response biases. However, this susceptibility is variable across individual children, and vulnerability has been shown to decrease with age. It seems likely, that a fundamental inability to understand the question, or to be sure of the correct response, is mainly responsible for this susceptibility to response bias. Furthermore, the literature provides compelling evidence that when young children do not understand questions, they seldom verbally indicate that lack of comprehension, either specifically *"I don't know what that means"* or through a request for clarification *"What does that mean?"* Instead, children will provide a response, the validity of which cannot be assumed.

Appropriate research methodology can reduce the likelihood of introduced error through response bias. Ensuring that children respond to interviews or questionnaires in a supportive socio-emotional context, and that the questions are not leading, and are brief, lexically simple, non threatening, and positively worded so they may be understood, provides the best opportunity for eliciting a child's bias free self-report. Researchers must also be prepared to accept children's first answers, to avoid cueing children to mistakenly assume their first response was incorrect. Providing instructions on the acceptability of non-comprehension, and strategies such as requesting clarification, or saying "*I don't know*" may also ensure the validity of data.

While it is possible to take methodological precautions to minimise the likelihood of response bias, these precautions afford no guarantee of a child's comprehension of questions, or capacity to respond as required. Can children provide valid data in response to appropriate interview and survey methodology? The following section considers this question, before the literature which describes children's cognitive and linguistic development is reviewed.

CAN CHILDREN PROVIDE VALID DATA?

If children are to act as principal informants with regard to their own experiences, it is necessary to examine whether children can provide valid responses to appropriate questioning. Responding to survey questions is known to be a cognitively demanding task (Paulhus & Vazire, 2007). However there is little evidence reporting children's ability to validly perform this task. Concerns over whether valid data may be collected directly from children, prompted one study which reported the differences in the quality of data collected via interview, from a sample of Australian children aged 8-9 years (n = 195) and adolescents aged 15-16 years (n = 207) (Amato & Ochiltree, 1987). A 165 item questionnaire was used to ask participants about their family life, school and friends.

The data, collected from the children and adolescents, were assessed in three ways to determine whether age related differences were apparent. First, interviewers were asked to complete a short questionnaire following data collection, to report the respondent's level of cooperation, and whether they appeared to experience any difficulties in answering the questions. Second, the data were analysed for the number of missing data points on the basis that young children may not be able to respond to all questions. And third, the level of agreement between the child and adolescent data, and data provided by their parents, who completed a 155 item questionnaire, was assessed. This was on the basis that the provision of incorrect responses, to relatively easy and objectively verifiable questions, would indicate an inability to validly respond to simple questions, thereby signalling a likely inability to provide a valid response to more difficult or complex questions.

Analysis of agreement between parent and child responses revealed high levels of agreement on objectively verifiable data such as family type and number of siblings. This correlation provided only preliminary evidence of the validity of children's responses to simple and objective questions. Analysis of missing data points revealed further information, with more missing data and *'Don't know'* responses appearing in the child than the adolescent data sets, as illustrated in Table 1.2.

Table 1.2: Amato & Ochiltree (1987) Mean data quality indices for responses

Data Quality Indices	8-9 year olds	15-16 year olds
n don't know responses	4.29	1.87
% don't know responses	1.92%	.81%
n missing responses	2.02	1.92
% missing responses	.91%	.81%
Total non-valid responses	6.31	3.80
Total % non-valid responses	2.83%	1.62%

However the differences between the child and adolescent data sets were small, with missing data or *'Don't know'* responses resulting in a total of 2.83% of data invalid in the child sample, and 1.62% of data invalid in the adolescent sample. This compares favourably to the parent data, where 1.63% of responses were invalid. From these results it is clear that for the questions asked, data loss due to the age of the respondent was minimal.

The results also showed that according to interviewer reports, more children (32.5%) had difficulty understanding the interview questions than adolescents (5.4%). However, most children understood most of the 165 questions, and only 8% of the children experienced difficulty understanding four or more questions. 9% of the children (n = 17) experienced difficulty with the same question *"What is your religion?"* This suggests that either the word *religion* is not well known by 8 to 9 year old children, or the concept of religion is either not known or is difficult for them. The necessity of ascertaining whether or not children understand the concepts and the vocabulary used in questionnaire items is highlighted by these findings, and the importance of this cannot be overstated if data validity is to be ensured.

The researchers also reported that children experienced difficulty with questions that related to the past, or to events that were not directly related to their experience, such as their parent's occupation. The capacity to think about the past and the future has been investigated developmentally, and an awareness of the past and the future evident in children's speech during the third year of life (Sachs, 1987). However there is little evidence regarding the age at which children are able to answer questions about themselves in a past or future context.

One study claiming to be the first to assess children's ability to recall yesterday and predict tomorrow, investigated 3, 4 and 5 year old children's ability to report events which did and did not occur yesterday, and which may or may not occur tomorrow (Busby & Suddendorf, 2005). Researchers asked the participants four questions, *"Can you tell me something you did yesterday?" "Can you tell me something you didn't do yesterday?"* and *"Can you tell me something you are going to do tomorrow?" "Can you tell me something you are not going to do tomorrow?"* The results revealed that the 4 and 5 year old participants significantly outperformed the 3 year olds on both the yesterday and tomorrow

questions. Moreover, while 3 year old participants often produced answers to the questions just like the 4 and 5 year olds, the events they reported did not reflect actual or likely past and future events, as judged by their parents. Furthermore, 3 year old children were significantly less able to report an event that did not occur yesterday, or would not occur tomorrow, than 4 and 5 year olds, suggesting that the 3 year olds found the negative request difficult.

The results of the Busby and Suddendorf (2005) study provide evidence of what can be known intuitively, that an understanding of temporal concepts such as past and future emerge developmentally. It is therefore not surprising that asking children about the past or the future presents a challenge to question comprehension. Indeed it appears that when temporal concepts are included in questions posed to children, it increases the difficulty of those questions. This is accompanied by a corresponding decrease in the likelihood of a valid response, due to the child's basic inability to understand what the question is asking. For this reason, instruments designed for use with children, should be cautious in the inclusion of questions which require contemplation of the past or future.

Furthermore, the results of the Busby and Suddendorf (2005) study provide evidence in accordance with the findings already discussed (see Acquiescent Responding, page 21), which demonstrate that children's comprehension, and therefore the quality of their response, is compromised when questions are worded negatively. Taken together, the evidence clearly indicates that characteristics of the question, such as negative wording, along with characteristics of the respondent, such as the developmentally achieved ability to understand temporal concepts, can both reduce the validity of children's responses to interview or survey questions.

In summary, although children's ability to report subjective variables was not assessed, the results of the Amato and Ochiltree (1987) study provide empirical evidence of 8-9 year old children's ability to provide valid data. Specifically, children provide valid reports of objective variables via interview questions, when they understand the vocabulary used, and the concepts they are being questioned about, and when the questions are oriented to their present circumstances. This highlights the absolute necessity of ensuring a child respondent is able to fully understand the assessment task required by researchers. This must include an understanding of the vocabulary and concepts used in the questions, and it is likely that this understanding will be mediated by the child's level of cognitive development. To enable consideration of the likely impact of cognitive development on children's ability to self-report their subjective experience, the developmental literature will now be reviewed.

THEORIES OF DEVELOPMENT

A compelling body of literature details the dramatic changes that take place in the human child during the first months and years of life. This process of maturation, although universal, is also variable, and normal individual differences between

children are evident. Many prominent and influential researchers have investigated and described aspects of child development. However primarily, it is the capacity for cognition, which enables the formation and communication of a self-report. Consideration of the major theories of cognitive development is therefore necessary.

Cognitive Development

It is obvious that a child's developing capacity for cognition will affect their ability to self-report subjective experience. To explore this, consideration must be given to the development of cognition within the child. Three theories dominate the field, Jean Piaget's cognitive-developmental theory (Piaget, 1926), Lev Vygotsky's sociocultural theory (Vygotsky, 1962), and the more recent information processing approach. Each provides a distinct view on the way children's cognitive capacities emerge and develop, and each will now be considered.

Piaget – Cognitive Developmental Theory

Unlike the early philosopher Locke, Jean Piaget did not view children as passive in their own development; rather, he believed that children were active and independent in the construction of their knowledge, developing cognitively through their exploration of the environment. Piaget's theory outlines four stages of cognitive development and proposes that normally developing children move through these stages in their own time, but in a fixed sequence, as the brain develops and matures. Piaget did not specify age norms associated with each stage, however approximate age ranges are applied to the stages by contemporary developmental theorists (Santrock, 2005). Piaget's theory proposes that as the child experiences, interprets and adapts to their external environment, cognitive change takes place in a genetically predetermined and stepwise process, with qualitatively distinct thinking characterising each of the stages (Piaget, 1926; 1955; 1969). It is these changes in thinking which directly impact the child's ability to make a valid self-report.

Piaget's first stage, the Sensorimotor stage, normally extends from birth through to 2 years of age and is characterised by the infant's sensory exploration of the world. Piaget holds that cognitive development occurring during this stage is associated with the infant's application of innate abilities such as gazing, grasping and sucking, to their environment. The infant's knowledge of the world is thus believed to be limited to sensory perceptions and motor activities. It is clear that attempts to elicit a self-report of SWB from a child in the Sensorimotor stage, using standard assessment procedures such as survey responses or interview, could not produce valid data.

The symbolic thinking of the preschool child emerges in Piaget's second stage, the Preoperational stage, which characteristically extends from 2-7 years of age, and which includes early and late preoperational sub-stages between 2 and 5 years and

from 5 to 7 years. During the Preoperational stage the major accomplishment of the child is the acquisition of language which will be discussed in detail later. With language, the child begins to symbolically represent their world with words, symbols and images. This capacity is fundamental to obtaining a valid self-report of SWB from a child. Furthermore, the capacity to understand written language is necessary if children are to be assessed through a self-report survey or questionnaire. These skills emerge in the preoperational child but are extended and consolidated over time as the child's vocabulary and reading expertise increase. This will be discussed in more detail later.

According to Piagetian theory, the preoperational child's thinking is illogical. However the capacity for more structured reasoning ability and logic emerges with the transition into the Concrete Operational stage. Characteristically, this stage extends from approximately 7-11 years of age. Piaget believed that the concrete operational child's reasoning is logical and organised, and he refers to children's developing use of mental operations such as classification, conservation, and seriation during this stage. Research, which will be described in detail later, has shown that children's ability to seriate (arrange in a series), predicts their ability to respond to questioning using a visual analogue scale (Shields, Palermo, Powers, Grewe, & Smith, 2005). Piaget's theory states that children acquire the cognitive skills representative of each stage in a stepwise process. Accordingly, the theory suggests that prior to entering the Concrete Operational stage, a child would not be able to seriate, and on the basis of the evidence described, would be unlikely to be able to correctly use a visual analogue scale.

Additionally, Piaget described the thinking of the concrete operational child as dichotomous, with children engaging in 'all or nothing' thinking. This dichotomous thinking has been cited as an explanation for the finding that younger children tend to respond to Likert scales using only the extreme ends of the response continuum (for example Chambers & Johnston, 2002) reporting themselves to experience the variable being measured either completely, or not at all. Research reporting this finding will be discussed in detail later. Young children's descriptions of self also provide evidence of this dichotomous thinking, with young children unable to acknowledge that they possess opposing attributes, for example being both good and bad (Damon, Lerner, & Eisenberg, 2006), and unable to acknowledge the experience of two emotions of opposing valence at the same time, for example being both happy and sad (Harter & Buddin, 1987).

The concrete operational child is also described as being oriented to the present, and as having an undeveloped sense of time (Piaget, 1969). Evidence that children experience difficulty responding to interview or survey questions, when they are not directly related to their present circumstances has already been described (Amato & Ochiltree, 1987) and research demonstrating children's difficulty with questions related to time (Breton, Bergeron, Valla, Lepine, Houde, & Gaudet, 1995) will be discussed later. Children's concept of time is acquired gradually, and is initially based on the schedule of their daily routines. For example, a child may

understand that a particular event will occur after lunch. In this way, although time is an abstract construct, it is initially understood by the child in a concrete way.

The emerging capacity to think logically about concrete events, but continued difficulty understanding or thinking about abstract events, is a further cognitive feature of Piaget's concrete operational child. During this stage, the ability to fully comprehend the concepts of past and future is likely to be difficult. The implication of Piaget's theory for obtaining a valid self-report is that during the Concrete Operational stage, a child would be unable to provide a valid response to questions about the past or the future due to their abstract nature.

Evidence that children have difficulty responding to questions about religion (Amato & Ochiltree, 1987) can also be seen as evidence of this difficulty with abstract concepts. Piaget believed that the capacity for abstract thinking evolves as the child enters the Formal Operational stage (at about 11 years onwards) and that this heralds the beginnings of adult cognition. With the emergence of abstract thought, the child is able to leave behind the necessity for concrete events and concrete things as the basis of thinking, and instead, consider and understand abstract concepts.

It was proposed by Piaget, that each child is limited to learning the cognitive skills related to the stage they are in, and that each stage follows the next in an invariant sequence. In this way, Piaget's theory explicitly holds that for example, the preoperational child is incapable of the cognitive skills of the concrete operational child, and the concrete operational child is incapable of formal operational thought. However modern researchers have modified Piaget's stepwise process of cognitive development, and view the change between stages as a more gradual process, regarding cognitive development as continuous (Case, 1992). Furthermore, it has been argued that in its focus on the typical child, Piaget's theory fails to adequately account for individual differences in children's development, and the possible effects of motivation, environment and teaching on children's learning. Despite this, Piaget's theory continues to influence the field of child development (Berk, 2006; Santrock, 2005) and the characteristic cognitive capacities of children in each of his four stages, do enable consideration of the approximate age at which a child may reasonably be expected to provide a valid and reliable self-report of SWB.

In summary, Piaget's theory suggests that during the Sensorimotor stage (approximate age 0-2 years) a child will be unable to provide a valid response to questions. During the Preoperational stage (approximate age 2-7 years), a child's capacity for language is still developing and this will limit their ability to adequately comprehend and respond to questioning. During the Concrete Operational stage (approximate age 7-11 years) the skills necessary to provide a valid self-report are emerging. The child is likely to possess sufficiently developed language skills to be able to understand a simple question and communicate a response. The capacity to seriate is developing in the concrete operational child and this will facilitate the correct use of a visual response scale. Due to the

dichotomous nature of the concrete operational child's thinking, they may tend to use extreme responses on a response scale indicating themselves to be all happy or all sad. Continued difficulty with abstract constructs is likely to impact the concrete operational child's comprehension of questions which include reference to abstract concepts such as time. Transition into the Formal Operations stage at around 11 years of age, signals the emergence of adult cognition, and children from this age onwards should demonstrate competence providing a valid report of subjective experience.

Vygotsky – Sociocultural Theory

Vygotsky's (1934-1986) sociocultural theory views the child's uniquely experienced social and cultural context as a principal influence on the development of cognition (Vygotsky, 1962; 1978). This theory challenges Piaget's contention that the hierarchy of cognitive skills develop in an invariant sequence. In contrast, Vygotsky proposed that the process of cognitive development is a socially mediated one, occurring only as children communicate and interact with others to acquire culturally specific ways of thinking. In this way, Vygotsky's theory predicts that rather than progressing through predetermined and stepwise stages, children's cognitive development is socially and culturally dependent and therefore highly variable.

Vygotsky believes that during the human infant's first two years of life, the elementary mental capacities with which the infant is pre-endowed; sensation, perception, attention and memory, develop through the infant's social interaction with the external world into higher mental functions. He referred to tools of intellectual adaptation, which are the culturally specific strategies by which the infant's cognitive capacities are developed into the higher mental functions. For example, all human infants are endowed with an elementary capacity for memory, however the methods by which this capacity is developed is culturally dependent. In literate societies, writing information down is a common aid to memory. In pre-literate societies, strategies which do not involve pen and paper, such as verbal repetition, or carrying pebbles, are used instead.

Vygotsky also emphasised the role of more knowledgeable others in the process of cognitive development. The more knowledgeable other facilitates the child's cognitive development by providing the child with extra information which enables better performance at a task, or better understanding of a concept. For example a child attempting a first jigsaw puzzle will perform better following the provision of strategies for success such as finding corner pieces (Shaffer & Kipp, 2009). The knowledgeable other possesses more information about the successful completion of a jigsaw puzzle than the child. This knowledge is shared with the child in a social and collaborative process which directly impacts the child's cognitive development. While the knowledgeable other may commonly be the child's parent, Vygotsky holds that siblings, peers, younger children and older adults may all contribute to a child's cognitive development in this way.

This collaborative sharing of skills and expertise enables the child's cognitive development to occur in what Vygotsky termed the zone of proximal development (Vygotsky, 1978). This concept refers to the opportunity for learning which occurs when the child is assisted to achieve a skill which is too difficult for them to perform alone, but which they are able to accomplish with guidance and encouragement from a knowledgeable other, and which they are then able to perform alone. In this way, children are able to develop their elementary mental capacities into higher mental functions.

In his emphasis on the social transmission of knowledge, Vygotsky paid little attention to the importance of heredity and brain maturation, in the process of development. However it is clear that the capacity for language is crucial to Vygotsky's socially mediated process. Language enables the communication of information to the child, and also becomes a tool of adaptation itself, with the development of the private inner speech of the child. Indeed Vygotsky maintained that it is the acquisition of language, which underpins the development of more sophisticated mental skills including planning, problem solving and self reflection, through the development of a private inner dialogue.

In this way, Vygotsky's theory supports what is known intuitively, that the capacity for language is fundamental to the child's capacity to provide a reliable self-report. The child must be able to comprehend the instructions given, engage in a process of internal reflection and accurately communicate a response. Vygotsky's theory does not suggest an age at which a child might be capable of these tasks. Instead, it implies that any language-proficient child, with the guidance and encouragement of a more knowledgeable other, may learn to provide a self-report of SWB.

Information Processing

A further approach to understanding cognitive development is through information processing. Here, human thought is viewed as a system which receives information through the senses, then codes, organises and manipulates that information in a manner analogous to a computer (Reed, 2000). This approach proposes that cognition occurs through active sensory registration of the external world, and its proponents seek to provide explicit models of the exact sequence of cognitive processes operating on that information.

An immature capacity for these cognitive processes is invoked by neo-piagetian theorists such as Juan Pascual-Leone (Pascual-Leone, 1970; Pascual-Leone & Johnson, 2005) and Robbie Case (1992, 1972), to explain the cognitive limitations observed and described in children by Piaget. These theorists hold that progression through Piaget's stages results from maturational increases in the speed and capacity of the information processing system, and especially working memory. This is the brain system responsible for the temporary storage and manipulation of information necessary for mental tasks (Reed, 2000).

According to Pascual-Leone (1970), the working memory of a 2-3 year old child, can attend to just one piece of information at a time. This capacity is said to increase due to epigenetic factors, to incorporate one additional piece of information every two years until age 15, when working memory is thought to operate at its maximum capacity. Extending this theory, Case (1972, 1992) proposed that in addition to the biological maturation of brain structures, the automatisation of cognitive processes, and an increasing repertoire of cognitive strategies, also facilitate increases in the capacity and efficiency of working memory. In this way, cognitive development is explained by the neo-piagetian theorists, as a direct function of increases in the magnitude and efficiency of a child's information processing system.

The implication of the information processing approach for the assessment of SWB in children, is that long questions, or questions which address more than one concept, have the potential to exceed a young child's working memory, and result in an invalid response. Furthermore, since the information processing system shows developmental increases, the ability to self-report SWB, is likely to show age related increases.

Ecological Systems Theory

A further major contemporary theory of child development is Ecological Systems Theory, proposed by Urie Brofenbrenner (1917-2005). Brofenbrenner did not focus solely on the development of cognition, but described child development as occurring through an interaction between the child, and the unique and complex context of their multidimensional environment (Brofenbrenner, 1979).

Ecological Systems Theory describes four systems which constitute different levels of the child's environment. Each system exerts a powerful influence on the child's development. The first, the Microsystem, represents the child's immediate environment and is said to have the most direct influence on the developing child. The Microsystem contains the child's immediate interactions and activities with family, school, peers and neighbourhood. The Microsystem is where interpersonal processes such as reinforcement, modelling, and social learning occur. The more encouraging and nurturing these relationships and interactions are, the more positive the influence of the Microsystem on the child's development (Brofenbrenner, 1979).

The second level, the Mesosystem, is comprised of the connections between aspects of the Microsystem such as the home and the school. For example positive parental involvement in the school is seen as fostering the child's development. Furthermore, interaction between the child and parent is likely to be affected by the child's relationships with others for example teachers at school. The child's relationships with teachers at school, in turn affects the child's relationship with their parents. In this way, the child's development is seen to be supported by the Mesosystem through productive, supportive interaction between different members of the child's Microsystem (Brofenbrenner, 1979).

The third level, the Exosystem, comprises community and social settings which do not contain the child, but which affect the child's experiences in their immediate environments (the Microsystem) (Brofenbrenner, 1979). The Exosystem may include, for example, a parents' workplace. This may directly and positively impact the child through additional financial resources available as the result of a pay rise, or conversely the effect may be negative through financial difficulty as the result of retrenchment.

The fourth and final level, the Macrosystem, is the cultural context in which the child lives (Brofenbrenner, 1979). This includes the culture and the resources of the society, for example the economy, the relative freedoms available as a result of government, and whether or not the society is at war. Although remote from the child, the influence of the Macrosystem on development is nonetheless powerful.

These four systems, Microsystem, Mesosystem, Exosystem and Macrosystem, are represented by Brofenbrenner as a series of concentric circles, with the child at the centre. Each system thus differs in its immediacy to the developing child, with the Microsystem having the most direct influence. Ecological Systems Theory thus clearly defines dimensions of the environment which affect the developing child. The child and the environment are said to engage in a dynamic and bi-directional interplay, in which the child both influences, and is influenced by, the environment (Brofenbrenner, 1979).

Summary

Each of the reviewed theories of cognitive development provides insight into children's cognitively mediated capacity to validly self-report their SWB. Piaget's theory describes four distinct stages of cognitive development and details the cognitive abilities which emerge and become more refined in children during each stage. From Piaget's theory, it appears likely that a child in the Concrete Operational stage (approximate age 7-11 years) could provide a valid and accurate report of subjective experience. Following the transition into Piaget's Formal Operations stage (approximate age 11 years onwards), children should be able to easily provide a valid report of SWB. In contrast, during the Sensorimotor and Preoperational stages, children's immature capacity for language, will compromise their ability to sufficiently comprehend an interview question or survey item regarding their subjectively experienced satisfaction with life.

In contrast to this, Vygotsky's sociocultural theory focuses on the unique social and cultural context within which the child develops, and highlights the socially mediated nature of children's cognitive development. The capacity for language is vital to this theory and suggests that once a child has achieved language proficiency, a knowledgeable other may assist a child in learning to provide a valid report of subjective experience.

The third theoretical approach, Information Processing, suggests that due to maturation of the brain, and an increased repertoire of cognitive strategies, the capacity to self-report SWB will show age related increases. Any assessment task used with young children should therefore be brief and simple, so as to not overwhelm the immature processing capacity of the young child's brain.

Finally, Brofenbrenner's Ecological Systems Theory describes the influence of the environment on the child. It is clear from this theory that aspects of each child's growth and development, including that of cognition, will be supported or hindered by the unique nature of their environment, and most immediately by their Microsystem. However this theory provides no basis for specific predictions regarding children's capacity to self-report their subjective experience.

The three theories of cognitive development described; those of Piaget and Vygotsky, and the Information Processing approach, do provide convergent evidence that the validity of data collected from children, can be potentially jeopardised by the child's level of cognitive development. Prior to the age of 11 years, it appears likely that the child's immature capacity for mental processing, along with an emerging, partially developed ability to seriate and a tendency to engage in dichotomous thinking, may impact a child's capacity to appropriately respond to a questionnaire seeking a self-report of subjective experience. Empirical evidence of these developmental effects in children's self-reports will now be reviewed.

DEVELOPMENTAL EFFECTS IN CHILDREN'S SELF-REPORTS

It has been proposed that the task of responding to a survey item is a multi-step process (Tourangeau & Rasinski, 1988). This requires that respondents are able to accurately interpret the meaning of a question, and also appropriately communicate a response. The successful execution of these tasks will obviously be mediated by a child's age-related development. However few studies have directly investigated this, perhaps because child development is so variable, and grouping children by age, whilst practical, certainly provides little assurance of homogenous ability. Nevertheless, age-related effects in children's question comprehension, and response communication, have been observed and reported. The evidence describing these effects will now be discussed. Children's understanding of survey items will first be considered, followed by the evidence reporting children's use of response scales. Each will be described in the context of the three major theories of cognitive development just described.

Children's Comprehension of the Question

Children's understanding of survey and interview questions will, of course, directly affect the validity of their responses. If questions are too difficult, children will be unable to make an appropriate response. The effect of question difficulty on children's responses has been investigated, and results indicate that linguistic

complexity attenuates the accuracy of 5-7 year old children's ability to report events, with simpler questions eliciting more accurate responses (Carter, Bottoms, & Levine, 1996). Similarly, when the effect of question difficulty on children's ability to recall information was investigated in a representative sample of 6 and 8 year old children, all children performed better on simple, developmentally appropriate questions (Saywitz, Snyder, & Nathanson, 1999).

These results are intuitively unsurprising. Of course young children will be vulnerable to question difficulty; however this may also be true of older respondents. One study explored the effect of question complexity on children's understanding by asking students in four graded groups to verbally respond to a number of simple and complex questions (Perry, McAuliff, Tam, Claycomb, Dostal, & Flanagan, 1995). The four groups (each $n = 30$) consisted of students in kindergarten, grade four, grade nine and college. All students were shown a videotaped incident which they were then questioned about. Half the students in each grade group were questioned with complex questions, and half with simple questions.

As expected, the results indicate that the ability of students to accurately comprehend the questions was significantly less for complex questions, than for simple questions. Furthermore, questions with multiple parts were the most difficult to answer, and questions which included negatives or difficult vocabulary, were also notably challenging. These results were true for all age groups tested. The detrimental effect of question complexity on comprehension, is thus not limited to young children, but occurs into and beyond adolescence. For this reason, children's evident and intuitively predictable difficulty understanding complex questions cannot be attributed to age related cognitive development alone. Rather, question complexity may impede comprehension in all respondents. Therefore, the use of simply phrased, positively worded, single proposition questions, which use uncomplicated vocabulary, is recommended to optimise respondent comprehension at all ages.

An exploratory study investigating whether children between 9 and 11 years of age understand the questions from the diagnostic interview schedule for children (DISC) version 2.25 (Breton, Bergeron, Valla, Lepine, Houde, & Gaudet, 1995), highlights the importance of careful questionnaire wording to ensure children's valid responses to survey items. The study addresses three questions specifically in relation to the DISC. What is children's understanding of the questions as a whole, what understanding do children have of time concepts, and what is the effect of the number of words in DISC questions, on children's comprehension of those questions.

The DISC 2.25 is a structured diagnostic interview for use in clinical settings. It assesses symptoms in six separate diagnostic areas. Before beginning the questionnaire, the interviewer constructs a timeline with the respondent for the past 12 months, including events of significance from the child's own life. The questionnaire items then address symptoms and their occurrence in relation to the

timeline. This time aspect of the DISC enabled the researchers to assess children's understanding of questions related to time, as well as the effect of item wording on understanding.

The researchers recruited a representative sample of 240 students from public schools in Canada. 60 DISC forms were completed with four children providing the responses for a single DISC due to the length (280 items) of the questionnaire. Children were tested individually. For each item they were asked *"Can you explain to me what this sentence means?"* Children were then required to verbally describe their understanding of the sentence. Answers were recorded verbatim. Two child psychiatrists, unaware of the age or sex of each child, then separately judged the recorded answers and classified them according to successful, unsuccessful, or doubtful comprehension.

The results revealed that 9, 10, and 11 year old children understood 38%, 38% and 42% of the questions respectively (Breton, et al., 1995). Questions were assessed for number of words, and were divided into three categories, 1-9, 10-19, and 20 or more words. The results indicated that item understanding decreased as word number increased, with differences between the categories significant at $p<.001$. This again is clear evidence that questionnaire items should be kept short to ensure they are understood by children.

These results are consistent with the Information Processing approach to cognitive development, which predicts that lengthy questionnaire items are likely to overwhelm the immature working memory of child respondents. The results are also consistent with Piaget's theory, which predicts that the complexity of lengthy questions makes them likely to exceed the cognitive abilities of 9, 10, and to a lesser extent 11 year old children, who characteristically engage in concrete operational thinking.

The results of the Breton et al. (1995) study also reveal that children had difficulty comprehending questions about time, with only 27% of time questions understood. Understanding decreased in questions which included a second or third time component, in comparison to those with only one. For example the question *"**In the last year**, were there **two weeks in a row**, when you felt sad or depressed almost **every day**?"* contains multiple time components making it more difficult for children than the question *"Was there a time when you felt sad or depressed almost every day?"* The effect of the inclusion of multiple time components on children's understanding of questions was significant. For example in relation to questions about ADHD symptoms, Breton et al. (1995) reported that understanding decreased from 19% of ADHD questions with one time component, to only 2% of ADHD questions with more than one time component.

These results are commensurate with the findings of Amato and Ochiltree (1987), which also revealed 8-9 year old children's conceptual difficulty with temporal items. Again, these findings are as predicted by the Information Processing approach, and also by Piaget's theory of cognitive development. Children between

9 and 11 years of age clearly experience difficulty with questions made complex by the inclusion of multiple components. Questions which require the ability to think abstractly, particularly with regard to temporal concepts, are also problematic.

Age related differences in children's understanding of survey questions, was also investigated and reported in a sample of 5-11 year old children (N = 60) (Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001). The children were required to respond to a series of 32 health related questions presented twice, to test alternative wordings. The sample included children recruited from after school care centres (n = 42) and also from a paediatric medical centre (n = 18), in order to include children who were familiar with the experience of poor health. A 'think aloud' methodology was used. After indicating their response on a scale provided, children were questioned about their understanding of key terms referred to in the questions. Examples of the terms include *healthy*, *energy*, *threatened*, *pain*, and *on a dare*. Children's understanding was then coded into three levels as; clear understanding, some understanding, or poor understanding. Inter-rater reliability for this coding was reported at 78%. The results reveal age related differences as expected, in the percentages of children poorly and clearly understanding key terms as illustrated in Table 1.3.

Table 1.3: Percentages of children poorly and clearly understanding item terms (Rebok et al. 2001)

	5 yrs (n = 7)	6 yrs (n = 12)	7yrs (n=16)	8-11 yrs (n = 25)	Total (n = 60)
Terms Poorly Understood (%)	50%	23.5%	19%	3.5%	17.4%
Terms Clearly Understood (%)	26.8%	47.2%	55.2%	73.5%	57.9%

Across the sample the age related differences in understanding are obvious, and the reported results of one way ANOVA show for most age groups, a significant difference in understanding by age (p< 0.001). It is likely that these results reflect age related increases in the size and nature of vocabulary. No gender differences were reported, and differences between the ages of children rated as having some understanding of the terms, were not significant.

The terms which were most difficult for children to understand were those considered by the researchers to be most abstract, such as *healthy*, *irritable*, and *energy*. This is as predicted by Piaget's theory of cognitive development which describes young children's thinking as concrete, with an understanding of abstract concepts only emerging as the child moves into the formal operational stage from 11 years onwards. Furthermore, Rebok et al. (2001) report that while most children understood and accurately responded to questions which referred to events occurring over a four week period, there was some evidence that the youngest children did not possess a clear understanding of the time concepts of

week, or *month*. This is also as predicted by Piaget's theory, and accords with the previous evidence described (Amato & Ochiltree, 1987; Breton et al., 1995) that young children experience difficulty with abstract, temporal concepts.

In summary, developmental differences in children's capacity to comprehend interview or survey questions is expected, and empirical evidence has shown that children's understanding can be impeded by various features of the questions they are asked. While question difficulty can also pose difficulties for respondents of any age, children's immature working memory, orientation to the present, and reliance upon concrete referents as the basis for thought, make question characteristics such as length, complexity, and wording, critical to comprehension. Specifically, questions are better understood by children younger than 11 years of age, when those questions are short (<10 words), when they are lexically simple, and when they do not include abstract words or temporal concepts.
As noted previously, responding to a survey question involves both comprehension of the question, and communication of a response. While some studies require children to communicate their response verbally, such as in the Amato and Ochiltree (1987) study, researchers often require children to indicate their response to questionnaire items using some form of response scale. Children's developmental level will of course mediate their ability to do this. If a child is unable to correctly use the response scale, the data collected will not be valid. The following section will review the literature reporting children's use of response scales, in the context of the theories of cognitive development which explain the developmental differences observed.

Children's Communication of a Response

A review of the literature reveals that, in contrast to the considerable body of research which describes adult responding, little is known about children's use of response formats. Furthermore, the developing nature of children's cognitive capacities prevents the transposition of adult research, to child populations. It is reasonable to expect developmental differences in children's ability to use response scales, however there have been very few empirical demonstrations of these effects. Moreover, much of the research that has been conducted, appears driven largely by the need to quantify pain severity in paediatric patients. These studies will now be considered, along with findings from the few other investigations which specifically report children's use of response scales.

Theoretical proposals that there are developmental changes in both the amount of information children use, and the way they use that information, have been cited to explain age related differences which have been demonstrated in children's use of Likert scales (Chambers & Johnston, 2002; Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001), visual analogue scales (Shields, Palermo, Powers, Grewe, & Smith; 2003, 2005) and also the way children respond to quantitative scales in general (Surber, 1984). These are important considerations in the assessment of children's SWB via self-report, where the use of a response scale is required. Before considering these empirical reports, it is necessary to

provide a description of the rating scales referred to in the research. These are Likert Scales, Visual Analogue Scales, Numeric Rating Scales and Faces Scales.

Likert Scales

Likert scales are a widely used and popular measure of attitudes (Jupp, 2006). They take their name from Rensis Likert who, in 1932, proposed a particular methodology for measuring psychological attitudes (Likert, 1932). The Likert scale is a multi choice measure which requires participants to respond to a set of statements on a continuum from Strongly Disagree, to Strongly Agree. Each end of the continuum thus represents a bivalent response option. Each response option is represented by a consecutive number enabling each response to be graded, for example from 1 to 5. These numbers are not usually depicted on the scale. The mid-point represents a position of neutrality requiring an odd number of response choices such as 5, 7 or 11. The responses are summed to form an average score for each participant.

Visual Analogue Scales

A Visual Analogue Scale (VAS) may be used to assess variables which are thought to range across a continuum. Rather than comprising discrete response points, a VAS typically consists of a 10 centimetre line, and word descriptors at each end usually define the extremes of the variable (Sim & Wright, 2000). The respondent indicates their response to a question by placing a mark at a point along the continuum which best represents their subjective perception of the variable being measured. The response is scored by measuring how far the respondent places their mark along the continuum.

Numeric Rating Scales

Numeric rating scales provide the respondent with a series of response choices defined by consecutive integers. The ends of the numeric continuum are marked by word anchors which define the extremes of the response choices. These response choices may be bivalent, representing two opposite extremes, for example *Completely satisfied* and *Very dissatisfied*. This is known as a bi-polar scale. Alternatively, the extreme responses may represent the limits of a single dimension, for example *Not at all satisfied* and *Very Satisfied*. This is known as a uni-polar scale. A numeric rating scale can be used for single item measures, and may also be used for a summated scale where scores on a number of items are aggregated to form an average score. The respondent indicates their response by selecting a number which best represents their feeling or point of view.

Faces Scale

A Faces scale typically consists of 5, 7 or 9 stylised faces which vary in their depiction of affect from low through to high, and include a neutral midpoint. Originally developed by Kunin in 1955 to measure job satisfaction, various

renderings of the faces scale have been widely used ever since, measuring a range of variables in child and adult populations (Bernard, 2000). Respondents select the face which best represents either their current experience, or their feeling toward a target statement.

Empirical Evidence reporting children's use of Response Scales

In an investigation of the reliability of three commonly used self-report measures of pain experience in children, Likert, visual analogue, and faces rating scales, the ability of non-patient preschool children aged 3-6 years ($N = 50$) to use each of the rating scales was examined (Belter, McIntosh, Finch, & Saylor, 1988). The investigators anecdotally reported that the younger respondents tended to use the high and low end of the response scales more frequently than the intermediate response choices. The children thus demonstrated only a crude capacity to differentiate degrees of pain experience using each of the self-report measures. These results reveal a capacity for self-report in children, which as would be expected, becomes more refined with age. More specifically, the implications of these findings are that children younger than 6 years of age, are unlikely to be able to report subtle variations in their subjective experience, and may respond extremely, indicating themselves to experience the variable in question either completely, or not at all.

Similar results have been reported in other studies. For example extreme responding was evident in self-reports of needle pain made by 4-6 year old children using a VAS (Goodenough, Addicoat, Champion, McInerney, Young, Juniper, & Ziegler, 1997). And in a study investigating children's ability to self-report their health related quality of life, the mean percentage of extreme responses given by 5, 6, and 7 year old children using a VAS were 87.1%, 78.9% and 61.4% (Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001). In contrast, only 50.4% of responses given by 8-11 year old children were extreme. The percentage of extreme responses given by the 5 and 6 year old children, was thus significantly higher than the percentage given by 7 year olds, and also the percentage given by 8-11 year old children ($p < 0.001$, df = 3; $F = 14.1$). Together, these findings indicate that self-report ratings made by younger children, are likely to be dichotomous reports of experience, rather than carefully discerned reports of variations in experience, made across the full extent of choices offered. In contrast, older respondents appear more likely to use a wider range of the response choices available.

In an investigation which specifically assessed developmental differences in children's use of Likert rating scales, (Chambers & Johnston, 2002), the effect of children's age and number of response choices, on their reports of emotional states was examined. The study assessed a representative sample of 60 children stratified into three age groupings, 5-6, 7-9, and 10-12 years. The results demonstrated that 5-6 year old children gave significantly more extreme responses than both the 7-9 and 10-12 year old children. There were no differences between the extreme scores of the 7-9 and 10-12 year olds. Furthermore, simplification of the response

options provided, by reducing the number of choices from five to three, did not reduce the children's tendency to choose extreme responses. Younger children were thus more likely to use extreme responses than older children, tending to respond that they felt "*a lot happy*" or "*not at all happy*" in comparison to older children who were able to select "*a little happy*" from the middle of the scale.

Piaget's theoretical proposal, that young children employ dichotomous thinking, has been proposed as an explanation for this observed phenomenon in young children's responses (Chambers and Johnston, 2002). This is on the basis that children's dichotomous thinking would result in their attendance only to each extreme end of the response choice continuum, reporting their experience as all or nothing. This dichotomous thinking has been reported in other research with young children. Studies have described young children's inability to acknowledge the simultaneous possession of two opposing characteristics such as being both good and bad (Damon, Lerner, & Eisenberg, 2006), and also their inability to acknowledge the concurrent experience of both positive and negative emotions (Harter & Buddin, 1987). Dichotomous views of self, and of emotional experience, are thus indicated.

The reviewed studies demonstrate a predictable association between children's age and their ability to correctly use a rating scale. However given the enormous variability in the rate of children's development, chronological age may not be the sole or best predictor of this ability. One study which directly assessed this proposition, investigated whether children's age, sex, socio-economic status, IQ, or ability to perform a seriation task, would better predict children's ability to correctly use a visual analogue scale (Shields, Palermo, Powers, Grewe, & Smith, 2003).

The sample was very small, consisting of 40 US kindergarten students, ranging in age from 5 to 6.8 years ($\underline{M}$ = 5.8 years). Participants were selected from schools with low, medium and high SES populations. The children's age and sex were recorded, and an assessment of IQ and SES was made. Children were asked to perform a seriation task which required them to arrange seven circles in order from smallest to largest. The capacity to seriate is a developmentally achieved cognitive ability in which a child is able to arrange similar items in a particular series or order on the basis of a specified dimension such as size, height, or length.

The results revealed that only 42% (n = 17) of the children tested could correctly use the VAS. Amongst those children who failed to correctly use the VAS (n = 23), the tendency to respond at the extreme ends of the scale was again observed. There were no effects for gender. Logistic regression analyses revealed that the child's age ($\geq$ 5.6 years), and cognitive ability (IQ $\geq$ 100) combined to best predict children's ability to use a VAS, such that younger children required a higher IQ to correctly use a VAS than older children. Furthermore, the ability to complete the seriation task was the best single predictor of ability to use the VAS.

A replication and extension of this research by the same authors, included a larger sample (N = 104), with participants ranging in age from 5-11 years (Shields, Palermo, Powers, Grewe, & Smith, 2005). The sample consisted of clinical and non-clinical children, recruited through two mid-western US children's hospitals. The results of this study demonstrate that while there is considerable variability in the ability of young children to correctly use a VAS, children with normal development, who are over 7 years of age, who can successfully complete a seriation task, are likely to be able to correctly report their experience using a VAS. The results of the Shields et al. (2005) study are presented in Table 1.4.

Table 1.4: Ability to use VAS Shields, Palermo, Powers, Grewe & Smith, (2005)

Variable	Able to use VAS	Not able to use VAS
n	70	34
Age (years)		
M (SD)	9.2 (1.6)	7.0 (1.7)
Mdn	9.2	6.6
Range	5.5-11.9	5.0-11.2
Able to do Seriation task *n*	67	13

It is interesting to note that of the 104 participants, the mean age of the 70 children able to correctly use the VAS was 9.2 years. This is in contrast to the 34 children unable to use the VAS, whose mean age was 7.0 years. Furthermore, of the 34 children deemed unable to use the VAS, 27 responded in the same way as the young children in the other studies described, using only the extreme ends of the continuums, or alternatively, the ends and midpoints of the continuum. It has been proposed, that a midpoint offered as part of a response continuum, may be selected as the option of choice when a respondent is undecided. This proposal was explored in a sample of young people (12-24 years) who responded to political option questions using a Likert response scale (Raaijmakers, Van Hoof, Hart, Verbogt, & Vollebergh 2000). This could possibly explain the children's use of the midpoint on the VAS, however there is no confirmatory evidence for this explanation in the sample of children tested.

In summary, the empirical evidence reviewed demonstrates developmental differences in children's ability to use rating scales, such that younger children provide dichotomous ratings of their experience, responding using only the extreme ends, or occasionally the midpoints of the response continuum. In contrast older children are more likely to discern variations in their experience, and to report those variations using a range of the response choices provided. The evidence shows clearly that while age provides an approximation of children's likely ability to correctly use a rating scale, this ability is better predicted by the child's combined age and IQ, such that a younger child must have a higher IQ, in order to be able to use the response scale. Furthermore, the research shows that the best predictor of children's ability to correctly use a rating scale, is not chronological age, but the ability to seriate, with children aged > 7 years, who can complete a seriation task, most likely to be able to also correctly use a VAS rating scale.

Children's Preference for Rating Scales

Although children's use of a number of different rating scales has been reported by the studies reviewed, none of these studies report children's preference for, or ease of use of any of these scales. Despite this, it is reasonable to expect that children

may have a preference, or may find one particular response format easier to use than another. One investigation which directly examined this, compared Likert, visual analogue and numeric rating scales to see which response format young people aged 6-18 years preferred or found easiest to use (van Laerhoven, van der Zaag-Loonen, & Derkx, 2004). A sample of 120 paediatric outpatients in the Netherlands participated in the study. The sample consisted of 69 children (6-12 years) and 51 adolescents (13-18 years) who responded to a set of seven questions three times using three different response formats. An example of an item from the questionnaire is illustrated in Figure 1.2 with (a) the Likert response option, (b) the VAS, and (c) the numeric response format.

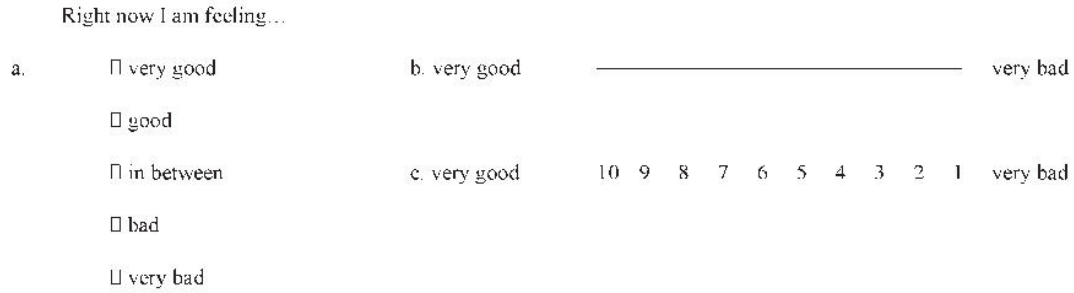


Figure 1.2: Three alternate response formats (van Laerhoven et al., 2004)

On completion of the questionnaire, participants were asked to indicate how much they liked using each of the response formats, and how easy each was to use, by providing a mark from one (least preferred or most difficult) to ten (most preferred or easiest). The median marks for the different response options are presented in Table 1.5.

Table 1.5: Median marks for each response option (van Laerhoven et al., 2004)

		Median Mark	6-12 years	12-18 years
Ease	Likert	10.0	9.1	9.2
	VAS	7.5	7.3	7.2
	Numeric	9.0	8.1	8.0
Preference	Likert	9.0	8.5	8.3
	VAS	6.0	6.2	6.2
	Numeric	8.0	7.6	7.6
Time taken (*M*)			8.5 mins	7 mins

The results demonstrate that although children required more time to complete the questionnaire than adolescents, both groups indicated that they preferred the Likert scale over the numeric rating scale and the visual analogue scale, and also found it easier to use. Furthermore, 3% of the questions in the VAS were missed, in

comparison to 0.5% of missed questions in the Likert response option, leading the authors to conclude that young people aged 6-18 years found the Likert scale easier to complete.

It has been proposed, that correct completion of a response scale may be affected by its orientation. To correctly respond, children must grasp the abstract notion of the scale as a method of indicating greater or lesser amounts of something, and it is thought that vertical, as opposed to horizontal orientation, may facilitate this understanding (Beyer & Aradine, 1988). This is on the basis that children's concrete thinking may predispose them to better understand a vertically oriented continuum, since each increasing level of response option, shows a corresponding visual increase. This proposal has been tested, and contrary to expectation, neither vertical nor horizontal presentation of the continuum predicted children's ability to correctly respond to a VAS. Both orientations seemed equally well understood by the children tested (Shields, Palermo, Powers, Grewe, & Smith, 2005), with agreement demonstrated between children's responses to the same item, reported on vertically and horizontally presented continuums (Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001). Furthermore, when asked whether they preferred the vertical or horizontal orientation of the scale, children in one study (N = 35) unanimously reported preferring the horizontal presentation, with one child explaining this preference with *"That's how you read."* (Rebok et al., 2001, p64).

The premise that young children's characteristically concrete thought may affect their use of different response formats is not unreasonable. A consequent hypothesis, that young children may better understand and respond to more concrete response scales, has been made and tested. In a study reporting the development of a Quality of Life (QOL) self-report measure for use with children aged 3-8 years, researchers set out to provide an empirical basis for their selection of a response format (Lawford, Volavka, & Eiser, 2001). They investigated the differences in young children's use of two simplified response formats, a circular coloured scale and a linear scale, to test the proposition that concrete response scales are developmentally more appropriate for use with young children. The two response formats used in the study are illustrated below in Figure 1.3.

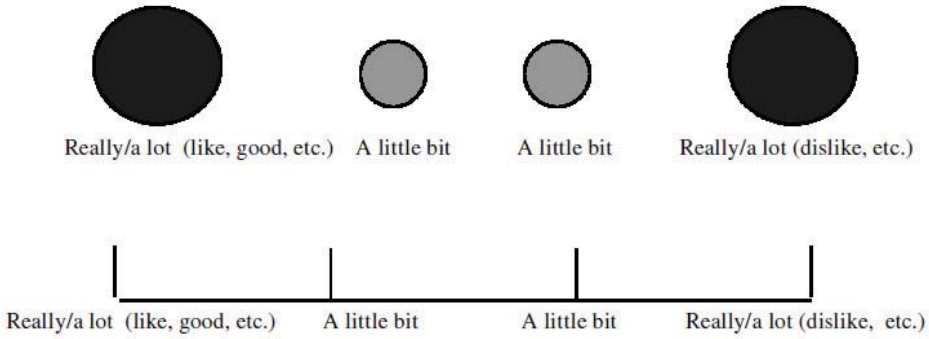


Figure 1.3: Circular and linear response scales (Lawford et.al., 2001)

The sample consisted of 3-5 year old children (*M* = 3.88 years, *N* = 28) from a UK nursery school. The study reported the use of the TedQL, a generic QOL scale. (For details of the measure and its administration see Lawford et al., 2001.) The results indicate that children responded using the coloured circular response scale more quickly (*M* = 8.07 mins) than the linear response scale (*M* = 11.01 mins). No effects for age or gender were found.

Children's preference for and ease of use of response formats was also investigated by Rebok, Riley, Forrest, Starfield, Green, Robertson, and Tambor, (2001). A sample of 19 children aged 5-11 years, recruited from after school day care centres, responded to 20 questions presented twice, to test five different response formats, and the agreement between participant's responses to each of them. Eight questions were used for each of the five formats. The response formats tested included a blank line VAS, a hatched line VAS (similar to the linear scale used in the Lawford et al. 2001 study), three same size circles, four same size circles, and four graduated circles. Illustrations instead of words were used to anchor the extreme ends of each continuum. An example of the formats is presented in Figure 1.4 below. In the example, children responded to the question *"In the past week, how often did you have a stomach ache?"*

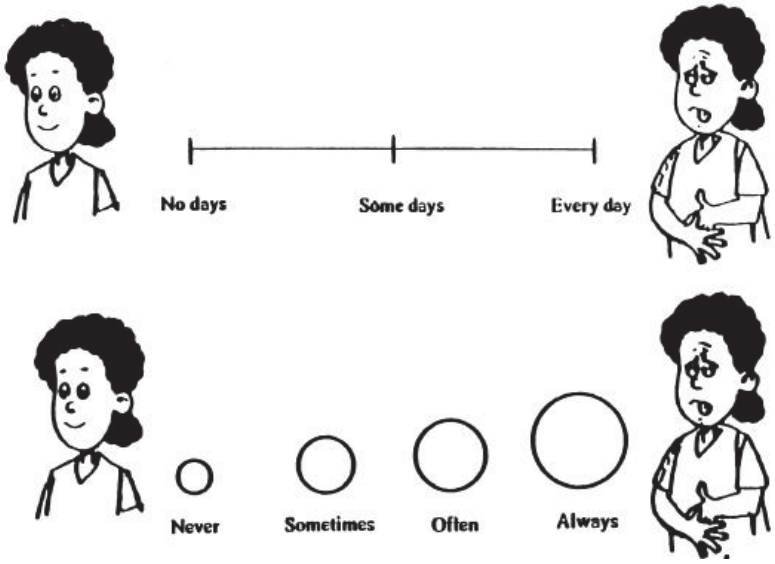


Figure 1.4: Rebok et al. (2001) Example of hatched line VAS and four graduated circle response options

The researchers first tested whether a straight line VAS was more easily used and understood by children than a discrete set of choices represented by circles. 74% of the children preferred the circle scale over the VAS. The researchers then assessed whether same size or graduated size circles were preferred and 68% of the children reported preferring the graduated circles. Furthermore, 74% preferred four circles over three, and no differences were reported in children's ability to respond based on the provision of three or four circle options. The researchers also reported 80% agreement between children's two responses to the same item, when responding using the same size and graduated circle formats. The authors report that due to the small size of the sample, and the limited number of items available for each comparison, statistical analysis was not possible.

Consideration of the evidence reported by Rebok et al. (2001) and Lawford et al. (2001), suggests that a concrete response scale, such as a series of graduated circles, may be preferred by young children, and may be easier for them to complete. This could be due to the concrete quality of young children's thinking, such that a concrete scale effectively provides children with a tangible demonstration of the incremental nature of each discrete response option. However once a child understands the concept of numbers as the universal symbolic representation of quantity, and the associated notion that different numbers represent more or less of something, it is reasonable to expect that a series of increasing integers such as in a numeric response scale, may equally well provide the child with a clear means by which they can accurately indicate their experience in a quantifiable way. This understanding of the meaning of numbers, although abstract, emerges early. Consideration of the likely response of a preschooler

asked *"Would you like one lolly or two?"* exemplifies this. A comparison of graduated circles versus a numeric scale was not made by Rebok et al. (2001).

The evidence reviewed above indicates children's preference for a horizontally oriented continuum. This orientation appears to make intuitive sense to children because it matches their understanding of the conventional orientation and directionality of text. Furthermore, children report liking, and finding easier, a discrete choice rather than a linear continuum such as a VAS. In order to correctly select one of these discrete options to convey a response, a child must understand the scale as an instrument of quantification. It has been proposed that concrete visual support for this abstract understanding, for example in the form of graduated circles, may facilitate children's correct use of the response scale. However it is reasonable to expect that consecutive integers may serve equally well, once the concept of numbers as a representation of quantity is grasped.

Summary

From the research that has been reviewed, it is clear that a child's self-reported SWB may potentially be confounded by their developmental ability to comprehend a question and communicate a response. Children may experience difficulty in comprehending questionnaire items due to the number of words in the item, whether those words are present in the child's vocabulary, and whether the child understands the concepts being asked about. Furthermore, a child's ability to report subtle variations in their experience using a response scale, may also confound data. The child's cognitive development is clearly implicated by the research, and it is clear that characteristics of both the question and the respondent are important.

While question comprehension and response ability will be related to developmental level, it is unwise to use chronological age as more than an approximation of these capacities. A definitive statement regarding children's ability to understand and respond to survey items according to age is not possible. Despite this caveat, it does appear that questions are better understood by children <11 years of age, when those questions are short (<10 words), when they are lexically simple, and when they do not include abstract words, or abstract concepts such as time. Furthermore, children prefer horizontally presented response continuums with discrete response options, and those >7 years of age who can seriate, are most likely to be able to correctly respond.

In attempting to elicit a self-report of experience from a child, a researcher must engage in a process of communication with the child as respondent. It is clear that the child's immature capacity for language, and limited vocabulary, will mediate the success of this communication. Assessing the developmental suitability of questionnaires is therefore essential. The following section reviews common methods of assessing text difficulty, before the development of language and vocabulary in the child are considered.

ASSESSING THE SUITABILITY OF A QUESTIONNAIRE

As has been discussed, measuring subjective variables in children is a challenging task. Eliciting a self-report of SWB directly from a child is essential because it has been established that having someone answer on behalf of a child produces data which are invalid. However in child populations, cognitive development, and the capacity for language, will directly affect the validity of children's self-report data, particularly through the ability of participating children to read and comprehend the questionnaire items used.

Children's cognition undergoes rapid development during the first years of life. The acquisition of language accompanies this cognitive development, and in a normally developing child, this precedes the ability to read. Learning to read is a gradual and complex process. Emergent readers begin to acquire concepts of print including letters of the alphabet, words as separate entities and the directionality of text. This understanding is consolidated and readers then begin to recognise some words by sight, and finally, as readers acquire fluency, they begin to comprehend the sentences they read. In attempting to measure the SWB of children via a questionnaire, it is obviously essential that children are able to read and comprehend the questionnaire items. It is therefore necessary to establish the suitability of any items proposed for use with children, to verify that children could reasonably be expected to read and comprehend them.

In a review of self-report measures for children, Beitchman and Corradini (1988) report that the measures most commonly used with children to assess a variety of variables, have readability levels ranging from first to third grade. This claim is based on a report by Kazdin and Petti (1982), which reviews self-report and interview measures of child and adolescent depression. These authors describe and recommend the use of a simple readability formula, to calculate the readability level of measures for use with children. A simple method for assessing suitability would certainly have value in determining an effective measure of childhood SWB. The following section describes the formulas available for predicting the reading level of text, and evaluates their utility in assessing SWB questionnaires for children.

Readability Formulas – Semantic and Syntactic measures of text

In the first half of the twentieth century the publication of Thorndike's *Teachers Word Book* provided the first objective measure for judging the reading level of texts (DuBay, 2004). Words were listed according to the frequency of their occurrence in literature, then, on the basis that the more frequently a word was encountered, the more likely it was to be understood, these lists were assumed to provide a guide to reading level.

Later, in 1948, Rudolph Flesch proposed a formula for calculating text difficulty based on the syntactic complexity of text. Edgar Dale and Jeanne Chall were subsequently inspired to propose yet another formula, and compiled a list of

familiar words to accompany it (Dale & Chall, 1948). In the following decades many more methods for estimating text difficulty were developed, each assessing certain syntactic, and or semantic, elements of the text. These methods, known as readability formulas, take the form of mathematical equations. Readability is predicted on the basis of only certain features of the text which are entered as factors into the equation. Readability is calculated and the output is presented, depending on the formula, as either a difficulty score from 0 to 100 or as a reading grade level.

Today, readability formulas are readily available and two, the Flesch Reading Ease scale (FRE) and the Flesch-Kincaid test (FK), are easily accessible through the word processing software Microsoft Office Word 2007. Here they are reached via the Review menu under the Spelling and Grammar option.

The FRE, first published in 1948 in The Journal of Applied Psychology (Flesch, 1948), yields a readability score between 0 and 100. The score is derived from the average number of syllables per word (calculated by dividing the number of syllables in the text by the number of words) and the average sentence length (calculated by dividing the number of words in the text by the number of sentences). Text containing shorter sentences and words are classified according to the FRE as easier than text containing longer sentences and words. Higher output scores of the FRE indicate easier readability. The FK produces a grade level score based upon an equation similar to the FRE.

Since the FRE and the FK produce output based on average syllables per word and average sentence length, both require samples of 100 words from a text in order to accurately scale the text for readability. It is recommended that this is repeated with samples from the beginning, middle and end of the text (Flesch, 1948). Despite this, a relatively recent study investigating variation in the readability of items within surveys (Calderon, Morales, Honghu, & Hays, 2006) used the FRE and FK to assess the readability of items from two health related quality of life surveys. They also reported a review of the literature which found 17 other health related surveys which had been assessed for readability, and noted that the FRE and FK were the formulas most commonly used to assess the readability of the survey items.

Assessing the readability of survey items using syntactic measures of readability such as the FRE or the FK, when the text tested contains less than 100 words, will produce a readability score which may not reflect the true readability of the text. Furthermore, satisfying the word requirement by grouping all the items from an entire test together, and applying a readability formula to the whole text, will produce an average readability score for the entire test. Individual items could have a readability score either much higher, or much lower, than the average readability score for the entire test. Moreover, since the equations utilise only syntactic aspects of the text, no measure of the complexity of the ideas presented is incorporated. The questions; *"Where is your mummy?"* and *"What is gross profit?"* both have an FRE score of 97 and an FK grade level score of 0.7,

indicating that the text is very easy to read, and is suitable for children before grade one. This is of course nonsense.

The potential for syntactic readability scores to seriously overestimate a text's suitability for the intended audience is obvious. The underlying and faulty assumption of the formulas is that shorter words and shorter sentences are easier. However the formulas provide, at best, a crude prediction of a text's difficulty or grade level suitability. They should not be used to assess the suitability of questionnaire items intended to assess any variable, including SWB, in child samples.

Despite this, the use of syntactic readability formulas to assess the suitability of self-report measures for children has been reported. In a review of measures of depression for children, Kazdin and Petti (1982) actively recommend the use of syntactic readability formulas to assess the likelihood of children's comprehension. Furthermore, they report reading ages of first, second, and third grade (6, 7 and 8 years of age) for the reviewed measures. Again these are derived from calculations of readability based on syllable length and sentence length. The authors conclude that "*the measures are not likely to be beyond the bounds of comprehension of normally intelligent (children)*" (p446) (Kazdin & Petti, 1982). However the outputs of syntactic readability formulas are an insufficient basis for this conclusion, because they rely only on syntactic elements of the text.

Readability formulas are available which also incorporate semantic elements of the text in the form of measures of word familiarity or word difficulty. Research has demonstrated that children's vocabularies and their comprehension of written text are linked (Chall, Jacobs, & Baldwin, 1990). For this reason a formula which incorporates a measure of word difficulty, may be useful in assessing the suitability of survey items for measuring SWB in children. One such semantic formula is the Dale-Chall readability formula. Originally proposed by Edgar Dale and Jeanne Chall in 1948, it was revised in 1995 and is still used today. Online calculation is available at

http://www.interventioncentral.org/htmdocs/tools/okapi/okapi.php

Unlike the Flesch Reading Ease and the Flesch Kincaid tests, the Dale-Chall formula calculates readability based upon semantic as well as syntactic elements of the text, by including a count of difficult words. Difficult words are judged according to their absence from Dale and Chall's list of 3000 words. These words are deemed familiar to 80% of fourth grade students in the US (approximate age 9-10 years) (Chall & Dale, 1995).

The output of the Dale-Chall readability formula is a grade level score. This is calculated from the average sentence length and the percentage of difficult words, derived from a sample of 100 to 150 words of text. Unfortunately, the Dale-Chall readability formula is no more suitable for the assessment of questionnaire items than the purely syntactic measures already discussed. This is because the formula

includes the calculation of average sentence length, and this, along with the count of difficult words, requires a substantial sample of sequential text. The Dale-Chall formula is therefore useless for short questionnaire items.

In summary, syntactic and semantic counts of readability enable a broad estimate of the demands of a piece of text in terms of grammar, and vocabulary. However it is a misconception that these formulas provide a valid measure of the difficulty of text for use in questionnaires for children. The typical concision of questionnaire items provides insufficient text for the formulas to be applied correctly, and the underlying assumption that shorter words and sentences are easier, is flawed.

Despite this, some determination of the suitability of questionnaire items for children must be made. My literature review has already identified vocabulary as a key factor affecting children's item comprehension. Others have posited that vocabulary is the primary factor influencing readability (Chall & Dale, 1995; Klare, 1984). For example when a child has difficulty recognising words, their attention to the content of the text is diminished (Drum, Calfee, & Cook, 1981). Therefore, any text, which includes words unlikely to be present in children's developing vocabularies, will be more difficult for children to read and comprehend. The following section will review the development of language in children, before considering vocabulary acquisition.

Language and Vocabulary

The capacity for language, which separates humans from all other species, emerges early and develops rapidly during the first years of life. The ability to understand and use language is critical to an investigation of childhood SWB, since it allows an enquiry of the subjective internal world of the child to be made, and enables the external expression of this. Although the word infant derives from the Latin *infans*, which means not speaking, the essential elements of language are thought to be laid down in the human infant during the first months of life.

In a normally developing infant, the acquisition of communicative skills requires the integration of physical and cognitive capacity, so that speech may be physically produced, and the meanings of words or sentences may be learned and understood. Pre-speech vocalisation is present in the neonate, but numerous physical changes occurring during the first months of life, facilitate the earliest production of speech by about the end of the first year (Locke & Bogin, 2006).

Concurrent maturational changes in the developing brain have been noted by researchers using functional neuroimaging techniques, such that the approximate symmetry observed in the newborn brain, transforms into the asymmetrical brain of a child with normal language skills. Here the left hemisphere, housing two of the brain's specific language centres, Broca's area and Wernicke's area, is larger than the right for right dominant children. Normal physical maturation is thus clearly implicated in the process of language acquisition. However marked

individual differences in the reported age of onset, and rate of vocabulary attainment, suggest a contribution from additional factors.

Linguist Noam Chomsky and behaviourist B. F. Skinner proposed alternate views to explain the remarkable progression from newborn infant to language-proficient child. Skinner emphasised the role of operant conditioning (Skinner, 1957) while Chomsky cited an inbuilt biological mechanism underpinning the acquisition of language (Chomsky, 1965, 1957). Since then, the interaction between innate and environmental factors has been emphasised. And more recently, the child's intentional action on their environment has been said to provide the basis and motivation for the acquisition of language, with theories emphasising the engagement of the child in a world of objects and people (Bloom, 2001).

While theoretical debate continues over the exact processes by which language is acquired, there is general consensus regarding the typical developmental course. Countless studies have shown that universally, children coo at around three months of age, babble at around six months of age, speak their first words by the end of the first year, combine words into phrases by the end of the second year, and make use of an impressive vocabulary according to complex grammatical rules by five years of age. For a normally developing child, early, cumulative, lexically rich and naturally occurring conversations are regarded as fundamental determinants of vocabulary acquisition (Weizman & Snow, 2001). For some privileged children, this means exposure to three times as many words as other children (Hart & Risley, 1999, 1995). It is therefore not surprising that remarkable size differences are evident in the vocabularies of children beginning school (Biemiller & Slonim, 2001).

Children's first words commonly refer to things within their immediate perceptual or motor environments which are easily observed and referred to. These are often object words (nouns) and action words (verbs) (Nelson, 1973) which the child uses to name their world and their behaviour within it. These words often reflect what is salient to the child and what they may consequently wish to communicate about, for example *"juice"* (McGuiness, 2005). Early communication also relates to events which are relevant to the child, for example "*bath*" (Nelson, 1998).

A robust literature supports the view that simple concrete words such as *cat*, *milk*, and *smile*, are learned and understood better, and earlier, than abstract words such as *history*, *democracy* or *freedom* (Altarriba, Bauer, Benvenuto, 1999; Schwanenflugel, Harnishfeger & Stowe, 1988; Werner & Kaplan, 1950). This is because the referents of concrete words are objects in the real world (Wauters, Tellings, Van Bon & Van Haaften, 2003; Begg & Clark, 1978). In contrast, the referents of abstract words are not perceptual. Acquisition is therefore more complex as it is dependent upon a verbal explanation, and thus requires the reception of linguistic information. This progression in vocabulary from the initial acquisition of predominantly concrete words, to the later acquisition of abstract words, is consistent with Piaget's theory of cognitive development as previously described (page 26).

A relationship between vocabulary acquisition and cognitive milestones is further evidenced, with the acquisition of some words being clearly related to specific problem solving achievements. For example the acquisition of words about disappearance, has been shown to be related to an understanding of object permanence (Tomasello & Farrar, 1984). Similarly, the acquisition of success words, has been shown to be related to the cognitive development of means-ends understanding (Gopnik & Meltzoff, 1986). Furthermore, maternal observation reports have indicated that at about two years of age, children begin to use words such as want and think, which refer to their cognitive processes (Bretherton & Beeghly, 1982). And at about the same time, children begin to use words such as happy, sad and mad, referring to their internal or affective states (Bretherton & Beeghly, 1982; Ridgeway, Water & Kuczaj, 1985). Thus as children develop cognitively, they acquire the vocabulary necessary to communicate about what they know, think and feel.

As has been stated, there is much normal variation in the size of children's vocabularies. For example vocabulary in 16 month old children may vary from less than nine words, to more than 198 words, and in 20 month old children may vary from less than 41 words, to more than 405 words (Fenson, Dale, Reznick, Bates, Thal, Hartung, & Reilly, 1993). Moreover, since vocabulary is acquired primarily through exposure to words and their meanings in the home environment (Weizman & Snow, 2001), it develops idiosyncratically according to each child's unique circumstances.

It is also known that young children sometimes have understandings of word meanings which are not congruent with conventional understandings of those same words. For example the word *chimney* was understood by a 33 month old to mean something Santa uses, and the word *vanity* was understood by a seven year old as meaning to look in a mirror (Werner & Kaplan, 1950). However these deviations from conventional understandings of word meanings lessen with age.

In summary, language acquisition is a gradual process dependent upon normal physical maturation, in conjunction with cognitive development. As thinking becomes more sophisticated, a more sophisticated vocabulary is acquired. Language is ultimately used not just to describe a child's concrete environment and their behaviour within it, but to represent and explore increasingly abstract ideas and concepts. Within the context of each child's unique circumstances, vocabulary thus evolves dynamically, according to interaction with the environment, and the achievement of cognitive milestones.

The resultant variability in vocabulary size and nature makes impossible a definitive statement about words that are known, and not known, by children of a specified chronological age. Despite this, in order to assess the suitability of questionnaire items for use with children, some measure of the likelihood of the words used being known must be made. Word frequency and familiarity lists are available which purportedly do this. The following sections will review these tools.

Word Frequency as an Assessment of Questionnaire items

In the absence of a list which definitively details the vocabularies of 8-12 year olds, frequency rankings of the occurrence of words in contemporary language, potentially inform an assessment of questionnaire items according to vocabulary. This is on the basis that common words are more likely to be encountered and learned by children, than words which are used infrequently. An early frequency list was compiled by Thorndike in 1921, and included words frequently appearing in literature at that time. A more recent, and therefore presumably more relevant frequency list, is the internet based tool *Wordcount* (http://www.wordcount.org/main.php)

Wordcount ranks the 86 800 most frequently used English words according to their commonness. Frequency is determined based on the occurrence of each word in the British National Corpus (BNC) (http://www.natcorp.ox.ac.uk/). The BNC is a 100 million word collection of samples of contemporary written and spoken language, derived from a range of child and adult sources. First released in 1995 and revised in 2007, the corpus is managed by an academic/industrial consortium lead by Oxford University Press.

Not surprisingly, the five most common words according in *Wordcount* are; *the, of, and, to,* and *a.* Certainly if these words appeared in a questionnaire item for use with 8-12 year old children, one would expect them to be known. However, as previously described, children's early vocabularies are dominated by words that are salient to them. It is likely then that the words *toy*, and *bath*, would be known and recognised by young children. However the word *bath* appears in *Wordcount* at 2555, and is followed by the word *concentration* at 2556. The word *toy*, appears at 7202, just one word away from *mandatory*. It is counterintuitive that sophisticated and abstract words, which are unlikely to be known by young children, would appear so close to very simple nouns such as *bath* and *toy*.

Furthermore, the word *government* appears as only the fifth noun in the count at number 140, suggesting a bias in the corpus towards adult concerns. Further exemplifying this, the word *minister* appears at number 368 while *teacher,* a word more likely to be known to children, appears at 1174. The word *university* appears at number 586, while *preschool*, incredibly, appears at 37 940.

These frequency rankings clearly reflect contemporary adult language, revealing the preoccupations and concerns of adults in our society, and not those of children. For this reason, despite its apparent potential for use in assessing questionnaire items for children, the frequency list *Wordcount* is unsuitable for this purpose. An alternative to word frequency as an assessment of word difficulty is word familiarity. This will now be considered.

Word Familiarity as an Assessment of Questionnaire items

A contemporary and comprehensive database on the familiarity of English words is the *Living Word Vocabulary*, compiled by Dale and O'Rourke (1981), (Hiebert & Kamil, 2005). The database includes 44 000 word meanings. Each has been assigned a grade level based upon correct identification by at least 67% of students in six age cohorts (grades 4, 6, 8, 10, 12 and young adults). Based on his findings during compilation of the *Living Word Vocabulary*, Edgar Dale produced a list of familiar words which now accompanies the previously discussed Dale-Chall readability formula (Chall & Dale, 1995).

The familiar word list includes 3000 words deemed known to 80% of US fourth grade students (approximate age 10 years). The words are described by Chall and Dale (1995) as *"...the most elemental words in the English language – words about home, family, food, clothing, emotions"* (p13). In contrast, specialised, technical, abstract, or literary words, are absent from the list (Chall & Dale, 1995). Certainly this conforms to the understanding that children's early vocabularies reflect what is salient to them. Guidelines for the inclusion of variations of the listed words, such as plurals, past tense and compound words, are outlined in the instructions for use of the new Dale-Chall Formula (Chall & Dale, 1995). For example, *carried* can be counted as familiar because *carry* is on the list, and *firelight* can be considered familiar because both *fire* and *light* are on the list.

However some included and some excluded words reveal shortcomings in the familiar wordlist, as a relevant index of words familiar to Australian fourth grade students in 2011. For example the words *boxcar, tiddlywinks* and *America* are present on the wordlist. This indicates their familiarity to US fourth grade students sampled over the two decades prior to 1976 when the *Living Word Vocabulary* was initially published (Hiebert & Kamil, 2005). It is from these data that Dale's list is derived.

In contrast, the words *ipod, internet* and *Australia* are absent from the list, when it is most likely that these words would be known by contemporary Australian fourth graders. The dynamic nature of vocabulary is clearly illustrated by these examples, with new words which describe present-day life (for example *internet*) becoming familiar to young children, while other words become outdated. Furthermore, the wordlist's American origins, has resulted in the exclusion of some words which would be known to Australian children (for example *Australia*).

Despite the shortcomings of the familiar wordlist, Chall and Dale's (1995) notion that it is elementary words and not abstract words that will most likely be known by children, is intuitively correct, and this is certainly the nature of the words included on the wordlist. For this reason, in the absence of a more recent wordlist, or one based on Australian data, Dale's 1983 familiar wordlist, published to accompany the Dale-Chall (1995) readability formula, provides an adequate means of making an initial assessment of the suitability of words included in a questionnaire for children, and will be used for this purpose in Study 1.

Summary

Assessing the suitability of questionnaire items for children is necessary to ensure the collection of valid data. It is essential that respondents are able to read and comprehend the questionnaire items. Measures of text difficulty are available in the form of syntactic and semantic readability formulas. However this review has shown that the underlying and faulty assumption of these formulas is that shorter words and sentences are easier. Furthermore, the requirement for samples of 100 to 150 words of text makes the application of readability formulas to short questionnaire items impossible. For these reasons, syntactic and semantic readability formulas are not suitable for assessing questionnaire items for children.

Furthermore, the frequency ranking tool *Wordcount* is also unsuitable for assessing questionnaire items, despite the intuitive appeal of the notion that the more frequently a word is encountered, the more likely it is to be known. This review has shown that although it draws on a vast collection of contemporary written and spoken language, from child and adult sources, *Wordcount* rankings predominantly reflect what is most salient to adults. This renders it unsuitable for making a vocabulary based assessment of questionnaire items for children.

On another track, since vocabulary is a key determinant of children's comprehension of questionnaire items, it is essential that the words used in items are known. The familiar wordlist compiled by Edgar Dale (Chall & Dale, 1995), provides an adequate means of assessing this. Containing basic words relating to home, family, food, clothing and emotions, the familiar wordlist reflects the unsophisticated aspects of daily life which are salient to children.

In summary, it is clear that the inclusion of unfamiliar words in questionnaire items will jeopardise data validity. A vocabulary based assessment of questionnaire items must be made, and Dale's familiar wordlist is suitable for this purpose. Chapter 2 will consider an appropriate measure of SWB for use with children. Before this however, it is useful to propose guidelines for collecting data from children, informed by the empirical evidence discussed so far.

COLLECTING SELF-REPORT DATA FROM CHILDREN

This chapter began by posing two questions that relate to the assessment of subjective variables in children. The first of these, what are the best methods for collecting subjective data from child samples, can be answered quite simply. The literature has been reviewed, and it is clear that when seeking an assessment of a child's subjective experience, the report must come from the child. Proxy data cannot be substituted for a child's self-report. The best method for collecting subjective data from a child is therefore by self-report. However, as described, the validity of a child's self-report can be adversely impacted by characteristics of the child, and also by characteristics of the questions they are asked. For this reason

researchers must take extreme care when eliciting self-reports of subjective experience from a child.

The second question, relating to the factors which may undermine the validity of these data, requires a more complex answer. The developmental literature illustrates the potential adverse impact of children's immature cognitive skills, on their capacity to provide a self-report. The ability to comprehend a question, formulate a response, and then to respond in the format required by a researcher, all depend crucially upon the child's cognitive capacity. Specifically, the literature suggests that before the age of at least 11 years; when adult cognition begins to emerge, aspects of children's thinking makes the provision of a valid self-report of subjective experience difficult. Researchers must therefore take particular care in the design, and use, of measures of SWB for use with children, as the cognitive characteristics of the respondent, are likely to affect the quality of their self-report data. Furthermore, clear evidence demonstrates that precise characteristics of the questions asked, may also affect the validity of children's self-report data.

In obtaining a self-report from a child, the empirical literature also provides compelling evidence, that the assumption of a child's capacity to comprehend, and respond, to questionnaire items on the basis of chronological age alone, is unwarranted. While age does provide a convenient system of classification, and is typically associated with particular stages of cognitive development, it affords no guarantee of ability. Since so many factors may impede the collection of valid self-report data from child samples, it is both necessary and possible, on the basis of the empirical evidence reviewed, to propose a set of methodological principles, to guide the collection of valid self-report data from children. The following section will put forward a set of guidelines to optimise the likelihood of obtaining a valid self-report of subjective experience from a child.

Guidelines for collecting children's self-report data

The methodological challenges inherent in attempts to assess subjective variables in respondents with limited cognitive capacities are clear. However these challenges are not unique to child assessment. In a review of issues in the assessment of quality of life in intellectually disabled people, where cognitive limitations directly impact the ability of respondents to provide self-reports, Cummins (2005) outlined a number of recommendations for researchers. These recommendations provide a guide for the collection of valid and reliable self-report data, from respondents whose cognitive limitations potentially impact the data collected.

When considering the use of self-report instruments with children, a consideration of Cummins' (2005) recommendations, is therefore highly relevant to the question of how best to measure children's wellbeing. The seven recommendations made by Cummins include two which relate directly to the generic assessment of subjective quality of life. These are that subjective and objective items must not be combined to form a scale, and satisfaction responses should not be weighted by

perceived importance. The other five recommendations relate directly to the assessment of variables by self-report measure, in populations with limited cognitive capacity. These five recommendations will now be discussed with a view to obtaining a valid report of SWB from a child, and in the context of the empirical evidence discussed so far in this chapter.

1. Questions must be kept simple and unambiguous

Just as for intellectually disabled people, asking children questions which are within their probable cognitive capacity is imperative. My literature review has revealed that children are unlikely to indicate when they do not understand, but instead will invariably provide a response, the validity of which must not be assumed. In questionnaires designed for use with children, it is therefore essential that items are composed to maximise the likelihood of comprehension.

Empirical research has shown that the validity of children's reports is attenuated by the lexical complexity of the question asked, and that children's comprehension of questionnaire items decreases as the number of words used in the item increases. Explanations for this include the increases in language proficiency and working memory which accompany cognitive development. Over time, the child's capacity to simultaneously process multiple pieces of information increases, along with their vocabulary and their understanding of the rules and conventions of language.

With these developing capacities in mind, keeping items short, perhaps <10 words, may therefore increase the likelihood that an item will be understood. This is because shorter items are less likely to overwhelm the child's immature working memory. Using words and concepts which are likely to be known to the young respondent is also fundamental. Each child's vocabulary will of course be idiosyncratic. This is because vocabulary is acquired in the context of each child's early exposure to language, and their own interests and experiences. It is known however, that children's understanding moves gradually from concrete to abstract. Therefore, limiting the inclusion of abstract words in items increases the likelihood that the words used will be understood.

This literature review has also considered evidence, that children's understanding of questionnaire items is reduced by item ambiguity caused by negative wording. Negatively worded items are sometimes included in an attempt to control for acquiescent responding. However it is clear that children find negatively worded items confusing. For this reason, negatively worded items must not be used. Adhering to the recommendation that questions be kept simple and unambiguous, therefore requires specifically that items for use with children are short, <10 words, positively worded, and should include only concrete words and concepts.

2. The response options must be understood before questioning commences.

In order to act as principal informants of their own subjective experience, children must be able to use the response format required by the researcher. The evidence shows that horizontally presented scales, with discrete response options such as those provided by Likert or numerical response scales, may be preferred by children over the abstract continuum of the visual analogue scale. In the provision of discrete, concrete response choices, Likert and numerical scales are thought to be appropriate for the distinctive cognitive tendencies of the concrete operational child, the stage of cognitive development which typically spans the ages of 7 to 11 years.

Once a developmentally appropriate response scale has been selected, it is necessary to ensure that a child understands the response options and is able to respond appropriately. A pretesting protocol may be undertaken to assess the competence of young respondents. Pretesting will be described under point four. Additionally, since a child may have no previous experience of responding to a discrete choice scale, it would make sense for the researcher to teach the child how to respond. To do this, the responding process would be modelled for a child by the questionnaire administrator. Through modelling, the child would observe the proficient execution of the responding task. This would be accompanied by a dialogue in which the administrator would provide a step by step description of their response. To optimise successful responding, modelling would be followed by an opportunity for the child to practise responding using a similar style of question to those in the questionnaire. The child would then have the opportunity to ask questions, and the administrator could confirm with the child that they understand the responding task. In this way, the recommendation that the response options be understood before questioning commences, could be met. (A modelling procedure and practice opportunity will be described in detail later in the procedure for Study 1. See page 78.)

3. Verbal presentations must be tightly controlled.

As outlined by Cummins (2005), in research with intellectually disabled people, the cognitive limitations of the respondent are widely thought to be overcome by reading the questions aloud. It has been reported, that self-report measures of depression in children, are also routinely presented orally in an attempt to limit the impact of the child's cognitive immaturity on data validity (Kazdin & Petti, 1982). The child's comprehension of questionnaire items is thereby supposedly ensured.

In support of this belief, it has been reported that when questionnaire items are presented orally, reading ability is removed as an impediment to the collection of valid self-report data (Beitchman & Corradini, 1988). However a child's reading ability is not the sole impediment to comprehension, and understanding does not automatically accompany hearing. As previously described, the inclusion of words and concepts known to children is vital to their understanding, and this is true whether the question is read, or heard.

Furthermore, it is imperative that questions are not repeated or rephrased during verbal presentation. As described previously (see Repeated Questions page 19), evidence shows that children are likely to change their original answer in response to restated or rephrased questions, assuming their original answer to be incorrect. For this reason, a child's first answer must be accepted as their best considered response to that question. The recommendation that verbal presentations be tightly controlled therefore requires the following steps. A question should only be repeated if the respondent did not hear it on first presentation, and when questionnaire items are read aloud, they should not be repeated through rephrasing.

4. Pre-testing to establish respondent competence is essential.

It is vital that the child is able to understand the task they are being asked to perform. This comprehension cannot be assumed by the researcher. What may seem to an adult to be a simple requirement, may be confusing to a child, or may be beyond their current level of cognitive development. Because of this, even when a brief and simple question and response format is to be used, it is necessary to pre-test the young respondent to ensure their competence for the task.

For example, when an end defined numerical response scale is used, and a respondent is required to use a numerical distribution, for example 0-10 such as in the Personal Wellbeing Index (International Wellbeing Group, 2006), the capacity to count from 0-10 is required. Therefore, in young children, this ability must be checked in a pre-testing procedure. My literature review has shown that the developmentally acquired capacity to seriate (put things in order according to a particular dimension such as size) is associated with children's ability to validly use a rating scale. It is therefore necessary to check for this ability through pre-testing. This can be achieved by providing the respondent with concrete stimulus materials such as blocks, or pictures of blocks, and asking them to put the blocks in order, or point to the blocks in order, from smallest to largest.

The literature review has also shown that children are particularly susceptible to acquiescent responding. This is evident when respondents consistently score at the maximum or minimum of the scale. This susceptibility decreases with age although individual variation is evident. When survey respondents are very young, the tendency to respond acquiescently should be checked before testing, through a simple questioning protocol. A series of questions including some to which an affirmative answer is incorrect, for example *"Do you make all your own shoes and clothes?"* should be asked. A positive response to all questions will indicate the tendency to acquiesce. Further testing should not take place with acquiescing respondents, or with those who do not have the skill necessary to respond in the manner required.

5. Data must be screened for acquiescent response patterns.

The literature review has considered empirical evidence which shows clearly that young children are susceptible to response biases. As already outlined, it is possible to take methodological precautions in the design and administration of questionnaires for use with children, to reduce the likelihood of response bias occurring. It is also very necessary to screen data for acquiescent response patterns following data collection. Response sets are evident in data when respondents consistently select the top or the bottom score on the scale. Data should therefore be checked for this response pattern and data sets from any individual respondents who consistently report either minimum or maximum scores, should be eliminated from further analysis.

These five recommendations for data collection with intellectually disabled people (Cummins, 2005), are supported for data collection in children by the evidence reviewed. The literature also suggests the need for additional recommendations for child samples as follows.

6. Provide a supportive socio-emotional environment.

The literature review has shown that children interviewed in a supportive context, are more likely to provide valid responses, while children questioned by intimidating interviewers are more vulnerable to suggestion. Children occupy a position subordinate to adults in the social hierarchy. Because of this, adults have a clear authority which may magnify the potential for response bias in data collected by adults. For example, a child may respond in a manner commensurate with what they perceive to be the wishes of an adult, or they may respond in a socially desirable way. A child may even provide a response when they do not understand the question, simply to meet the adult's requirement for a response to be made. As described earlier (see Response Bias page 16) the amelioration of the status imbalance between researcher and child, through the provision of a supportive socio-emotional environment, may reduce the likelihood of this response bias occurring.

7. Offer a 'Don't Know' response option

Evidence has shown that even very young children understand the implicit communicative expectation to respond to a question. Moreover, they will obligingly do so, even when they do not understand the question, and they are unlikely to indicate their non-comprehension either explicitly "*I don't know what that means*" or through a request for clarification "*What does that mean?*" The provision of a *'Don't know'* response option is therefore essential to reduce the likelihood of children selecting a random response when they do not understand what the question is asking. Children should be offered explicit instructions on the acceptability of a *'Don't know'* response, and should be informed that there are no right or wrong answers.

8. Emphasise confidentiality and anonymity.

Self-report data are susceptible to the response bias of socially desirable responding. This occurs when a respondent answers in a manner they think will be viewed favourably, rather than providing a true and valid response. Since the assessment of subjective variables necessarily relies upon self-report data, it is important to guard against the occurrence of socially desirable responding. As previously described (see Socially Desirable Responding, page 20) reassuring the respondent of the confidentiality and anonymity of their response, when this is the case, is recommended as a method of reducing the risk of such data contamination.

Summary of guidelines

In summary, the reviewed evidence of children's capacity to provide valid data, along with evidence of the factors which impede this, has enabled the proposal of specific guidelines for the collection of valid data from children. The three key objectives are to maximise the likelihood of children's comprehension of the questionnaire items, minimise the likelihood of response bias, and to maximise the likelihood of correct use of the response format.

<u>To maximise the likelihood of comprehension;</u>

Items must be kept short (<10 words).
Items must include words and concepts likely to be known to children (ie: concrete rather than abstract).
Items must be positively worded.

<u>To minimise the likelihood of response bias;</u>

Maximise the likelihood of children's comprehension of items as described.
Provide a supportive socio-emotional environment for the collection of data.
Emphasise confidentiality and anonymity (where possible).
Provide a *"Don't know"* response option and advise the acceptability of this.
Accept children's first response (do not repeat or rephrase verbally presented items).

<u>To maximise the likelihood of correct use of a response format;</u>

Pre-test to ensure respondent's capacity to seriate.
Use a horizontally presented discrete choice response format.
Pre-test to ensure respondent's capacity to count when a numerical format is used.

Conclusion

The assessment of subjective variables in child populations presents complex challenges for investigators. However, clear evidence indicates the invalidity of

proxy data, with adult perceptions of children's subjective experience manifestly failing to converge with children's actual subjective experience. Other research indicates the particular susceptibility of children to response bias, the potential for children's non-comprehension of questions, and incorrect use of response scales. Therefore, while it is essential that any report on a child's subjective experience comes from the child; great care must be taken in its acquisition.

Based on the literature review, guidelines have been proposed which specify the optimal circumstances under which a valid measure of subjective variables in child samples may be made. While it is likely that in an investigation of children's SWB developmental effects would be apparent, no study has directly assessed or reported these effects. There are however, many studies which ostensibly measure and report children's wellbeing, and this literature will be reviewed shortly. Prior to this, it is necessary to consider the construct of SWB within the quality of life literature. Chapter 2 will provide a review of SWB, before considering the developmentally appropriate assessment of SWB in a child sample.

CHAPTER 2: SUBJECTIVE WELLBEING

The SWB of adults has received extensive research attention. In contrast, little research has been conducted to establish the normative levels of childhood SWB. It remains unclear whether SWB in children is the same as for adults, and whether it can be legitimately assessed in the same way. To explore these issues, this chapter begins with an introduction to the measurement of SWB. The theory of SWB homeostasis and its operation in adults will then be discussed, before the research reporting the nebulous construct of 'wellbeing' in children is briefly reviewed.

The Measurement of SWB – Global & Domain Based Measures

In measuring SWB, researchers are specifically concerned with capturing an individual's subjective experience of life. This is not directly observable, but comprises a judgment of life from the subjective view of the individual. As a consequence, self-disclosure provides the only basis for the valid assessment of SWB. Indeed this is the hallmark of contemporary measures of adult SWB. People are asked to report their subjective perception of life, or of some specific aspect of it, and a multitude of instruments have been developed for this purpose.

Valid measures of SWB suitable for use with the general adult population take two forms, global and domain based measures of satisfaction with life. Instruments which assess the SWB of specific groups and subgroups of the population are also available; for example measures for people who are elderly (Brod, Stewart, Sands, Walton, 1999), people with intellectual disability (Nota, Soresi, & Perry, 2006), and people with medical conditions (Zigmond & Snaith, 1983). However such measures are not applicable to the wider population, and so will not be discussed here.

SWB in adult populations is validly measured via the now classic question *"How satisfied are you with your life as a whole?"* However single item global measures of satisfaction with life such as this have been criticised as being influenced by unrelated contextual factors for example the weather, mood and even survey item order (Schwarz & Strack, 1999). Despite this, single item global questions continue to be used in the measurement of adult SWB, and consistently produce data that prove remarkably stable (Cummins, 1995), suggesting that any context effects are small.

Global life satisfaction may also be assessed using multi item instruments. The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larson, & Griffin, 1985) is an example. The scale contains five items, each of which represents global life satisfaction. The five items are aggregated to provide a rating of global life satisfaction. This is in contrast to multi item instruments which assess satisfaction with particular aspects of life, known as domains, which are known to be important to wellbeing (for example relationships, health, and safety). One such

instrument is the Personal Wellbeing Index (PWI; International Wellbeing Group, 2006). The PWI consists of eight items each assessing satisfaction with a specific life domain. When regressed against the single global question of life satisfaction, each of these domains contributes unique variance, a characteristic which makes the scale unique.

Studies utilising both global and domain based measures of SWB in adult populations have produced data which reveal a distinct psychometric profile for SWB. However the effectiveness of either global or domain based measures of SWB in children has not been established. Before considering the developmentally appropriate measurement of child SWB, some established characteristics and correlates of adult SWB will be discussed, and the theory of SWB homeostasis will be introduced.

Characteristics and correlates of SWB

Since the earliest studies of SWB in adult populations (Campbell, Converse & Rodgers, 1976), demographic variables such as age, gender, ethnicity and socio economic status, have been found to correlate poorly with SWB. Additionally, research has shown that personal income has little influence on reports of SWB (Diener, Suh, Lucas, & Smith, 1999) provided that it is sufficient to meet life circumstances (Cummins, 2000). In contrast, a vast literature indicates that cognitive and dispositional factors do demonstrate strong and significant correlations with adult SWB, and some predictable features of SWB have emerged.

The two most significant characteristics of SWB, clearly supported by the literature are that it is normally positive, and it is stable. Adults consistently report their perception of wellbeing within a narrow range of scores, which predictably fall above the mid-point of a scale (Headey and Wearing, 1989; Cummins, 1998, 2000). Within western populations, this stable set point for wellbeing consistently demonstrates moderately high mean levels, revealing that SWB is normally positive (Cummins, 1995, 1998, 2010).

Such research also indicates that SWB normally returns to a positive set point range following significant adverse life events (Headey, Holstrum, & Wearing, 1984; Suh, Diener, & Fujita, 1996). Thus, in addition to positivity and stability, SWB also appears to be strongly genetically determined (Lykken & Tellegen, 1996; Cummins, 2010). This has been widely investigated in terms of personality, and a large body of research suggests that personality variables strongly and consistently predict SWB in adults (DeNeeve & Cooper, 1998; Headey & Wearing, 1989, 1992; Cummins, 2000; Cummins, Gullone, & Lau, 2002). Modest correlations between personality variables and Global Life Satisfaction have also been reported in an adolescent sample (McKnight, Huebner, & Suldo, 2002).

More recently however, research has shown that SWB in adults primarily comprises pleasant activated affect (Davern, Cummins, & Stokes, 2007). This

finding has been replicated in an adolescent sample (Tomyn & Cummins, 2011). A construct initially referred to as core affect, but now known as homeostatically protected mood (HPMood) (Cummins, 2010) has been shown to underlie and drive SWB, and appears responsible for the predictive ability of the personality variables extraversion and neuroticism.

HPMood is a phenomenologically experienced neuropsychological state. It provides a person's affective milieu, and can be described as the individually experienced, and subjectively accessible, feeling of wellbeing (Cummins, 2010). The stable, and positive levels of SWB previously described, reveal that it is normal for adults to feel good about themselves and their lives, thus HPMood is normally positive. This has been explained by the proposal that SWB is actively protected by an adaptive mechanism termed SWB homeostasis (Cummins, Gullone, & Lau, 2002; Cummins, 2010). This will now be discussed.

SWB Homeostasis

The finding, that adults normally experience moderately positive levels of SWB, has been explained by the theory of SWB homeostasis (Cummins, 1995, 2010). The homeostatic system enables people to feel positive about their lives, and themselves, despite negative influences in their environment which challenge their SWB. Under circumstances in which SWB is challenged, homeostasis is proposed to utilise a system of protective buffers which function to maintain stable and positive levels of SWB.

This protective system comprises external and internal buffers, which operate to defend HPMood. The primary external buffers are wealth and relationships, which are important for their capacity to protect against or ameliorate the impact of potential challenges to SWB. The internal buffers include self-esteem, optimism and perceived control. These buffers act through cognition to mediate the impact of adverse extrinsic conditions, enabling positive SWB to be maintained (Cummins, 2010).

To date, the applicability of the model of SWB homeostasis to children has not been empirically assessed, and verification that children also experience consistent and moderately high mean levels of SWB has not been made. The finding that, in adults, SWB is primarily driven by affect, has not been replicated in children, and furthermore, confirmation that the cognitive buffering system of homeostasis is present and operates as for adults is an important extension of knowledge. It is illogical to impute a system of cognitive defences to infants due to the immature functioning of their cerebral cortex. However such a system can be contemplated in children, even though it will be immature.

The methodological barriers to obtaining valid data from child samples, probably explains this lacunae in the predominantly adult generated literature. Chapter 1 reviewed these methodological challenges and proposed guidelines for the collection of self-report data from children. Chapter 1 also reviewed the theories of cognitive development. However research reporting the cognitive components of

the internal buffering system, has not yet been described. The following section will review the relevant research, before measures of SWB suitable for use with children are considered.

Internal Buffers

Three cognitive components are proposed to comprise the internal buffering system of SWB homeostasis. These are self-esteem, optimism and perceived control. Each will now be discussed in relation to children.

Self-esteem

The term self-esteem refers to an individual's evaluative self perception. From infancy, children begin to acquire and organise information to form a concept of self. This information is assembled as children develop cognitively and begin to interact with others. Conscious and descriptive beliefs about the self constitute self concept, while positive or negative evaluations of this self concept constitute self-esteem (Kernis & Goldman, 2003).

Self-concept is not imputed to the new born infant but rather is thought to emerge and develop gradually. Despite clear methodological barriers, the emerging self has been investigated in infants using tests for self recognition. These involve showing the infant images of themselves with mirrors or pictures (Bahrick, Moss, & Fadil, 1996; Lewis & Brooks-Gunn, 1979; Amsterdam, 1972). The results suggest that within the first months of life, discrimination of self from others is beginning, and that by the end of the first year, children have an awareness of self as distinct from others.

As children acquire language, researchers have better access to the developing self through verbal descriptions. These appear during the second year and are made on the basis of salient, concrete, and observable characteristics such as gender, age and physical attributes (Damon, Lerner, & Eisenberg, 2006; Lewis & Brooks-Gunn, 1979; Broughton, 1978; Keller, Ford, & Meachum, 1978). Evaluation of the self, evidenced by the first appearance of emotions such as pride or shame follows during the second and third years (Stipek, Gralinski, & Kopp, 1990).

This evaluation of self tends to be overly positive in preschool children, becoming more accurate by 8 years of age as the likely result of cognitive development (Harter, 2006). Varying levels of self-esteem have been observed in different children, and a combination of genetics and unique experience are thought responsible for these individual differences (Harter, 2006; Kamakura, Ando, & Ono, 2007).

Positive self-esteem is said to assist adults in the defence and maintenance of SWB, by allowing a positive view of self to be maintained despite threats occurring as the result of personal failures (Cummins, 1995, 2010). On the basis of the evidence reviewed, it appears that this component of the system of SWB

homeostasis is present in children, and a correlation between self-esteem and Life Satisfaction has been reported in youths (Huebner, 1991). Self-esteem in 8-12 year old children will be assessed and reported in Studies 1 and 2.

Optimism

Optimism reflects the extent to which an individual holds generalised positive expectancies about the future (Carver, Scheier & Segerstrom, 2010). This can be measured by asking people about whether they expect things to turn out well in their lives. In this sense optimism, and its measurement, involves cognition beyond the capacity of an infant or very young child. However optimism is also considered an individual difference variable with a clear genetic component (Carver et al., 2010). In this sense, the tendency to expect the best is a pre-endowed trait.

According to the theory of SWB homeostasis, expecting the best for the future, even in the face of adverse current circumstances, protects and maintains SWB when it is under threat. However as described in Chapter 1, young children have a clear orientation to their present circumstances, and contemplation of the future is a developmentally achieved ability (Piaget, 1926; Busby & Suddendorf, 2005). It seems likely then, that the role of optimism as a cognitive buffer for children's SWB will be less sophisticated than it is for adults. Optimism will be measured in 8-12 year olds in Studies 1 and 2 to test this proposition.

Perceived Control

The final component of the internal buffering system of SWB homeostasis is perceived control which involves primary and secondary control strategies. As outlined in the life span theory of control proposed by Heckhausen and Schulz (1995), primary control refers to behavioural attempts to change the external world so that it meets the desires or needs of the individual. In contrast, secondary control refers to cognitive efforts to make the external world acceptable to the individual. Both primary and secondary control strategies are important to the maintenance of HPMood in adults, as an integral part of the homeostatic system (Cummins, 2010).

Primary control strategies are believed to be present at birth, for example in the cries of a hungry infant (Heckhausen & Schulz, 1995). In contrast, secondary control is dependent upon cognitive maturation, and thus emerges gradually throughout middle childhood (e.g., Altshuler & Ruble, 1989; Band & Weisz, 1990; Heckhausen & Schulz, 1995). A small study investigating the use of primary and secondary control by children aged 5-12 years (N = 66) reported that although children as young as 5 were able to use secondary control strategies, older children were more likely to use these than younger children, who more often employed primary control (Marriage & Cummins, 2004). This is consistent with the intuitive understanding that secondary control, being wholly cognitive, must emerge gradually with cognitive development.

To summarise, the reviewed literature suggests that HPMood may not be protected by cognition in young children, as effectively as it is for adults. However no study has reported the operation of the system of SWB homeostasis in children. Studies 1 and 2 will investigate the cognitive components of the internal buffering system in 8-12 year old children, along with other variables. Before Study 1 is introduced however, a review of the literature reporting the nebulous construct of 'wellbeing' in children will be made, and a measure of SWB suitable for use with children will be presented.

Reports of Children's Wellbeing

The first thing apparent in the children's wellbeing literature is that wellbeing is an ambiguous concept, lacking an unequivocal and universally agreed definition. This is exemplified by the many studies which purportedly measure and report the wellbeing of children, but which in fact measure a range of variables from which wellbeing is assumed.

Predominantly, the absence of cognitive or behavioural problems provides the primary indicator of children's wellbeing in many studies. For example one study investigating the effects of family instability on child wellbeing (Fomby & Cherlin, 2007), assessed wellbeing based on the combined results of a cognitive achievement test, mother reported measure of externalising behaviours, and child self-report of delinquent behaviour. Similarly, a study reporting maternal working conditions and child wellbeing (Dunifon, Kalil, & Bajracharya, 2005) assumed wellbeing from maternal reports of the frequency, range and type of children's behavioural problems. This is typical of many studies which report children's wellbeing in relation to specific demographic or family circumstances, which could theoretically detract from children's wellbeing. However the principal assumption of these studies, that children's wellbeing may be reliably inferred from either their behaviour or their cognitive ability, has no reliable empirical basis.

A further issue is that many studies rely on proxy data. As described in Chapter 1, the literature is replete with studies reporting data from third party informants despite the demonstrated invalidity of this method (Bethell, Read, & Blumberg, 2007). The reliance on proxy data is also evident in studies which report the impact of specific medical conditions and their treatment on children's wellbeing, in an area of research known as Health Related Quality of Life (HRQOL). Typically these studies erroneously infer wellbeing on the basis of factors related to the disorder, such as the presence or absence of symptoms, and the functional status of the patient (Yong, Chengye, & Jiong, 2006; Ennett, De Vellis, Earp, Kredich, Warren, & Wilhelm, 1991).

In summary, many studies report the 'wellbeing' of children. However the construct is poorly defined and the measures used are typically disease or behaviour specific. 'Wellbeing' is often assumed from the absence of cognitive or behavioral problems, and measures commonly rely on third party informants,

rather than self-report. Currently, the age and means by which children come to hold consistent and distinct subjective perceptions regarding their own quality of life is fundamentally unknown. Having established that self report is the only valid method for assessing SWB, it is important to consider a suitable instrument for use with children.

A MEASURE OF SWB IN CHILDREN

As described at the beginning of this chapter, SWB is commonly measured in adult populations using global and domain based measures. The SWB of Australian adults has been measured twice yearly since 2000 through the Australian Unity Wellbeing Project, using the single item question of global life satisfaction (GLS), along with the Personal Wellbeing Index (PWI) (International Wellbeing Group, 2006). The PWI has been shown to function well with samples of adolescents in international communities (Casas, Sarriera, Alfaro, Gonzalez, Malo, Bertran, Figuer, da Cruz, Bedin, Paradiso, Weinreich, & Valdenegro, 2011). Recently, the SWB of Australian adolescents aged 12 to 20 years (N = 351) was assessed using the GLS and a parallel form of the PWI intended for school children (PWI-SC) (Cummins & Lau, 2005). The PWI-SC will now be discussed.

The Personal Wellbeing Index – School Children Version

Intended to measure the SWB of school aged children, the Personal Wellbeing Index – School Children Version (PWI-SC) (Cummins & Lau, 2005) is a seven item scale designed to assess satisfaction with seven of the life domains known to be relevant to the wellbeing of adults. These domains are selected to represent the first level deconstruction of satisfaction with life as a whole. The domain of religion/spirituality, added as an eighth domain to the PWI adult version, is not included in the PWI-SC. The literature reviewed in Chapter 1 supports this exclusion as young children find responding to questions about religion difficult (Amato & Ochiltree, 1987).

In comparison to the adult version of the PWI, the PWI-SC has simplified wording, which is intended to make the items easier to comprehend, and the response scales use the word happiness rather than the word satisfaction. The authors acknowledge that happiness and satisfaction are not equivalent but state that similar data are obtained using each term (Cummins & Lau, 2005). The seven items included in the PWI-SC are as follows;

> How happy are you about the things that belong to you? Like your toys?
> How happy are you with your health?
> How happy are you with the things you want to be good at?
> How happy are you about getting on with the people you know?
> How happy are you with how safe you feel?
> How happy are you about playing or doing things with people away from your home?
> How happy are you about what may happen to you later on in your life?

The simplified wording of the PWI-SC will now be discussed.

Simplified wording of the PWI-SC

As described in Chapter 1, applying readability formulas cannot produce meaningful ratings of the readability of questionnaire items, and cannot gauge the suitability of those items for use with children. However syntactic complexity does increase the difficulty of text. All seven items of the PWI-SC are plainly syntactically simple. All except one are single sentences and all are short consisting of only a few words. The PWI-A is also syntactically simple.

Vocabulary, like syntactic complexity, has also proven to be a robust predictor of text readability, and the difficulty of questionnaire items has been shown to increase according to the number of unfamiliar words included in the text (Homan, Hewitt, & Linder, 1994). As comprehensively described in Chapter 1, the Dale-Chall wordlist provides a suitable means by which the familiarity of words to children can be assessed.

None of the words included in the PWI-SC are absent from the Dale-Chall word list, and therefore all are assumed to likely be familiar to children at grade 4 (approximately 10 years of age). The difference between the PWI-SC and PWI-A in terms of vocabulary is evident. The eight items included in the PWI-A are as follows;

> How satisfied are you with your standard of living?
> How satisfied are you with your health?
> How satisfied are you with what you achieve in life?
> How satisfied are you with your personal relationships?
> How satisfied are you with how safe you feel?
> How satisfied are you with feeling part of your community?
> How satisfied are you with your future security?
> How satisfied are you with your spirituality or religion?

The words, *satisfied, standard, achieve, personal, relationships, community, future,* and *security,* are all absent from the Dale-Chall word list, and are therefore possibly unfamiliar to children. These words are also abstract, having no concrete referent. The methodological guidelines proposed at the end of Chapter 1 recommended that where possible, concrete words should be used to maximise the likelihood of comprehension. Replacing the abstract words of the PWI-A, with the more concrete ones of the PWI-SC, thus makes sense.

However it is reasonable to question whether simplifying wording, necessarily eliminates any difficulty a child may have in comprehending an item. Children are known to acquire vocabulary as they acquire knowledge of the world. The words children know are a reflection of the concepts they have come to understand through interaction with their world. As a child learns more complex words, they

are also thinking about the world in more complex ways. Vocabulary and thinking can thus be seen to go hand in hand.

It seems improbable then, that a fundamental developmental inability to understand a concept could be overcome by simplifying the words used to enquire about it. For example, if a child does not understand future security, then it is unlikely that they will think or talk about it. As described in Chapter 1 temporal understanding undergoes substantial change during childhood. The capacity to take either a past or future perspective of self is subject to the developmental process (Busby & Suddendorf, 2005). Asking children to envisage the future is thus potentially beyond their level of cognitive development, regardless of the words used to make the request.

In summary, the methodological guidelines proposed at the end of Chapter 1, recommend the use of concrete over abstract words in questionnaire items for children. It is possible however, that cognitive immaturity may prevent children from comprehending an item, even when they understand the words used in it. Before selecting the measure of SWB to be used in Study 1, the assumption that domains relevant to adult SWB, are also meaningful for children, and may be directly transposed into a child measure must be challenged. Since children are dependent upon adults, and are still developing cognitive, social and emotional skills, it is plausible that other domains may be more salient. This will now be discussed.

Domains of Child SWB

A recent qualitative study explored and reported on the views of young Australians (aged 8-15 years) regarding what constitutes wellbeing (Fattore, Mason, & Watson, 2009). The principal underlying elements which emerged were children's emotional lives and their significant relationships with others. These factors appeared to provide the context within which the children experienced and discussed their sense of wellbeing.

Domains germane to children's subjective experience of wellbeing, and consistent with some of the domains of the PWI, were also identified by these authors. However these aspects of life were recognised by the children as relevant to their wellbeing, only insofar as they impacted their present significant relationships, and their current emotional life. For example the domain of *health* is described by Fattore, et al., (2009) as relevant to children's wellbeing, only via its manifestation in current significant relationships, such as in the child receiving appropriate care from significant others when ill; and the domain *standard of living*, is relevant only through the child's experience of an emotion such as shame, when desired possessions cannot be purchased.

Children's perception of wellbeing as grounded in current relationships is consistent with Brofenbrenner's (1979) Ecological Systems Theory, which views the child's significant relationships as having the most direct effect on child

wellbeing. As described in Chapter 1, the theory proposes that child development occurs within a complex system of bidirectional relationships. There is a dynamic interplay wherein the child actively affects, and is affected by their relational environment, such that reciprocal interactions with significant others enhance or undermine the child's development in an enduring way (Brofenbrenner & Morris, 1998).

Children's awareness of their wellbeing as occurring in the context of their current emotional life is consistent with Piaget's view that children are oriented to the present. Their emotional experience in the present moment is therefore highly relevant to their SWB. Fattore et al.'s (2009) study emphasises the fact that children's SWB occurs "right now at this point in their lives (p70)" and highlights the way in which children comprehensively experience wellbeing via their existing intrapersonal and interpersonal environments. In addition, the study proposes domains which can be tested in a measure of SWB alongside the domains of the PWI, which are known to be salient to adult SWB.

The PWI and Exploratory Domains

The PWI includes items which assess satisfaction with eight life domains as; *standard of living, health, achieving in life, personal relationships, safety, community connection,* and *future security*. The eighth item measures satisfaction with religion or spirituality. One study investigated satisfaction with this domain in a sample of adolescents, and reported that the concepts of religion and spirituality are each interpreted differently by youngsters (Casas, Gonzalez, & Figuer, 2009). Furthermore, the study highlighted the fact that these abstract concepts are understood quite differently by people depending on their stage of life. As previously described, satisfaction with religion or spirituality is not included in the PWI-SC. My literature review supports its exclusion and only the seven domains of the PWI will be tested with children in Study 1.

The psychometric properties of the PWI-A in samples of adults are well established (International Wellbeing Group, 2006), and good functioning of the scale with adolescent samples has been reported (Casas, Sarriera, Alfaro, Gonzalez, Malo, Bertran, Figuer, da Cruz, Bedin, Paradiso, Weinreich, & Valdenegro, 2011). However the psychometric characteristics of the PWI-SC have not been reported, and there is no evidence that it is a superior measure of SWB in children than the adult form, despite its simplified wording. For this reason, Study 1 will use the PWI-A to measure the SWB of children in grades 3-6. (A procedure for administration of the questionnaire, designed to reduce the cognitive load of the responding process, will be described fully in Chapter 3.)

The PWI domains *standard of living, health*, and *safety* all have parallel domains proposed for children by Fattore et al. (2009). *Agency, self, activities, dealing with adversity* and *physical environment*, are domains also proposed by Fattore et al. (2009) which have no parallel in the PWI, but will be included in Study 1 to test their predictive ability.

A recent study tested the exploratory domain *school* with a sample of Australian adolescents (Tomyn & Cummins, 2011). *School satisfaction* was found to meet the criteria for inclusion in the PWI, explaining 1% unique variance over the existing seven domains. *School* will be included as an exploratory domain in Study 1 to test its ability to predict child SWB.

In summary, there is presently no evidence that the domains of the PWI, which predict adult SWB, also predict child SWB. Study 1 will test the predictive ability of seven PWI domains. Five exploratory domains will also be included, to test their ability to predict SWB in a child sample.

Other variables will also be included in the questionnaire, to test the applicability of the theory of SWB homeostasis. These variables and their measures will be described in Chapter 3. Before this however, it is important to consider affect, since it has recently been shown that SWB in adults and adolescents is primarily driven by affect. The following section will briefly review affect in children before Study 1 is introduced in Chapter 3.

AFFECT MEASUREMENT IN CHILDREN

Recent research reporting the relative contributions of affect and cognition to SWB in adults, indicates that SWB is primarily affective in nature (Davern, Cummins, & Stokes, 2007). These findings have been replicated in a sample of Australian adolescents (Tomyn & Cummins, 2011). However as with much SWB research, these findings have not been replicated in a child sample.

The emergence of capacities for cognition and mobility in infants is undoubtedly dependent upon concurrent physiological maturation. However researchers have long assumed that the newborn infant is innately prepared to experience and express affect, at least at a primitive level (Darwin, 1872/1965).

A major developmental achievement during the first years of life is the ability to regulate this affect. Caregiver-infant interaction is integral to this skill development (Bowlby, 1969), as are increases in the employment of strategies such as gaze redirection to regulate affect (Tronick, 1989; Toda & Fogel, 1993).

Individual differences in infants' affective response and regulation are considered to be based in temperament (Chess & Thomas, 1996), which is regarded as biologically based and genetically inherited (Derryberry & Rothbart, 1984; Kagan, 1994). An affective 'set point' for humans is also regarded as genetically determined (Headey & Wearing, 1989). It is this stable, positive affective experience that SWB homeostasis is proposed to defend (Cummins; 1995, 2010), and which has been termed HPMood. (Davern, Cummins, & Stokes, 2007; Cummins, 2010).

The affective adjectives, *happy, content, and excited or alert*, have been shown to define HPMood in Australian adults (Davern et al., 2007) and adolescents (Tomyn & Cummins, 2011). However whether this finding can be replicated in children is uncertain. One study casting doubt on this possibility showed that whereas *happy* was known and used by 100% of the children in the 2-2½ year old age group, very few children either knew, or used the words *content* or *alert* as they approached their 6th birthday (Ridgeway, Waters & Kuczaj, 1985).

Conclusion

It remains unclear whether SWB in children has the same composition as for adults, and whether it can be legitimately assessed in the same way. Further, there is reason to doubt that all of the domains of the PWI are salient to children. The finding that SWB is primarily driven by affect has not been replicated in a child sample, and HPMood and components of the system of SWB homeostasis have not been investigated in children. Study 1 will address these issues.

CHAPTER 3 STUDY 1

With few exceptions, previous research reporting children's wellbeing has relied on the perceptions of parents or teachers. This proxy response method has been shown to produce data which are fundamentally invalid for the reasons set out in Chapter 1 (page 15). Moreover, studies which do ostensibly report children's wellbeing based on self-report data often include samples of respondents aged between 12 and 18 years. The remarkable development of children's cognition described in Chapter 1, means that this age group does not adequately represent all children. There are of course legitimate concerns regarding the capacity of children younger than this to reliably report their own subjective state via questionnaire. As a consequence of these issues, the normative range of SWB within children 12 years and younger remains unverified.

The ability of these children to provide a self-report of their SWB has not been empirically tested, and developmental effects in the SWB data of children have not been demonstrated. This is true despite evidence of developmental effects in children's understanding of, and responses to questions assessing other variables, as described in Chapter 1 (page 33). It is likely that similar effects would appear in children's responses to questions about their subjective experience of wellbeing. However there is no evidence confirming this. Study 1 aims to demonstrate developmental effects in the ability of children aged 8 to 12 years to report subjective variables, in particular life satisfaction and personal wellbeing. Following this, Study 2 will report children's SWB, and the factors associated with it as predicted by the theory of SWB homeostasis. Study 2 will also investigate the extent to which HPMood is able to predict SWB, and will explore whether other domains can be discovered that are more salient to child wellbeing, than those domains which predict SWB in adults.

Study 1 – Aims & Hypotheses

It is quite likely that children aged between 8 and 12 years, with normal cognitive development, could comprehend and respond to a self-report questionnaire measuring SWB and the variables related to it. However, there is no evidence to verify this, and it is likely that developmental effects in SWB data would be apparent. Before the SWB of such children can be assessed, these developmental effects must be demonstrated and explored. The aim of the present study therefore, is to investigate whether children as young as 8 years may be able to reliably and accurately report subjective variables via a self-report questionnaire. It is expected that the responses of these children will show developmental effects such as the tendency to respond using the extreme ends of the response continuum, as has been described in Chapter 1.

Evidence of this tendency should be apparent in children's responses to two measures of SWB used in adult populations, the single global question of life satisfaction (GLS), and the Personal Wellbeing Index (PWI) (International

Wellbeing Group, 2006). Mean GLS and SWB scores in adult samples are normally positive. For this reason, it is expected that in response to these measures of SWB, children will respond more often than adults using the extreme positive end of the continuum. This will be tested in Hypothesis 1. As a result of this extreme responding, mean GLS and SWB in the child sample is expected to exceed the mean for Australian adult SWB data. This will be tested in Hypotheses 2 and 3.

Hypothesis 4 will test the effect of provision of a *'Don't know'* response option, to a subset of the sample. The option to respond *'Don't know'* is not always provided in questionnaires. However as described in Chapter 1, children seldom indicate when they do not understand a question, but instead will select from the response choices offered, thereby providing a response of doubtful validity. It is expected that children who do not receive the *'Don't know'* option, will respond to all questions using the response scale.

Hypothesis 5 will test for further developmental effects, which are expected to be apparent in children's understanding of those questionnaire items which include abstract words or concepts (for example *optimism* and *self-esteem*). Children younger than 12 years tend to engage in concrete thinking as described in Chapter 1, and typically acquire and comprehend words with concrete referents earlier than abstract words and concepts. For this reason, items containing abstract words or concepts are likely to be difficult for some children, and are expected to receive a higher number of *'Don't know'* responses than other items.

In Summary, Study 1 will investigate and report developmental effects in children's self-report of subjective variables. The following hypotheses will be tested.

1. *Children will respond to measures of SWB using the extreme positive end of the response scale more often than adults.*
2. *Mean global life satisfaction reported by children will exceed that of adults.*
3. *Children's reported SWB and all PWI domains will exceed those of adults.*
4. *Children who receive explicit instructions on the acceptability of a 'Don't know' response will be less likely to respond substantively to all items.*
5. *Items highly endorsed with 'Don't know' responses will contain abstract words or concepts.*

DATA COLLECTION – Round 1 Grades 3-6

The first study will investigate developmental effects in 8-12 year old children's responses to a questionnaire assessing subjective variables. The normative range of life satisfaction in the child sample will be established, along with the age at which a child may reliably self-report their SWB. The second study will investigate the factors associated with SWB as predicted by the theory of SWB homeostasis, and also the contribution of HPMood to the prediction of SWB. As described previously, the collection of valid data from children requires that the methodological guidelines outlined at the end of Chapter 1 are followed. A single round of data collection was undertaken to enable the hypotheses for Studies 1 and 2 to be tested. A second round of data collection was undertaken for Study 3. The procedures for both rounds of data collection follow the guidelines proposed previously. The procedure for round one of data collection will now be described in detail.

METHOD

Participants

The sample consists of 217 participants aged from 8 to 12 years (M = 9.79) with 121 males (55.8%) and 96 females (44.2%). The sample was taken from Grades 3, 4, 5 and 6 students at two Independent Schools in Victoria. Both schools acted in loco parentis to provide informed consent for the children's participation. Verbal consent for participation was also obtained from each child. All 217 questionnaires were completed.

Procedure

Approval from the Deakin University Ethics Committee, and agreement to participate from the two Independent schools from which the samples were taken, was obtained prior to the commencement of the study. An information letter detailing the study was sent to the parents or legal guardians of each child. Parents were able to indicate in writing if they did not wish their child to participate. Six children were excluded on this basis. Verbal consent to participate was then obtained from each child, first by the class teacher, and then by the researcher. All children present on each day of testing agreed to participate.

Pretesting

No pretesting was undertaken. Children's enrolment in a mainstream school in a grade from 3 to 6, was taken as an indication that they should be able to count from 1 to 10 (to be able to use the response format), and that they would possess sufficient reading skills to follow the questionnaire. The researcher checked with the individual class teachers for children with particular learning difficulties which may adversely impact their capacity to complete the questionnaire. Four children

in one group were identified who had diagnosed auditory processing deficits. The researcher ensured that these children understood the instructions before commencing administration of the questionnaire. Three children with autism were also identified by class teachers. These children were excluded on the basis that participation in completion of the questionnaire was outside of their usual routine, and was therefore likely to be highly upsetting. These children worked with their assigned teacher aid during the administration of the questionnaire.

Group Administration

The researcher is a fully qualified and registered teacher in the state of Victoria. Ten 35 minute sessions were scheduled by the schools within the normal daily timetable, for the researcher to administer the questionnaire to children in their usual class groups and in their usual classrooms. This was important to ensure that children did not feel threatened or uncomfortable by an unfamiliar setting, or by disruption to their usual routine. The groups ranged in total size from 14 to 44 children.

After being introduced by the children's usual class teacher, the researcher began a discussion with each group about science, asking the children *"Put your hand up if you can tell me something about science."* Children were then invited to share their ideas about science with the group. Some of the children's ideas included; *It's finding out about things. It's doing experiments. You can blow things up. It's measuring and investigating.* The researcher then continued to lead the discussion, to establish rapport with the students, orient them to the task, and to generate enthusiasm for their cooperative and informed participation in the study.

Through the discussion, the researcher highlighted the importance of giving authentic and individual responses. The researcher asked a number of children *"Can you tell me what your favourite colour is?"* The differences in children's choice of favourite colour, was then used to indicate that everyone would provide a different response to the questionnaire items, and that there were no right or wrong answers. The researcher then explained the response format with a visual demonstration on the white board using the question "*How satisfied are you with what you ate for breakfast today?*" to demonstrate the satisfaction response, and the statement "*I like to eat apples*" to demonstrate the agreement response. In this way the researcher modelled the responding process for the students, to ensure their full understanding of the task.

Three groups of children (n = 50) were encouraged to provide a response to all items. The other seven groups of children (n = 167) were instructed on the acceptability of a *'Don't know'* response. Children were told to indicate when they did not understand a question, with a question mark "?" at the end of the item. This was to test the effect of a *'Don't know'* option in comparison to an encouragement to respond to all items.

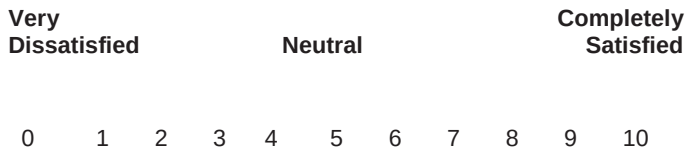
Finally, the children were invited to ask questions. The questionnaire was then distributed for them to complete at their desks. The researcher asked the children to indicate their age in years, and their grade level and gender in the space provided on the questionnaire. Children were then asked to put a ruler under the first item on the questionnaire, so that the item and the response options were easy to see. The researcher also read each questionnaire item aloud, to reduce the cognitive load of the responding task. Students were asked to mark their response choice on the questionnaire using a pencil. This also ensured that the children took care in the selection of their response choice, thereby reducing the likelihood of missed items. The researcher then asked the students to move their ruler down to the next item, and the process was repeated for all items.

For the two measures of SWB, the GLS and PWI, each item was read aloud, and the researcher added a verbal explanation. For the GLS question (item 1) this involved replacing the word *satisfied* with the word *happy*. *"How satisfied are you with your life as a whole? This means how happy you are with your life as a whole."* This was provided on the basis that the word *happy* may be better understood by the children than *satisfied*. Each of the PWI items were also read aloud (items 2-8), and a verbal explanation which was the wording from the PWI-SC was provided. The PWI item was then repeated. For example; *"How satisfied are you with your standard of living? This means how happy you are with the things that belong to you like your money, or your toys, or your games. How satisfied are you with your standard of living?"* Explanations were not provided for any other items on the questionnaire.

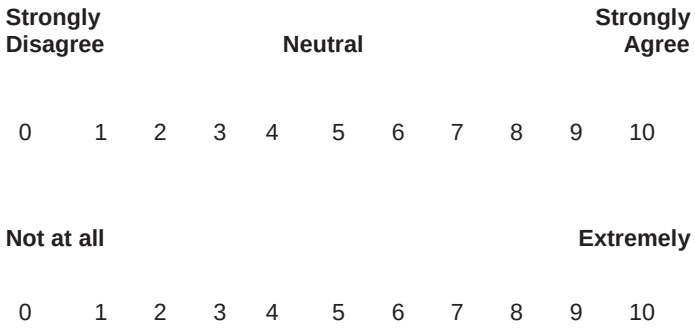
At the completion of the questionnaire, the researcher collected the completed surveys, and thanked the children for their participation.

Questionnaire (Grades 3-6)

A two part pencil and paper questionnaire was used to assess participants. The questionnaire consisted of 41 items. Part one assessed the following variables: Global Life Satisfaction, Subjective Wellbeing, Self-esteem, Optimism, Primary and Secondary Control, and Extraversion, and Neuroticism. Part two assessed HPMood, and six exploratory domains of satisfaction with life. Participants were required to respond on an eleven point end defined scale, with 0 indicating *'strongly disagree' 'very dissatisfied'* or *'not at all'*, 5 indicating *'neutral'*, and 10 indicating *'strongly agree' 'very satisfied'* or *'extremely'* as illustrated below



Or



The questionnaire incorporates a number of individual scales and items to measure the relevant variables as follows.

Global Life Satisfaction

Two measures of SWB were employed. The first is the single global life satisfaction item (GLS) used in the Australian Unity Wellbeing Index (International Wellbeing Group, 2006) *"How satisfied are you with your life as a whole?"* The origins of this question are in the work of Andrews and Withey (1974), and Campbell, Converse and Rogers (1976). The use of global measures of life satisfaction in adult populations is common in the quality of life literature. However there appear to be no reports of the use of this single item measure of life satisfaction in samples of children aged between 8 and 12 years. Its use in this child sample is therefore exploratory.

Subjective Wellbeing

Seven items from the Personal Wellbeing Index (PWI) (International Wellbeing Group, 2006), were also used as a measure of SWB. These items comprise satisfaction with seven life domains as; standard of living, health, achieving in life, personal relationships, safety, community connection, and future security. An eighth item measuring satisfaction with religion or spirituality, which is included in the PWI when measuring the SWB of adults, was left out on the basis of evidence that children find questions regarding religion difficult to answer.

The psychometric characteristics of the PWI have been comprehensively investigated, and Cronbach's α between .70 and .85 have been reported (International Wellbeing Group, 2006). Good internal reliability was demonstrated with the current sample (Cronbach's α = .68). As previously described, a simplified version of the PWI, intended for use with children is also available. However for the reasons previously described (see Chapter 2), the use of the adult version of the PWI will be investigated in a child sample in this study. Children were required to respond using the 11 point, end defined numerical scale anchored with the oppositely valenced descriptors of *Very Dissatisfied* and *Completely Satisfied*.

The Global Life Satisfaction item and the seven item PWI scale are presented in the questionnaire as items 1 to 8.

Exploratory Domains

The PWI includes domains of adult wellbeing however it is not known whether these domains also best represent children's wellbeing. A recent study proposed alternate domains for child wellbeing (Fattore, Mason, & Watson, 2009). Each of these domains is included in the questionnaire to enable an assessment of the domains which best predict child SWB. The included exploratory domains are agency, environment, self, activities and dealing with adversity. Children were required to respond in the same way as for the PWI. An additional domain, satisfaction with school, was included on an exploratory basis. Items 9 to 14 on the questionnaire comprise the six exploratory domains.

Self-Esteem

The Rosenberg Self-esteem scale (Rosenberg, 1965) was used to measure Self-esteem. This is a widely used and simple measure of self-esteem (Schmitt & Allik, 2005). Intended for use with adolescent samples, the face valid scale was designed for brevity and ease of administration, and has been recommended for use with child samples (Chiu, 1988). The scale usually consists of ten items measuring global self-esteem. Five items are positively worded and five are negatively worded on the basis that this may control for acquiescent responding. However negatively worded items have been shown to increase the difficulty of items for children, and to consequently increase the potential for response bias, so only the five positively worded items were included in the questionnaire.

The Rosenberg Self-esteem scale requires participants to indicate the extent to which they agree or disagree with statements about themselves. The reliability of the scale with undergraduate student samples has been investigated and Cronbach's α between .72 and .88 have been reported (Gray-Little, Williams, & Hancock, 1997). Good internal reliability was demonstrated with the current sample (Cronbach's α = .82). Items 24 to 28 of the questionnaire represent the five Rosenberg self-esteem items used. Children were required to respond using the 11 point end defined scale anchored by the terms *Strongly Disagree* and *Strongly Agree*. A composite variable *'self-esteem'* was computed.

A single item measure of Self-esteem *"I have high self-esteem"* was also included to explore its validity with child populations. (Questionnaire item 29). This measure has been validated with adult populations (Robins, Hendin, & Trzesniewski, 2001). However lower convergent validity has been demonstrated in a child sample (r = .52) than in adult samples (rs = .73 to .75) and so its use with this child sample remains exploratory.

Optimism

The Life Orientation Test – Revised (LOT-R) (Scheier, Carver, & Bridges, 1994) was used to measure dispositional optimism. The LOT-R has been reported as the best measure of adult expectations about the future (Ey, Hadley, Allen, Palmer, Klosky, Deptula, Thomas, & Cohen, 2005). However the use of the LOT-R with a child sample has not been reported. For the purposes of the present study, the LOT-R was selected as a potentially satisfactory measure of optimism in children, due to its brevity and the simplicity of the language used. One of the three items does however use the word *"optimistic"* and it is anticipated that this word may not be known by some children. The use of the LOT-R as a measure of optimism in a child sample is therefore exploratory.

The scale usually contains six items which measure generalised positive outcome expectancies. In an attempt to control for acquiescent response bias, 3 items of the LOT-R are worded positively, and 3 items are worded negatively. As for the self-esteem scale, the three negatively worded items were not used. Respondents are required to indicate their agreement or disagreement with statements about themselves, for example; *"In uncertain times, I usually expect the best."* Cronbach's α has been reported at .76 for undergraduate student samples, with test-retest reliability at four weeks reported at r = .79 (Scheier & Carver, 1985). The three items of the LOT-R used in the current study are items 21 to 23 of the questionnaire. Good internal reliability was demonstrated with the current sample (Cronbach's α = .74). Children were required to respond on the 11 point end defined scale anchored by the terms *Strongly Disagree* and *Strongly Agree*. A composite variable *'optimism'* was computed.

Perceived Control

Perceived control was measured using items from a scale developed with an adult sample (Chambers, Holloway, Parsons & Wallage, 2003). Its use with a child sample is exploratory. Two dimensions of perceived control, primary and secondary control, were measured using six items. Participants respond to items with the stem *"When something bad happens to me,"* indicating the extent to which they agree or disagree with each statement. The first three items (questionnaire items 15 to 17) represent the use of primary control, and the second three items (questionnaire items 18 to 20) represent the use of secondary control strategies. Alphas for the primary and secondary control items in the scale have been reported at .88 and .90 (Chambers et al., 2003). Children were required to respond using the 11 point end defined response scale anchored by *Strongly Disagree* and *Strongly agree*.

Personality

Extraversion and Neuroticism were measured using four items from the Ten Item Personality Inventory (TIPI) developed by Gosling, Rentfrow, and Swann (2003). This measure was developed for use in situations when only a brief measure of

personality is required. Respondents indicate their agreement or disagreement with statements beginning with the stem *"I see myself as"*. Adequate psychometric properties have been demonstrated for the TIPI. It has face validity, and convergent validity has also been demonstrated, with the TIPI correlated at $r = .77$ with the Big Five Inventory (Gosling, Rentfrow, & Swann, 2003). Test re-test reliability at six weeks with a sample of undergraduate students, has been reported at $r = .72$ (Gosling, Rentfrow, & Swann, 2003).

For the purposes of the current research, the TIPI was selected as a satisfactory measure of the personality dimensions of extraversion and neuroticism in children, primarily because of its brevity. However its use with a child sample is exploratory, and it is likely that the abstract nature of some words used in the items (for example *extraverted*), will be beyond the scope of children's vocabularies.

HPMood

HPMood was measured using eight affect terms (questionnaire items 34 to 41). These terms represent the pleasant-unpleasant and activated-deactivated dimensions of Russell's (2003) Circumplex Model of Affect. Each dimension of the circumplex is best represented by the adjectives located at each of the four poles (Russell, 2003). On this basis, nine adjectives were included by Davern, Cummins and Stokes (2007) to assess core affect in an adult sample. The adjectives *happy* and *content* represent the Pleasant pole (90°) while the adjectives *unhappy* and *discontent* represent the Unpleasant pole (270°). The adjectives *active*, *alert* and *excited* represent the Activated pole (180°) while the adjectives *sleepy* and *quiet* represent the Deactivated pole (180°). The adjective *discontent* was excluded from the current study on the basis that it would be unlikely to be understood by children. All eight other items were included in the questionnaire. Children were required to indicate how they generally feel, by responding on an eleven point scale anchored by the maximum positive response option *'extremely'* and the minimum response option of *'not at all'*.

CHAPTER 4: STUDY 1 RESULTS

Preliminary Data Screening

PASW statistics software (version 18.0) was used for data screening and analysis. All data collected in round one of data collection were entered then screened before separate analyses for Studies 1 and 2 were conducted. PASW Frequencies was used to screen data for entry errors. Minimum and maximum scores for all variables were checked, and incorrect data points were re-entered. There were no missing data.

Don't Know Responses

A *'Don't know'* option was provided to 167 of the child respondents. When this option was selected, no score was available. Cases were thus excluded from specific analyses when a value was unavailable due to a *'Don't know'* response.

Screening for Response Sets

Data from child samples may be distorted by response sets, due to acquiescence, or to non-comprehension of the question. All data sets were checked for this. No child consistently scored maximum or minimum scores across the questionnaire. Therefore no data sets were completely eliminated on the basis of response set.

Three children responded with the maximum score for all items of the PWI (case numbers, 21, 22 and 79). For the analyses relating to the PWI only, these data sets were excluded according to the PWI rules (International Wellbeing Group, 2006). These analyses included calculation of means and SD's for the PWI domains, and for SWB, along with the *t*-test and MANOVA performed to test Hypothesis 3.

Composite Variables

Individual scale items were summed, to form aggregate scores for SWB, self-esteem, optimism, primary and secondary control, neuroticism and extraversion.

Normality

Prior to analysis, the data were screened for normality. Kolmogorov-Smirnov's statistic was significant for all variables. These non-normal distributions were not corrected. Skewness does not have a substantive effect on analyses when the sample size is sufficiently large, and underestimation of variance as the result of positive or negative kurtosis disappears in samples of 100 and 200 cases respectively (Tabachnick & Fidell, 2001). This sample of 217 participants was thus sufficiently large for the natural shape of each distribution to be retained without transformation.

Univariate outliers

Univariate outliers were present for all variables except content, sleepy, quiet, extraversion, neuroticism, and secondary control. Comparison of mean scores for variables containing outliers, with corresponding means trimmed at the upper and lower 5%, showed that none of these outliers significantly influenced mean scores. For this reason, univariate outliers were not excluded from analysis.

Multicollinearity and Singularity

The major independent variables were tested for multicollinearity and singularity. Variables with a bivariate correlation of .70 or more should not be included in the same analysis (Tabachnick & Fidell, 2001). The highest correlations were between SWB and self-esteem (r = .65), and the adjective happy and self-esteem (r = .63). Therefore no variables were excluded from analysis on this basis.

Statistical Power

The sample size criterion for multiple regression analysis is: $N \geq 50 + 8m$. Where N = minimum number of cases and m = number of independent variables (Tabachnick & Fidell, 2001). Multiple regression analysis will be used to test the hypotheses of Study 2. The maximum number of independent variables to be entered is 8. To calculate the necessary sample size therefore; $N \geq 50 + 8 \times 8$. A minimum of 114 cases are thus needed for adequate statistical power. With 217 cases, this sample meets the power requirement for all major analyses.

Unequal Sample Sizes

To test some hypotheses, data from the child sample (N = 217) will be compared with data from an adult sample (N = 2001). These sample sizes are unequal. When sample sizes exceed the ratio of 4:1 (Tabachnick & Fidell, 2001), there is an increased risk of Type I error. To account for this risk, the more stringent alpha level of .01 will be used for analyses where child and adult data are compared. This is as recommended by Tabachnick & Fidell (2001).

Standardise Scale Data

Data were standardised into Percentage of Scale Maximum (%SM) which transforms data to lie on a 0-100 distribution. This form of standardisation enables comparison with other SWB findings (Cummins, 2003). Original data were on a 0-10 distribution, therefore moving the decimal point one place to the right achieved this standardisation. (A score of 6 became 60.)

Hypothesis 1:

Children will respond to measures of SWB using the extreme positive end of the response scale more often than adults.

Children's tendency to use the extreme ends of the response continuum has been reported in studies measuring other variables. It was therefore expected that this response tendency would also be apparent for SWB. It was expected that children would be more likely than adults to respond using the extreme positive end, because wellbeing is normally positive.

To test this hypothesis, children's response frequency to the single global question of life satisfaction (GLS), and the seven items of the PWI, were separately examined (N = 217). These responses were compared with adult responses to the same measures (N = 2001), made in May 2009 as part of the twenty first survey of the Australian Unity Wellbeing Index.

Responses were made on an 11 point end-defined response scale, with '0' = extreme negative response, and '10' = extreme positive response. *'Don't know'* and *'Don't understand'* options were also available to the adult sample. A *'Don't know'* option was available to 167 of the 217 child respondents as previously described. This was to test hypothesis 3 which will be discussed later. 167 children were thus able to select from the response options 0-10 and *'Don't know'* while 50 children were able to select only response options 0-10.

Because the child and adult samples differed in size, the percentage of responses each response option received was calculated for both samples. Responses to the GLS are presented in a frequency table below.

Table 4.1: Frequency of response selection to Global Life Satisfaction question

Response Option	*f* children	%	*f* adults	%	% Difference
0	1	0.5	9	0.4	+0.1
1	0	0	7	0.3	-0.3
2	2	0.9	14	0.7	+0.2
3	4	1.8	19	0.9	+0.9
4	6	2.8	33	1.6	+1.2
5	12	5.5	112	5.6	-0.1
6	13	6.0	118	5.9	+0.1
7	35	16.1	311	15.5	+0.6
8	52	24.0	695	34.7	-10.7
9	38	17.5	374	18.7	-1.2
10	54	24.9	307	15.3	+9.6
Don't know	0	0	2	0.1	-0.1
Total	217	100	2001	100	

Table 4.1 shows the frequency and the percentage of each response option. The final column, the *% Difference* column, shows the difference in the percentage of responses made by both groups, where a + indicates that the percentage of responses is higher for children. A comparable proportion of each group scored at or above 6 (88.5% of children, 90.2% of adults). This is consistent with theory.

In support of the hypothesis, 9.6% more children selected the extreme positive response choice than adults. The relationship between age (child or adult) and selection of the extreme positive response choice was significant (χ^2 (1, n = 2218) = 12.39, p = .000, phi = .08) confirming the hypothesis.

To further test the hypothesis, the frequency and percentage of responses to the seven items of the PWI were individually tabulated for both samples. Table 4.2 summarises the percentage of extreme positive responses made by each group.

Table 4.2: Percentage of '10' responses to PWI domains by children and adults

	Standard	Health	Achieve	Relationships	Safety	Community	Future
Child	48.8	31.1	27.6	54.8	30.9	23.5	23.5
Adult	15.8	14.1	11.8	25.6	21.0	11.7	9.5
% Difference	+33.0	+17.2	+15.8	+29.2	+9.9	+11.8	+14.0
χ^2	140.33**	42.16**	41.20**	80.86**	10.47*	23.06**	37.81**

** p = .000 * p = .001

In confirmation of the hypothesis, the extreme positive response option was selected more often by children than by adults for all domains. The percentage difference varied across the domains, with the highest difference on *standard of living* and the lowest on *safety*. However Chi-square tests indicate that children selected the 10 response significantly more often than adults for all domains.

To also test whether children selected '10' more often than they selected any other response option, PASW Frequencies was used to generate the mode for both measures of SWB. The results are presented in Table 4.3 along with adult modes for the same items.

Table 4.3: Child and Adult Modes for GLS and PWI Domains

	GLS	Standard	Health	Achieve	Relationships	Safety	Community	Future
Child	10	10	10	9	10	10	9	10
Adult	8	8	8	8	10	8	8	8

The table shows that children selected '10' more frequently than any other response option for the GLS question, and for five of the seven domain items. This

is in contrast to adults, who selected '10' more frequently only in response to the personal relationships item.

In summary, in confirmation of the hypothesis, children selected the extreme positive response choice more frequently than adults in response to the single GLS question, and the seven items of the PWI. The relationship between age (child or adult) and selection of the extreme response choice was significant for both measures of SWB. Furthermore, 10 was the mode for children's responses to six of the eight items measuring SWB. The impact of this extreme response tendency on mean SWB will be tested in hypotheses 2 and 3.

Hypothesis 2:

Mean global life satisfaction reported by children will exceed that of adults.

On the basis of the literature review, it was expected that children would tend to respond using the extreme positive response option. This was confirmed in Hypothesis 1. This extreme response tendency was expected to result in inflation of the mean such that it caused the child mean to exceed the adult mean.

However an independent samples *t*-test indicated no significant difference in GLS scores for children (M = 79.31%SM, SD = 19.0%SM) and adults (M = 78.49%SM, SD = 17.41%SM); t (256.88) = .611, p = .54. Furthermore, the child mean (79.31 points) approximates the upper margin of the adult normative range of 79.10%SM (Cummins, Woerner, Gibson, Weinberg, Collard, & Chester, 2009).

In summary, the level of global life satisfaction in these samples does not differ significantly between Australian children and adults, providing no support for the hypothesis.

Hypothesis 3:

Children's reported SWB and all PWI domains will exceed that of adults.

Children's tendency to respond extremely was also expected to result in inflation of mean SWB in the child sample such that it would exceed that of adults. An independent samples *t*-test was conducted to compare SWB for children and adults. In confirmation of the hypothesis, the results reveal a statistically significant difference in SWB for children (M = 83.95%SM, SD = 9.96%SM) and adults (M = 76.40%SM, SD = 11.33%SM); t (2050) = 8.97, p = .000.

The means and standard deviations of each of the seven PWI domains are presented individually in Table 4.4. A multivariate analysis of variance (MANOVA) was performed to investigate the differences between child and adult scores for each domain. Preliminary testing revealed 65 multivariate outliers

(Mahalanobis distance > 24.32). Cases which exceeded the critical value included six child and 59 adult data sets. Since there were a large number of multivariate outliers and MANOVA is sensitive to these, these cases were excluded from analysis (Tabachnick and Fidell, 2001).

Box's M test was significant F (28, 399820.75) = 3.17, p = .000, and Levene's test was significant for the domains of personal relationships (p = .000) and safety (p = .001). These tests indicate violations of the assumption of homogeneity of equality of covariance matrices, and homogeneity of variance, respectively. Because of these violations, along with the unequal N values for each sample, the robust Pillai's trace test was used as recommended by Tabachnick and Fidell (2001). Pillai's criterion indicates a significant multivariate difference between children and adults, F (7, 2044) = 16.49, p = .000, partial eta squared = .053.

Table 4.4: Multivariate ANOVA for Child and Adult Mean Domain Scores

	Child (N = 196) Mean (SD)	Adult (N = 1856) Mean (SD)	*F*	*p*	Partial Eta^2
Standard	88.98 (14.46)	79.56 (14.75)	72.48	.000	.034
Health	82.09 (19.25)	75.34 (18.53)	23.36	.000	.011
Achieve	83.83 (16.27)	74.20 (17.04)	57.05	.000	.027
Relationships	89.95 (14.83)	80.29 (19.33)	46.09	.000	.022
Safety	83.37 (16.76)	81.70 (14.79)	2.202	.138	.001
Community	79.13 (20.30)	72.46 (18.28)	23.10	.000	.011
Future Security	80.31 (18.03)	71.27 (17.87)	45.31	.000	.022

As shown in Table 4.4, significant differences between children and adults were detected for all domains except safety. To enable further consideration of these results, the mean SWB and domain values for the child sample are plotted against the adult normative data in Figure 4.1.

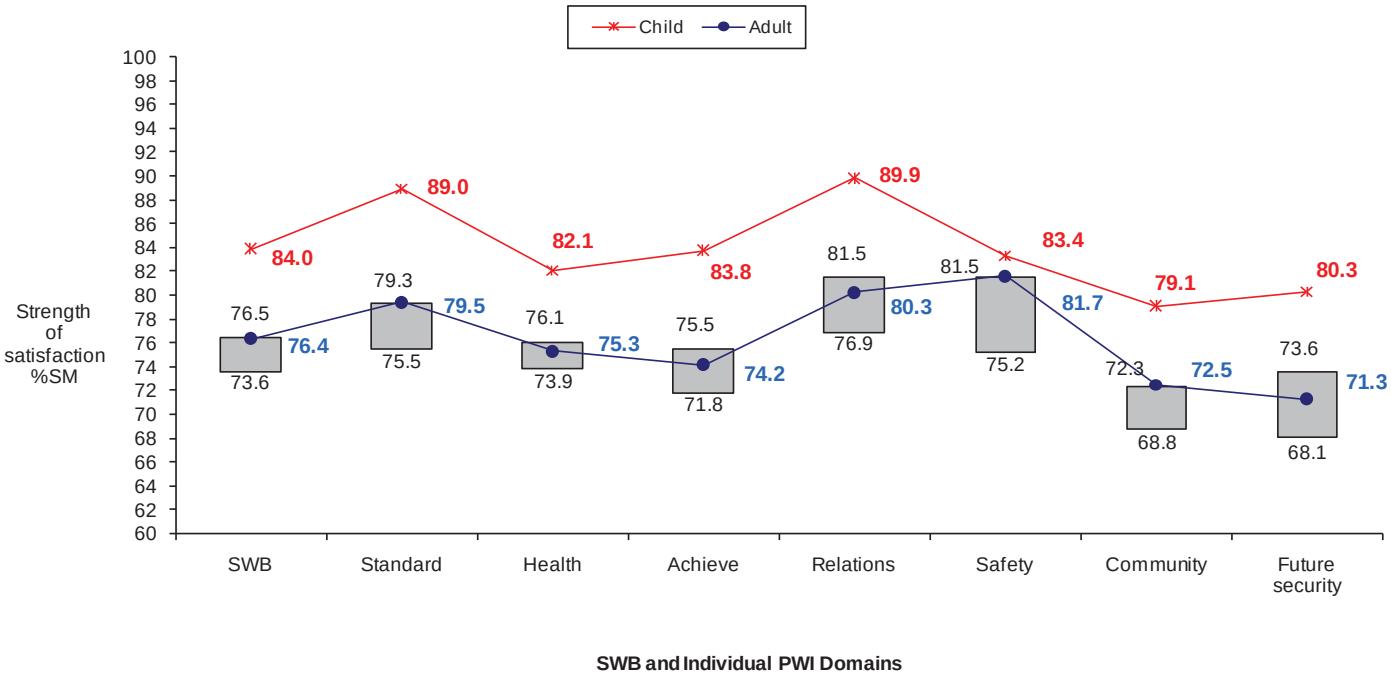


Figure 4.1: Child and adult means for SWB and the seven domains of the PWI

The figure shows the normative range (vertical grey bars) for SWB and domain values in the Australian adult population. These ranges are calculated as two standard deviations from the mean using data from the first 20 national surveys undertaken by the Australian Wellbeing Index. The most recent adult means for SWB and the seven domains, taken from Survey 21 of the Australian Unity Wellbeing Index, are plotted against their normal range with circles marking the means. Child means from the current study are plotted with crosses marking the means.

Figure 4.1 shows that all child means are higher than adult means and also exceed the normal adult ranges. This can be explained by the finding in Hypothesis 1, that children selected the extreme positive response choice '*10*' in response to PWI items, significantly more often than adults. More interesting, is that while all child means are higher, six of the seven domain means maintain an approximately equivalent relative distance (an average of eight points) above the corresponding adult means. The exception to this pattern is the domain of safety, where the child mean approximates the adult mean.

In summary, the results confirm hypothesis 3 with child SWB exceeding adult SWB. This inflated mean is the result of children's tendency to respond using the extreme end of the response scale as demonstrated in Hypothesis 1. The finding that the child mean for the domain of safety, differs in its position relative to the other child means, and relative to the adult domain is of interest and requires further exploration.

Hypothesis 4:

Children who receive explicit instructions on the acceptability of the 'Don't know' response will be less likely to respond substantively to all items.

As described previously, children seldom indicate when they do not understand a question, but will commonly provide a response anyway. To test the hypothesis, 167 of the 217 participants were provided with a *'Don't know'* response option. The other 50 participants were provided with the motivational instructions *"Do your best to answer all the questions."*

100% of the children in the motivational instruction condition and 36.5% of the children in the *'Don't know'* condition responded to all items. The differences between these percentages is significant, χ^2 (n = 217) = 59.53, p = .00, phi = .535 confirming the hypothesis.

63.5% of respondents in the *'Don't know'* condition (n = 107) used the *'Don't know'* option at least once. Of these participants, 62% used it more than once (n = 66). Frequency use of the *'Don't know'* option is illustrated in Table 4.5.

Table 4.5: Frequency use of the 'Don't Know' Option (n = 107)

# of Don't know responses per child	1	2	3	4	5	6
% of Children	38.3%	18.7%	15.9%	13.1%	4.7%	2.8%

Table 4.5 shows that the maximum number of *'Don't know'* responses made by any child is six. More than one third of respondents selected *'Don't know'* only once. The percentage of children who selected *'Don't know'* more than once decreases, as *'Don't know'* responses per child increase.

To test whether children opted for the midpoint in the absence of a *'Don't know'* response option, the mean number of midpoint responses for each condition was calculated. In the motivational instruction condition, the mean number of midpoint responses was 4.5, in comparison to 3.6 for the *'Don't know'* condition. This difference just failed to reach significance (t (215) = 1.906, p = .058) providing no support for a differential selection of the scale midpoint.

In summary, the results confirm the hypothesis that children who receive explicit instructions on the acceptability of a *'Don't know'* response, will be less likely to respond to all items. 100% of the children who were encouraged to answer all the questions responded to all items. This was in comparison to only 36.5% of children who were provided with the *'Don't know'* response option.

It was predicted that certain items would be more likely to be endorsed with a *'Don't know'* response than others. This will now be discussed under hypothesis 5.

Hypothesis 5:

Items highly endorsed with 'Don't know' responses will contain abstract words or concepts.

The results of Hypothesis 4 showed that children will use a *'Don't know'* response, following instruction that they may do so when they do not understand or are confused by an item. Items endorsed with *'Don't know'* responses, can thus be considered poorly understood or confusing.

The literature review showed that long or negatively worded items are confusing to children. For this reason all items were positively worded, and where possible contained ≤10 words. The review also showed that vocabulary is idiosyncratic, and acquired within the context of each child's unique experience. In general however, children's understanding of words and concepts moves from concrete to abstract, consistent with their cognitive development. On this basis, it was expected that poorly understood or confusing items, highly endorsed with *'Don't know'* responses, would include abstract words or concepts, less likely to be universally present in the vocabularies of 8-12 year old children.

To test the hypothesis, the frequency of *'Don't know'* responses for all items was first tabulated. The total number of *'Don't know'* responses given was 279. This was just over 3% of total responses, and just over 4% of responses given in the condition where *'Don't know'* was offered as an alternative. Frequency of *'Don't know'* responses to all items, are presented in Table 4.6 along with descriptive statistics (mean, standard deviation, and mode) for each variable.

Also presented in Table 4.6 is a count of unfamiliar words. Unfamiliar words in each item are formatted bold. They are judged unfamiliar on the basis of their absence from the familiar word list of 3000 common words (Chall & Dale, 1995). (A description of the familiar word list is provided in the literature review.) Unfamiliar words will be discussed following hypothesis testing in an assessment of children's understanding of items.

Table 4.6: Descriptive Statistics for all Questionnaire Items (n = 167)

Item #		% Don't know Responses	M (%SM)	SD (%SM)	Mode (raw score)	Number of Unfamiliar Words	Total Number of Words
	Personal Wellbeing						
1	How satisfied are you with your life as a whole	0	79.31	19.00	10	0	10
2	How satisfied are you with your **standard** of living	0	88.76	15.57	10	1	9
3	How satisfied are you with your health	0.6	81.99	19.49	10	0	7
4	How satisfied are you with what you are **currently achieving**	0.6	83.47	16.77	9	1	10
5	How satisfied are you with your personal **relationships**	0	90.05	14.67	10	1	8
6	How satisfied are you with how safe you feel	0	82.03	19.64	10	0	9
7	How satisfied are you with feeling part of your **community**	1.2	79.35	20.47	9	1	10
8	How satisfied are you with your **future security**	4.8	80.00	19.06	10	2	8
	Proposed Domains						
9	How satisfied are you with the control you have over your life	1.8	74.67	22.96	9	0	12
10	How satisfied are you with your **physical environment**	1.8	81.45	20.10	10	2	8
11	How satisfied are you with yourself	0.6	87.69	17.07	10	0	6
12	How satisfied are you with the **activities** you are **involved** in	0	86.22	17.73	10	2	11
13	How satisfied are you with how you deal with difficult times	1.2	61.07	24.56	7	0	11
14	How satisfied are you with your school	1.2	87.16	17.85	10	0	7
	Perceived Control						
15	I ask others for help or **advice**	0.6	69.91	25.02	10	1	7
16	I look for different ways to improve the **situation**	0.6	69.86	24.27	10	1	9
17	I use my **skills** to **overcome** the **problem**	0.6	71.81	24.05	10	3	8
18	I remind myself that something good may come of it	0.6	63.75	30.27	10	0	10
19	I remind myself that I am better off than some others	2.4	67.84	29.27	10	0	11
20	I remember that the **situation** will improve if I am **patient**	0.6	64.54	29.46	10	2	11

		% Don't know	M (%SM)	SD (%SM)	Mode (raw score)	Number of Unfamiliar words	Total Number of Words
	Optimism						
21	In **uncertain** times I always expect the best	1.8	59.21	26.28	5	1	8
22	I'm always **optimistic** about my **future**	32.3	73.68	25.65	10	2	6
23	**Overall**, I expect more good things to happen to me than bad	0	75.44	26.01	10	1	12
	Self-esteem						
24	I take a **positive attitude** toward myself	3.0	76.75	19.53	8	2	7
25	I feel that I have a number of good **qualities**	0.6	82.82	18.90	10	1	10
26	I feel that I am a person of worth at least on an equal plane with others	29.9	76.47	20.39	10	0	17
27	On the whole I am satisfied with myself	3.6	81.85	19.32	10	0	8
28	I am able to do things as well as most other people	0	76.45	24.26	10	0	12
29	I have high **self-esteem**	19.8	75.87	22.69	8, 9, 10	1	4
	Personality						
30	I see myself as **extraverted** and **enthusiastic**	8.4	81.43	18.86	10	2	7
31	I see myself as **anxious** and easily upset	1.2	42.84	30.04	5	1	8
32	I see myself as **reserved** and quiet	1.2	40.79	34.75	0	1	7
33	I see myself as **calm** and **emotionally** stable	3.0	61.37	29.38	10	2	8
	Affect						
34	How happy do you generally feel?	0	76.87	20.35	8	0	6
35	How **content** do you generally feel?	38.9	67.43	20.73	5	1	6
36	How unhappy do you generally feel?	0.6	37.96	22.63	3	0	6
37	How **active** do you generally feel?	0	84.33	20.52	10	1	6
38	How **alert** do you generally feel?	4.8	74.98	19.98	8	1	6
39	How excited do you generally feel?	0	78.89	19.50	10	0	6
40	How sleepy do you generally feel?	0	55.99	31.26	10	0	6
41	How quiet do you generally feel?	0	40.78	31.12	0	0	6

12 of the 41 questionnaire items did not receive any *'Don't know'* responses. It can be concluded that children believed they understood these items, and felt able to provide a response.

29 items were endorsed with one or more *'Don't know'* response. Of these, 10 received only one *'Don't know'* response, a further 11 received five or less, and a further three received between six and eight. The remaining five items were observably problematic for the children, receiving between 14 and 65 *'Don't know'* responses each as illustrated in Table 4.7.

Table 4.7: Items receiving most 'Don't know' responses

Item		*f* Don't Know Response	% *n* = 167 Responses	Number of Unfamiliar words
22	I'm always **optimistic** about my **future**	54	32.3%	2
26	I feel that I am a person of worth at least on an equal plane with others	50	29.9%	0
29	I have high **self-esteem**	33	19.8%	1
30	I see myself as **extraverted** and **enthusiastic**	14	8.4%	2
35	How **content** do you usually feel	65	38.9%	1

These five items received a remarkable 77% of the total *'Don't know'* responses given. The hypothesis predicts that items highly endorsed with *'Don't know'* responses, will contain abstract words or concepts. The Merriam-Webster Online Dictionary (http://www.merriam-webster.com/dictionary/abstract) defines abstract as expressing a quality apart from an object. The Cambridge Online Dictionary similarly defines abstract as existing as an idea, feeling or quality, not as a material object (http://dictionary.cambridge.org/define.asp?key=323&dict=CALD).

In confirmation of the hypothesis, these five highly endorsed items contain abstract words in; *optimism, worth, self-esteem, extraverted, enthusiastic* and *content*. Item 26 also contains the phrase *"on an equal plane"* and this is an abstract concept. These words express a quality or idea, have no concrete referent, and are thus clearly abstract.

The three items (8, 38, and 27) receiving the next highest number of *'Don't know'* responses are presented in Table 4.8.

Table 4.8: Items receiving 6-8 Don't know responses

Item		*f* Don't Know Response	% *n* = 167 Responses	Number of Unfamiliar words
8	How satisfied are you with your **future security**	8	4.8%	2
38	How **alert** do you generally feel	8	4.8%	1
27	On the whole I am satisfied with myself	6	3.6%	0

These items include the words and terms *'future security'*, *'alert'*, and *'on the whole.'* Again these items can be seen to contain abstract words or concepts. For items 8 and 38 these abstract words are also unfamiliar. In contrast, item 27 does not contain unfamiliar words. However evidence will be presented in the following section to show that the phrase *"on the whole"* was confusing to the children and required a verbal explanation.

Eleven further items were endorsed with a *'Don't know'* response between 2 and 5 times. These are presented in table 4.9.

Table 4.9: Items receiving 2-5 Don't know responses

Item		*f* Don't Know Response	% *n* = 167 Responses	Number of Unfamiliar words
7	How satisfied are you with feeling part of your **community**	2	1.2%	1
9	How satisfied are you with the control you have over your life	3	1.8%	0
10	How satisfied are you with your **physical environment**	3	1.8%	3
13	How satisfied are you with how you deal with difficult times	2	1.2%	0
14	How satisfied are you with your school	2	1.2%	0
19	I remind myself that I am better off than some others	4	2.4%	0
21	In **uncertain** times I always expect the best	3	1.8%	1
24	I take a **positive attitude** toward myself	5	3.0%	2
31	I see myself as **anxious** and easily upset	2	1.2%	1
32	I see myself as **reserved** and quiet	2	1.2%	1
33	I see myself as **calm** and **emotionally** stable	5	3.0%	2

Table 4.9 shows that *'Don't know'* responses comprised a very low percentage of total responses to these eleven items. Four items did not include unfamiliar words (items 9, 13, 14 and 19). However item 9 contains 12 words, and items 13 and 19 contain 11 words each. This slightly contravenes the recommendation of $\leq$10 words per item proposed in Chapter 1 and it is possible that the items overwhelmed the working memory capacity of the children who responded *'Don't know'*. The unfamiliar words present in the remaining eight items are all observably abstract in nature. In confirmation of the hypothesis, all items endorsed more than once with a *'Don't know'* response, can be seen to include abstract words or concepts.

In summary, just over 4% of total responses were *'Don't know*' responses. 12 of the 41 questionnaire items did not receive a *'Don't know'* response at all, while 10 items received just one, and a further 14 items received between two and eight. The remaining five items received 77% of the total *'Don't know'* responses given. Children clearly indicated their non-comprehension of these latter items. In confirmation of the hypothesis, these five items all include abstract words, with *abstract* defined according to the Merriam-Webster and Cambridge Online

Dictionaries. In further support of the hypothesis, the three items receiving the next highest number of *'Don't know'* responses also contain abstract words.

However some questionnaire items which were not highly endorsed with *'Don't know'* responses also include unfamiliar and abstract words. The following section will explore possible explanations for this, before evidence of children's likely understanding of all questionnaire items is considered.

Further Analysis: Children's Understanding of Questionnaire Items

Contextual Clues to Meaning

A strategy used by beginning readers when they meet unfamiliar words, is to surmise meaning based on the context in which the words occur. This is relevant to an assessment of children's comprehension of short questionnaire items, where often, little context is available to facilitate understanding. Consideration of two questionnaire items, which both contain a single unfamiliar abstract word, illustrates this. Item 15 contains the unfamiliar word *advice*, but only 0.6% of responses were *'Don't know.'* In contrast, an incredible 38.9% of responses to item 35, which contains the unfamiliar word *content*, were *'Don't know.'* The difference in children's understanding of these two items is clear. To explore this difference the items can be compared, with the unfamiliar words (*advice* and *content*) replaced with the nonsense word *zeeg*.

Item #	
15	When something bad happens I ask others for help or **zeeg**
35	How **zeeg** do you usually feel

In item 15, a respondent may use context to surmise meaning. They may deduce that the unfamiliar word *zeeg (advice)* is associated with asking for help. Alternatively, they may ignore the unfamiliar word and respond only to *"I ask others for help."* This could explain the finding that although the word *advice* is both abstract and unfamiliar, only one child responded *'Don't know'* to this item. In contrast, in item 35, if the word *zeeg (content)* is not understood, it is not clear what the item is asking about. The meaning of the word must be known, so that the item may be understood and validly responded to.

Of the five items most highly endorsed with *'Don't know'* responses, the four which include abstract and unfamiliar words (items 22, 29, 30, and 35*)*, provide no context by which the meaning of those unfamiliar words may be deduced. The four items are presented below with the unfamiliar words replaced with the nonsense word *zeeg*.

Item #	
22	I'm always **zeeg** about my **zeeg**
29	I have high **zeeg**
30	I see myself as **zeeg** and **zeeg**
35	How **zeeg** do you usually feel

When the unfamiliar words are not understood, it is impossible to ascertain what these items are asking. Furthermore, unlike item 15, there is no additional part to these items which may be responded to. On this basis it is plausible to propose that the absence of contextual clues, may have contributed to the very high *'Don't know'* endorsement of these four items, when other items which also contain unfamiliar abstract words, received very few *'Don't know'* responses.

Children's understanding of all questionnaire items will now be considered in turn. While the *'Don't know'* response provides a clear means of assessing children's understanding, an examination of response variance and anomalies in the descriptive statistics presented in Table 4.6, along with anecdotal observations made by the researcher, provides further evidence of item non-comprehension, beyond the use of the *'Don't know'* response.

Item 1 – Global Life Satisfaction

The single GLS question *"How satisfied are you with your life as a whole?"* required verbal explanation during first administration of the questionnaire. This explanation was retained for administration to all subsequent groups. The explanation was made in response to obvious confusion caused by the inclusion of the phrase *"as a whole."*After the GLS item was read aloud for the first time, a student immediately called out *"How can you have your life as a* ***hole****?"* This was followed by a number of others who verbally expressed their amused confusion, and indicated their view that the question was nonsense.

Indeed the question is nonsense when the meaning of the homonym *whole*, is replaced with the meaning of the word *hole*. Clearly children's knowledge of the homonym was primarily based on an understanding of the definition of the concrete *hole*, rather than the abstract *whole*. This is consistent with the understanding that children's vocabulary progresses from concrete, to gradually include more abstract words. Once the researcher explained the meaning of *"as a whole"* to the children, and repeated the item, children promptly made their response.

There were no *'Don't know'* responses given. This indicates that with the verbal explanation, children believed they understood the question and felt able to provide a response. As shown in Hypothesis 2, the mean and SD approximate those found for adults. It therefore appears that the single item GLS, with an explanation of the phrase *"as a whole"* is suitable for use with children aged 8-12 years.

Item 27 also includes the phrase *"On the whole..." "On the whole I am satisfied with myself."* 3.6% of children responded *'Don't know'* to this item. It is reasonable to suppose that the phrase *"on the whole"* may have also caused confusion in this case. On the basis of these findings, it is recommended that words which are homonyms should not be used in questionnaire items with children.

In further support of this, children's response to homonyms was observed by the researcher in relation to item 35 *"How content do you usually feel?"* A group of three Grade 6 students, obviously aware of the alternate meaning of the word, were overheard during administration of the questionnaire, saying *"My contents feel fine thank you!"* Meanwhile they amusedly pressed their stomachs as though making a diagnostic examination of their own *'contents'*. Item 35 (*content*) has already been discussed in Hypothesis 5. It was highly endorsed with *'Don't know'* responses and this is likely due to the unfamiliarity of the word *content* (an abstract word) to many 8-12 year old children. It is also possible that the fact that *content* is a homonym caused confusion. As already stated, words which are homonyms should not be used in questionnaires for children.

Items 2-8 Personal Wellbeing Index

Five of the seven PWI items include unfamiliar words. However, as described in the Method section, following each PWI item being read aloud, the alternate wording of the PWI-SC was read as an explanation. For example; *"How satisfied are you with your standard of living? This means how happy are you with the things that belong to you like your money or your toys?"* In this way, children were provided with an opportunity to understand each item through a more concrete example. For items 2-7, none of the words in the PWI-SC items are absent from the unfamiliar wordlist. The low *'Don't know'* endorsement of each item suggests children believed they understood, and felt able to provide a response. Furthermore, response variance for these items is commensurate with that observed in adult samples, providing additional support for the conclusion that children understood the items. Child and adult standard deviations for PWI items are presented in Table 4.4 (Hypothesis 3).

The PWI-SC wording for item 8 (future security) however, includes the abstract word *future*, which is absent from the familiar wordlist. Furthermore, research reported in the literature review (See Can children provide valid data?) has shown that children find questions related to the future difficult. 4.8% of children provided a *'Don't know'* response to this item. It is likely, that consistent with Piaget's theory of cognitive development, an understanding of the abstract concept *'future'* emerges with the transition from concrete operations to formal operational thought at around 11 to 12 years of age. On this basis, interpretation of 8-12 year old children's responses to this PWI item should be undertaken cautiously, as their ability to understand it is likely to be undeveloped.

Despite this, good internal reliability for the PWI was found with the present sample (Cronbach's alpha = .68). This is comparable to the reliability co-efficients reported for the PWI in adult populations (Cronbach's α between .70 and .85; International Wellbeing Group, 2006) and in an adolescent sample (α = .83, Tomyn & Cummins, 2011).

Items 9-14 Proposed SWB Domains

Although most of these items contain one or two unfamiliar words (**bold**), none were highly endorsed with *'Don't know'* responses as shown in Table 4.10. This indicates that children believed they understood the items and felt able to provide a response, perhaps because the words were in fact known.

Table 4.10: Don't know responses, SD's and word count for items 9-14

Item #		% Don't Know	SD *(%SM)*	Number of words
9	How satisfied are you with the **control** you have over your life	1.8	22.96	12
10	How satisfied are you with your **physical environment**	1.8	20.10	8
11	How satisfied are you with yourself	0.6	17.07	6
12	How satisfied are you with the **activities** you are **involved** in	0	17.73	11
13	How satisfied are you with how you deal with **difficult** times	1.2	24.56	11
14	How satisfied are you with your school	1.2	17.85	7

It can be seen that the greatest variance is evident in two of the longest items (item 9 and item 13). Adult data for these items are not available for comparison. It is possible that children's immature capacity for cognitive processing was overwhelmed by the length of these items, resulting in greater response variance than for the other items. This is consistent with the Information Processing approach to cognitive development (See Chapter 1). However, item 12 is equally long but has lower response variance making this explanation seem unlikely.

A more probable explanation is that items 9 and 13 are less specific in what they ask. Items 10, 11, 12 and 14 require the respondent to make a satisfaction judgement about a specific and concrete thing which can be readily called to mind (ie: *environment*, *yourself, activities* and *school).* In contrast, item 9 requires the respondent to first establish what constitutes having control in life, then recall an experience of this from memory, and then make a satisfaction judgement. Responding to item 13 requires a similar series of cognitive steps. In this way, the cognitive load of these two items is greater than required for the others, potentially overwhelming children's immature cognitive processing capacity, and resulting in higher response variance. In the absence of adult data for comparison however, it is not possible to conclusively determine this.

In summary, the presence of unfamiliar words in items 9-14 did not result in many children responding *'Don't know,'* perhaps because the words were in fact known.

Furthermore, while the two longest items (9 and 13) had the greatest response variance, an equally long item (item 12) had a lower SD. Since items 9 and 13 are less specific, it is possible that the greater cognitive load required in order to respond may have overwhelmed the children's immature cognitive processing capacities, thus producing greater response variance.

Items 15-20 Perceived Control

These six items assess primary (items 15-17) and secondary (items 18-20) control strategies. As for previous items, the presence of unfamiliar words (**bold**) seems unrelated to *'Don't know'* responses. It appears that most children felt they understood the items and could provide a response. The mode for all items was 10, consistent with a developmentally related extreme response bias. It is of interest however that these items exhibit amongst the highest standard deviations of all questionnaire items (SD's for all items shown in Table 4.6 page 94) and this warrants exploration. The items are presented in Table 4.11

Table 4.11: Don't know responses, SD's and word count for items 15-20

Item #	When something bad happens...	% Don't Know	SD *(%SM)*	Number of words
15	I ask others for help or **advice**	0.6	25.02	7
16	I look for different ways to improve the **situation**	0.6	24.27	9
17	I use my **skills** to **overcome** the **problem**	0.6	24.05	8
18	I remind myself that something good may come of it	0.6	30.27	10
19	I remind myself that I am better off than some others	2.4	29.27	11
20	I remember that the situation will improve if I am patient	0.6	29.46	11

Response variance is highest for items 18, 19 and 20. These three items assess secondary control strategies. These consist of specific cognitions employed to buffer against the impact of external negative events. Since it is known that cognitive abilities develop gradually, it makes sense that in 8-12 year old children, these cognitive strategies may be undeveloped.

Response variance is also high for items 15-17. These assess behavioural strategies, similarly used to protect against negative occurrences. The activation of primary and secondary control strategies, as a response to problems, necessarily requires the ability to problem solve. This is a developmentally acquired ability. It therefore seems plausible, that the very high response variance evident for these items reflects the absence, or immaturity, of primary and secondary control strategies in 8-12 year old children.

In summary, it appears that for these six items, unfamiliar words and item length did not adversely affect children's understanding. Most children felt able to respond and very few *'Don't know'* responses were made. Despite this, response variance was higher for these six items than for most others on the questionnaire.

The immature problem solving ability of 8-12 year old children is proposed as a likely explanation for this variance.

Items 21-23 Optimism

These three items, taken from the Life Orientation Test (Scheier, Carver, & Bridges, 1994) assess optimism. Item 22 has already been discussed as one of the five questionnaire items most highly endorsed with *'Don't know'* responses (32.3%). Items 21 and 23 both contain unfamiliar words; *uncertain* and *overall*, as shown in Table 4.12, however most children provided a response.

Table 4.12: Don't know responses, SD's and words count for items 21-23

Item #		% Don't Know	SD *(%SM)*	Number of words
21	In **uncertain** times I always expect the best	1.8	26.28	8
22	I'm always **optimistic** about my future	32.3	25.65	6
23	**Overall**, I expect more good things to happen to me than bad	0	26.01	12

As previously described, when beginning readers encounter unfamiliar words, they commonly use the accompanying text to surmise the meaning of the word. It has been shown that the items most highly endorsed with *'Don't know'* responses, (including item 22) provide no contextual clues by which meaning can be deduced. Furthermore, those highly endorsed items consist of no additional part that allows the unfamiliar words to be ignored while another part of the item is responded to. This is not the case for items 21 and 23 where the unfamiliar words can be ignored. To illustrate this, the items are presented with the potentially ignored words bracketed.

Item #	
21	*(In uncertain times)* I always expect the best
23	*(Overall)* I expect more good things to happen to me than bad

Thus items 21 and 23 may not have been highly endorsed with *'Don't know'* responses either because the unfamiliar words were actually known, or alternatively, children may have ignored the unfamiliar words and responded only to those words they did understand.

Response variance was high for item 22 as already discussed. As shown in Table 4.12, standard deviations are even higher for items 21 and 23, and it is likely that children found these items confusing, despite the low *'Don't know'* endorsement. It is possible that this high response variance reflects children's undeveloped cognitive capabilities, as the wholly cognitive positive expectancies of optimism, are very likely to be immature.

In summary, for items 21 and 23, it seems likely that children believed they understood the items. Either the words deemed unfamiliar were in fact known to the children, or alternatively, children ignored those words and attended only to parts of the items which they did understand. It makes sense however, that this understanding was limited by the extent of each child's cognitive development. It is thus proposed that the high response variance evident for these items reflects children's immature repertoire of cognitive skills.

Items 24 – 29 Self-esteem

As a measure of self-esteem, the questionnaire included five items from the Rosenberg self-esteem scale (items 24-28), along with a single item measure (item 29). The single item was included on an exploratory basis, to test its suitability for use with a child sample. As shown in Table 4.13, items 26 and 29 received a high percentage of *'Don't know'* responses. These items were previously discussed as among the items most highly endorsed with *'Don't know'* responses. Of the four remaining items from the Rosenberg self-esteem scale, three also received *'Don't know'* responses. However the percentages were low indicating that most children believed they understood what they were being asked, and felt able to provide a response.

Table 4.13: Don't know responses, SD's and word count for items 24-29

Item #		% Don't Know	SD *(%SM)*	Number of words
24	I take a **positive attitude** toward myself	3.0	19.35	7
25	I feel that I have a number of good **qualities**	0.6	18.90	10
26	I feel that I am a *person of worth*, at least *on an equal plane* with others	29.9	20.39	17
27	On the whole I am satisfied with myself	3.6	19.32	8
28	I am able to do things as well as most other people	0	24.26	12
29	I have high **self-esteem**	19.8	29.60	5

The five items from the Rosenberg self-esteem scale were summed to form an aggregate self-esteem score (RSE). Internal reliability for the scale was good (Cronbach's alpha = .82). To test the suitability of the single item measure of self esteem (SSE) for use with a child sample, a *t*-test was conducted and the mean scores for the two measures were compared. The mean score for RSE (M = 78.88%SM, SD = 15.33%SM) did not differ significantly from the mean score for the SSE (M = 75.87%SM, SD = 29.60%SM), however response variance was much greater for the single item measure.

These results show that although the RSE and SSE produce equivalent mean scores for self-esteem, children's understanding of the two measures differs. This is evident in the high number of *'Don't know'* responses made to the single item

measure, along with high response variance. On this basis the single item measure is not recommended for use with young children.

It is worth noting that item 26 (Rosenberg self-esteem scale) was very poorly understood by the children, with 29.9% of responses to this item *'Don't knows'*. It is likely that this was due to several factors including item length (17 words), the presence of abstract concepts (*person of worth* and *on an equal plane*) and the inclusion of the homonym *plane* (more likely to be known by children as an aircraft). This item is clearly unsuitable for use with young children and should not be used. Recalculation of the mean score for RSE, with item 26 removed from analysis produces a mean score of 79.64%SM. A *t*-test reveals that this mean does not differ significantly from the original mean for the five item scale. Furthermore the scale's internal reliability is not altered by the exclusion of item 26 ($\alpha = .82$). It therefore appears that the Rosenberg self-esteem scale may be effectively used with children with the poorly understood item (26) removed.

In summary, four of the five items of the Rosenberg self-esteem scale received very few *'Don't know'* responses and it appears children believed they understood what they were being asked. Item 26 proved unsuitable for use as it was very poorly understood by the children. The single item measure of self-esteem (item 29) also received a high percentage of *'Don't know'* responses (19.8%) and it is proposed that this was due to the absence of the term self-esteem from the children's vocabularies. Furthermore, response variance was high (29.60 points) suggesting respondent confusion or non-comprehension. The single item measure is therefore not recommended for use with children aged 8-12 years. In contrast, four items from the Rosenberg self-esteem scale do appear suitable as a measure of self-esteem in child samples.

Personality

Four items from the Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) were used to test two dimensions of personality, extraversion (items 30 and 33) and neuroticism (items 31 and 32). All items met the proposed criteria for item length, containing <10 words. Item 30 has already been discussed as one of the items most highly endorsed with *'Don't know'* responses. It has been proposed that this was because the unfamiliar words were not known by the children, and no context was available from which meaning could be deduced. The percentages of *'Don't know'* responses for the remaining three items were much lower. All four items are presented in Table 4.14.

Table 4.14: Don't know responses, SD's and word count for items 30-33

Item #		% Don't Know	SD (%SM)	Number of words
30	I see myself as **extraverted** and **enthusiastic**	8.4%	18.86	7
31	I see myself as **anxious** and easily upset	1.2%	30.04	8
32	I see myself as **reserved** and quiet	1.2%	34.75	7
33	I see myself as **calm** and **emotionally** stable	3.0%	29.38	8

It is plausible to argue that in responding to items 31 and 32, children ignored the unfamiliar words, and responded instead to the rest of the item. For example *"I see myself as ... easily upset." "I see myself as ... quiet."* This may explain the small percentage of *'Don't know'* responses. Alternatively the unfamiliar words may have been known to the children. However standard deviations for items 31, 32 and 33 reveal high response variance. This suggests respondent confusion or non-comprehension, even though this was not indicated by the respondents through the *'Don't know'* response.

It is possible, that these questions, which require recognition of the self in terms of subjective inner states, exceeded the developmental level of some children. Studies have shown, that in early childhood, young children's self descriptions, which are indicative of self concept, are based on concrete and observable characteristics (Damon, Lerner & Eisenberg, 2006; Broughton, 1978; Keller, Ford & Meachum, 1978). The self is described in terms of behaviours (*I'm fast, watch me run*), preferences (*I like ice-cream*), and possessions (*I have a pet dog called Spot*) (Damon, Lerner, & Eisenberg, 2006). However between the ages of 8 and 12, self concept expands, and children increasingly include personality traits in their self descriptions (Damon et al., 2006; Broughton, 1978). It is plausible that the high response variance evident reflects differing levels of development in the self concepts of the 8-12 year old children tested.

In summary, with the exception of item 30 which has already been discussed, the presence of unfamiliar words in items 31-33 did not result in many children responding *'Don't know.'* However response variance to these three items was high. It is proposed that immature self concepts, dominated by concrete and observable characteristics, are responsible for this variance in 8-12 year old children.

Affect

Eight items (34-41) represent the four poles of the Circumplex Model of Affect. All items have less than 10 words as recommended. The items are presented in Table 4.15.

Table 4.15: Don't know responses, SD's and word count for items 34-41

Item #		% Don't Know	SD *(%SM)*	Number of words
34	How happy do you generally feel	0	20.35	6
35	How **content** do you generally feel	38.9	20.73	6
36	How unhappy do you generally feel	0.6	22.63	6
37	How **active** do you generally feel	0	20.52	6
38	How **alert** do you generally feel	4.8	19.98	6
39	How excited do you generally feel	0	19.50	6
40	How sleepy do you generally feel	0	31.26	6
41	How quiet do you generally feel	0	31.12	6

Item 35 (*content*) has already been extensively discussed. Item 38 (*alert*) was in the second group of items highly endorsed with *'Don't know'* responses. The absence of contextual clues to the meaning of the unfamiliar words *content* and *alert* may explain these responses.

The only other affect item to contain an unfamiliar word is item 37 (*active*). This did not receive any *'Don't know'* responses and it is likely that the word was known. It is proposed, that the emphasis in the Australian school curriculum on being active, has made this word known to Australian children.

It is important to note that response variance for items 40 (*sleepy*) and 41 (*quiet*) was very high. The mode for *sleepy* was 10 and the median was 50%SM. In contrast the mode for *quiet* was 0 and the median was 40%SM. These two items represent the Deactivated pole of the Circumplex. It is therefore unusual that children responded so differently to these two items. It is not known why this occurred.

The results and further analyses of Study 1 will now be discussed in the following chapter.

CHAPTER 5: STUDY 1 DISCUSSION

The normative distribution of SWB in adult populations has been widely investigated and is now well established. In stark contrast, the SWB of children aged 12 years and younger has been largely unreported. Justifiable doubts about the ability of young children to reliably report their subjective experience have led to a reliance on the opinions of parents and teachers as proxies for children's self-report. As a result, the authentic voice of young children as expert informants of their own SWB, is notably absent from the literature.

The invalidity of proxy data, as a substitute for any individual's self-report, was described in Chapter 1. However the literature review also revealed that there is good cause for methodological caution, in any attempt to elicit a self-report of subjective experience from a child. The very real potential for response bias and immature cognition to affect the veridicality of child self-report was described in detail. Moreover, my review showed clearly that developmental characteristics of child respondents, along with features of the questions they are asked, combine to either facilitate or impede the likelihood of obtaining valid self-reports from children.

Since young children's self-report of SWB has seldom been sought, their ability to validly provide such a self-report has not been empirically tested, and response biases, although likely, have not been demonstrated. Study 1 addressed this issue, investigating response effects in 8-12 year old children's self-reported SWB, as predicted from the literature review. The results demonstrate clear and expected biases in children's responses to two measures of SWB, and provide preliminary evidence of the normative distribution of SWB in a sample of 8-12 year old children. Each of the tested hypotheses will now be discussed.

Hypothesis 1

Children will respond to measures of SWB using the extreme positive end of the response scale more often than adults.

The first response effect to emerge from Study 1 is the tendency of young children to respond to questionnaire items using the extreme ends of the response continuum. This was predicted based on reports of this tendency in young children, in studies of other variables, as reviewed in Chapter 1 (Belter, McIntosh, Finch, & Saylor, 1988; Goodenough, 1997; Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001; Chambers & Johnson, 2002).

Because SWB is normally positive, Hypothesis 1 predicted that children would respond to measures of SWB using the extreme positive end of the response scale more often than adults. To test this, the responses of a sample of 8-12 year old children, to two measures of SWB, the single item question of global life

satisfaction, and seven items from the Personal Wellbeing Index (International Wellbeing Group, 2006), were compared with the responses of Australian adults to the same eight items.

The results confirm Hypothesis 1, with the percentage of extreme positive responses made by the children, significantly higher than those made by adults to the same two measures. Furthermore, in response to all items, the children selected the response option 10, more often than any other response choice. A typical feature of the concrete operational thought characteristic of 7-11 year olds explains this response tendency, with children at this age known to engage in dichotomous thinking (Piaget, 1955; Harter & Buddin, 1987, Damon, Lerner & Eisenberg, 2006).

Although age provides only an approximation of cognitive development, the results of this study show that as predicted, and commensurate with research reporting other variables, children's ability to discriminate and report subtle variations in satisfaction with life as a whole, or with life domains, is developmentally limited. In response to questions of SWB, 8-12 year old children are likely to report complete satisfaction with their life, and with aspects of it.

It was expected that children's extreme response tendency, would result in reported levels of global life satisfaction (GLS) and SWB in the sample of Australian children, which exceeds that of Australian adults. This was tested in Hypotheses 2 (GLS) and 3 (SWB).

Hypotheses 2 & 3

Mean Global Life Satisfaction reported by children, will exceed that of adults. Children's reported SWB and all PWI domains will exceed that of adults.

Mean GLS of 79.31%SM in the child sample did not differ significantly from that of adults, and approximated the upper margin of the normal range for adult GLS (79.10%SM). Response variance was also roughly equivalent for the child (SD = 19.0%SM) and adult (SD = 17.41%SM) samples. This is contrary to the prediction made by Hypothesis 2. This requires further investigation as an explanation for this result is not clear. It is possible that between the ages of 8 and 12 years, children become developmentally able to respond to the life as a whole question, in a manner similar to adults. This will be explored in Study 3 when the responses of adults and 8-12 year old children to the single GLS question, will be compared to those of 6-8 year olds.

In contrast, and consistent with Hypothesis 3, extreme responding did result in inflation of mean child SWB (83.9%SM) beyond that of adults (76.4%SM), exceeding the upper margin of the normal range for adult SWB (73.6 – 76.5%SM) by 7.4 points. Furthermore, domain means in the child sample were significantly higher (on average 8.5 points higher) than those of adults, for all domains except *safety*, where the child mean (83.37%SM) approximated that of adults

(81.70%SM). Australian adults report high satisfaction with their safety (Cummins, Woerner, Gibson, Weinberg, Collard, & Chester, 2009) however the domain of *safety* rarely contributes uniquely to the prediction of global life satisfaction in Australian adults. It is retained in the PWI because it does contribute uniquely to the prediction of GLS in citizens of other nations. It is possible that child and adult means for the domain of *safety* are equivalent, because Australian adults report such high levels of satisfaction in response to this domain.

However it is also plausible that, in their dependence upon adults for protection from danger, and for the regulation of the powerful and elemental emotion, fear, children may be acutely aware of their own vulnerability and defencelessness. Children's satisfaction with *safety* may thus be reliant upon the availability of significant adult protectors. Furthermore, given its proposed relatedness in children to primal emotion, *safety* may well be more relevant to them than, for example, satisfaction with *standard of living*, which will be subject to the normal processes of accommodation and habituation. The data collection method (whole class questionnaire administration) provided no opportunity for the researcher to question children about this domain to establish a reason for its singular equivalence to the adult data. This needs further exploration.

Although children report higher mean levels of SWB than adults, it cannot be claimed that children actually experience higher SWB than adults. Rather, the results show that children's tendency to select the extreme positive response choice, when responding to measures of SWB via self-report questionnaire, inflates the mean above that normally found in adult populations. Children's higher reported SWB is thus clearly the result of a response bias, previously unreported in relation to children's SWB, but consistent with the developmental literature as described in Chapter 1.

Furthermore, while the child means for SWB and for the individual domains of the PWI are all higher than those reported for adult populations (except *safety*), these means maintain approximately the same relative position to one another as do the adult means. In this way, children's reported satisfaction with life domains, matches the pattern of satisfaction reported by adults, although the graph is transposed up by an average of eight and a half points. Again it is proposed that this is the result of an immature response bias in children's self-report of subjective experience. It is not clear from these results however, whether the domains which best predict adult SWB, are also the most salient to children's SWB. This will be investigated in Study 2.

In summary, children's GLS approximated that found for adults. However inflation of child SWB, above that found in adult populations was observed. It appears that this is the direct result of children's developmentally related extreme response tendency. As well as extreme responding, a further bias in children's responding was identified by Study 1. This was in relation to children's responses

in the absence of an option to respond *'Don't know.'* This was investigated in Hypothesis 4.

Hypothesis 4:

Children who receive explicit instructions on the acceptability of a "Don't know" response will be less likely to respond to all items.

50 child participants were instructed by the interviewer to *"Do your best to answer the questions."* The remaining 167 participants were provided with a *'Don't know'* response option, and were explicitly instructed on the acceptability of this response. As expected, based on my literature review, all 50 children who were given only motivational instructions responded to all questionnaire items, even though it was evident to the researcher that some children did not understand some of the items. Indeed, the researcher noted anecdotally that a number of children openly indicated their non-comprehension verbally, for example *"Huh?"* or *"What?"* accompanied by quizzical or confused facial expressions. However when the researcher remained silent, the children proceeded to select from the response choices offered.

The conscientious provision of responses by the children who were not given a *'Don't know'* option, even when it was clear that they did not understand the question, is a source of response bias, and is consistent with the literature reviewed (Saywitz, Snyder, & Nathanson, 1999; Carter, Bottoms, & Levine, 1996; Van Hekken & Roelofsen, 1982). As described in Chapter 1 (Response Bias) adults are clear figures of authority in children's lives. Children are usually familiar with doing as requested by adults both at home and at school. And in the classroom, the authority of the teacher is normally unquestioned. Children follow the directions of the teacher on a daily basis, routinely carrying out tasks and responding to worksheets as instructed. When test conditions are imposed, children are acutely aware of the test taking protocol; *don't talk, don't ask questions, and fill in your answers because you are being tested*. In the present study, the researcher observed that the children displayed this test taking behaviour as soon as the questionnaire was distributed. It is clear that, as predicted from the literature describing children's responses to objective variables, when responding to a questionnaire assessing subjective variables, where no *'Don't know'* option is available, children will select from the response choices offered, whether or not they understand the question.

One 9 year old male student in the motivational instruction condition, was overheard by the researcher whispering to his perplexed classmate *"If you don't know just put a 5 'cos that's halfway."* As described in Chapter 1 it has been suggested that when a respondent is undecided, they will select the midpoint (Raaijmakers, Van Hoof, t'Art, Verbogt, & Vollebergh, 2000). The results of Study 1 failed, by a small margin, to demonstrate a significant difference in children's selection of the midpoint in the motivational instruction or *'Don't know'* conditions. This could have been as a result of the small sample of children in the

motivational condition. Further investigation of differential selection of the midpoint is required.

In summary, the child participants clearly understood the expectation to respond, and they dutifully did so. As expected, in the absence of an option to indicate their non-comprehension, the children selected from the available options, thereby potentially contributing response bias to the data set. It is clearly imperative in any research conducted with children that a *'Don't know'* response option is provided, and that children are instructed on the acceptability of this option. In this way, researchers can ensure the validity of data, by catering for the event of respondent non-comprehension. It was expected that the presence of abstract words or concepts in questionnaire items, would contribute to non-comprehension. This was addressed in Hypothesis 5.

Hypothesis 5

Items highly endorsed with 'Don't know' responses will contain abstract words or concepts.

On the basis that concrete words with real world referents, are learned earlier and better than abstract words (as described in Chapter 1, Altarriba, Bauer, Benvenuto, 1999; Schwanenflugel, Akin, & Luh, 1992) it was expected that many abstract words would be absent from the vocabularies of 8-12 year old children. It was therefore hypothesised that items containing abstract words or terms would be unknown to some children and would receive more *'Don't know'* responses than other items.

107 of the 167 students instructed on the acceptability of a *'Don't know'* response, competently exercised this option, responding *'Don't know'* 279 times. This represented just over 4% of their total responses. Most children believed they understood most of the 41 questionnaire items, and only 7.5% of the children had difficulty understanding five or more questions. 29 of the 41 questionnaire items received at least one *'Don't know'* response. However just five items emerged as being most difficult for the children, receiving an incredible 77% of the *'Don't know'* responses. These items were endorsed between 14 and 65 times each with a *'Don't know'* response, representing between 8.4% and 38.9% of responses to those individual items.

In confirmation of Hypothesis 5, these five highly endorsed items all contained abstract and unfamiliar words. These results verify what can be known intuitively, that the inclusion of abstract words in questionnaire items for children increases item difficulty, probably because those words are not yet present in children's vocabularies.

However further inspection of these items revealed a feature beyond the inclusion of abstract words, which affected children's responding. This was the absence of contextual clues. Context can be used to determine meaning when readers encounter an unknown word. Indeed children are explicitly taught this skill at

school as part of the reading curriculum (Vaughn & Linan-Thompson, 2004; Honig, 2001). The five items most highly endorsed with *'Don't know'* responses in this study contained no context by which the meaning of abstract words could be deduced, and many children clearly felt unable to provide a response. In contrast, when abstract or unfamiliar words were encountered in other items, where children could ignore the word and respond to another part of the question, *'Don't know'* responses were less, but response variance was greater, signalling possible respondent confusion. This is an important finding which has implications for research with adults as well as children. It is vital that questionnaire items contain only a single component. This eliminates the potential for difficult or confusing aspects of the question to be ignored, while another part of the question is responded to.

In summary, the inclusion of abstract words in questionnaire items for children is not recommended, as these words are likely to be absent from young children's vocabularies, as was described in Chapter 1 (Language and vocabulary). However the results of Study 1 show that children will respond to questionnaire items containing abstract or unfamiliar words, when the item provides context by which the meaning of the word may be guessed. Children will also respond when items contain a second component which can be responded to, while the abstract or unfamiliar word is ignored. The presence of an abstract or unfamiliar word in questionnaire items does not result automatically in a *'Don't know'* response. But children's full comprehension of items which include these words cannot be assumed. Further analysis to assess children's likely understanding of all questionnaire items was undertaken, and the findings will now be discussed.

Further Analysis of Questionnaire Items

Three noteworthy findings emerged from the further analysis of questionnaire items. 1) Recommendation against the inclusion of homonyms. 2) Recommendation for the use of multi rather than single item assessment of self-esteem. 3) Assessing immature cognitive skills using known words. These will now be presented in turn.

1. *Recommendation against the inclusion of homonyms in questionnaire items*

The inclusion of homonyms in the questionnaire items proved problematic. Homonyms are words that sound the same but have different meanings. For example *whole* and *hole*, which have different spellings, or *plane* (aircraft) and *plane* (flat two dimensional surface), which are spelled the same. The inclusion of homonyms caused confusion. Children's knowledge of homonyms, illustrated clearly by one respondent's question *"How can you have your life as a **hole**?"* was limited to one simple and concrete meaning. Therefore, in addition to the recommendations for the collection of data from child samples proposed at the end of Chapter 1, a further recommendation can be made. Homonyms must not be used in questionnaire items for children.

2. *Recommendation for multi-item assessment of self-esteem*

A second recommendation to be made based on the results of Study 1 is the use of multi rather than single item assessment of self-esteem. The Study employed five items from the Rosenberg self-esteem scale. These items were summed to form a composite self-esteem score. A single item measure of self-esteem was also included on an exploratory basis, to assess its suitability for use with a child sample. When assessing variables in child samples, brief measures can reduce the time needed for assessment so that children's capacity for attention is not exceeded, and the likelihood of children's working memory being overwhelmed is reduced. Previous studies have reported equivocal results using the single item measure of self-esteem in child samples.

The results of the present study reveal that the single item measure of self-esteem was poorly understood by many children. 19.8% indicated their non-comprehension by responding *'Don't know'* to the item. It is likely that the term *self-esteem* was unknown to these children as it is abstract, having no concrete referent, and must therefore be learned based on the reception of linguistic information. For *self-esteem* to feature in the vocabulary of an 8-12 year old child, they must be explicitly taught the word and have the mental development to understand its meaning.

Despite this high level of non-comprehension, a *t*-test revealed no difference between mean self-esteem assessed by the single item measure, or by the Rosenberg self-esteem scale. However response variance was greater for the single item than the composite measure, indicating respondent confusion. Based on these results, the single item measure of self-esteem is not recommended for use with 8-12 year old children. This is because the term *self-esteem* is likely to be unknown by many children, resulting in high response variance and missing data.

3. *Assessing immature cognitive skills using known words.*

A final finding to emerge from Study 1 is that when items contain known or familiar words, children feel able to respond. However when these items assess skills which are undeveloped in 8-12 year old children, response variance is high, even though *'Don't know'* responses are low, and children's cognitive immaturity is thus exposed. This effect was apparent in children's responses to items assessing perceived control and optimism. These variables make up part of the internal buffering system which, through SWB homeostasis, defends and maintains HPMood (as described in Chapter 2). The likely immaturity of these cognitive restructuring strategies in 8-12 year old children, as revealed by these results, has implications for the applicability of the theory of SWB homeostasis to children of this age. It appears that, while adults possess an armoury of cognitive strategies which enable the flexible and effective defence of SWB, these cognitive buffering mechanisms are immature in children. This will be investigated in Study 2.

STUDY 1 CONCLUSIONS

The results of Study 1 confirm response effects in the ability of this sample of 8-12 year old children to self-report their SWB. Although not previously investigated or reported in relation to children's SWB, these immature response biases were expected based on the literature reviewed in Chapter 1. In response to the single GLS question, and also the seven items of the PWI, children selected the extreme positive response option significantly more often than adults. Moreover, children selected '10' as the response choice of preference on both measures of SWB. This extreme response style is likely the result of the developmentally related dichotomous thinking, which typifies cognition in children in this age range (Piaget, 1955; Harter & Buddin, 1987, Damon, Lerner & Eisenberg, 2006). In response to questions about their SWB, children are most likely to report complete satisfaction with their life, and with aspects of it.

Although previously unreported in relation to SWB, this extreme response bias had a noteworthy effect on the mean level of children's self-reported SWB. Across all seven domains of the PWI, and for children's SWB, the means for children were higher than the means for adults. This difference was significant for all domains except *safety*, where the child mean approximated that of Australian adults. In contrast, the mean for children's GLS was commensurate with that of adults. It is possible that between the ages of 8 and 12 years, children become developmentally able to respond to this item in a manner analogous to adults.

The results of Study 1 also demonstrate, that in the absence of an option to respond *Don't know*, children will usually provide a response to all items presented, whether they understand the item or not. This was commensurate with the literature reviewed in Chapter 1, and is a clear source of bias which contributes error to the data set. In the measurement of child SWB, a '*Don't know*' option must always be provided, to cater for the event of children's non comprehension.

In this study, questions which were poorly understood, and highly endorsed with '*Don't know*' responses, included abstract words or concepts. This is consistent with the development of children's vocabulary (Altarriba, Bauer, & Benvenuto, 1999; Schwanenflugel, Akin, & Luh, 1992), and their conceptual understanding, which moves from primarily concrete in nature, to abstract (Piaget 1955).

The results also reveal that when questionnaire items include only known words, children feel able to respond. However when these items assess undeveloped cognitive skills, such as the cognitive buffering strategies of optimism and perceived control, high response variance suggests that children find these items confusing.

Although clear response effects have been revealed by Study 1, it has also been shown that children can provide valid self-reports of subjective experience. Taken together with the knowledge that proxy data for subjective variables are invalid,

these results dictate that while extreme care must be taken in its acquisition, any report of an 8-12 year old child's subjective state must, necessarily, come from the child.

Three major questions emerge from the results of Study 1. First, are the domains which predict adult SWB, and the theory of homeostasis which explains SWB's normal stability and positivity, applicable to child SWB? Second, do these observed response biases constitute an age related developmental trend? And finally, can children younger than 8 years also provide valid self-reports of SWB. These questions will be investigated in Studies 2 and 3.

CHAPTER 6: STUDY 2

The results of Study 1 demonstrate developmental effects in the responses of 8-12 year old children to questions relating to SWB and other subjective variables. This second study will begin by examining the contribution of the domains of the Personal Wellbeing Index (PWI) to the prediction of global life satisfaction (GLS) in children. The potential contribution of other variables as putative domains will also be explored. An assessment of the contribution of affect to SWB in a child sample will then be made, before the relationships between GLS, SWB and the cognitive buffer variables of homeostasis, along with personality variables, are investigated. This will enable a determination of whether the pattern of results found for adult SWB, are the same for child SWB. These aims will now be discussed in turn.

Study 2 Aims

The suitability of the PWI domains

The SWB of Australian adults has been measured biannually since 2001 using the Personal Wellbeing Index (PWI) (International Wellbeing Group, 2006). As described in Chapter 2 the PWI is a domain based measure of SWB. It consists of eight items measuring satisfaction with a number of life domains. (The eighth domain, religiosity/spirituality has been excluded for use with children as described in the Method section). The domains of the PWI have been selected for their ability to contribute uniquely to the prediction of GLS in adult populations. However, the relevance of these domains to children, or the ability of these domains to contribute uniquely to the prediction of GLS in 8-12 year old children, has not been tested. Hypothesis 1 will address this.

Furthermore, it is not known whether other domains may also independently predict child GLS. It is possible to propose an almost infinite number of putative domains. However using the theoretical principle of 'deconstruction' employed in the selection of PWI domains, SWB must be measured by the minimum number of domains which together uniquely predict GLS, thus representing the first level deconstruction of GLS (International Wellbeing Group, 2006). An additional requirement for inclusion as a PWI domain according to the International Wellbeing Group (2006) is that domains must have both an objective and subjective representation amenable to measurement. This criterion is based on the principle that Quality of Life concerns subjective and objective dimensions.

A recent qualitative investigation proposed a number of domains considered relevant to children's subjective experience of wellbeing. As discussed in Chapter 2 some of these domains match those of the PWI, while additional domains suggested include *agency, the physical environment, self, activities,* and *dealing with adversity*. Items assessing each of these variables were included in the questionnaire (items 9-13) and were described in Study 1. However, according to

the principle requiring the possibility of objective measurement, (ie; the variables must be able to be measured through physical quantities or frequencies in the public domain) only the domains, *physical environment, self,* and *activities* actually meet the criteria for potential inclusion as new domains. Because of this, data for the items assessing *agency* and *adversity* (items 9 and 13) were not included in Study 2 analyses.

An additional domain, *school*, was able to uniquely predict GLS in a sample of Australian adolescents, and therefore meets the criteria for inclusion as a new PWI domain (Tomyn & Cummins, 2011). It will be explored in the present study, as it may also contribute uniquely to the prediction of GLS in a child sample.

In addition to investigating the suitability of the PWI and other domains as predictors of children's GLS, this study will also assess the applicability of the theory of SWB homeostasis to a child sample. This will include an assessment of the contributions of affective adjectives, and cognitive variables, to the prediction of GLS and SWB in children. This will now be described.

SWB Homeostasis

As detailed in Chapter 2 the theory of SWB Homeostasis proposes a genetically predetermined set-point that is both positive and stable. The set-point is experienced subjectively as a basic positive mood state, described by the term Homeostatically Protected Mood (HPMood) (Cummins, 2010). SWB Homeostasis also proposes a system of cognitive buffers which activate to defend SWB when it is under threat from negative external influences. This study will investigate the affective and cognitive components of SWB homeostasis as follows.

Affect

As described in Chapter 2, recent research indicates that adult SWB is primarily an affective construct. The affective adjectives *content*, *happy*, and *excited*, representing the pleasant and activated dimensions of the Circumplex Model of Affect, have been shown to explain 64% of the variance in adult SWB (Davern, Cummins, & Stokes, 2007).

Currently however, there are no empirical data supporting the notion that child SWB is also primarily an affective construct. Furthermore, Study 1 showed that the questionnaire item which assessed the adjective *content* was poorly understood, probably because the word '*content'* was absent from the vocabularies of the respondents. For this reason, while it is expected that pleasant and activated affects will define child SWB as it does for adults, it is likely that the affective adjectives will not be the same. This is due to the developing nature of vocabulary in 8-12 year old children. Hypothesis 2 will examine the relative contributions of eight affective adjectives to the prediction of SWB.

Hypothesis 3 will extend the investigation of child SWB as an affective construct, by exploring the relationship between HPMood, measured via the affective adjectives, and personality (extraversion and neuroticism). As described in Chapter 2 HPMood is the dominant affective constituent of adult SWB, and is responsible for the relationships, which have previously been reported, between personality and SWB. Consistent with this, the contribution of personality to the explanation of adult SWB was reduced, when HPMood was controlled for (Davern, Cummins, & Stokes, 2007). Hypothesis 3 will determine whether personality is similarly related to GLS and SWB in children. It is expected that extraversion will show a positive correlation to GLS and SWB, as it does for adults, while neuroticism will show a negative correlation. The ability of personality to predict GLS and SWB in children is expected to be reduced when HPMood is controlled for.

SWB homeostasis – Cognition

As described in detail in Chapter 2, the theory of SWB homeostasis proposes a set of cognitive buffers comprising self-esteem, optimism, and primary and secondary control techniques. These activate to defend HPMood when it is under threat. Consistent with this, positive relationships between the buffer variables and SWB have been demonstrated (Cummins & Nistico, 2002). However to date, there are no empirical data which support the same relationships in children aged 8-12 years. Hypothesis 4 will test these relationships.

Since cognition in 8-12 year old children is still immature, it is very likely that the cognitive strategies used by adults to defend SWB, will be undeveloped in children of this age. Furthermore, the results of Study 1 suggest that the buffer variables of optimism and perceived control, in particular, are undeveloped in 8-12 year olds. The ability of the cognitive buffer variables to uniquely predict child SWB will therefore be explored, as currently, the relationship of the cognitive buffers of homeostasis to child SWB remains unreported.

In summary, Study 2 will investigate child SWB in the context of the theory of SWB homeostasis. The domains which uniquely predict adult SWB will first be assessed for their ability to predict child SWB. The contribution of other additional domains to this prediction will also be explored. The pattern of relationships between child and adult SWB and affective and cognitive variables will then be compared, to determine whether the same relationships are evident in both samples. This will enable an examination of the applicability of the theory of SWB homeostasis to children. The following hypotheses will be tested.

Study 2 Hypotheses

1. *The PWI domains will all uniquely predict GLS in the child sample.*
2. *Pleasant and activated affects will define HPMood in children.*
3. *Personality will show relationships to SWB consistent with the adult literature. These will be reduced when HPMood is controlled for.*
4. *The cognitive buffer variables will show relationships to GLS and SWB consistent with the adult literature.*

CHAPTER 7: STUDY 2 RESULTS

The participants, procedure and questionnaire are the same as for Study 1. For a full description refer to Chapter 3. Preliminary data screening was undertaken using PASW and is described fully on page 84.

Hypothesis 1:

The PWI domains will all uniquely predict GLS in the child sample.

In adult populations, each of the PWI domains predicts GLS. Hypothesis 1 will determine whether this is also true for child populations. The predictive ability of four exploratory domains will also be analysed.

The hypothesis was tested using multiple regression. Independent variables in multiple regression should show a relationship with the dependent variable (*r*'s between .30 and .70; Pallant, 2001). As shown in Table 7.1, *personal relationships* and *community* both correlate with GLS below .30. On the basis of these weak correlations these variables could be excluded. However, since they both contribute uniquely to the prediction of SWB in adult populations, both variables were retained. Three of the exploratory domains correlate significantly with GLS, *environment, self,* and *activities*. The domain of *self* correlates most highly. The domain of *school* demonstrates a weak and non-significant relationship with GLS.

Table 7.1: Correlations between GLS and the PWI and exploratory domains

	DV:GLS	1	2	3	4	5	6	7	8	9	10
1.Standard of living	.31										
2.Health	.37	.17									
3.Achieve in life	.38	.27	.22								
4.Personal rel/ships	.26	.28	.23	.22							
5.Safety	.32	.24	.19	.24	.25						
6.Comm. connect	.27	.21	.16	.26	.24	.22					
7.Future security	.34	.33	.21	.24	.27	.44	.16				
8.Environment	.32	.25	.23	.20	.22	.24	.24	.29			
9.Self	.42	.22	.41	.48	.37	.34	.20	.40	.29		
10.Activities	.29	.29	.34	.47	.18	.21	.29	.22	.25	.39	
11.School	.22	.02	.19	.19	.10	.19	.19	.21	.10	.29	.13

Multiple regression was used to test the hypothesis. Three cases (21, 22 and 79) were excluded on the basis of response set. Eleven cases with a Mahalanobis

distance which exceeded the critical value (24.32) were also excluded. Table 7.2 shows the correlations between GLS and the PWI domains, along with the results of the regression. Unstandardised (B) and standardised (β) regression coefficients are also shown along with the percentage of unique variance contributed by each variable. This is calculated by multiplication of the sr^2 statistic, which is itself calculated as the square of the 'Part' statistic which can be requested from PASW in association with a multiple regression.

Table 7.2: Predicting GLS from seven PWI domains.

Variable	GLS	1.	2.	3.	4.	5.	6.	B	β	sr^2 x100
1. Standard of living	.31							.17	.12	1.25
2. Health	.37	.17						.25**	.25	5.52
3. Achieve in life	.38	.27	.22					.23**	.20	3.20
4. Personal rel/ships	.26	.28	.23	.22				-.03	-.02	0.04
5. Safety	.32	.24	.19	.24	.25			.20*	.19	2.89
6. Comm. connect	.27	.21	.16	.26	.24	.22		.11	.11	1.06
7. Future security	.34	.33	.21	.24	.27	.44	.16	.18	.17	2.22

** p<.001 * p<.05 $R^2 = .37^a$

[a]Unique variance = 16.18%; Shared variance = .20.82% Adjusted $R^2 = .34$

The R for the regression is significantly different from zero, F (7, 185) = 15.40, p = .000. Overall, 34% of the variance in GLS is predicted by the PWI domains. However only the contributions made by the domains of *health, achieving in life,* and *safety* are significant. *Health* contributes the greatest unique variance (5.52%) while *personal relationships* contributes the least (0.04%, ns).

These results are contrary to the hypothesis, and raise the question of whether other domains may better predict children's GLS than those of the PWI.

A hierarchical regression was conducted to assess the ability of the four exploratory domains to explain additional variance over the domains of the PWI. Three cases (21, 22 and 79) were again excluded on the basis of response set. Nine cases with a Mahalanobis distance which exceeded the critical value, (31.26 – based on eleven variables) were also excluded from the analysis. Any cases with missing data for any of the variables included in the regression were excluded by PASW. Table 7.3 shows the results of the regression.

Table 7.3 Predicting GLS with seven PWI domains and four exploratory domains

Variable	B	β	*p*	sr^2	% *Unique variance*	R^2	*Adj* R^2	ΔR^2
Model 1						.35	.32	
Standard of living	.17	.13	.06	.01	1.28			
Health	.17	.17	.01*	.02	2.40			
Life achieving	.27	.22	.00*	.04	3.80			
Relationships	.03	.02	.73	.00	0.06			
Safety	.14	.14	.04*	.01	1.42			
Community	.10	.10	.12	.01	0.86			
Future security	.18	.17	.02*	.02	2.07			
Model 2						.37	.33	.02
Standard of living	.19	.14	.05	.01	1.46			
Health	.12	.11	.09	.01	1.02			
Life achieving	.23	.19	.01*	.02	1.64			
Relationships	-.02	-.01	.85	.00	0.01			
Safety	.10	.09	.20	.01	0.59			
Community	.09	.09	.19	.01	0.64			
Future security	.12	.12	.12	.01	0.88			
Environment	.06	.06	.34	.00	0.33			
Self	.16	.13	.12	.01	0.88			
Activities	.00	.00	.99	.00	0.00			
School	.08	.08	.26	.00	0.46			

After step one, with the seven PWI domains predicting GLS, $R^2 = .35$, F (7, 179) = 13.56, $p = .000$. After step two, with the addition of the exploratory domains, $R^2 = .37$, (Adjusted $R^2 = .33$). The inclusion of the exploratory domains at step two did not significantly improve R^2 with only 2% additional variance in GLS accounted for, $\Delta R^2 = .02$, F_{inc} (4, 175) = 1.50, $p = .20$, and none of the exploratory domains contributed significant unique variance. Furthermore, with the inclusion of the exploratory domains, only the PWI domain *achieving in life*, was able to uniquely and significantly predict GLS. Interestingly, the PWI domain *future security*, which failed to reach significance when the PWI domains were regressed against GLS (see Table 7.2), contributed significant unique variance in this analysis.

In Summary, when regressed against GLS, the seven domains of the PWI account for just 34% of the variance. Contrary to Hypothesis 1, each of the PWI domains does not contribute unique variance. Only the domains of *health, achieving in life,* and *safety* make significant unique contributions to the prediction of child GLS. Inclusion of the four exploratory domains at step two of a hierarchical regression, contributes no additional significant variance to the prediction of GLS in children over the domains of the PWI. On this basis, there are no grounds for the inclusion of any of the four exploratory domains to aid in the prediction of child GLS.

Hypothesis 2:

Pleasant and activated affects will define HPMood in children.

The adjectives *content, happy* and *excited* have been reported to explain 64% of the variance in adult SWB (Davern, Cummins, & Stokes, 2007). These adjectives represent pleasant and activated affect. Based on this, it was expected that pleasant and activated affect would also define HPMood in children. However due to the developmental nature of vocabulary, it is possible that the affective adjectives may not be exactly the same as for adults.

The results of Study 1 showed that not all children understood the adjective *content,* as the item assessing it was highly endorsed with *'Don't know'* responses (38.9%). However for the valid responses, assumed as the responses showing a rating for the item, the child mean and SD (M = 67.43%SM, SD = 20.73%SM) are approximately equivalent to those of adults (M = 70.30%SM, SD = 21.88%SM) (Davern, Cummins, & Stokes, 2007) indicating the data are probably reliable.

Table 7.4 shows the means and standard deviations for each of the affective variables in the present sample. These values are derived only from those children who provided a rating on the item in question. The correlations between each of the affects, and GLS and SWB are also shown, along with the pole each adjective represents on either the pleasant/unpleasant or activated/deactivated dimensions of the Circumplex.

Table 7.4: Means, SD's and circumplex pole represented by affect terms (N =217)

Affect	n	Mean	SD	Circumplex pole represented	Correlations GLS	SWB
Happy	217	76.87	20.35	Pleasant	.57**	.48**
Content	152	67.43	20.73	Pleasant	.40**	.44**
Unhappy	216	37.96	22.63	Unpleasant	-.33**	-.24**
Active	217	84.33	20.52	Activated	.25**	.29**
Alert	209	74.98	19.98	Activated	.10	.16*
Excited	217	78.89	19.50	Activated	.41**	.30**
Sleepy	217	55.99	31.26	Deactivated	-.10	-.12
Quiet	217	40.78	31.12	Deactivated	-.03	-.05

In partial confirmation of the hypothesis, GLS is most strongly related to the adjectives *happy* (r = .57) and *excited* (r = .41). SWB is most strongly related to *happy* (r = .48) and *content* (r = .44). *Happy* and *content* represent the pleasant pole of the pleasant-unpleasant dimension of the circumplex, while *excited* represents the activated pole of the activated-deactivated dimension. A significant negative correlation is evident between GLS and SWB and the adjective *unhappy* representing the unpleasant pole. Affects representing the deactivated pole were not significantly related to GLS or SWB.

To determine which affects contribute most strongly to the prediction of GLS and SWB, two multiple regression analyses were conducted. Four cases were excluded from the analysis. Three were excluded on the basis of response set, and one multivariate outlier with a Mahalanobis distance exceeding the critical value (26.13). The relative contributions of each affect variable are shown in Tables 7.5 and 7.6.

Table 7.5: Predicting GLS by eight Affect Variables

Variable	DV:GLS	1.	2.	3.	4.	5.	6.	7.	B	β	sr^2 x100
1. Happy	.57**								3.67**	.39	8.64
2. Content	.40**	.39							1.63*	.18	2.56
3. Unhappy	-.33**	-.44	-.22						-.62	-.07	0.36
4. Active	.25**	.36	.13	-.24					.18	.00	0.00
5. Alert	.10	.06	.12	.06	.09				.03	.02	0.05
6. Excited	.41**	.52	.24	-.26	.37	.21			1.47	.15	1.51
7. Sleepy	-.10	-.11	-.05	.34	.34	.00	-.03		-.24	-.04	0.13
8. Quiet	-.03	-.08	.09	.34	-.19	.04	-.13	.23	.13	.02	0.04

** p<.001 *p<.05 R^2 = .39[a]

[a]Unique variance = 13.29%; Shared variance = 21.71% Adjusted R^2 = .35

The R for this regression is significantly different from zero, F (8, 139) = 10.96, p = .001. 35% of the variance in GLS is explained by the affect variables. Two adjectives make a significant unique contribution to the prediction of GLS, these are *happy* (8.64%, p<.001) and *content* (2.56%, p<.05). *Excited* makes the next largest contribution (1.51%), however this is non-significant.

Table 7.6 Predicting SWB by eight Affect Variables.

Variable	SWB	1.	2.	3.	4.	5.	6.	7.	B	β	sr^2 x100
1. Happy	.48								1.74**	.33	6.25
2. Content	.44	.39							1.39**	.27	5.86
3. Unhappy	-.24	-.44	-.22						.12	.02	0.04
4. Active	.29	.36	.13	-.24					.51	.10	0.76
5. Alert	.16	.06	.12	.06	.09				.53	.10	0.94
6. Excited	.30	.52	.24	-.26	.37	.21			.10	.02	0.02
7. Sleepy	-.12	-.11	-.05	.34	.34	.00	-.03		-.26	-.08	0.49
8. Quiet	-.05	-.08	.09	.34	-.19	.04	-.13	.23	-.13	-.04	0.10

** p<.001 R^2 = .33[a]

[a]Unique variance = 14.46%; Shared variance = 14.54% Adjusted R^2 = .29

The R for this regression is also significantly different from zero, F (8, 136) = 8.36, p = 000. 29% of the variance in SWB is explained by the affect variables. Significant unique variance is contributed by *happy* (6.25%) and *content* (5.86%) p<.001. The next largest independent contributors are *alert* (0.94%) and *active* (0.76%) however these are non-significant.

The affective adjectives explained more variance in the prediction of GLS (35%) than SWB (29%), as expected. Also as expected, somewhat greater unique variance was accounted for in SWB (14.46%) as opposed to GLS (13.29%). It is notable that in contrast to findings for adults, the variable *excited*, did not contribute significantly to the prediction of either GLS or SWB in children.

In summary, providing only partial support of the hypothesis, the adjectives *happy*, *excited*, and *content*, representing the pleasant and activated poles of the circumplex, show the strongest positive relationships to GLS and SWB, while *unhappy* at the unpleasant pole, shows a strong inverse relationship. However, only the pleasant affects *happy* and *content* contribute significant unique variance to the prediction of GLS and SWB in this child sample. Activated affects, *excited*, *active* and *alert* are the next largest independent predictors (non-significant) but do not contribute uniquely to the prediction of either GLS or SWB. These results are largely consistent with the adult data where pleasant and activated affects define HPMood, however contrary to the hypothesis, only pleasant affects define HPMood in this sample of children.

Hypothesis 3:

Personality will show relationships to SWB consistent with the adult literature. These will be reduced when HPMood is controlled for.

Within the adult literature, relationships between SWB and the personality dimensions extraversion and neuroticism, have been consistently reported. More recently however, it has been shown that the predictive ability of personality is reduced when HPMood is controlled for.

It was expected that the relationships between personality variables and SWB, evident in adult samples, would also be evident in this child sample. To test the hypothesis, composite variables for extraversion and neuroticism were first computed. Correlations presented in Table 7.7 indicate the strength and direction of the relationships. Partial correlations controlling for HPMood are presented in brackets.

Table 7.7: Means, SDs and Correlations of GLS, SWB and Personality

Variable	Mean	SD	1	2	3
1 GLS	79.31	19.00	-		
2 SWB	83.56	10.75	.59**(.33**)	-	
3 Extraversion	70.10	20.75	.16*(.01)	.16*(.03)	-
4 Neuroticism	40.86	20.28	-.27**(-.10)	-.23**(-.09)	-.21**(-.12)

**p < .01 *p < .05 (.xx) partial correlations shown in brackets

Consistent with the adult literature, extraversion shows a significant positive relationship to GLS and to SWB, and a strong and significant inverse relationship is evident between neuroticism and GLS and SWB. Furthermore, and consistent with the hypothesis, these relationships become non-significant when HPMood is controlled for. To enable further comparison of these child data with those of adults, accumulated data from the 21 Australian Unity Wellbeing Index surveys were accessed.

Means and standard deviations for extraversion and neuroticism in each sample were calculated. *T*-tests revealed significantly higher mean extraversion in children (M = 70.10%SM, SD = 20.75%SM), than adults (M = 53.34%SM SD = 23.43%SM), t (201) = 11.48, p = .00; and significantly higher mean neuroticism in children (M = 40.86%SM, SD = 20.28) than adults (M = 30.87%SM, SD = 20.63%SM), t(209) = 7.14, p = .00. Furthermore, the modal values for the composite extraversion and neuroticism variables in the child sample are 10 and 4.5 respectively, whereas for adults the values are 5 and 1.

Thus, in confirmation of the hypothesis, the expected significant positive correlations between extraversion and GLS and SWB are evident, along with the expected significant inverse relationships between neuroticism and GLS and SWB. These relationships become non-significant when HPMood is controlled for. Furthermore, in this child sample, children's reported extraversion and neuroticism are both significantly higher than that reported by adults.

Predicting GLS with HPMood and Personality

In the next analysis, hierarchical regression was used to assess the ability of the two personality variables (extraversion and neuroticism) to predict GLS, after controlling for the influence of HPMood. Hypothesis 2 revealed that only the affective variables *happy* and *content* made a significant unique contribution to the prediction of child GLS. For this reason these variables were included in the regression to represent child HPMood. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. The results of the regression are presented in Table 7.8.

Table 7.8: Predicting GLS using extraversion and neuroticism.

Variable	B	β	*p*	$sr^2 \times 100$	R^2	*Adj* R^2	ΔR^2
Model 1					.38	.38	
Happy	.50	.53	.00**	23.14			
Content	.17	.18	.02*	2.59			
Model 2					.39	.38	.01
Happy	.48	.51	.00**	17.72			
Content	.17	.18	.01*	2.62			
Extraversion	-.08	-.09	.21	0.69			
Neuroticism	-.11	-.11	.14	0.96			

**$p = 0$ * $p < .05$

Consistent with the hypothesis, the personality variables explain no significant additional variance in GLS over HPMood, $\Delta R^2 = .01$, $F_{inc}(2, 141) = 1.63$, $p = .20$. This result is also consistent with the adult literature.

In summary, confirming the hypothesis, the results show that extraversion is positively related to GLS and SWB while neuroticism is inversely related. These relationships are reduced, becoming non-significant, when HPMood is controlled for. Furthermore, the personality variables do not explain additional variance in GLS, over that which is accounted for by HPMood.

Hypothesis 4:

The levels of correlation between GLS and SWB, and the cognitive buffer variables will be consistent with the adult literature.

The correlations between variables in the child sample are shown in Table 7.9.

Table 7.9: Means, SDs and Correlations of GLS, SWB and Cognitive Buffers

Variable	Mean	SD	1	2	3	4	5	6
1 GLS	79.31	19.00	-					
2 SWB	83.56	10.75	.55*	-				
3 Self-esteem	78.88	15.33	.52*	.65*	-			
4 Optimism	68.94	21.46	.36*	.50*	.57*	-		
5 Primary Control	70.57	18.20	.29*	.44*	.56*	.45*	-	
6 Secondary Control	65.39	21.93	.31*	.43*	.51*	.49*	.51*	-

*$p < .01$

These results are commensurate with the adult literature, where all cognitive buffer variables show a significant positive relationship to GLS and to SWB. In this child sample, as for adults, the correlations are stronger between the buffer variables and SWB than GLS. To enable further comparison of these child data with those of adults, accumulated data from the 21 Australian Unity Wellbeing Index surveys were accessed. The variables of self-esteem, optimism and primary and secondary control were considered.

Means and standard deviations for self-esteem in each sample were calculated based on the five items of the Rosenberg self-esteem scale (as described in Study 1 Methodology). A *t*-test revealed significantly higher mean self-esteem in children (M = 78.88%SM), than adults (M = 72.13%SM), t (161) = 5.60, p = .00. Response variance was lower for children (SD = 15.33%SM) than for adults (SD = 19.07%SM). Furthermore, in the child sample the mode for four of the five scale items was 10, whereas for adults, the mode for all five items was 8. Thus although the expected significant and positive correlations between self-esteem, GLS and SWB were evident in this child sample, children's reported self-esteem was significantly higher than that reported by adults.

In terms of optimism, adult data were available for only two of the three items used to measure children's optimism in this study (Item 21; *In uncertain times I usually expect the best*, and item 22; *I'm always optimistic about my future*). A composite variable was computed from just these two items and a *t*-test revealed that optimism in the child sample was significantly higher (M = 66.52%SM, SD = 22.09%SM) than for adults (M = 62.73%SM, SD = 22.13%SM), t (160) = 2.18, p = .03. However, response variance was approximately equivalent.

Individual analyses of items 21 and 22 reveal that for item 21, the mode was 5 for both child and adult responses. No significant difference between means in each sample was evident for this item (child *M* = 59.21%SM, *SD* = 26.28%SM, vs adult *M* = 59.71%SM, *SD* = 23.97), *t* (213) = -.281, *p* = .779. In contrast, for item 22 the mode was 10 for children and 8 for adults and means for this item (child *M* = 73.68%SM, *SD* = 25.65%SM vs adult *M* = 65.75%SM, *SD* = 23.58%SM) differed significantly *t* (162) = 3.95, *p* = .00. Thus for item 21 children responded similarly to adults whereas for item 22, children responded extremely which inflated the mean above that found for adults. This also affected the composite optimism variable resulting in significantly higher reported optimism in children than adults.

Finally composite variables for primary and secondary control were compared. There was no significant difference between means for primary control in the child and adult samples (child *M* = 70.57%SM, *SD* = 18.20%SM vs adult *M* = 69.31%SM, *SD* = 17.15%SM), *t* (214) = 1.02, *p* = .31. Response variance was also approximately equivalent.

In contrast, the mean for secondary control in the child sample (*M* = 65.39%SM, *SD* = 21.93%SM) was significantly lower than for adults (*M* = 72.03%SM, *SD* = 19.26%SM), *t* (210) = -4.40, *p* = .00. Response variance for the composite variables is approximately equivalent in each sample, however standard deviations for the three individual secondary control items from which the composite variables are derived, are much higher for children than for adults (child *SD's* = 30.27, 29.27 and 29.46%SM vs adult *SD's* = 22.55, 21.12 and 22.82%SM). This is as reported in the results of Study 1. Thus, although the expected significant and positive correlations between primary and secondary control and GLS and SWB were evident in this child sample, children reported significantly lower secondary control than adults.

To summarise, in confirmation of the hypothesis, significant and positive correlations between GLS, SWB and the cognitive buffer variables are evident and this is consistent with the adult literature. However the results show that children reported significantly higher self-esteem and optimism and lower secondary control than adults.

The cognitive buffer variables are also known to predict GLS and SWB in adult populations. A standard multiple regression tested whether this is also true in the child sample. The results are presented in Table 7.10.

Table 7.10 Predicting GLS by Cognitive Buffer Variables.

Variable	B	β	sr^2 x100
Self-esteem	.59*	.47	11.90
Optimism	.07	.08	0.42
Primary control	-.03	-.03	0.07
Secondary control	.04	.04	0.11
** p= .000*			*R^2 = .28*
[a]Unique variance = 12%; Shared variance = 16%			*Adjusted R^2 = .26*

The R for this regression is significantly different from zero, F (4, 127) = 12.353, p = 000. The buffers explain 26% of the variance in GLS. However *self-esteem* is the only variable to make a significant unique contribution.

Table 7.11 Predicting SWB by Cognitive Buffer Variables

Variable	B	β	sr^2 x100
Self-esteem	.34*	.48	12.39
Optimism	.08	.16	1.49
Primary control	.04	.06	0.22
Secondary control	.04	.08	0.38
** p= .000*			*R^2 = .45*
[a]Unique variance = 13%; Shared variance = 32%			*Adjusted R^2 = .43*

The R for this regression is also significantly different from zero, F (4, 127) = 26.08, p = 000. The buffer variables explain 43% of the variance in SWB. Again *self-esteem* is the only variable to make a significant unique contribution. These results show that the buffers explain more variance in SWB (43%) than GLS (26%). This is consistent with theory since SWB is known to have a greater cognitive component than GLS.

In conclusion, consistent with the hypothesis, the cognitive buffer variables show significant positive relationships with GLS and SWB as is found for adult populations. However the results reveal that this sample of children reported significantly higher self-esteem and optimism, and lower secondary control than Australian adults. Furthermore, self-esteem was the only cognitive buffer variable able to uniquely and significantly predict GLS and SWB. These findings will be discussed in Chapter 8.

CHAPTER 8: STUDY 2 DISCUSSION

Study 2 began by investigating whether the domains which predict global life satisfaction (GLS) in adults, are also able to predict GLS in a sample of 8-12 year old children. The potential for other variables to contribute as putative domains was also explored. In addition, the applicability of the variables of the theory of SWB homeostasis were investigated, to establish an empirical basis for the proposition that SWB is protected and maintained in children, in a manner analogous to adults. Each of the tested hypotheses will now be discussed.

Hypothesis 1:

The PWI domains will all uniquely predict SWB in the child sample.

The wellbeing of Australian adults has been measured biannually since 2001 using the Personal Wellbeing Index (International Wellbeing Group, 2006). As described in Chapter 2, this measure is unique in that it assesses satisfaction with a number of life domains, representing the first level deconstruction of the single global question of life satisfaction *"How satisfied are you with your life as a whole?"* When the PWI domains are regressed against GLS, each domain contributes uniquely to its prediction in Australian adults. The exception is the domain of *safety* which contributes only rarely (International Wellbeing Group, 2006). However *safety* is retained in the PWI because it contributes uniquely to the prediction of GLS in other cultures. Based on the literature reporting findings in adult populations, it was hypothesised that the PWI domains would predict GLS in a sample of 8-12 year old Australian school children. This was tested in Hypothesis 1.

Contrary to the hypothesis, only three PWI domains; *health*, *achieving in life* and *safety*, contribute uniquely to the prediction of GLS in this child sample. This is quite different to the pattern of results found for adults as described in Chapter 2. The four domains that do not predict child GLS are *standard of living, personal relationships, community connectedness*, and *future security*. However it is noteworthy, that three of these domains; *personal relationships, community connectedness* and *future security*, also failed to uniquely predict GLS in two separate samples of Australian adolescents (unpublished PhD thesis, Tomyn, 2008). Children and adolescents have in common a dependence upon adults, and immature cognition, which together may explain the inability of these three domains to predict either child or adolescent GLS.

Certainly immature cognition must be held responsible for the failure of the last domain, *future security*, to predict child GLS in the present study. As described in Chapter 1, and confirmed in the results of Study 1, children are confused by questionnaire items which include reference to the future (Amato & Ochiltree, 1987). This is due to the developmental emergence of an understanding of temporal concepts (Busby & Suddendorf, 2005) and probably the acquisition of an associated abstract vocabulary.

Failure of the domain *community connectedness* to predict child GLS, may also be explained by reference to child development. As described by Brofenbrenner's Ecological Systems Theory (1979, 1998), child development occurs initially within the immediate context of family. This expands only gradually to include interaction with outside groups such as school, and later, individuals associate with community groups. In this way, children primarily experience a sense of belonging or connectedness, within the proximal context of their family. It is probable then, that connections to distal contexts such as community, are less relevant to 8-12 year olds than to adults. This would explain the inability of the domain *community connectedness* to uniquely predict child GLS.

The failure of the domain *personal relationships* to predict child GLS is not so simply explained. It is counter intuitive that personal relationships would not be highly relevant to children's SWB. Indeed in their complete dependence upon adults, it is obvious that personal relationships are fundamental to children's SWB. As described in Chapter 2, personal relationships act as a primary external buffer, moderating the impact of negative external events (Cummins, 2010). In children, this moderation is comprehensively experienced, with responsible care-giving adults supervising and filtering most aspects of children's experience.

Since it is clear that personal relationships are essential to children, an explanation for the failure of this domain to uniquely predict child GLS is necessary. The finding in Study 1 that children tend to respond extremely provides one possible explanation. The mean for the domain of *personal relationships* was the highest of all domain means (M = 89.95%SM), and the standard deviation was the lowest of the domains (SD = 14.83%SM). The mode for *personal relationships* was 10 and this was selected by 54.8% of children. A further 31.3% selected either 8 or 9. Thus children endorsed the *personal relationship* domain highly, even in comparison to the other domains. Furthermore, the correlation between personal relationships and GLS was weak, suggesting that when children reported lower GLS, satisfaction with personal relationships was not also lower. Thus the ability of the domain to predict children's GLS was poor.

In addition, consideration of the differences between the wording of the PWI-A, *"How happy are you with your personal relationships?"* and the PWI-SC *"How happy are you with getting along with the people you know?"* reveals that the PWI-A is more abstract. In directing attention specifically towards people the children know, the wording of the PWI-SC (provided as a verbal explanation) may encourage responses which reflect children's dependence upon primary and significant caregivers, relationships which children are cognitively unlikely to be able to evaluate. Further investigation is required to comprehensively explain the inability of the domain *personal relationships* to predict child GLS, when it is clearly fundamental to children's SWB.

The wording of the PWI-SC, along with children's dependence upon adults, may also be responsible for the failure of the domain *standard of living* to predict children's GLS. The PWI-SC specifically prompts children to consider their

possessions; *"How happy are you with the things that belong to you? Like your toys?"* The sample consisted of children attending two prestigious independent schools situated in affluent Melbourne suburbs. It is unlikely that dissatisfaction with money or possessions would feature very highly in the concerns of these children. Moreover, the actions of significant caregivers can be seen to function to mediate children's experience of this domain. This occurs either through the direct provision of material possessions or pocket money, or by the effective management of children's material expectations. In this way, children's responses to the domain *standard of living* may actually indicate the success with which significant adults are able to provide desired possessions, or moderate children's expectations of these.

This finding, that two domains which must in fact be salient to children's GLS, (*standard of living* and *personal relationships*) do not contribute unique variance to its prediction, enables a proposal regarding the way the PWI domains operate in relation to GLS. This is that when satisfaction with a domain is fully saturated, the only variance the domain can contribute to GLS is the shared variance of individual differences in HPMood. That these two domains are saturated with satisfaction responses, is evidenced by the descriptive statistics reported in Study 1, which show the means for these domains are the highest of all domain means, while response variance is the lowest of all domains (*standard of living M* = 88.98%SM, *SD* = 14.46%SM; *personal relationships M* = 89.95%SM, *SD* = 14.83%SM). (See Table 4.4).

For children, domain satisfaction saturation occurs as a direct result of the actions of primary caregivers. This active moderation of children's experience of the domains defends against potential dissatisfaction. Thus while the domains remain salient for the children, satisfaction saturation eliminates domain capacity to carry unique variance. Extending this logic, the failure of the domain *safety* to uniquely predict the GLS of Australian adults, can also be explained in terms of satisfaction saturation resulting from a predominantly peaceful and secure political and cultural milieu.

In summary, immature cognitive ability, along with children's developmental dependence upon adults, provides a credible explanation for the failure of the domains *future security* and *community connectedness* to uniquely predict child GLS. Furthermore, while it is probable that the domain *standard of living* failed to predict GLS in this sample because the children were from prosperous families, the experience of this life domain, by children of all backgrounds, is likely to be moderated by the actions of the adults upon whom they are dependent. Additionally, although the domain *personal relationships* also failed to predict child GLS, it is evident, that personal relationships are in fact fundamental to children's subjective experience of wellbeing, and that this domain is also moderated by adults. Moreover, it is proposed that domain satisfaction saturation is responsible for the failure of the domains *standard of living*, and *personal relationships,* to uniquely predict child GLS in the present sample.

The three PWI domains which do uniquely predict child GLS in the present study are *health, achieving in life,* and *safety.* These three domains are not saturated with satisfaction responses, but rather each domain carries unique variance. It is likely that this is because they are experienced more directly than the four domains already discussed. For example although a child's experience of poor health may be moderated by significant adults who seek out medical assistance, or provide emotional support, ultimately health is experienced directly by the child. It is also worth noting that a considerable research supports a link in children between somatisation and psychological distress (Garber, Zeman, & Walker, 1990). Children whose SWB is under threat, may therefore be more likely to experience or report symptoms of ill health, than children whose SWB is in the normal positive range. This requires further investigation.

The second of the predictive domains, *achieving in life*, can also be seen to be experienced directly by the child. The wording of the PWI-SC item which assesses this domain, *"How happy are you with the things you want to be good at?"* directs children's attention towards their own feelings of accomplishment or failure in activities that are important to them. The feeling of pride in winning an award, or of elation in kicking a goal, as well as the disappointments of failure, are experienced directly, and deeply, by children. The ability of adults to moderate children's satisfaction with this domain may therefore be limited to enthusiasm in times of accomplishment, and the modelling of strategies to cognitively manage disappointments, (eg; *"You did your best and that is all that matters"*). In the end however, achieving in life is experienced directly by each individual child.

The third predictive domain, *safety*, was discussed in Study 1 as the only child domain mean to approximate that of adults. It was proposed in that discussion that associated with children's responses to this domain is the elemental emotion fear. This is experienced powerfully and directly by children, as it is also for adults. For children, *safety* is unlikely to be experienced through thoughts about distal factors such as regional, national or international safety. Rather, *safety* will be experienced in the direct context of home and family. Children's satisfaction with *safety* may thus be reliant upon the availability of significant adult protectors, and this will surely be relevant to GLS.

In summary, it appears that the three domains which uniquely predict child GLS, (*health, achieving in life,* and *safety*) are experienced directly by children. Because they have not been saturated with satisfaction responses in the present sample, these three domains carry unique variance. This enables them to predict child GLS, when *standard of living* and *personal relationships* do not. Additionally, unlike *community connectedness,* these domains are relevant to 8-12 year old children, and unlike *future security* are within the bounds of their capacity for comprehension.

The potential for four exploratory domains to also contribute to the prediction of children's GLS was also investigated in Study 2. The results will now be discussed.

Exploratory domains

As described in Chapter 2, a recent qualitative investigation proposed a number of factors as relevant to children's subjective experience of wellbeing (Fattore, Mason, & Watson, 2009). Some of these factors match the life domains of the PWI, however others do not; these are *agency, environment, self, activities*, and *adversity*. As previously described, it is possible to propose an almost infinite number of putative domains relevant to SWB. However the domains of the PWI have been selected based on the principle of deconstruction, such that when regressed against GLS, each domain contributes significant unique variance.

Furthermore, an additional criterion is that domains must be amenable to both objective and subjective assessment. Accordingly, neither *agency* nor *adversity* qualified for inclusion as a PWI domain and data for these variables were not considered further. The remaining three exploratory factors (*environment, self* and *activities*) were included in Study 2 analyses. Also, the exploratory domain *school* was included on the basis that it may well constitute a life domain relevant to children's SWB. The unique contribution of *school* has been shown to be significant in the prediction of adolescent GLS (Tomyn & Cummins, 2011).

The results of Study 2 reveal that none of the exploratory domains contribute additional significant unique variance, over and above those of the PWI (*health achieving in life* and *safety*). Children's tendency to respond extremely provides a potential explanation for this. Consider the domain of *school*. As discussed in relation to *personal relationships*, the mean for *school* is high (M = 87.49%SM) and the standard deviation is relatively low (SD = 17.69%SM). Furthermore, the correlation between *school* and GLS is weak (r = .23) indicating that when children reported lower GLS, satisfaction with school was not also lower. Thus the ability of *school* to predict GLS in the present sample was poor.

In conclusion, none of the exploratory domains contributed additional unique variance over the domains of the PWI. Furthermore, contrary to the hypothesis, and to findings for adults, only three domains of the PWI (*health, achieving in life* and *safety*) contributed uniquely to the prediction of child GLS.

Hypothesis 2:

Pleasant and activated affects will define HPMood in children.

As described in Chapter 2, the dominance of affect in adult SWB has been demonstrated. Affective adjectives representing the pleasant and activated dimensions of the Circumplex Model of Affect, *happy, content*, and *excited*, explained 64% of the variance in adult SWB (Davern, Cummins, & Stokes, 2007). Hypothesis 2 examined the relative contributions of eight affective variables to the prediction of SWB, to determine whether, as for adults, pleasant and activated affects explain child SWB.

It was considered possible that, due to the developmental nature of vocabulary acquisition, the affective adjectives that define HPMood in children may not be the same as for adults. Supporting this, the results of Study 1 indicated that the word *content* was absent from the vocabularies of many of the children tested, with 38.9% providing a *'Don't know'* response. However using the child data that were available, the mean and standard deviation for the item were approximately equivalent to that found for adults. It was concluded that the data were reliable, and the affective adjective *content* was consequently retained for analysis using the data sub-set of responses to this item.

Consistent with the hypothesis, *happy* and *content* representing the pleasant pole of the circumplex, together explain significant variance in child GLS and SWB. This is commensurate with the finding for adults (Davern, Cummins, & Stokes, 2007). However for adults, the contributions of *happy* and *content* are approximately equivalent, whereas in this child sample HPMood is most strongly defined by the affective adjective *happy*. *Happy* explains 8.64% and 6.25% of the variance in GLS and SWB respectively. In comparison *content* contributes only 2.56% unique variance to GLS, and 5.86% to SWB.

Plausible explanations for this difference lie in children's use and knowledge of affective adjectives, and also their capacity to acknowledge complex emotions. Empirical evidence that both these things emerge developmentally, was described earlier. The word *content* is acquired years after the word *happy* (Ridgeway, Waters, & Kuczaj, 1985), and the capacity to acknowledge the experience of contentment, emerges later than the capacity to acknowledge experience of the prototypical emotion happiness (Shaver, Schwartz, Kirson, & O'Connor, 1987). In 8-12 year old children therefore, familiarity with the word and affect *content*, will clearly be less well established than familiarity with the word and affect *happy*. This probably explains the difference in the contributions of *happy* and *content*, to the prediction of child GLS and SWB.

In addition to the pleasant affects *happy* and *content*, the hypothesis states that as for adults, activated affects will also define HPMood in children. The affective adjectives *excited, active* and *alert* were selected to represent the activated dimension of the Circumplex. Significant positive relationships were evident between two of these adjectives, *excited* and *active*, and GLS and SWB. A weaker but still significant relationship between *alert* and SWB was evident, but the relationship between *alert* and GLS was non-significant. These correlations provide only partial support for the hypothesis. Contrary to the hypothesis, not one of these activated affects contributes significant unique variance to the prediction of either GLS or SWB in this child sample. This is quite different to the finding for adults, where *excited* along with *happy* and *content*, makes a significant unique contribution.

It is likely, that the failure of these activated descriptors to significantly define children's HPMood, has a developmental basis. With increasing development, affective adjectives representing greater differentiation and complexity of emotion

are used and acknowledged by children (Shaver, Schwartz, Kirson, & O'Connor, 1987). It is probable that this development enables the emergence of activated affects to also define HPMood, as is the case for adults.

In summary, these results show that for 8-12 year old children, contrary to the hypothesis, HPMood is defined by pleasant affects alone. These pleasant affects, *happy* and *content*, do not equivalently define HPMood in children, as they do in adults. It is likely that this is because the adjectives, and the affective experiences they represent, are not equally well known or understood by 8-12 year olds.

Hypothesis 3

Personality will show relationships to SWB consistent with the adult literature. These will be reduced when HPMood is controlled for.

Chapter 2 described relationships between the personality dimensions extraversion and neuroticism and SWB, which have been consistently reported in the adult literature (DeNeeve & Cooper, 1998; Headey & Wearing, 1989, 1992; Cummins, 2000; Cummins, Gullone, & Lau, 2002). Though previously unreported in a child population, it was expected that these same relationships would be evident. In confirmation of the hypothesis, a strong positive relationship between extraversion and GLS and SWB was demonstrated, while neuroticism was strongly inversely related to GLS and SWB.

In adults, these relationships are reduced when HPMood is controlled for (Davern, Cummins, & Stokes, 2007). Likewise in this child sample, the correlations between the personality dimensions and GLS and SWB disappeared when HPMood was controlled for. Furthermore, the personality dimensions were unable to account for any significant variance in GLS over that accounted for by HPMood. These results indicate that as for adults, the relationships between personality and GLS and SWB, are strongly driven by individual differences in HPMood.

Hypothesis 4

The levels of correlation between GLS and SWB, and the cognitive buffer variables will be consistent with the adult literature.

As described in Chapter 2, significant positive correlations have been reported in adult populations between the cognitive buffer variables; self-esteem, optimism, and primary and secondary control, and GLS and SWB. In confirmation of the hypothesis, these relationships were also evident between the same variables in this child sample. However further exploration also revealed significant differences between the two samples.

The first observed difference is a significantly higher level of self-esteem reported by children. Examination of child and adult responses to the five items, from which a composite self-esteem variable was calculated, revealed that whereas the mode for adult responses was 8, the mode for four of the five items in the child sample was 10. Chapter 1 described evidence of children's tendency to respond extremely. Study 1 confirmed the presence of extreme bias in some of the responses of the 8-12 year old children sampled. This extreme response bias explains the higher child self-esteem.

The results also showed that children's reported optimism was significantly higher than that of adults. Analysis of child and adult responses to the two items comprising optimism, revealed an extreme response bias in children's responses to one item (item 22, child mode = 10, adult mode = 8), however both children and adults endorsed the midpoint (5) as the mode to item 21. Both items are shown below.

Item #	
21	In **uncertain** times I always expect the best
22	I'm always **optimistic** about my future

The literature review reported research suggesting that when respondents are uncertain, they are likely to select the midpoint as their response (Raaijmakers, Van Hoof, Hart, Verbogt, & Vollebergh, 2000). It is possible that this occurred with item 21. Inspection of the item reveals that it is less straightforward than item 22. It requires that the respondent first consider what might constitute uncertain times, and then decide whether the best is always expected during those times. This is clearly more involved than deciding whether or not one is always optimistic. Targeted research is required to establish whether both child and adult selection of the midpoint, in response to item 21, is explained by uncertainty.

The final difference was significantly lower secondary control reported by the children in comparison to adults. This is commensurate with the literature reviewed in Chapter 2, which reports the emergence and gradual development of secondary control strategies during middle childhood (e.g., Altshuler & Ruble, 1989; Band & Weisz, 1990; Heckhausen & Schulz, 1995; Marriage & Cummins, 2004). The three items used to measure secondary control (listed below) assess specific cognitive strategies which buffer against the impact of negative external events.

Item #	When something bad happens...
18	I remind myself that something good may come of it
19	I remind myself that I am better off than some others
20	I remember that the situation will improve if I am patient

Since these strategies are cognitive, they must emerge in relation to the process of cognitive maturation which, as described in Chapter 1 is incomplete in 8-12 year olds. Cognitive immaturity then explains this finding, that 8-12 year old children report significantly less use of secondary control strategies, than do adults.

In contrast, no significant difference in the reported use of primary control was evident between children and adults. Although similarly used to protect against the impact of negative events, primary control strategies are fundamentally behavioural rather than cognitive, as indicated by the three items used to assess primary control (listed below).

Item #	When something bad happens...
15	I ask others for help or **advice**
16	I look for different ways to improve the **situation**
17	I use my **skills** to **overcome** the **problem**

Furthermore, as described in Chapter 2, primary control strategies, such as crying when hungry, are present at birth (Heckhausen & Schulz, 1995). Primary control thus developmentally precedes secondary control, which emerges with cognitive maturation. In summary, the results of this study are consistent with the literature described, with 8-12 year olds reporting equivalent primary control, but significantly less use of secondary control than adults.

In addition to the findings reported so far, and in contrast to findings for adults, self-esteem is the only cognitive buffer variable to make a significant unique contribution to the prediction of child GLS and SWB in the present study. This is consistent with the study reported in Chapter 2, where self-esteem, but not control, predicted SWB in a sample of 5-12 year old children (Marriage & Cummins, 2004). A developmental explanation is proposed, in that the employment of optimism and control, in order to defend wellbeing, is undeveloped in young children. The ability to cognitively reinterpret an external negative event with optimism *"This situation is bad but things will be better in the future"* or control *"This situation is bad but if I use my skills things will improve"* is simply beyond the cognitive capabilities of young children.

In contrast, as described in Chapter 2, a perception of self emerges in the early stages of cognitive development (Damon, Lerner, & Eisenberg, 2006). Furthermore, the self-esteem literature shows that perception of the self is normally positive (Banaji & Prentice, 1994; Baumeister, 1982; Greenwald, 1980). This positive perception of self, present in young children, can thus been seen to developmentally precede the more sophisticated cognitive strategies of optimism and control. This is supported by the results of the present study where, of the cognitive buffers of SWB homeostasis, only the perception of self through self-esteem, predicts GLS and SWB in children of this age.

In summary, the results of Hypothesis 4 reveal the presence of extreme response bias as reported in Study 1, inflating children's mean self-esteem and optimism above that found for adults. Furthermore, lower secondary control reported by this sample of children, is consistent with immature cognitive ability in 8-12 year old children. Also consistent with this immature cognition, is the finding that the only cognitive buffer variable able to predict GLS and SWB in this sample of children is self-esteem. Additional studies are necessary to confirm these findings in other samples of children.

STUDY 2 CONCLUSIONS

Study 2 investigated the ability of seven domains of the PWI to uniquely predict GLS in a child sample, as they do for adults. In addition, four exploratory domains were investigated for their potential to also uniquely predict children's GLS. The results show that only three PWI domains were able to contribute uniquely. These were *health*, *achieving in life* and *safety*. It is argued that these domains are salient to children's GLS, because they are experienced directly by children without moderation by parents or significant adults.

Two of the four PWI domains which failed to predict child GLS are *community connectedness* and *future security*. It is proposed that cognitive immaturity, along with children's dependence upon adults, either singly or in combination prevent these domains from predicting child GLS.

Standard of living and *personal relationships* were also unable to uniquely predict child GLS. It is proposed that the experience of these domains is moderated for children by significant adults. As a result of this moderation, these domains are saturated with satisfaction responses, and the only variance the domains can contribute to the prediction of GLS, is the shared variance of individual differences in HPMood. This is an important new understanding of the way the PWI domains operate to predict GLS.

Study 2 also investigated the variables of the system of SWB homeostasis, to establish an empirical basis for the proposal that HPMood in children is protected and maintained in a manner analogous to that of adults. However, the results indicate that the cognitive mechanisms of SWB homeostasis are immature in 8-12 year old children. Self-esteem emerged as the only cognitive variable able to uniquely predict GLS and SWB in this sample.

The results also show that whereas pleasant and activated affects define HPMood in adults, for children the adjectives *happy* and *content*, representing pleasant affect alone, define HPMood. Immature vocabulary is most likely responsible for this. Finally, the relationships between GLS, SWB and the personality dimensions extraversion and neuroticism, were shown to be strongly driven by individual differences in HPMood, and this is consistent with the adult literature.

Study 3 will investigate whether the assessment of SWB in a younger sample of children (6-8 year olds) may be undertaken with similar results as found in Studies 1 and 2.

CHAPTER 9: STUDY 3

The results of Study 1 showed that Australian children aged 8-12 years, attending grades 3 to 6, can provide valid and reliable self-reports of their SWB. However a response effect was evident, with children tending to respond using the extreme positive end of the response continuum. This resulted in inflation of children's mean level of SWB (but not GLS) above the range normally reported by Australian adults. Furthermore, means for each of the domains of the PWI, with the exception of *safety*, were higher for children than for adults by an average of 8.5 points.

Three major questions emerged from the results of Study 1. Study 2 addressed the first of these, which related to the applicability of the PWI domains, and the theory of SWB homeostasis, to children. The results showed that the domains which predict adult SWB, do not all predict child SWB. Cognitive immaturity and children's dependence upon adults, either singly or in combination, prevented some of the domains from predicting GLS. Other domains were unable to carry unique variance because they were saturated with satisfaction responses. Furthermore, the results also showed that the cognitive mechanisms of SWB homeostasis are immature in 8-12 year old children.

The remaining two questions emerging from Study 1 will be investigated by the present study. Is the response bias observed in 8 to 12 year old children in Study 1, also present in the responses of 6 to 8 year old children? And second, can children younger than 8 years also provide valid self-reports of SWB. These questions will be investigated in Study 3.

Study 3 – Aims

The present study aims to investigate whether Australian children aged between 6 and 8 years, attending grades 1 and 2, can reliably self-report their SWB when asked developmentally appropriate questions. Each child's spontaneous comments and conversation during the interview will be recorded verbatim. These qualitative data will be considered and patterns which emerge will be reported.

Quantitative data will also be considered. The study aims to provide evidence that 6-8 year old children can indicate their response using an end defined numerical response scale. A response effect is expected with children likely to use the extreme positive end of the response continuum, as has been shown in 8-12 year old children in Study 1. Hypothesis 1 will test this. Mean GLS and SWB in the younger and older groups will also be compared; to assess the possible presence of age related developmental trends in children's ability to respond to questions of life satisfaction. This will be investigated in Hypotheses 2 and 3.

In responding to questions, the children will be required to use a numerical response scale and also a visual analogue scale. As described in Chapter 1, visual

analogue scales are often provided to children on the basis that no reading ability is required. This supposedly makes the visual analogue scale easier for young children to complete. As also described in Chapter 1, it has been reported that children prefer Likert scales and also find them easier to use. However no explanation for this preference was provided.

In the present study, a comparison of 6-8 year old children's responses using an end defined numerical response scale, and a visual analogue scale will be made. It is expected that, commensurate with the literature, the discrete response choices provided by the numerical response scale will be preferred by children. It is proposed that this is because the scale provides concrete response options, which are suited to children's concrete style of thinking. Hypothesis 4 will test this.

The final Hypothesis will investigate whether pleasant and activated affects, which define HPMood in adults and older children (8-12 year olds, Study 2) will also define HPMood in this sample of younger children. For adults, the pleasant affective variables, *happy* and *content*, along with the activated variable *excited*, define HPMood. The results of Study 2 showed that in 8-12 year olds, immature vocabulary prevented the variable *content* from contributing to the prediction of GLS. For this reason, *content* was omitted from this study, and only four affective adjectives, each representing one pole of the Circumplex, were included. These were *happy* (pleasant pole), *unhappy* (unpleasant pole), *active* (activated pole) and *quiet* (deactivated pole). It is expected that pleasant and activated affective variables will define HPMood in 6-8 year old children. Hypothesis 5 will test this.

The following hypotheses have been made:

Study 3 Hypotheses

1. *The Modal value will be 10 for GLS and the seven PWI domains.*
2. *Younger children's mean global life satisfaction will exceed the mean reported for 8-12 year old children.*
3. *Younger children's mean SWB will approximate the mean reported for 8-12 year old children.*
4. *Children will prefer the numerical response scale over the visual analogue scale.*
5. *Pleasant and activated affective adjectives will define HPMood in 6-8 year old children.*

METHOD

Participants

The sample consists of 134 participants aged from 6 to 8 years (M = 7.0) with 69 males (51.9%) and 64 females (47.8%). The sample was taken from Grades 1 and 2 students at two Independent Schools in Victoria. Both schools acted in loco parentis to provide informed consent for the children's participation. Verbal consent for participation was also obtained from each child.

Procedure

Approval from the Deakin University Ethics Committee, and agreement to participate from the two Independent schools from which the samples were taken, was obtained prior to the commencement of the study. An information letter detailing the study was sent to the parents or legal guardians of each child. Parents were able to indicate in writing if they did not wish their child to participate. No children were excluded on this basis. Verbal consent to participate was then obtained from each child, first by the class teacher, and then by the researcher. All children present on the day of testing agreed to participate.

Individual Administration

Times were scheduled by the schools for the researcher to meet with each child individually in their own classroom during the normal school routine. This was to ensure that children were in their familiar environment and did not feel threatened by their participation in the study. At the beginning of each interview the interviewer established rapport with each child through a short discussion, and oriented each child to the task before commencing pretesting.

Pre-testing

In responding to a questionnaire, it is essential that the young respondent understands the nature of the task they are being asked to perform. Pre-testing with each child was therefore undertaken to verify this prior to the commencement of testing.

Exclusion

The researcher checked with the individual class teachers to identify any child who was unlikely to be able to participate in the study. One child with cognitive deficits due to damage received in utero was excluded. Five children diagnosed with autism were also identified by the teachers, and were excluded on the basis that the researcher was unfamiliar to them, and working with her on an unfamiliar task was potentially disruptive and possibly upsetting, and therefore not in the best interests of those children.

Acquiescent responding

Each grade level teacher was asked whether any individual child was likely to respond acquiescently. No individual children were identified by the teachers.

Building Rapport

Each child was greeted by the interviewer and was engaged in a short discussion to establish rapport. Through this discussion each respondent was able to feel comfortable with the interviewer and was oriented to the task of responding before pretesting was begun.

Testing for Numerical Scale competence

When assessing child respondents with a numerical scale, competence with this response format must be established prior to the commencement of testing. The PWI-SC (Cummins & Lau, 2005) employs an 11 point, end-defined numerical scale, but replaces the anchoring words completely satisfied, used in the adult version, with very happy, on the basis that it is more likely to be present in children's vocabularies. It was essential to verify children's ability to use this scale by first ensuring that each respondent was competent with a 0-10 distribution, and then establishing that they could use the 0-10 numerical scale.

Grade level teachers indicated that each child could competently count from zero to ten. The interviewer verified this by informing each respondent that in order to complete the questions, they would need to be able to count from 0 to 10. Children indicated this skill quickly and enthusiastically through a verbal demonstration counting up to ten. Children appeared to enjoy performing their counting skills and were commended for their ability. Numerous children volunteered that they could count to one thousand if necessary. One 7 year old male Caucasian child also proudly demonstrated his ability to count to ten in Chinese.

Testing for the capacity to Seriate

Respondents were told that they would also need to be able to put things in order. They were shown a picture of a series of five steps and were told that the steps were already in order. The children were asked what order the steps were in. All children were able to respond that the steps were in order going from smallest to biggest. Children differed in how they indicated this. For example twelve children named the steps with words representing different size categories. For example, *"small, medium, big, mega-big and humongous."* Most children however stated simply *"smallest (or littlest, shortest, lowest) to biggest."*

The researcher then showed each respondent a picture of a series of five different sized blocks which were not in size order. Children were asked to point to them in the order from smallest to biggest. Twenty children pointed to each block in turn, and then also indicated on the page the new position each block would hold in the

series. For example *"This block would move to here and this block would move to here."* Most children simply pointed to each block in order. Children were commended for their success on this task which indicated their capacity to seriate. All except one of the respondents successfully completed this task. The single child unable to demonstrate the capacity to seriate was not excluded from further testing, and his responses did not appear different to those of any other child.

Introducing the Response Scale

The interviewer then presented an illustration of an 11 item numerical response scale, and informed the children that it was a happiness ruler which showed happiness from smallest to biggest. Children were asked to indicate the smallest end and the biggest end and were asked which number they would choose if they had to show how happy they were right now. All children selected a number between 5 and 10. Children were then asked to indicate how unhappy they felt right now. Children selected numbers between 0 and 5. In this way children were provided with an opportunity to practise responding.

The researcher concluded this introductory session with commendation of each child's ability to listen well and to use any of the numbers on the scale to show how they felt from none, to a little bit, and right up to a lot. Children were also informed that some of the questions might be *"a bit hard"* and that if they didn't know how to respond it was important that they verbally indicate this. The researcher then asked *"Do you think you can do that for me?"* All children indicated their belief that they could complete the task as requested.

The purpose of this introductory session and the tasks used in it was threefold. First, as described in the literature review, it is known that children perform better in a supportive socio-emotional context (Carter, Bottoms, & Levine, 1996). So the interviewer established vital rapport with each child, and ensured they felt comfortable with the tasks they were being asked to perform. The second purpose was to pretest each child to establish their capacity to respond appropriately, and to instruct each child on the use of the numerical response format. Finally, it was important to provide a graduated introduction to the response format the children would be required to use. Children in grades 1 and 2 may not have used a numerical response scale before. Cold presentation of this format may have been intimidating for the children. Instead, they were led to the numerical scale with a series of tasks of increasing complexity, so they could easily and successfully complete these preliminary tasks, and ultimately feel confident in their ability to respond in the format required.

Questionnaire 2

The 17 item questionnaire was based on Questionnaire 1 which was used in round one of data collection for Studies 1 and 2. The questionnaire was modified for the present study so as to be suitable for younger children.

Subjective Wellbeing (Items 1-8)

The Single Item Global Life Satisfaction question, and the seven item Personal Wellbeing Index – School children, were used to measure SWB. The sample of 8-12 year old children responded to these questions competently as reported in Studies 1 and 2. However as reported in Study 1, 4.8% of responses to item seven of the PWI, assessing the domain *future security*, were *'Don't know'* responses. It was retained in the questionnaire for 6-8 year olds, to assess whether younger children would experience equal or greater difficulty than the older children.

Five exploratory domains of life SWB were also included. The first four of these, Agency, Environment, Self and Activities, were as proposed by Fattore, Mason and Watson (2009) as salient to the SWB of children. Due to a typographical error, a further exploratory domain which was tested with 8-12 year olds, *dealing with adversity*, was omitted from the questionnaire. A fifth exploratory domain, *school*, was included on the basis that this may well also be salient to children. (Items 9-13 of the questionnaire assessed the exploratory domains.)

HPMood (Items 14-17)

HPMood was assessed using four of the eight affect items which were included in Questionnaire One. These items were *happy*, *unhappy*, *active* and *quiet* representing each pole of the pleasant-unpleasant and activated-deactivated dimensions of the Circumplex Model of Affect. These four adjectives were selected as the best two pairs of antonyms taken from the eight adjectives used in Studies 1 and 2.

Response Formats

The children were required to respond using two different response formats to test which is more appropriate for use with a sample of young children. Children responded to items 1-17 using an 11 point numerical scale similar to that used for the older children in round one of data collection as illustrated below.

0 1 2 3 4 5 6 7 8 9 10

Very Sad **Very Happy**

A 10cm long visual analogue scale was also used. The numerical scale and the visual analogue scale were both anchored by the words very sad and very happy (items 1-13), and by the words not at all and very (items 14-17).

Very Sad |_____| **Very Happy**

On completion of the interview the researcher asked respondents if they had any questions. Most children replied *"No"* however 17 children said *"Yes."* These questions were usually single and included the following examples;

"What was your name again?"
"How old are you?"
"What number did my friend choose?"
"Where did you get your watch?"

Some questions were similar to questions from the interview for example;

"Can you count to 10?"
"How happy are you?"

A 7 year old male in Grade 2 asked fifteen questions, most of which were repeats of questionnaire items for example *"How happy are you with your life?"* and *"How active are you?"* He included two additional questions;

"How happy are you when you are teaching?"
"How happy are you when you are talking to children?"

CHAPTER 10: STUDY 3 RESULTS

Preliminary Data Screening

All data were entered into PASW statistics software package (version 18.0) for screening and analysis. PASW Frequencies was used to screen data for entry errors. All scores fell within the possible range. There were no missing data.

Screening for Response Sets

Data from child samples may be distorted by response sets, due to acquiescence, or to non-comprehension of the question. Two children consistently selected the maximum score on all seven items of the PWI-SC. The PWI-SC Manual (Cummins & Lau, 2005), states that data from any respondent, who consistently responds with minimum or maximum scores, should be excluded from analysis on the basis that this indicates acquiescence or non-comprehension. However the individual data collection interview enabled the interviewer to clearly assess each child's engagement in the responding process, and comprehension of questionnaire items. One of the two children who consistently responded with a '10', an 8 year old male in grade 2, clearly understood the questions, and made his responses in a considered manner. His maximum responses to all seven items of the PWI-SC appeared to be a true indication of his subjective perception of happiness with each of the PWI domains. He selected responses other than '10' to other items on the questionnaire. There was no evidence of either acquiescence or non-comprehension in this child's responding, and therefore no grounds for exclusion of this case. This child's data was retained for analysis.

In contrast, the other child, a 6 year old female in grade 1, was readily engaged in the initial rapport building discussion, and successfully completed the pretesting tasks. However as testing commenced it became clear that her responses were acquiescent, sometimes even circling the response choice '10' before the interviewer had finished asking the question. When responding on the visual analogue scale, the child made random dots on the paper sheet which often fell outside the response continuum. She was enthusiastic in her participation however she was clearly unable to provide a valid response. In a later discussion about the child with the class teacher, the interviewer learned that this child performed below other children in the class in all areas of the curriculum. This child's data was excluded from analysis on the basis of acquiescence due to non-comprehension. No other child consistently scored maximum or minimum scores on any other part of the questionnaire, and no further data sets were eliminated.

Don't Know Responses

A *'Don't know'* option was provided to all respondents. When this option was selected, no score was available. Cases were thus excluded from specific analyses when a value was unavailable due to a *'Don't know'* response.

Composite Variables

Individual scale items were summed to form aggregate scores for SWB.

Normality

Kolmogorov-Smirnov's statistic was significant for all variables. However the sample was sufficiently large for the natural shape of each distribution to be retained without transformation

Univariate outliers

Univariate outliers were present for all variables. Comparison of mean scores for variables containing outliers, with corresponding means trimmed at the upper and lower 5%, showed that none of these outliers significantly influenced mean scores. For this reason, univariate outliers were not excluded from analysis.

Multicollinearity and Singularity

No variables were excluded from analysis on the basis of multicollinearity or singularity.

Statistical Power

The sample size meets the power requirement for all major analyses.

Unequal Sample Sizes

To test some hypotheses, data from the child sample (N = 133) will be compared with data from the sample of older children used in Studies 1 and 2 (N = 217). Unequal sample sizes have an increased risk of Type I error when they exceed the ratio of 4:1 (Tabachnick & Fidell, 2001). To account for this risk, the more stringent alpha level of .01 will be used for analyses where child and adult data are compared. This is as recommended by Tabachnick & Fidell (2001).

Standardise Scale Data

Data were standardised into Percentage of Scale Maximum (%SM) on a 0-100 distribution to enable comparison with other SWB findings (Cummins, 2003). Original data were on a 0-10 distribution, therefore moving the decimal point one place to the right achieved this standardisation. (A score of 6 became 60.)

DID CHILDREN UNDERSTAND THE QUESTIONS?

Young children's comprehension of questionnaire items is a fundamental concern. Before commencing hypothesis testing, it is essential that this concern is addressed. To do this, consideration of both quantitative and qualitative data is important. In their comments and conversation during interview, children revealed much about themselves and their construal of the questions. These comments were candid, and were not made in response to directed questions or prompts by the interviewer. All comments were recorded verbatim. They are of value for the support they lend to the quantitative data, revealing the thoughts behind children's response selection, and providing additional evidence of comprehension or otherwise.

In order to establish whether or not children understood the questions, means and standard deviations were first generated, along with the percentage of *'Don't know'* responses for each variable. Children responded to 17 questions. The first 13 relate to happiness with life and life domains, and will be discussed first. The results are presented in Table 10.1. This will be followed by consideration of the final four items which relate to affect.

For comparative purposes, adult standard deviations for life as a whole and the domains of the PWI, taken from the report of the 21st Australian Unity Wellbeing Index (Cummins, Woerner, Gibson, Weinberg, Collard, & Chester, 2009) are also shown in Table 10.1. (It is important to note that these are based on 2000 respondents, and larger samples show less variance. This has implications for comparison to N = 134, however these data do provide a point of comparison.)

Also shown are domain standard deviations for 8-12 year old children taken from Study 1. Consideration of these standard deviations assists in the assessment of younger children's understanding of questionnaire items, with higher response variance potentially indicative of younger children's confusion, or poor item comprehension.

Table 10.1 Means, Standard Deviations and 'Don't know' responses (N=134)

Variable	Mean (SD) %SM Child 6-8yo	% Don't know Responses	SD %SM Child 8-12yo	SD %SM Adult
Life as a whole (GLS)	89.63 (16.01)	0.00	19.00	16.95
PWI Domains				
Standard of Living	89.25 (14.80)	0.75	14.46	16.47
Health	87.88 (19.54)	4.48	19.25	19.50
Achieve in Life	88.24 (16.80)	2.24	16.27	18.64
Relationships	89.78 (17.87)	0.00	14.83	20.99
Safety	87.20 (18.91)	1.49	16.76	16.93
Community	74.62 (29.64)	1.49	20.30	18.99
Future Security	75.51 (28.72)	11.94	18.03	16.95

Variable	Mean (SD) %SM Child 6-8yo	% Don't know Responses	SD %SM Child 8-12yo	SD %SM Adult
Exploratory Domains				
Environment	83.11 (24.72)	1.49	20.10	-
Self	90.45 (18.51)	0.00	17.07	-
Activities	87.69 (17.21)	0.00	17.73	-
School	93.43 (15.22)	0.00	17.85	-

Means for GLS and life domains for the 6-8 year old children are high in the positive end of the scale. This is consistent with the data for 8-12 year old children (Studies 1 and 2) (Statistical comparison will be undertaken later). The lowest mean is 74.62%SM (*community connectedness*) and the highest is 90.45%SM (*self*). Standard deviations for most of these variables are between 14.80%SM (*standard of living*) and 19.54%SM (*health*). This is consistent with standard deviations shown for adults. However, greater response variance is evident for three variables, *community connectedness* (29.64%SM) *future security* (28.72%SM) and *environment* (24.72%SM). It is quite possible that these items were confusing or not well understood by the children, and thus attracted greater response variance. However it would be pre-emptive to exclude these variables due to children's possible non-comprehension, without consideration of the qualitative data. These three items will now be discussed in more detail.

QUALITATIVE DATA

Community Connectedness – Item 6

"How happy are you with doing things with other people, away from your home?"

The domain of *community connectedness* had the highest response variance of all variables tested (*SD* = 29.64%SM). However, only 1.49% of children responded *'Don't know.'* This suggests that children believed they understood the question, and felt able to provide a response. The qualitative data shows clearly that children interpreted this item in direct relation to the sense of security provided to them by family and friends. The following examples illustrate this.

> *8yo Male Grade 2 – responds 7*
> If I don't know the people there it would be zero but otherwise it's ok.
>
> *6yo Female Grade 1 – responds 9*
> Happy 'cos my brother would be there and he wants to keep me safe.
>
> *6yo Male Grade 1 – responds 10*
> If my sister was there it would be ok.

7yo Male Grade 1 – responds 0
I would miss my Mummy.

7yo Male Grade 2 – responds 4
I feel sad when I don't have friends with me.

It cannot be claimed that children did not understand the item. Rather, the high response variance can be explained by reference to children's use of concrete examples in their formulation of a response. These examples were specifically related to the security provided by the presence of family or friends. When children considered the question in the context of a known person being present, they responded above the midpoint. In contrast, when children thought friends and family would be absent, they responded below the midpoint.

Thus item 6 was clearly understood by the children. However high response variance was the direct result of the varying nature of the concrete examples individual children used to frame their response. Items, 7 and 10 will now also be considered.

Future security – Item 7

"How happy are you with what may happen to you later on in your life?"

11.94% of responses to the future security question were *'Don't know'* responses, and response variance was high (*SD* = 28.72%SM). This suggests that the children found this item difficult. This is consistent with the developmental literature discussed in Chapter 1 which shows that children experience difficulty with contemplation of the future. This also emerged clearly from the qualitative data. On hearing the item many children promptly indicated that they did not know what the future would hold. For example;

7yo Male Grade 2
(*Frowning*.) That's hard because I don't know what might happen. (*Pauses, circles 5*.) It might be good or it might be bad.

7yo Female Grade 2
(*Pauses, shrugs shoulders*.) I don't know what will happen. (*Don't know response*.)

8yo Male Grade 2
(*Rolls eyes*.) Anything could happen. (*Don't know response*.)

Some children clearly indicated that they didn't understand the question, for example *"I don't get it"*. While other children made comments which revealed their non comprehension.

7yo Male Grade 1
Do you mean when you feel happy on this planet? (*Interviewer prompt, "Later on in your life."*) Hmmm. Well I don't know anything about that. (*Don't know response*.)

However, most children did select a response despite initially indicating that the question was difficult. These responses varied greatly, as evidenced by the high standard deviation. When children selected responses above the midpoint, (between 6 and 10) their comments reflected positive events that were either planned or possible for the future.

8yo Male Grade 2
I know what's going to happen. (*Circles 10.*) I'm going to see David Copperfield.

7yo Female Grade 1
(*Circles 9.)* In my life I'm going to be a soccer player.

7yo Female Grade 2
(*Circles 10. Smiles and whispers conspiratorially.*) Don't tell anyone but my friend and I are going to start a zoo.

When children responded below the midpoint (0 to 4), their comments reflected concern over the possibility of negative events, both real and imagined, in the future.

8yo Male Grade 2
(*Considers options. Circles 0*). You never know, I might get hurt sometime.

8yo Female Grade 2
(*Circles 1.*) Bad things might happen like, um, break your arm, get blind, or get paralysed.

7yo Male Grade 1
(*Circles 5. Smiles broadly.*) Because a T-Rex might eat me or a car might crash me.

Together, the quantitative and qualitative results reveal that for 6-8 year old children contemplation of the future is a difficult and unfamiliar task. Almost 12% of children were unable to make a response. For some children this was because they didn't understand the question. For others, it reflected an inability to picture the future in a concrete way "*I don't know what will happen."* When children did select a response, it reflected the positive or negative nature of a concrete example.

As for Item 6, it can be concluded that most children understood the item. However again, children framed their responses in terms of concrete examples, the positive or negative nature of which determined the selection of a response above or below the midpoint. When children were unable to envisage the future concretely, they were unable to provide a response.

Environment – Item 10

"How happy are you with your environment?"

Children's responses to item ten, representing the domain of environment, were typically provided emphatically. Less than 1.5% of children were unable to provide a response, however response variance was high (*SD* = 24.72%SM). The interviewer noted anecdotally that children appeared to be aware of, and to have considered the environment previously. Again, the reliance on concrete examples was evident. When children responded above the midpoint (6-10), their comments reflected a sense of ownership of the environment.

> 7yo Female Grade 1
> (*Seriously and nodding*.) The environment is really important to us.
>
> 6yo Male Grade 1
> At our school we are cleaning up and we are encouraging other schools to do the same.
>
> 7yo Male Grade 2
> (*Excitedly*.) I have an awesome backyard that joins onto the bush and I made a cubby out of sticks and you can crawl through it (*Gets down onto floor and demonstrates crawling through cubby*).

When children selected a response at or below the midpoint (0 to 5), their comments reflected concern with some aspect of the environment.

> 8yo Male Grade 2
> It's dry. There's a drought. All the plants have shrivelled up 'cos they're thirsty. (*Demonstrates thirsty plants by lying back in the chair with arms outstretched and tongue protruding*.)
>
> 7yo Female Grade 2
> They are cutting down so many trees near my house. It's because of the fires. (*Earnest and nodding*.) They came close.
>
> 6yo Female Grade 1
> Not that happy. People throw their rubbish around. You should see what's in the Yarra River! (*Eyebrows raised. Shakes head*.)

7yo Male Grade 2
My Dad sometimes forgets to turn the lights out. (*Rolls eyes and slaps hand across forehead.*) I have to remind him.

Children's comments thus reveal both an interest in, and a concern for the environment. It is likely that this was partly related to the school curriculum. In one Grade 1 class, six out of the twenty children made specific reference to the Yarra River.

6yo Male Grade 1
We looked at a picture of the Yarra with all things in it.

7yo Female Grade 1
When I saw a picture of the Yarra and there was junk in it, it was annoying.

The class teacher revealed in a later discussion with the interviewer that she had conducted a lesson in the previous week during which the children had viewed photos of pollution in the Yarra River. Children's attention had clearly been directed towards the environment by the school curriculum. Thus children had been primed in relation to the environment, and presented their opinions as they made their responses.

As for items 6 and 7, high response variance in item 10 cannot be explained in terms of children's non-comprehension. Rather, children's reliance on concrete examples, the nature of which may be positive or negative, is responsible for the high response variance.

Although response variance in other questionnaire items was less than for the three items discussed (SD's between 14.80 and 19.54%SM), the qualitative data reveals children's consistent reference to concrete examples, and response selections which reflect the positive or negative nature of those examples. This is consistent with the developmental literature reported in Chapter 1, which shows that young children's cognition is concrete. As revealed by their candid and voluntary comments, when formulating their responses to questionnaire items, 6-8 year old children employ this characteristic concrete thinking, relating each question to a concrete example. When the example is positive in nature, the response is positive; the contrary is true when the example is negative. Furthermore, it appears that when unable to imagine an example which relates to the question, children are unable to respond.

Summary

In summary, while high response variance can indicate respondent non-comprehension, the qualitative data suggest this is not true for the present study. Rather, it is clear that children rely on concrete examples which drive their response selection. These discrete examples are not considered in a wider context but singularly influence response selection. It is the positive or negative nature of

the example that persuades selection above or below the midpoint. Furthermore, when a child is unable to reduce the question to a specific concrete example, they appear unable to make a response. This occurred as children attempted to respond to the question of *future security* (Item 7) and it is likely that this was due to the abstractness of the concept of 'later on'.

These results provide evidence of a clear response effect in children's answers to questions relating to happiness with life and life domains. It can be concluded, that young children will relate questions to specific concrete examples, and will respond on the basis of those examples. In the present study the nature of the concrete examples, positive or negative, varied from child to child, and for this reason, wide variation in children's responses was observed.

In the absence of retest data for comparison, it is not known whether individual children would subsequently respond in the same way, possibly indicating a predisposition to generate an example valenced either positively or negatively, or whether the generation of a concrete example is a spontaneous and random process, influenced by mood state or the current situation. It does appear however, that children may be unable to respond to questions relating to abstract concepts, and if they are unable to generate a concrete example on which to base their response, they will be unable to respond to the question. For this reason, along with the fact that abstract words may not be present in the vocabularies of young children, asking children about abstract concepts is not recommended.

Don't know responses

Of further relevance to the question of children's comprehension of questionnaire items, is the percentage of *'Don't know'* responses each item received. The question most highly endorsed with *'Don't know'* responses was item 7 (*future security*) which has already been discussed (11.94%). The item to receive the next highest percentage (4.48%) was item 3 which relates to the domain of *health*. The qualitative data reveals that all children who responded *'Don't know'* to this item; *"How happy are you with your health?"* did not understand the word *health*.

> 6yo Male Grade 1
> (*Frowning*.) What do you mean by health?
>
> 7yo Female Grade 2
> (*Pauses*.) What's that?

This is consistent with the developmental literature which indicates steady increases in children's vocabulary over time. All other items received very few *'Don't know'* responses (between 0% and 2.24%) and will not be discussed further.

In summary, the word *health* was not understood by 4.48% of children and this was indicated by *'Don't know'* responses. The absence of this word from the

vocabularies of some young children is consistent with the developmental literature which shows the growth of vocabulary from primarily concrete words, to gradually include words of increasing complexity and abstractness.

Affective variables

Children responded to a further four items which related to affect (items 14, 15, 16 and 17). Means, standard deviations and percentage of *'Don't know'* responses were calculated for these variables as for the first 13 items of the questionnaire. The results are presented in Table 10.2.

Table 10.2 Means, SD's & percentage of Don't know response for affect variables

Variable	Mean (SD) %SM 6-8yo	% Don't know Responses	Mean (SD) %SM 8-12yo	Mean (SD) %SM Adult
Happy	84.07 (24.00)	0.00	76.87 (20.35)	71.96 (20.08)
Unhappy	32.65 (30.34)	1.49	37.96 (22.63)	-
Active	88.20 (19.02)	0.75	84.33 (20.52)	-
Quiet	56.20 (36.09)	0.75	40.78 (31.12)	-

The means for *happy* and *active* representing pleasant and activated affects are highly positive. This is consistent with the data for 8-12 year olds (Studies 1 and 2) (Statistical comparison will be undertaken later.) Less than 1% of children provided a *'Don't know'* response to these items.

The mean for *unhappy* the polar opposite of *happy*, is below the midpoint (32.65%SM) and the standard deviation is very high (30.34%SM). The researcher noted anecdotally, that most children moved their pencil quickly to the lower end of the response continuum on hearing this item, however a response option was not selected quickly, and children often moved between the lower response options before finally selecting a number to circle. Furthermore some children clarified with the researcher that a low response would indicate that they weren't very unhappy. For example;

> 7yo Male Grade 2
> (*After a pause.*) "So if I put a 10 would that mean I'm very unhappy?"
> (*Interviewer responds "Yes". Child circles 3.*)
>
> 7yo Female Grade 1
> (*Circles 3.*) "That means I'm not very unhappy doesn't it?"

Considered along with the high standard deviation, this suggests that children were confused by the *unhappy* item. A probable explanation for this is that the item is oppositely valenced to all previous items. A high score on this item indicates

"Very unhappy" a negative state. In contrast, a high score to all previous items indicates a positive state. It is possible that this was confusing for many children and resulted in the high response variance observed.

The final affect variable, *quiet*, also appears to have confused the children. The mean approximates the midpoint (56.20%SM) and the standard deviation is higher than for any other variable (36.09%SM). Again a high score does not indicate a positive state, and this is in contrast to most other questionnaire items. It is quite possible that children were confused as to what they were indicating by the selection of a high or low score. For example, one 7 year old female in Grade 1 selected '10' indicating that she generally felt very quiet, and yet commented mischievously *"I like to call out in class."*

In summary, it seems likely that the affects *happy* and *active* were understood by the children. In contrast, the high standard deviations for the affects *unhappy* and *quiet*, together with their qualitative data, suggest that these items were confusing. It cannot however be claimed that children did not understand these items, rather, children were confused about how to respond. It is possible that this was caused by all items presented prior to the four affect items requiring a high score to indicate a positively valenced state. When faced with items which required a response shift, children were unsure how to respond.

Conclusion

It is vital in research with young children, that their comprehension of questionnaire items is established. Together, the quantitative and qualitative data considered so far, seems to indicate that non-comprehension cannot be concluded on the basis of high response variance, or percentage of *'Don't know'* responses alone, and children's candid comments provide great insight into their responding.

The most significant insight to emerge is children's reliance on concrete examples, which guides their response selection. When the concrete example they generate is positive, the response will be above the midpoint. The contrary is true when their example is negative. When the child is unable to imagine a concrete example on which to base their response, they appear unable to provide a response at all.

However, it appears that most children understood most of the questionnaire items. There is therefore no basis on which to recommend data screening or transformation additional to that already undertaken. Instead, it seems that children may not be responding to these questionnaire items in the same ways as adults. Consideration of the quantitative data should confirm this. Before hypothesis testing is undertaken, and the quantitative results are presented, the remainder of the qualitative data will be considered.

Further themes from the Qualitative Data

Further consideration of the qualitative data reveals themes which are consistent with previously described understandings of cognition in 6-8 year old children. These themes will now be discussed, illustrated with examples of children's comments.

Orientation to the present

The most striking theme to emerge is children's absolute connection to the present. Their interpretation of, and responses to the questions, were anchored in the immediate and current experience of their life. The following examples of responses and accompanying dialogue illustrate this.

How happy are you with your life as a whole?

> 7yo Female Grade 1
> Hmmmmm. I think…. 10. Yes 10. (*Circles 10 on the response sheet*.) But not yesterday. (*Shakes head vigorously. Makes eye contact*.) Yesterday would have been a zero. I got stung by a bee! *(Indicates bee sting*.)

> 8yo Male Grade 2
> (*Circles 10*.) Very happy because on Saturday I'm going to be in the Grand Final for football.

How happy are you with getting on with the people you know?

> 8 yo Male Grade 2
> (*Looks sullen as he observes a male classmate. Circles 7*.) That's because of him over there. (*Indicates the boy*.) He's a pain.

How happy are you with how safe you feel?

> 6yo Male Grade 1
> (*Considers options then circles 2*.) Today someone brought nuts (*to school*) and I'm allergic to nuts.

How happy are you with what may happen to you later on in your life?

> 8yo Male Grade 2
> (*Big smile. Circles 10*). Because Lochie is coming over to my house on Wednesday and on Saturday.

These examples are typical. They reveal children's singular connection to their current experience and the events that are occurring for them right now. In making their responses, children draw on experiences that are presently in progress for

them. Any verbal references to the past are directly related to events of last weekend, and most references to the future are limited to next week or next weekend. These findings are consistent with developmental understandings of cognition in 6-8 year olds, who are known to possess an undeveloped sense of time, and to be oriented to the present rather than the future.

Family

The importance of family to children's sense of security emerged strongly from the qualitative data. This was revealed through their comments to items 5 (*personal relationships*) 6 (*personal safety*) and as previously discussed, item 7 (*community connectedness*). The following examples demonstrate this.

> 6yo Female Grade 1
> I don't like to be away from the people in my family.
>
> 6yo Male Grade 1
> If I didn't see much of my grandparents and cousins I wouldn't like it 'cos I feel nervous without them.
>
> 8yo Male Grade 2
> I'm not as confident when I'm away from my home.
>
> 6yo Female Grade 1
> When I snuggle up to Mum and Dad I feel a lot safer.

Family is clearly the primary and central aspect of young children's lives. This is intuitive, and is also consistent with a major contemporary theory of child development, Ecological Systems Theory, proposed by Urie Brofenbrenner (1917-2005). Brofenbrenner describes child development as occurring through an interaction between the child, and the unique and complex context of their multidimensional environment.

The theory describes four systems which constitute different levels of the child's environment. Brofenbrenner proposed that each system exerts a powerful influence on the developing individual. The first, the Microsystem, represents the child's immediate environment and is said to have the most direct influence on the developing child. The Microsystem contains the child's immediate interactions and activities with family, school, peers and neighbourhood. The importance of these interactions to 6-8 year old children is revealed through the qualitative data.

Midpoint Selection

The quantitative results of Study 1 just failed to reveal significant differential selection of the midpoint by 8-12 year old children when they were uncertain of their response. In contrast to this, the qualitative data reveal some support for midpoint selection by 6-8 year olds, when they didn't know or were undecided.

How happy are you about doing things with other people away from your home?

> 8yo Male Grade 2
> Ummmm. I'm not sure about that so I'll put a 5.

How happy are you with your life as a whole?

> 8yo Female Grade 2
> Oooh. Um. I'm sometimes happy and I'm sometimes sad. Um. I don't know. *(Circles 5.)*

How happy are you with how safe you feel?

> 6yo Male Grade 1
> That's hard. Sometimes I feel safe and sometimes I don't. Like when I'm alone or when the lights are out. *(Circles 5.)*

It is important to note that this qualitative data provides only anecdotal support for differential selection of the midpoint. There was no statistical evidence of differential selection of the midpoint in the quantitative results for 6-8 year old children.

Conclusions from the Qualitative Data

The qualitative data contribute an additional dimension, facilitating understanding of the quantitative results. Children's connection to the immediate and current experience of their life is highlighted. This is consistent with the understanding of young children as oriented to the present. Furthermore, the importance of family to children's sense of security is revealed by children's comments in response to several items.

It is also clear from the qualitative results that most children understood most of the questions. However their responses were driven by reference to single and specific concrete events. The positive or negative nature of these recalled events dictate a corresponding positive or negative response. Moreover, the single events are not considered in a broader context as might be the case for an adult. A child's negative response to the domain *health* would more likely reflect a current head cold, than a view of overall health. Again this is consistent with an orientation to the present.

While 6-8 year old children do understand questions relating to their subjective experience, it appears from the qualitative results that they may not respond to these questions in the same way as adults. Hypothesis testing will next be undertaken and quantitative results presented.

QUANTITATIVE RESULTS

Hypothesis 1:

The Modal value will be 10 for GLS and for all PWI domain items.

Children's tendency to respond using the extreme ends of response continuums was reported in the literature review. The results of Study 1 provided evidence of this extreme response tendency in 8-12 year old children's responses to two measures of SWB (GLS and PWI). It was expected that this response tendency would also be apparent in this younger sample of 6-8 year old children.

To test the hypothesis, PASW frequencies was used to generate the mode for the GLS and the seven PWI domain items. In confirmation of the hypothesis, '10' was the mode for all eight items.

The percentage of extreme (10) responses made by the younger children (N = 134 6-8 year olds in Grades 1 and 2) to the GLS question and the PWI domains was compared with those made by older children (N = 217 8-12 year olds in Grades 3-6 from Study 1). Less than 1.5% of children in each sample responded '10' across all PWI domains. The results of the comparison are presented in Table 10.3.

Table 10.3: Percentage of extreme responses to GLS and PWI domains made by younger and older children

	GLS %	Standard %	Health %	Achieve %	Relationships %	Safety %	Community %	Future %
Older (8-12)	24.9	48.8	31.3	27.6	54.8	30.9	23.5	23.5
Younger (6-8)	59.7	50.0	52.2	50.7	58.2	50.7	33.6	29.1
% Difference	+34.8	+1.2	+20.9	+23.1	+3.4	+19.8	+10.1	+5.6
χ^2	41.09*	0.01	14.31*	18.09*	0.26	12.99*	3.74	1.09

*p = .000

Table 10.3 shows that younger children responded '10' significantly more often than older children to the GLS question and to the domains of *health, achieving in life* and *safety.*

In summary, confirming the hypothesis, younger children selected '10' as the mode for both measures of SWB. Furthermore, younger children selected '10' significantly more often than older children in response to the GLS question, and also to three of the seven PWI domains (*health, achieving in life* and *safety*). The effect of this extreme responding on GLS and the domain means will be tested in Hypotheses 2 and 3.

Hypothesis 2:

Younger children's mean global life satisfaction will exceed the mean reported for 8-12 year old children.

In Study 1, 8-12 year old children's tendency to respond extremely was expected to result in inflation of mean GLS beyond that reported for adults. However no significant difference was found. Despite this, on the basis of the extreme response tendency already demonstrated in older children (Study 1 Hypothesis 1) and expected in younger children (Study 3 Hypothesis 1), it was expected that mean GLS in this sample of 6-8 year old children, would exceed that found for the older children, and would therefore also exceed the adult normative range for mean GLS scores.

Confirming the hypothesis, an independent samples *t*-test indicated significantly higher GLS for younger children (M = 89.63%SM, SD = 16.10%SM, vs M = 79.31%SM, SD = 19.00%SM); t (316.16) = 5.44, p = .000. Furthermore, whereas mean GLS in the older children approximated the upper margin of the adult normative GLS range for group mean scores (79.10%SM; Cummins, Woerner, Gibson, Weinberg, Collard, & Chester, 2009) the younger children's mean GLS exceeds this upper margin by more than ten points.

To test whether this difference was caused by a differential selection of the upper extreme response option, all category 10 scores were removed and the t-test was repeated. This found no significant difference between group mean GLS for younger (n = 54) and older (n = 163) children (M = 74.26%SM, SD = 15.73%SM vs M = 72.45%SM, SD = 17.07%SM); t(215) = .686, p = .493. Thus when the effect of differential selection of the upper response option is removed, the mean GLS for younger children enters the normative GLS range for adult group mean scores. Younger children's responses to a second measure of SWB, the PWI, will next be analysed in Hypothesis 3.

Hypothesis 3:

The mean SWB of younger and older children will not differ.

It was expected that, as for Study 1 with 8-12 year old children, the responses of 6-8 year old children would be affected by extreme response bias. This was confirmed. It was therefore expected that mean SWB in younger and older children would not differ. This was also confirmed for younger (M = 84.60%SM, SD = 11.95%SM) and older children (M = 83.56%SM, SD = 10.73%SM); t (312) = .784, p = .434.

However, extreme responding by 6-8 year olds caused their mean to exceed the upper margin of the adult normative range (73.6%SM – 76.5%SM; Cummins, Woerner, Gibson, Weinberg, Collard, & Chester, 2009) by 8.1 points. This is

consistent with the results of Study 1, where a significant difference was found between mean SWB in 8-12 year olds, and adults, with children's SWB exceeding the adult range by 7.4 points (Study 1, Hypothesis 3).

To enable further consideration of these results, the mean domain values for the younger and older sample, are plotted against the adult normative ranges in Figure 10.1.The figure shows the normative range (vertical grey bars) for SWB and domain values in the Australian adult population. These ranges are calculated as two standard deviations from the mean using data from the first 20 national surveys undertaken by the Australian Wellbeing Index. The means for the 8-12 year old sample of children as reported in Study 1 are plotted with crosses marking the means. The means for the younger sample of 6-8 year old children are plotted with circles marking the means.

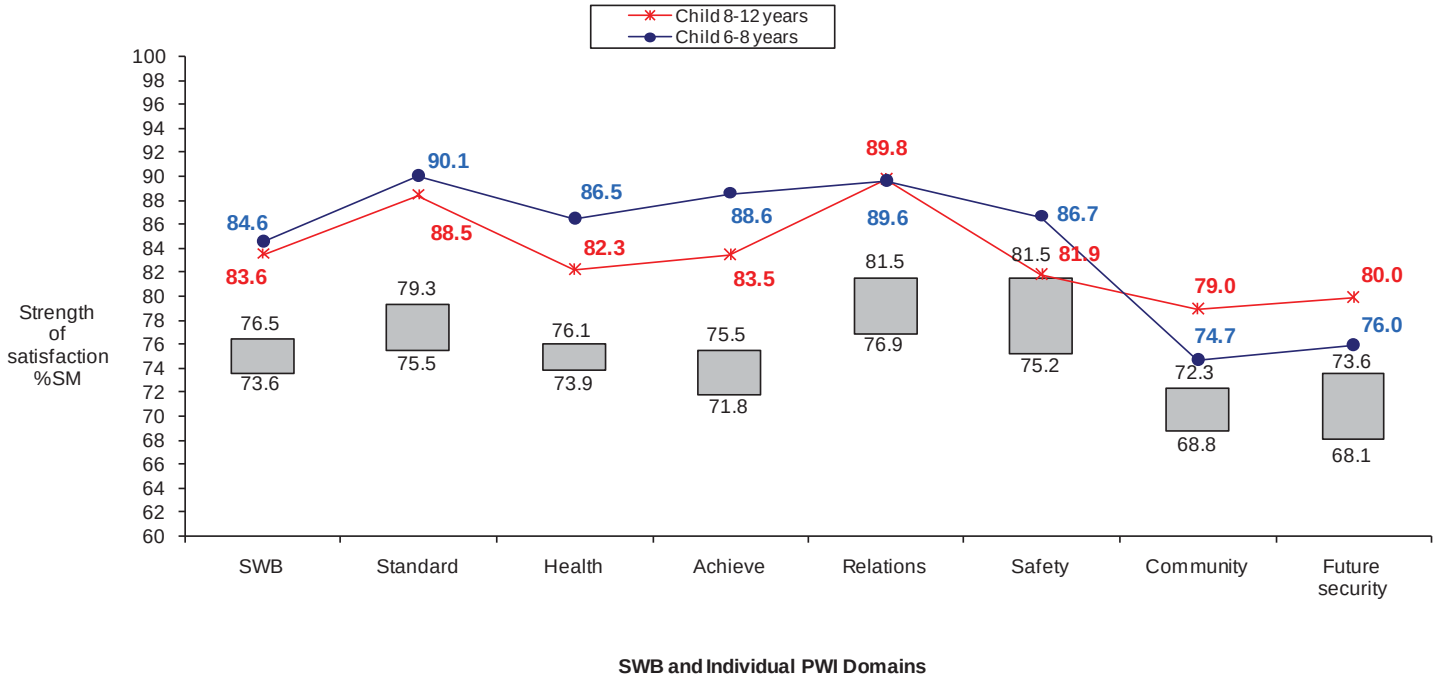


Figure 10.1 Younger and older child means for SWB and the PWI domains

With the exception of the mean for the domain of *safety*, which in the 8-12 year old sample approximates the upper margin of the adult range, Figure 10.1 shows that all other child means exceed the normal adult ranges.

Means and standard deviations for each of the seven PWI domains, from which SWB is calculated, are presented individually in Table 10.1. Prior to multivariate analysis of variance (MANOVA) preliminary assumption testing revealed no multivariate outliers. PASW excluded some cases from analysis due to *'Don't know'* responses leaving N = 109 in the younger sample and N = 205 in the older

sample. Box's M test was significant F (28, 176484.39) = 3.05, p = .000, and Levene's test was significant for the domains of *community* (p = .000) and *future security* (p = .000). These tests indicate violations of the assumption of homogeneity of equality of covariance matrices, and homogeneity of variance respectively. Because of these violations, along with unequal N values for the younger and older children, the robust Pillai's trace test was used as recommended by Tabachnick and Fidell (2001). Pillai's criterion indicates a significant multivariate difference between younger and older children, F (7, 306) = 3.397, p = .002.

Table 10.4 MANOVA for younger and older children's mean domain scores

	Younger 6-8yo (N = 109) Mean (SD)	Older 8-12yo (N = 205) Mean (SD)	*F*	*p*	Partial Eta^2
Standard	90.09 (14.56)	88.49 (15.85)	0.771	.381	.002
Health	86.50 (20.51)	82.29 (19.51)	3.201	.075	.010
Achieving	88.62 (16.80)	83.51 (16.90)	6.536	.011	.021
Relationships	89.63 (18.20)	89.80 (14.85)	0.008	.928	.000
Safety	86.70 (18.96)	81.90 (19.97)	4.248	.040	.013
Community	74.68 (29.39)	78.98 (20.71)	2.267	.133	.007
Future Security	75.96 (28.35)	79.95 (19.21)	2.178	.141	.007

*p <.05

However when the results for the dependent variables were considered separately, no difference reached statistical significance using a Bonferroni adjusted alpha level of .007 as recommended by Pallant (2007). The greatest actual difference between any domain means was just five points (*achieving* and *safety*). Furthermore, partial eta squared values show that the effect size for each domain is quite small, with all values ≤ .02. This indicates that no more than 2% of the variance in domain scores is explained by the age of the child.

In summary, the results confirm the hypothesis with younger children's SWB approximating that of older children. Relative to the normal adult ranges for SWB and PWI domains, group means for the younger children exceed the upper margin on all ranges. There are no significant differences between younger and older children's scores for any of the domains. The capacity of the PWI domains to predict GLS in younger children will next be considered, along with the four exploratory domains tested with 8-12 year old children in Study 2.

Predicting GLS in 6-8 year olds with the PWI and exploratory domains

A hierarchical regression was conducted to assess first the predictive ability of the PWI domains, and then the capacity of four exploratory domains (also tested with 8-12 year olds in Study 2) to explain additional variance. Twenty three cases with

a Mahalanobis distance which exceeded the critical value, (31.26 – based on eleven variables) were excluded from the analysis. Any cases with missing data for any of the variables included in the regression were excluded by PASW. N = 86. Table 10.5 shows the results of the regression.

Table 10.5 Predicting GLS in 6-8 yo's with PWI and four exploratory domains

Variable	B	β	*p*	sr^2	% *Unique variance*	R^2	*Adj* R^2	ΔR^2
Model 1						.29	.23	
Standard of living	-.14	-.10	.34	.01	0.81			
Health	.09	.08	.47	.00	0.48			
Life achieving	.39	.28	.01*	.07	6.81			
Relationships	.44	.37	.00*	.11	10.96			
Safety	.30	.30	.01*	.07	7.51			
Community	-.01	-.01	.90	.00	0.01			
Future security	-.03	-.05	.67	.00	0.17			
						Unique variance = 26.75%		
						Shared variance = 2.25%		
Model 2						.45	.37	.15
Standard of living	-.01	-.01	.93	.00	0.01			
Health	.07	.06	.59	.00	0.22			
Life achieving	.32	.24	.01*	.04	4.28			
Relationships	.17	.14	.20	.02	2.22			
Safety	.28	.28	.01*	.06	5.66			
Community	-.03	-.05	.64	.00	0.16			
Future security	-.06	-.11	.28	.01	0.86			
Environment	-.10	-.14	.15	.02	1.61			
Self	.25	.13	.17	.01	1.42			
Activities	-.15	-.13	.22	.01	1.12			
School	.98	.46	.00*	.12	12.46			
						Unique variance = 30.02%		
						Shared variance = 14.98%		

After step one, with the seven PWI domains predicting GLS, $R^2 = .29$, F (7, 78) = 4.66, $p = .000$. The PWI domains thus explain 29% of the variance in GLS, with the domains *achieving in life, personal relationships,* and *safety* contributing significant unique variance. After step two, with the addition of the exploratory domains, $R^2 = .45$, (Adjusted $R^2 = .37$). This significantly improves R^2 with an additional 15% variance in GLS accounted for, $\Delta R^2 = .15$, F_{inc} (4, 74) = 5.18, p = .00. However at step two, *personal relationships* no longer contributes significant unique variance, and *school* emerges as a significant unique predictor of GLS in 6-8 year olds, along with *achieving in life* and *safety*. The domain *school* is clearly very important, and the increase in shared variance from 2.25% at step one, to 14.98% at step two, indicates a greater component of HPMood at step two, than at step one.

In summary, in this sample of 6-8 year old children, the PWI domains account for 29% of the variance in GLS, with *achieving in life, personal relationships* and *safety* making significant unique contributions. This is similar to the results of Study 2, where *health, achieving in life and safety* were significant predictors of GLS in 8-12 year olds. The inclusion of the exploratory domains explains an additional 15% variance in GLS in this sample, however *school* is the only exploratory domain to contribute uniquely. This is quite different to the pattern of results found for adults, and will be discussed.

Hypothesis 4:

Children will prefer the end defined numerical response scale over the Visual Analogue Scale.

Children's preference for responding using a Likert scale, rather than a visual analogue scale (VAS) was reported in the literature review. It was expected that children in the present sample, would similarly prefer the discrete response options of a numerical response scale, over a VAS. To test this hypothesis, children were required to respond to the same questions using each response format. Upon completion of each individual interview, respondents were asked whether they preferred to use the numerical response scale, or the visual analogue scale. They were also asked the reason for their preference.

PASW Frequencies was used to calculate the frequency with which children reported preferring each of the scales. The results are presented in Table 10.6.

Table 10.6: Frequency of preference for numerical response scale or VAS

	n	%
Numerical response scale	87	64.9%
Visual analogue scale	24	17.9%
No preference	23	17.2%

Table 10.6 shows that in confirmation of the hypothesis, the majority of children indicated a preference for the numerical response scale.

Children's reasons for their preference were recorded. All children who indicated a preference for the numerical scale provided a reason related to the provision of a concrete referent. For example an 8 year old female respondent indicated her preference for the numerical scale stating *"Because you can actually pick your answer. Otherwise you don't know what you're doing 'cos you don't know where the answer is."* In contrast, respondents who preferred using the VAS each cited individual reasons for their preference. For example *"It's harder and I like doing hard things."* and *"I like doing dots more than circles."*

In the next analysis means and standard deviations for GLS and SWB using the numerical response and VAS formats were compared as shown in Table 10.7.

Table 10.7: GLS & SWB Means & (SD's) using numerical response or VAS formats

	Numerical	*VAS*
GLS	89.63 (16.10)	88.92 (18.10)
SWB	84.60 (11.95)	83.04 (14.13)

T-tests revealed no significant difference between means using each response format for either GLS, $t(133) = .508$, $p = .612$, or SWB, $t(108) = 1.36$, $p = .176$. However response variance was greater for VAS data on both measures.

Similarly, comparison of means and standard deviations for the seven PWI domains and the four affect variables using the numerical response and VAS data revealed no significant difference between means according to response format for all variables except *unhappy*, ($t(132) = -2.58$, $p = .01$). This will be discussed in Chapter 11. Response variance was consistently higher for VAS data on all variables as shown in Table 10.8.

Table 10.8: PWI Domain Means & (SD's) using numerical response or VAS formats

	Numerical	*VAS*
Standard of living	89.25 (14.80)	88.15 (17.86)
Health	87.88 (19.53)	87.03 (19.54)
Achieve in life	88.17 (16.77)	85.74 (22.53)
Personal rel/ships	89.78 (17.87)	87.98 (18.39)
Safety	87.20 (18.91)	84.11 (23.37)
Comm. Connect	74.62 (29.64)	72.00 (30.51)
Future security	75.51 (28.72)	75.08 (31.03)
Happy	84.07 (24.00)	83.77 (25.71)
Unhappy	32.31 (30.39)	39.14 (36.86)
Active	88.20 (19.02)	86.36 (23.52)
Quiet	56.20 (36.10)	60.31 (35.98)

In summary, the results demonstrate that as expected, most children preferred using the end defined numerical response scale over the VAS. Those respondents who preferred the numerical format cited the availability of a discrete concrete referent as the reason for their preference. Equivalent data were obtained using numerical response and VAS formats however response variance was greater for VAS data.

Hypothesis 5

Pleasant and activated affective adjectives will define HPMood in 6-8 year old children.

The results of Study 2 showed that, as for adults, pleasant and activated affects are most strongly related to GLS and SWB in 8-12 year old children. However only the adjectives *happy* and *content* contributed to the prediction of GLS and SWB in those children, whereas for adults, the pleasant activated affect *excited*, also contributes unique variance. In the present study only four adjectives were tested as opposed to eight in Study 1. Pleasant and activated affect in the present study are represented by the adjectives *happy* and *active*, while unpleasant and deactivated affect are represented by *unhappy* and *quiet*.

As shown previously (See Did children understand the questions?) it appears likely that children were confused about how to respond to the items *unhappy* and *quiet*. For this reason, although these affective variables will be included for analysis, results associated with them will be interpreted cautiously.

Table 10.9 shows the results of a multiple regression which tested the contribution of the four affective variables to the prediction of GLS in 6-8 year old children. Six multivariate outliers (Mahalanobis distance >18.47) were excluded from the analysis as multiple regression is sensitive to these (Tabachnick & Fidell, 2001).

Table 10.9: Predicting GLS from four affective variables

Variable	M	SD	DV:GLS	1.	2.	3.	B	β	sr^2 x100
1. Happy	85.58	21.74	.40**				.26*	.35	11.36
2. Unhappy	32.23	30.00	.07	-.00			.02	.04	0.16
3. Active	89.30	16.16	.26**	.27**	.11		.16	.16	2.43
4. Quiet	56.23	36.08	.14	.06	.15	.04	.05	.11	1.12

** p≤.05 ** P≤ .001* $R^2 = .20^a$

[a]Unique variance = 15.07%; Shared variance = 2.93% *Adjusted* $R^2 = .18$

In support of the hypothesis, the adjectives *happy* and *active*, representing pleasant and activated affect, show significant relationships to GLS (*r*'s = .40 and .26 respectively) and also to each other (*r* = .27).

The R for the regression is significantly different from zero, F (4, 122) = 7.705, p = .000. Only a small amount of variance in GLS is described by the affective adjectives (18%). Furthermore, the adjective *happy* is the only variable to make a significant unique contribution (p = .000). The contribution of the adjective *active*, just failed to reach significance (p = .057).

The contribution of the four affective variables to the prediction of SWB was also tested. Four multivariate outliers exceeding the critical value (18.47) were excluded. Cases with missing data (*Don't know* responses) on PWI domains were unavailable for analysis as no SWB score was calculated for them. This further reduced the sample (n = 103) for this analysis. The results are shown in Table 10.10.

Table 10.10: Predicting SWB from four affective variables

Variable	M	SD	DV:SWB	1.	2.	3.	B	β	sr^2 x100
1. Happy	85.47	21.79	.48***				.22***	.41	15.21
2. Unhappy	32.09	30.08	.15	-.01			.04	.10	0.92
3. Active	89.22	16.20	.36***	.26***	.11		.17**	.23	4.80
4. Quiet	56.36	36.19	.27**	.06	.15*	.04	.07**	.22	4.80

** p≤.05 ** p≤.01 ***p≤ .001* $R^2 = .35^a$

[a]Unique variance = 25.73%; Shared variance = 6.27% *Adjusted* $R^2 = .32$

In support of the hypothesis, the adjectives *happy* and *active*, representing pleasant and activated affects, are most strongly related to SWB (*r'*s = .48 and .36 respectively) and are also significantly related to each other (*r* = .26). The adjective *quiet* also shows a significant relationship to SWB (*r* = .27, p≤.05) and to the adjective *happy* (*r* = .15). The relationship between SWB and *unhappy* just failed to reach significance (*p* = .06).

The R for the regression is significantly different from zero, *F* (4, 99) = 13.395, *p* = 000. 32% of the variance in SWB is described by the affective adjectives. The adjective *happy* makes the greatest unique contribution (15.21%). *Active* and *quiet* are also significant contributors, each explaining 4.8% of the variance. The adjective *unhappy*, failed to make an independent contribution. It is unclear why the contribution of the affective variable *quiet* reached significance. The qualitative data revealed children's confusion about how to respond to this item and high variability in children's responses (*SD* = 36.19%SM) reflects this. It is most likely that the responses are unreliable.

In summary, in support of the hypothesis, the adjectives representing pleasant and activated affects are significantly related to GLS and to SWB. Pleasant affect predicts GLS, while pleasant and activated affects predict SWB. However it is important to note that these affective adjectives provide only very weak predictive power. Furthermore, immature vocabulary prevents the same adjectives that define HPMood in adults, from being measured in younger children.

CHAPTER 11: STUDY 3 DISCUSSION

Following on from Studies 1 and 2, the aim of Study 3 was to assess whether children aged between 6 and 8 years of age, attending grades 1 and 2, would self-report their SWB in the same manner as 8-12 year old children in grades 3 to 6. Each of the tested hypotheses will now be discussed.

Hypothesis 1

The modal value will be 10 for GLS and all PWI domains

The literature review presented evidence of an extreme bias in young children's responses to questions relating to subjective variables such as pain perception (Belter, McIntosh, Finch, & Saylor, 1988; Goodenough, van Dongen, Brouer, Abu-Saad, & Champion, 1999), health related quality of life (Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001), and emotional states (Chambers & Johnson, 2002). This bias is evident as young children responding to questionnaire items using the extreme end of the response continuum. However such a bias has not previously been reported in relation to children's SWB. Study 1 confirmed the presence of this bias in the responses of 8-12 year old children to both measures of SWB. The first hypothesis tested in Study 3 was that this same bias would also be evident in the responses of 6 to 8 year old children.

The results confirm the presence of this bias, with 10 the modal value for GLS and all PWI domains. It can therefore be concluded, that the response bias is similarly present in this younger age group. Moreover the strength of the bias appears greater in the younger children. When responding to both measures, younger children made extreme responses significantly more often than older children. The three items of the PWI, that showed this trend, are those domains which in Study 2, were shown to uniquely predict the GLS of 8-12 year old children, *health*, *achieving in life,* and *safety*. The likely salience of these domains to 8-12 year old children was discussed in Study 2.

These results support the intuitive notion that as children develop cognitively, they become more able to report variations in their satisfaction responses. Since as predicted, 6-8 year old children tend to report complete satisfaction with their life and with all aspects of it, global and domain based satisfaction measures are likely to yield mean results which are inflated. This was tested in Hypotheses 2 and 3.

Hypothesis 2

Younger children's global life satisfaction will exceed the mean reported for 8-12 year old children.

The results confirm the hypothesis. As shown in hypothesis 1, younger children made extreme responses significantly more often than older children when

responding to the single question of GLS. This resulted in inflation of their mean GLS which also lay above the normal range for adult GLS.

Extreme responding in the 8-12 year old children tested in Study 1, also resulted in the inflation of mean SWB above that of adults. It was expected that, due to extreme response bias, mean SWB in the 6-8 year old children would be equivalent to that of 8-12 year old children, and this was tested in Hypothesis 3.

Hypothesis 3

The mean SWB of younger and older children will not differ.

The results confirm the hypothesis with no significant difference between the two groups. Since the responses of both younger and older children are affected by extreme response bias, both means lie above the normal range for adult SWB. Since normal ranges for children have not been established, it is not possible to determine the relative position of either mean relative to age-appropriate scores.

In terms of the PWI domains, multivariate analysis of variance indicated a significant difference overall for younger and older children, however no significant differences were revealed between domain values. The greatest between-group difference for domains was approximately five points. This small difference was for the domains *achieving in life* and *safety*, where younger children scored higher. It is likely that this is due to younger children's greater selection of the extreme score '10' in response to these items, as shown in Hypothesis 1.

When considered against adult data, all PWI domain scores for 6-8 year old children exceed the adult domain ranges. Bias in children's responses explains this. This finding is consistent with the results of Study 2 where with the exception of *safety*; domain scores for 8-12 year olds also exceed those of adults. Furthermore, whereas a robust literature shows that, with the exception of *safety*, the PWI domains consistently predict adult GLS in Australian population samples, in this sample of 6-8 year olds, only the domains *achieving in life, personal relationships,* and *safety* significantly predict GLS. This is similar to the results found for 8-12 year old children in Study 1, where *achieving in life* and *safety* along with *health* predicted GLS. The results for children thus differ substantially from the pattern of results found for adults.

Two factors acting in combination may explain this. The first is satisfaction saturation. It is proposed that this occurs as a direct result of the actions of primary caregivers. As described in Study 2 the domain *standard of living* can be used to illustrate satisfaction saturation. The domain item asks *"How happy are you with the things that belong to you like your toys?"* This directs the respondents' attention to their belongings. Since the sample was drawn from two prestigious independent schools situated in affluent Melbourne suburbs, it is almost certain that the children were well provided for in terms of their belongings. Thus primary

caregivers actively moderate children's experience of this domain through the provision of belongings. This defends against potential dissatisfaction. Thus while the domain *standard of living* may be salient, and well understood by these children, satisfaction saturation eliminates its capacity to carry unique variance in this sample.

When satisfaction with a domain is fully saturated, the only variance it can contribute to GLS is the shared variance of HPMood. This finding was reported in Study 2. A high domain mean, along with low response variance, is indicative of satisfaction saturation. For this sample of 6-8 year olds, this is true for *standard of living*, which has the second highest domain mean (*M* = 89.25%SM), and the lowest standard deviation (*SD* = 14.80%SM). However it cannot be assumed that, in a child sample, satisfaction saturation will always prevent *standard of living* from predicting GLS. Rather, the role of primary caregivers, or significant others, as potential moderators of children's experience of any domain, must be taken into consideration.

In addition to the moderating influence provided by primary caregivers, cognitive immaturity is also implicated in the failure of all domains to predict child GLS. In 6-8 year old children, this is the case for the domains *health*, *community connectedness*, and *future security*. The qualitative data reveal children's confusion over the items assessing these three domains. Furthermore, the results support this explanation with children responding *"Don't know"* to *future security* and *health* 11.94% and 4.48% of the time respectively. Response variance for *community connectedness* (*SD* = 29.39%SM) and *future security* (*SD* = 28.34%SM) was high, also possibly indicating respondent confusion.

This explanation is consistent with the developmental literature discussed in Chapter 1 which shows that children experience difficulty with contemplation of the future (Busby & Suddendorf, 2005), and that the word *health*, which is an abstract noun, is unfamiliar to young children (Dale & Chall, 1994; Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001). Thus cognitive immaturity may explain the failure of the domains *health*, *community connectedness* and *future security*, to predict GLS in the 6-8 year old sample.

The only PWI domains able to significantly predict GLS in this sample are therefore *achieving in life*, *personal relationships* and *safety*. It is likely that these domains predict GLS in these young children for two reasons. First, the items are understood. Second, the domains are experienced directly by children, without moderation by significant adults resulting in satisfaction saturation as previously described. Two of these domains, *achieving in life and safety*, were also able to uniquely predict GLS in 8-12 year olds in Study 2, along with *health*, which was not understood by 6-8 year olds. However the domain *personal relationships*, was unable to predict GLS in 8-12 year olds.

The qualitative data clearly show the importance of personal relationships to 6-8 year olds. This is in keeping with Brofenbrenner's (1979, 1998) Ecological

Systems Theory. As described earlier this theory posits that children develop initially within the immediate context of the family. This expands only gradually to include interaction with outside groups such as school, and later, individuals associate with community groups.

When the exploratory domains were included in the analysis, *school* contributed significant unique variance; however the significance of *personal relationships* as a predictor of GLS in 6-8 year olds disappeared. This shows that the variance contributed by *personal relationships*, was subsumed by the greater variance explained by *school*. The qualitative data corroborate this. While most children responded '10' to the item assessing satisfaction with school, the comments made by those who did not, without exception related to relationships with friends. For example a 6 year old female in grade 1 responded '5' and commented *"Today when I looked for my friends I couldn't find them."* An 8 year old male in grade 2 responded '10' and commented *"That's for this school. When I was at my old school it would have been a 2 or 3 because I didn't have enough friends."*

Responses made by 6-8 year olds to the domain *school*, are thus strongly influenced by the relationships experienced at school. This again in consistent with Brofenbrenner's Ecological Systems Theory (1979, 1998). It is of further interest that the interviews were conducted at school in the session immediately following morning recess. When responding to the interview items, children were clearly immersed in school, and the impact of peer relationships upon the experience of it. Children's absolute connection to the events that are in progress for them right now is, thus, again evidenced by their responses, and their candid comments. In keeping with this, it is reasonable to speculate that conducting the interview in the home environment of a 6-8 year old may result in responses that relate to the current experience of relationships with family members. This requires further investigation.

In conclusion, the results confirm the hypothesis. No significant difference is evident between SWB in the younger and older children. However data in both groups are affected by extreme response bias, resulting in group means for child SWB, which exceed the normal adult range. Response bias also inflates PWI domain means for 6-8 year olds above the domain means for adults. Furthermore, in contrast to the adult literature, the only PWI domains able to significantly predict GLS in 6-8 year old children are *achieving in life, personal relationships*, and *safety*. The moderating influence provided by primary caregivers, combined with children's immature cognition, explains this finding. Furthermore, the inclusion of the domain *school* eliminates the significance of *personal relationships*. However the qualitative data reveal that children's responses to *school* depend upon satisfaction with relationships at school. The importance of personal relationships to young children's subjective experience of wellbeing has emerged strongly from both the quantitative and qualitative results.

Hypothesis 4

The literature reviewed in Chapter 1 described research reporting children's preference for a discrete choice, rather than a linear continuum such as a visual analogue scale (VAS) (van Laerhoven, van der Zaag-Loonen, & Derkx, 2004; Chambers & Johnston, 2002; Rebok, Riley, Forrest, Starfield, Green, Robertson, & Tambor, 2001; Lawford, Volavka, & Eiser, 2001). While the validity of the end defined format employed by the PWI has not previously been reported for children, it was hypothesised that children would similarly prefer using this, than a VAS.

The hypothesis was confirmed, with the majority of children (64.9%) stating their preference for the end defined format. All children who provided a reason for preferring the numerical format indicated that the provision of discrete concrete options for responding made the task easier. For example *"You know where you need to put your answer." "You just circle your answer." "It's easier to see where to put your answer."* This is consistent with an understanding of the very concrete nature of cognition in 6-8 year old children as described in Chapter 1. In contrast, those children who preferred the VAS, provided varied and individual reasons for their preference. For example, *"I didn't have to draw a whole circle, just a dot." "You could choose wherever you wanted." "I could put higher than 10." "There's more of it so it's more exciting."*

It is noteworthy that all responses on the numerical scale were indicated clearly. Children were able to circle the number of their choice, with the only variation being that some children shaded the circle as shown in Figure 11.1.

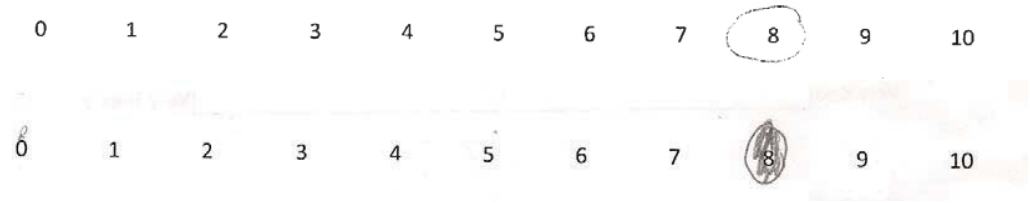


Figure 11.1: Variations in children's responding using the numerical response scale

There was much more variation in the way children indicated their responses on the VAS. While most children simply placed a small dot on the continuum, some children made large dots and some children drew lines. Some children placed their mark outside the continuum presumably indicative of an extreme response. Two children even wrote numerals on the continuum, however both these children completed the VAS after they had already completed the numerical response scale and this may have caused their confusion. Examples are shown in Figure 11.2.

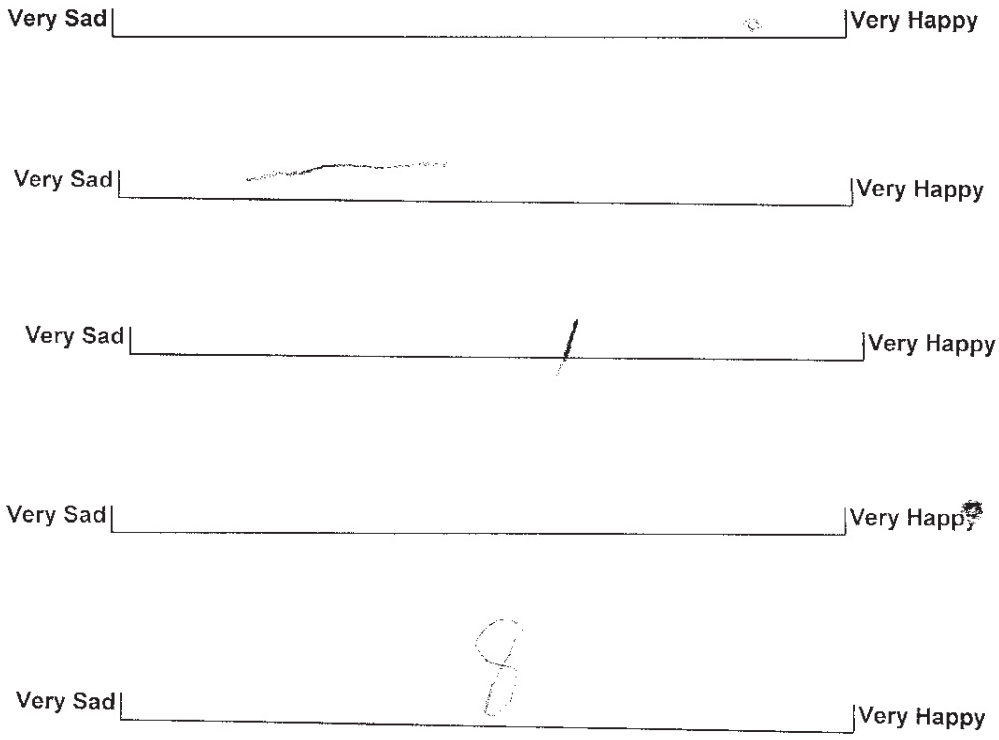


Figure 11.2: Variations in children's responding using the VAS

This ambiguity resulted in some cases being excluded as invalid. In contrast, all responses made using the numerical response scale were clear.

Despite these differences, equivalent data were obtained with each scale format. The only variable for which a significant difference was found was *unhappy*. As described in Chapter 10 "Did children understand the Questions" it appears likely that this item was poorly understood. Response variance was high (numerical response scale *SD* = 30.39%SM, VAS *SD* = 36.86%SM) and the researcher noted anecdotally that children took longer to make their response, often moving their pencil up and down the scale before selecting a response option or placing a mark. It is proposed that respondent confusion was responsible for the observed difference in means for *unhappy*, rather than children's ability to use each scale. While equivalent data were obtained using the numerical response and VAS formats for all other items, it is important to note that response variance was consistently greater for VAS data.

In summary, confirming the hypothesis, the majority of children preferred the discrete response options of the numerical response scale over the abstract linear continuum of the VAS. This is consistent with the literature and is commensurate with the concrete quality of thinking in 6-8 year old children. Furthermore, while

valid responses were consistently obtained using the numerical scale, variation in children's responses using the VAS resulted in some cases being excluded from analysis. Although equivalent data were obtained using each of the response formats; response variance was consistently greater for VAS data than for numerical response data. For all these reasons, the use of a discrete option response scale is recommended for child respondents in preference to a VAS.

Hypothesis 5

HPMood in younger children will be defined by pleasant and activated affects as for adults and older children.

It was expected that pleasant and activated affects would explain significant unique variance in GLS and SWB in younger children, as they do for adults (Davern, Cummins, & Stokes, 2007) and older children (Study 2). This was confirmed. However due to immature vocabulary, the same affective adjectives tested with adults (Davern, et al., 2007) and 8-12 year olds in Study 2, were unable to be tested with 6-8 year olds. This meant that the pleasant affective adjective *content*, which contributes significant unique variance in those groups, was omitted from the questionnaire for younger children as it was unlikely to be understood. Instead, the only adjective included to represent pleasant affect, was *happy*.

Happy dominated in explaining significant variance in GLS (8.64%) and SWB (6.25%) in older children. Similarly, *happy* contributed the greatest unique variance in this younger group, explaining 11.36% and 15.21% of the variance in GLS and SWB respectively. Additional variance (2.43% in GLS and 4.80% in SWB) was explained by the affective adjective *active*, representing activated affect. This is commensurate with findings for adults, where SWB has been shown to be primarily a measure of pleasant affect, with some activation included (Davern, Cummins, & Stokes, 2007).

However, the affective adjectives of HPMood typically explain greater variance in GLS than SWB. This is because GLS has a greater level of abstraction, with responses to the PWI domains containing more cognition (Cummins, Eckersley, Pallant, Van Vugt, & Misajon, 2003). The results of the present study are not consistent with this. Instead, just 18% of the variance in GLS is explained by the affective adjectives of HPMood, in contrast to 32% in SWB.

This result requires explanation, and examples from the qualitative data may assist in this. It is clear from those data, that 6-8 year old children are singularly connected to events that are in progress for them right now. Their interpretation of, and responses to questions, are anchored in the immediate and current experience of their life. Furthermore, they lack the cognitive sophistication necessary, to consider current events in an overall context. Because of this, it is plausible that the domain based questions of the PWI, actually elicit an affective, rather than a cognitive response, from young children.

The researcher noted this occur anecdotally, when a 7 year old male in grade 1, responded to the community connectedness item *"How happy are you with doing things with other people, away from your family?"* He thought very briefly before selecting '3' as his response. His eyes filled with tears and his lips quivered as he stated *"I miss my father and mother."* The researcher responded to assist him regulate his emotion.

The child's demeanour clearly reflects an affective response. Intuitively, cognitive immaturity may prevent young children from considering life domains in the same way as adults. Certainly the qualitative data supports this contention. It is possible to propose therefore, that affect explains more variance in SWB than GLS in 6-8 year old children, because the domain based measure prompts a greater affective response than does the global question of life satisfaction.

Furthermore, it is important to note that whereas in adults, 57% of the variance in SWB is explained by pleasant and activated affects (Davern, Cummins, & Stokes, 2007) much less variance is explained in the SWB of 6-8 year olds (32%) and 8-12 year olds (29% Study 2). These results, along with the qualitative data, show clearly that children do not respond to questions of their subjective experience in the same way as adults.

In summary, as for adults and older children, pleasant (*happy*) and activated (*active*) affects are most strongly related to GLS and SWB in 6-8 year olds. However the predictive ability of these affects is poor in children.

STUDY 3 CONCLUSIONS

This study demonstrates that the responses of children aged 6-8 years, attending Grade 1 and 2 in Australia, exhibit a response bias. Young children are unable to report subtle variation in their subjective experience. Instead, they tend to respond extremely, commonly indicating themselves to experience complete satisfaction with their life and with aspects of it.

This response bias inflates mean values obtained for 6-8 year old children's self reported GLS, SWB, and the PWI domain values, above the normative adult range. Moreover, the only PWI domains able to predict SWB in 6-8 year olds are *achieving in life, personal relationships* and *safety*. It is proposed that saturation of domains with satisfaction responses, along with cognitive immaturity, are together responsible for the non-significance of the other PWI domains.

When included in the analysis, the exploratory domain *school* also contributes significant unique variance. However *school* subsumes the variance contributed by *personal relationships* rendering it non significant. Taken together with the qualitative data, it appears that the importance of the domain *school*, for 6-8 year old children, is related to the relationships experienced at school.

In further contrast to the adult data, affect explains more variance in child SWB than it does in GLS. It is proposed that the domain items actually elicit an affective rather than a cognitive response in young children. This is due to cognitive immaturity, which prevents consideration of domain related events in a broad, objective context. Furthermore, pleasant and activated affects are only weakly predictive of child GLS and SWB, and immature vocabulary prevents all the adjectives tested with adults, from being tested with 6-8 year olds.

Finally, the results of Study 3 also reveal that 6-8 year old children can reliably use an end defined numerical response scale. Equivalent data were obtained using a Visual Analogue Scale. However, response variance was higher using this scale, and children indicated a preference for the concrete response option of the numerical scale.

In conclusion, the results of Study 3 show that 6-8 year old children can provide valid reports of their subjective experience. However they do not respond in the same way as adults. Their responses are affected by response bias, and cognitive immaturity affects their understanding of the questions asked.

CHAPTER 12: OVERVIEW

The aim of this thesis was to assess the subjective perception of wellbeing held by 6-12 year old children. This was achieved through three separate studies. The major finding is that 6-12 year old children can provide valid self-reports of subjective experience when developmentally appropriate research methodology is used. However the results also show that children do not respond to questions of subjective wellbeing (SWB) in exactly the same way as adults, and that the system of SWB homeostasis, which protects and maintains SWB in adults, is immature in 6-12 year old children. These findings are significant and their implications will now be discussed.

Developmentally Appropriate Research Methodology

It is possible to elicit a valid self-report of subjective experience from normal 6-12 year old children. However the importance of using developmentally appropriate research methodology cannot be overstated. Methodological guidelines for use with child respondents were proposed at the end of Chapter 1. Adherence to these optimises respondent comprehension, and guards against response bias. This is imperative for respondents of all ages. However immature language ability magnifies the risk of non comprehension in children. Moreover, my research has shown that children will respond to questions whether they understand them or not. A *'Don't know'* option must always be provided. When it is not, children will select from the available options, rather than admitting non comprehension. Furthermore, as described in Chapter 1, children are more susceptible than adults to response biases such as suggestibility (Goodman, 2006; Chae & Ceci, 2005). It is therefore essential that developmentally appropriate research methodology is used.

Using the methodology proposed in this thesis, a number of subjective variables were assessed, first in 8-12 year old children (grades 3-6), and then by individual interview with 6-8 year olds (grades 1 and 2). These data were analysed and compared to those of adults. The results provide important new insights into the way children respond to questions of SWB which will be discussed shortly. First however, the findings regarding the utility of the single item General Life Satisfaction question (GLS), and the eight item Personal Wellbeing Index (PWI) (International Wellbeing Group, 2006) as measures of SWB in 6-12 year old children will be discussed.

The GLS and PWI as Measures of SWB in 6-12 Year Old Children

In broad terms, the results show that the GLS and PWI are both suitable for use in the measurement of SWB in 6-12 year old children. Most of the children understood the single item question of GLS *(How happy/satisfied are you with your life as a whole?)* However a caveat applies in that an explanation for the term *"on the whole"* must always be provided. This is because the word *whole* is a

homonym. Its pair, *hole*, is more concrete and is therefore more likely to be familiar to young children. Substitution of the meaning for *hole*, instead of *whole*, renders the question nonsensical. Also, the term *"on the whole"* is abstract, and may not be well understood by young children. A verbal explanation is therefore essential.

Most children also understood and responded to the seven PWI domain items used. However the eighth domain, *religiosity/spirituality*, was omitted on the basis of its abstractness, and evidence that it was unlikely to be understood by young children (Amato & Ochiltree, 1987). Although a parallel form of the PWI is available for use with school children, it was not used in the present study. The main reason for this was to enable comparison of adult and child data, collected using the same instrument. However it is also argued that simplification of wording in items intended for adults may not render them suitable for children, if they assesses a concept which is immature in the child. The results support this argument as will be described shortly.

Although the wording from the adult version of the PWI was used in the questionnaire, a verbal explanation consisting of the more concrete wording from the school children version was also given, to assist comprehension. (A detailed explanation is provided in Chapter 3). This is recommended, along with modelling the responding process. This involves a visual and verbal demonstration of responding using a practice question, to ensure children's full understanding of the task.

The results show that some children experienced difficulty responding to the item for the domain *future.* This was less evident in the older (4.8%) than the younger sample (11.94%), consistent with evidence that an understanding of temporal concepts is achieved developmentally (Busby & Suddendorf, 2005). Such difficulty is also evident in the qualitative data, with 6-8 year old children freely expressing their confusion over the future domain. On this basis, the inclusion of *future* when assessing SWB in 6-8 year olds is not recommended. Furthermore, the responses of 8-12 year olds to this PWI item should be interpreted with caution, as their ability to understand it is likely to be undeveloped.

In addition to the PWI domains, four exploratory domains were also tested (*self, environment, activities* and *school*). However these failed to contribute additional unique variance to the explanation of GLS, and therefore do not meet the criteria for inclusion in the PWI (International Wellbeing Group, 2006). Although the exploratory domain *school* was unable to predict GLS in the 8-12 year old sample, in the younger 6-8 year old sample, the inclusion of *school* captured the variance contributed by *personal relationships*, and became a unique predictor of GLS. Considered alongside the qualitative data, which clearly reveals the importance of relationships to young children, it appears that the importance of the domain *school*, for 6-8 year old children, is dependent upon the personal relationships experienced in that location. The results of research with Australian high school

students (Tomyn & Cummins, 2011) demonstrated, similarly, that *school* cuts across other domains, causing more of their variance to be shared.

It is of note that not all the PWI domains, which predict adult GLS, were able to predict the GLS of 6-12 year old children. Cognitive immaturity (manifest for example in an inability to understand the word or concept *health*), along with children's dependence upon adult caregivers, provide credible explanations for the predictive failure of some domains.

This dependence upon adults can also result in the phenomenon of satisfaction saturation. It is proposed that this occurs when a domain is saturated with satisfaction. For example, children's experience of the domain *standard of living* is dependent upon the actions and values of adult caregivers. When parents provide desired material possessions, or influence children's expectations about them, dissatisfaction with the domain can be eliminated. Although the domain may be intuitively fundamental to children's subjective wellbeing, the moderating actions of primary caregivers can result in complete satisfaction in the child. The variance able to be carried by a saturated domain may thereby be limited to individual differences in HPMood. This is an important new understanding for the way the PWI domains operate.

To summarise, the GLS and PWI are both suitable for use with children. However immature vocabulary and cognition may affect children's understanding of some items. For this reason, unambiguous and concrete explanations, as described, must accompany administration of the GLS and PWI, in order to achieve valid responding. Furthermore, cognitive immaturity, along with satisfaction saturation due to the moderating actions of primary caregivers, is likely to result in the failure of some PWI domains to predict child GLS.

Assessing other variables in 6-12 year old children

In addition to enabling an assessment of the GLS and PWI, the questionnaire included a number of other items. Again, immature cognition and vocabulary affected children's responses. The results also reveal that when items include only known words, children do feel able to respond. But if these items assess immature aspects of the child such as self concept, or undeveloped cognitive skills such as the buffering strategies of optimism and perceived control, high response variance indicates that children find such items confusing.

This is an important finding. A questionnaire item that is sufficiently simple to be understood by child respondents may still be confusing if the variable being assessed, or some aspect of it, is undeveloped in the child. This is exemplified in the PWI item for the domain *future*. The adult version uses the wording *"in the future"* whereas the school children version uses the simplified wording *"later on."* Young children's immature grasp of temporal constructs is clearly revealed by analysis of these data, despite this simplified wording.

In addition to revealing the combined effect of immature vocabulary and cognition on children's understanding of questionnaire items, the results also enable insight into the way children respond to them. This will now be discussed.

Explaining Children's Responses to Questions of SWB

The results reveal a response effect in children's self reported SWB, with respondents tending to use the extreme ends of the response continuum. This effect is greatest for 6 to 8 year olds, but is also evident for children aged 8-12 years. It is possible that this extreme responding represents acquiescence due to non comprehension. However great care was taken to ensure respondent comprehension, and children did use the *Don't know* response option when it was provided. Furthermore, the qualitative data collected in Study 3, show clearly that the children did understand most of the questions they were asked. The explanation of acquiescent responding is therefore rejected.

Instead, it is proposed that extreme responding occurs as the result of the concrete and dichotomous thinking typical of young children. The results show a decrease in extreme responding in the 8-12 year old sample, and this is consistent with an explanation of age related cognitive maturation. Thus it appears that 6-8 year old children tend to use the response scale as a binary choice, reflecting their thinking style. As cognition matures between 8 and 12 years, children are increasingly able to report subtle variations in their subjective experience.

The effect of children's tendency to use the response scale as a binary choice (*completely happy* or *not at all happy*) is to inflate child SWB data above the normative adult range. Data for Australian Adults are normally negatively skewed (Cummins, 2010). Thus the results indicate that as for adults, child SWB is also normally positive. However since children do not use the response scale in the same way as adults, their higher mean SWB reflects dichotomous thinking, not higher SWB.

When responding to questions assessing their SWB, it is known that adults use HPMood, flavoured with cognition specific to the item (Cummins, 2010). It seems likely that children also respond in this way, with HPMood providing a positive affective background, against which cognition related to specific events occurs. However an important difference must be noted. This is that a single, current, negative experience can result in young children reporting themselves to be not at all happy. It is proposed that this occurs for two reasons. The first is the use of the scale as a binary choice as just described. The second relates to young children's absolute connectedness to their present experience, as revealed by the qualitative data.

From these data, it is clear that single negatively valenced events, occurring very recently, may exclusively influence a 6-8 year old child's response to domain items. Rather than considering these events within a bigger picture as an adult might, for example *"I have a head cold today but all things considered I am*

generally satisfied with my health" a child with a head cold may report themselves in general to be not at all happy. Young children's self reported SWB can thus be impacted strongly, but temporarily, by minor negative events. The comments of a 7 year old female exemplify this. While responding to the question of satisfaction with life as a whole, she said *"I think 10. Yes 10. But not yesterday. Yesterday would have been a zero. I got stung by a bee!"*

Self reported SWB in 6-8 year olds can thus be seen to represent a moment in time, a snapshot of subjective experience. This is in contrast to adult self reported SWB, where mature cognition enables sophisticated consideration of individual events within a broader context of life, and life domains. Understanding this potential for unreliability in young children's self report data is crucial to the effective assessment of their SWB.

My research indicates that, in the absence of a recent or current negative event, most 6-8 year old children report their SWB as 10 during individual interview. If this finding is able to be replicated, any extreme negative deviations from a response of 10, occurring in the absence of a recent or current negative event (no matter how apparently minor or temporary) would constitute cause for concern regarding the child's SWB. It is thus recommended that both quantitative and qualitative data are gathered during individual interview with young children, to provide a context against which low SWB scores can be considered. Furthermore, retesting is also recommended, given the clear potential for unreliability.

It is intuitive that the likely impact of minor negative events on children's self reported SWB would decrease through the process of cognitive maturation, and also through developmental gains in emotion regulation. However qualitative data were not gathered for the 8-12 year old sample, so this cannot be verified by my research. It is clear however, that unreliability should not be touted as reason to exclude young children from self reporting their SWB. Rather their valid self report should be elicited, and then considered, within the framework of their developmental immaturity.

To summarise, as for adults, SWB in 6-12 year old children is normally positive. However young children do not respond to questions of SWB in the same way as adults. Just as using developmentally appropriate research methodology is essential, it is also essential to consider child data in a developmental context.

The understanding that children's self reported SWB can be impacted strongly, but temporarily, by minor negative events, leads naturally to questions about the system of SWB homeostasis, which operates in adults to moderate the impact of negative events. The implications of my findings regarding SWB homeostasis in young children will now be discussed.

The operation of SWB homeostasis in young children

In adults, it is proposed that the cognitive defence mechanisms of SWB homeostasis act to protect and maintain SWB by moderating the impact of negative or positive external events (Cummins, 2010). The results of my research reveal that two of the proposed homeostatic buffers, optimism and perceived control, are immature in 8-12 year old children. Since children of this age are still developing cognitively, this result makes sense.

It seems plausible, then, to propose that primary caregivers may play a pivotal role in the defence of children's SWB, by acting to scaffold children's immature cognitive defences. This probably occurs through the verbal reframing and interpretation of negative external events for children, until they develop the cognitive maturity to defend HPMood in this way for themselves.

Consider a 9 year old who fails to win a running race. Supportive adult caregivers could assist the child, by verbally modelling the cognitive strategies which buffer against the impact of this negative event. For example *"You didn't win today but there is always the next race." "You did your best and that is more important than winning."* While the buffering strategies of SWB homeostasis are immature, adult caregivers can thus assist children to interpret negative events so that impact is moderated. It is also likely that children's connection to the present moment assists in buffering their SWB. This is because once a negative event is over, the child's focus will move inexorably to the new events of the present.

It is clear that young children lack the cognitive strategies which defend SWB in adults, and their moment to moment subjective experience can be volatile. Significant adults can thus intercede to stabilise SWB in children, by reframing negative events so that their emotional response may be regulated. Furthermore, by observing adults modelling the buffering strategies, children can learn the skills required to cognitively defend SWB for themselves.

In summary, the cognitive components of the system of SWB homeostasis are immature in 6-12 year old children. It is likely that significant adults play a pivotal role in assisting young children to defend and maintain HPMood, until such time as they develop the cognitive strategies required to do this themselves.

Conclusion

There is much to be learned about the subjective experience of the child, by listening to their authentic voice. The methodological barriers to this are many and complex. However, this thesis has shown that through the application of developmentally appropriate research methodology, and consideration of child data within a framework of developmental immaturity, the subjective experience of the child may be properly elicited and understood.

The Personal Wellbeing Index (International Wellbeing Group, 2006) provides a useful tool for eliciting 6-12 year old children's self report of SWB. In seeking this, my research has clearly revealed that like adults, children's SWB is normally positive. However young children do not respond to questions of SWB in the same way as adults, and are clearly dependent upon adults for the protection and maintenance of their SWB until they are cognitively mature enough to do so for themselves.

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