

# Anxiety in Children: Testing the Role of Cognition

Jackie Lodge and Gail Tripp

*University of Otago*

Research on anxiety in children has focused on the assessment, diagnosis, and epidemiology of childhood anxiety disorders. The etiology of children's anxiety has received limited attention. Recently, researchers have suggested that cognitive models of anxiety, developed to explain adult anxiety disorders, may be appropriate to children. Following a brief overview of fear and anxiety in children, the empirical evidence in support of a cognitive explanation of childhood anxiety is presented. The role of negative self-talk in children's anxiety is targeted specifically. Next several important methodological and theoretical issues in the assessment of children's cognitions, and the cognitive model of anxiety, are addressed: the age at which children can report their self-talk, the validity of cognitive assessment procedures, unitizing and coding children's self-talk, and the site and timing of data collection. Where appropriate, the authors' research is presented to highlight these issues.

**C**hild psychopathology is a new discipline with an accompanying short research history. It is only in the last two to three decades that researchers have begun to recognize, and study, psychological disorders in children separately from adults. A majority of this research has focused on the externalizing disorders (e.g., Attention Deficit Hyperactivity Disorder), with the internalizing disorders, including anxiety, receiving relatively less attention.

The limited attention paid to the internalizing disorders seems to reflect their nature (i.e., they are seldom troubling to others), rather than their occurrence or the impact they have on children. Studies which have considered the internalizing disorders report large numbers of children experience significant difficulties with anxiety. In fact anxiety disorders have been cited as the most prevalent disorders of childhood and adolescence (Beidel, 1991; Bernstein & Borchardt, 1991). Furthermore, although the

prognosis for the internalizing disorders is generally better than that of the externalizing disorders, many children do not simply outgrow their anxiety (Beitchman, Wekerle & Hood, 1987; Esser, Schmidt & Werner, 1990; Fischer, Rolf, Hasazi & Cummings, 1984).

Research on the etiology and maintenance of anxiety in children has lagged behind work on its assessment, diagnosis, and epidemiology. Clinicians and researchers have largely relied on the adult literature and models to explain anxiety in children. Most recently, researchers have attempted to apply the cognitive model of anxiety to children, suggesting that cognitions, particularly negative self-talk, play a role in maintaining, if not causing, children's anxiety (Kendall, Howard & Epps, 1988; Francis, 1988). In response, cognitive therapy is now being used in the treatment of anxiety disorders in children. The empirical evidence to support the use of this approach is limited.

The present paper aims to introduce the reader to the area of childhood anxiety, before going on to consider the role of cognitive factors in its etiology and maintenance. The paper is in three parts. Part one serves as a brief introduction to, and an overview of, childhood anxiety: the development of fear/anxiety, and the epidemiology and prognosis of childhood anxiety disorders. In part two the cognitive model of anxiety is introduced and empirical evidence supporting a role for cognition in children's anxiety is reviewed. Finally methodological and theoretical issues in the assessment of children's cognitions are discussed, with reference to our own research.

## Fear and Anxiety in Children

Before beginning a discussion of anxiety in children, it is helpful to draw attention to the manner in which the terms "fear" and "anxiety" are used in the literature. Some researchers use these terms interchangeably whereas others assert they are independent constructs and should be treated as such. Unfortunately it is not always clear how different researchers are using these terms. As a general rule, the developmental literature on emotion refers to fear rather than anxiety, while the clinical literature tends to focus on anxiety rather than fear. In keeping with this practice, the term fear is used when describing the normal development of anxiety and the nomenclature of the American Psychiatric

Association (APA, 1980; 1987; 1994) is used when discussing clinically abnormal levels of anxiety.

### **Normal Fears of Childhood**

Research on "normal" fears has indicated they are common, relatively short-lived, mild in intensity, and necessary for children's safety and survival (King, 1993). The number and nature of children's fears appear to change as a function of age and developmental level (Bauer, 1976; 1980; Ferrari, 1986; Marks, 1987; Morris & Kratochwill, 1983). Infants and young children tend to fear events that occur in their immediate environment (e.g., loud noises). By school age, with developing imaginations, children express fears of supernatural creatures and being left alone. Later, with increasing cognitive maturity and control over their environment, children's fears become more specific and reality-based. Concerns associated with school, safety, social situations, and personal appearance are common by middle childhood and adolescence. In general, the number of fears reported by children peaks around age three years (Draper & James, 1985) and then steadily declines with age (Ferrari, 1986; Marks, 1987).

### **Childhood Anxiety Disorders**

The distinction between "normal" anxiety and "pathological" anxiety depends on a number of factors, including the developmental appropriateness and severity of the anxiety, and the context in which it is experienced. Klein and Last (1989) describe pathological anxiety as of inappropriate severity for a child of that age, and causing impairment in functioning or considerable subjective distress. Thus, the anxiety must be limiting to the child, and not merely distressing to adults, in order to be considered pathological. In such cases, a psychiatric diagnosis (of a clinical "anxiety disorder") would usually be made, and an intervention considered (Klein & Last, 1989).

It is only in the last decade that prevalence estimates for childhood anxiety disorders have become available. This probably reflects the inclusion of the category "Anxiety Disorders of Childhood or Adolescence" in the DSM-III in 1980 (APA, 1980). The introduction of this category represented the first formal recognition and refinement of anxiety disorders of childhood (Last, Strauss, & Francis, 1987). The DSM-III (1980) described three disorders, Separation Anxiety Disorder, Overanxious Disorder, and Avoidant Disorder of Childhood. These three disorders were retained, and their criteria updated, in the DSM-III-R (1987). In the recently published DSM-IV (APA, 1994) Separation Anxiety Disorder is retained, however, Overanxious Disorder and Avoidant Disorder have been subsumed under Generalized Anxiety Disorder and Social Phobia respectively.

Prevalence estimates tend to vary with the age of the sample, the population studied (clinic or community), the definition of the disorder being reported, the assessment measures used, and the source of information about the child (child or parent or both) (see Bernstein and Borchardt, 1991, for a review). However, general population studies suggest that between 9 percent and 21 percent of children and adolescents meet DSM-III criteria for some form of an

anxiety disorder, with prevalence rates for individual anxiety disorders ranging from less than 1 percent to 13 percent (Anderson, Williams, McGee, & Silva, 1987; Costello, 1989; Kashani & Orvaschel, 1990; Kashani, Orvaschel, Rosenberg, & Reid, 1989).

Relatively few studies have investigated the course, and long-term outcome, of childhood anxiety disorders. The available studies tend to be either retrospective (Hollingsworth, Tanguay, Grossman, & Pabst, 1980), or short-term (i.e., 4-10 years, generally five years) longitudinal studies (Agras, Chapin, Jackson, & Oliveau, 1972; Beitchman et al., 1987; Berg & Jackson, 1985; Cantwell & Baker, 1989; Esser et al., 1990; Fischer et al., 1984). Of these methods, the latter is preferable as it is less prone to retrospective distortions, such as memory biases (Klein & Last, 1989).

Data from the short-term prospective studies suggest a promising prognosis for neurotic/emotional disorders (Beitchman et al., 1987; Esser et al., 1990) or internalising disorders (Fischer et al., 1984) compared with externalising disorders. However, the prognosis appears to be at least partly dependent on the type of anxiety disorder under study. Overanxious Disorder, which has an older age of onset than Separation Anxiety or Avoidant Disorder, has been identified as following a chronic course (Cantwell & Baker, 1989; Keller, Lavori, Wunder, Beardslee, Schwartz, & Roth, 1992). Similarly, poor long-term prognoses have been found for Obsessive-Compulsive Disorder (Flament, Whitaker, Rapoport, Davis, Berg, Kalikow, Sceery, & Shaffer, 1988; Hollingsworth et al., 1980), and School Phobia (Berg & Jackson, 1985). There is also evidence to suggest that certain anxiety disorders (e.g., Separation Anxiety) may not remit entirely, but develop into other disorders over time (Cantwell & Baker, 1989). Although the evidence is not conclusive, Separation Anxiety has been linked with Agoraphobia or Panic Disorder in adulthood (see Gittelman-Klein & Klein, 1988, for a review).

In addition to disorder type, prognosis may be dependent on the age at which treatment is sought and the success of the intervention. In their 10-year follow-up study of 168 adolescent school-refusers, Berg and Jackson (1985) noted that intelligent youngsters treated prior to age 14 years who were "well or substantially better shortly after discharge" had particularly favorable outcomes (p366).

At present, the nature and extent of continuity between childhood anxiety disorders and adult anxiety disorders are unclear. The meaning and importance of the similarities and differences between child onset anxiety disorders which persist into adulthood, and adult onset disorders is not well understood. However, there is evidence to suggest that, untreated, childhood anxiety may have ongoing negative consequences for a significant number of adults (see Bulik and Oakely-Brown this volume).

### **Cognition and Anxiety in Children**

Cognitive theorists propose that dysfunctional or unhelpful cognitions (internal dialogue, covert thoughts, self-talk) are important in the etiology and maintenance of adult anxiety. More specifically, it is argued that the cognitions of anxious adults are characterized by themes of threat, danger, and

unpredictability (Beck, Brown, Steer, Eidelson, & Riskind, 1987; Greenberg & Beck, 1989). Such negatively valenced cognitions are also thought to play a role in the development and/or maintenance of anxiety disorders in children (Kendall et al., 1988; Francis, 1988).

Research with clinically anxious adults has shown they report, or endorse, more threat-related or negative self-talk (internal dialogue which impedes self-control and task completion) than non-anxious individuals (Beck, Laude, & Bohnert, 1974; Chambless, Caputo, Bright, & Gallagher, 1984; Hibbert, 1984; Mizes, Landolf-Fritsche, & Grossman-McKee, 1987). Similarly, an increased frequency of negative self-talk has been identified in "normal" adults in situations generating social anxiety (Cacioppo, Glass, & Merluzzi, 1979; Myszka, Galassi, & Ware, 1986), dental anxiety (Kent, 1985), and test anxiety (Kent & Jambunathan, 1989). Positive self-talk (self-statements likely to facilitate control of anxiety and task completion), on the other hand, has not been linked with the absence of anxiety in adults (Cacioppo et al., 1979; Kendall & Hollon, 1981). The relationship between anxiety and cognitions in children is less well established. However, a limited number of studies have been published suggesting cognitive differences between anxious and non-anxious children. The majority of these studies have focused on the self-talk of situationally anxious children.

### *Self-Talk and Situational Anxiety*

Consistent with the results from studies with adults, negative self-talk has been shown to feature in the internal dialogue of anxious children. Children with high levels of situational anxiety have been found to engage in, or endorse, significantly more negative self-statements than children with low levels of anxiety (Prins, 1985; 1986; Prins, Groot, & Handwald, 1994; Zatz & Chassin, 1983, 1985).

Prins (1985) used a structured verbal thought-listing approach (the individual provides a retrospective verbal record of their self-talk during a specific time period) to examine self-talk and self-regulation (strategies, cognitive or behavioural, the child consciously engages in to control emotional distress) in forty 8-10 year old children during a dental visit. Just prior to receiving an amalgam restoration, high- and low-anxious subjects were individually interviewed regarding their dental fear, self-talk, and self-regulation. High dental fear was related to negative self-talk, while low dental fear was not clearly associated with any particular type of self-talk.

In a second, similar study, Prins (1986) examined self-talk and self-regulation in forty-four 8-10 year old children during a fear-provoking behavioural test (jumping off a high board and diving off a low board into a swimming pool). Subjects, divided into high-, moderate-, and low-anxious groups based on their performance (i.e., whether they could jump/dive off the board), were asked to recall their thoughts while climbing onto, and standing on, the diving boards. As in the first study, negative self-talk was related to high fear, while no specific type of self-talk was clearly related to moderate or low fear.

Two separate studies used the Children's Cognitive Assessment Questionnaire (CCAQ), a 50-item measure

devised to assess self-talk associated with test anxiety in fifth and sixth grade children (Zatz & Chassin, 1985), to compare the self-talk of children with high and low levels of test anxiety. The results from both studies showed the high-test-anxious children endorsed significantly more off-task, negative, and coping self-statements (self-instruction directing thoughts or behaviours), than low-anxious children (Prins et al., 1994; Zatz & Chassin, 1985).

Unlike the adult research, the relationship between positive self-talk and anxiety in children is equivocal. Some studies (Zatz & Chassin, 1983, 1985) have reported higher rates of positive self-talk in situationally low-anxious children, while others (Prins, 1985, 1986; Prins et al., 1994) have found no difference in rates of positive self-talk between high- and low-anxious children. The reason for these discrepant findings is unclear. It is tempting to explain the differences on methodological grounds (i.e., differences in the data generated by recall [thought listing] and endorsement [questionnaire] procedures), however, Zatz and Chassin (1985) and Prins et al. (1994) obtained different results for positive self-talk using the same questionnaire.

### *Self-talk in Clinically Anxious Children*

To date, only one study (Kendall & Chansky, 1991) has considered the relationship between anxiety and self-talk in clinically anxious children. Kendall and Chansky (1991) used verbal thought-listing and a self-statement questionnaire to compare the self-talk of twenty-four 9-14 year-old clinically anxious (DSM-III-R) children with that of nine clinic-referred non-anxious children during a mildly anxiety provoking event (giving a short videotaped talk about themselves). Positive and negative self-talk werenot found to differentiate the groups. However, anxious subjects were found to report significantly more coping/strategic self-talk than controls (i.e., self-talk "directing a thought or behaviour, positively influencing control and completion of the task", p174). This finding is consistent with reports from other researchers that situationally high-anxious children endorse more coping cognitions than the low anxious children (Prins et al., 1994; Zatz & Chassin, 1985).

The failure of negative and positive self-talk to differentiate the anxious and non-anxious clinical group in this study is not surprising. Both groups participated in the mildly anxiety provoking task and children from the two groups may have experienced similar levels of situational anxiety. Comparisons of the self-talk of anxious and non-anxious subjects outside the laboratory are necessary before drawing conclusions about self-talk valence in clinically anxious children.

The difference in the occurrence of coping self-talk in these two groups is more interesting. Kendall and Chansky (1991) suggest that this increased coping self-talk may be a marker of anxiety, either an attempt to reduce discomfort through personal reassurance, or dysfunctional self-focused attention. Unfortunately information on coping self-statements in anxious children (clinic or situational) is limited as such statements are seldom identified separately from positive self-statements.

From the few available studies it appears that increased negative self-talk and, to a lesser extent, decreased

positive self-talk, is associated with heightened levels of situational anxiety in children. The importance of valence in the self-talk of clinically anxious children is unclear. There is some evidence that coping self-statements, although not well studied, may discriminate between anxious and non-anxious children. Under conditions of mild anxiety, clinically anxious children and children with high levels of situational anxiety produce more coping self-statements than non-anxious children or children with low levels of situational anxiety.

There are, however, too few studies from which to draw any firm conclusions about the role of cognition in children's anxiety generally, or the importance of negative, positive, and coping self-talk specifically. Certainly, from a clinical perspective, it is unclear whether cognitive therapists should strive to decrease negative self-talk, increase positive self-talk, or target the coping self-statements of anxious children. Further research on the nature (content, valence, and frequency) of self-talk and its relationship to anxiety in both situationally and clinically anxious children is clearly required. However, this research cannot proceed without considering how best to assess self-talk in children. The way in which self-talk is measured and coded, the child's developmental level, and the situation in which the self-talk is assessed are all likely to influence the resulting cognitive data.

### Assessing Children's Cognitions

A number of important methodological and theoretical issues face researchers and clinicians interested in the assessment of anxious children's cognitions. Attention is drawn to four of these: the age at which children can reliably report their self talk, the validity of cognitive assessment methods, the coding of cognitive data, and the site and timing of data collection. Ongoing research by the authors is described as appropriate.

### Developmental Considerations

It seems reasonable to assume that certain processes must be sufficiently developed in order for children to be able to report their self-talk. Children must recognise that thoughts exist, possess a concept of self, and possess the ability to communicate verbally to report their internal dialogue. In other words they must possess metacognitive abilities - knowledge of their cognitive processes and the ability to guide and control them.

There is evidence that children as young as three years of age use mental verbs such as *know* and *think* to refer to mental states (Astington & Gopnik, 1991). This suggests that from early childhood children have at least a vague awareness of mental processes. By five years of age the basic dimensions of language development (i.e., phonology, syntax/grammar, semantics, and pragmatics) are well-established and children have a vocabulary of more than two thousand words (Stone & Lemanek, 1990). However, it is not until around eight years that children acquire a global sense of self. By this age children are able to differentiate between mental and physical aspects of the self, and can explain their uniqueness in terms of experiencing different thoughts and feelings to others (Stone

& Lemanek, 1990).

Thus, while quite young children (e.g., five to six years) may be able to report self-talk, the reliability of such reports should be considered carefully. Interestingly, all published reports on anxious children's self-talk describe subjects eight years and older (Ambrose & Rholes, 1993; Brown, O'Keeffe, Sanders, & Baker, 1986; Fox, Houston, & Pittner, 1983; Houston, Fox, & Forbes, 1984; Kendall & Chansky, 1991; Prins, 1985, 1986; Prins et al., 1994; Zatz & Chassin, 1985). It is not clear if these researchers attempted to collect data from younger subjects. In developing assessment protocols for our research in this area, we found children as young as five to six years could use think-aloud and verbal thought-listing procedures to report their thoughts and feelings. However, the number of children of this age able to report their self-talk was small. By eight years of age, the majority of children assessed were able to report their self-talk using these techniques. All of the 10 year old children who were assessed reported self-talk.

### The Validity of Cognitive Assessment Procedures

Over the years a variety of techniques have been developed for assessing self-talk in adults (Glass & Merluzzi, 1981; Kendall & Hollon, 1981; Martzke et al., 1987). These procedures (i.e., think-aloud, thought-sampling, thought-listing, thought-dubbing, self-statement questionnaires)<sup>1</sup> are now being used (with few modifications) to assess self-talk in children. For the most part children seem capable of responding to these procedures, producing self-talk which is codeable. However, two closely linked questions arise, "Is the self-talk produced by these methods valid?" and "Which is/are the best technique(s) for assessing children's self-talk?"

As cognitive assessment methods rely on self-report, it is difficult to determine if the self-talk reported accurately reflects what is experienced. In response, Meichenbaum and Cameron (1981) proposed a set of guidelines for the collection of cognitive self-report data designed to maximise its validity (see Meichenbaum & Cameron, 1981, p6-7). The concurrent/expressive methods (i.e., think-aloud, thought-sampling) seem to fit best with their guidelines. These procedures tap self-talk as it occurs, involve minimal probing, and yield a large sample of self-talk. If conducted immediately after the target situation/event, recall and prompted recall procedures (i.e., thought-listing, video-mediated recall) also fare well.

More recently, two reviews on the validity of cognitive assessment procedures with adults have appeared (Clark, 1988; Glass & Arnkoff, 1994). Clark (1988) examined the validity of structured self-statement questionnaires, thought-listing, thought-sampling, and think-aloud procedures. He concluded "no single approach to cognitive assessment is consistently superior to all others" (p14) and "more research is needed to establish the validity of these measures" (p14). Glass and Arnkoff (1994) reviewed the adult literature on the cognitive assessment of social phobia and social anxiety, specifically considering structured self-statement questionnaires and production techniques (e.g., thought-listing, thought-sampling, video-mediated recall). They concluded that "in general, most self-statement measures

used with social phobia and social anxiety have shown clear evidence of content and criterion-related validity. However, in deciding *which* measure to choose, the specific purpose of the research study or clinical assessment must be considered carefully" (p264). There are no reviews on the validity of cognitive assessment techniques with children.

Another important aspect of validity is the extent to which different cognitive assessment measures yield comparable data. If separate measures of a construct produce similar data, this serves to strengthen confidence in the accuracy of the measures (Clark, 1988). Only two studies in the literature have used multiple cognitive assessment methods to assess self-talk in anxious children. Houston et al. (1984) used both a think-aloud and an endorsement approach to assess self-talk in 67 situationally-anxious fourth-grade children. Low to moderate significant correlations between the two cognitive assessment methods were found for five of the seven self-talk types coded. Kendall and Chansky (1991) applied both a thought-listing and an endorsement approach to measure self-talk in 9-14 year-old clinically anxious children and clinic-referred non-anxious controls. Although the self-statement questionnaire did not differentiate anxious from non-anxious children, thought-listing data indicated that significantly more anxious than non-anxious subjects reported "coping" self-talk.

The limited overlap in the self-talk recorded by these multiple cognitive assessment methods may lead some to question the validity of the different approaches. However, the assessment procedures differ on at least three dimensions which could explain their lack of agreement. To begin with, the different cognitive assessment methods utilise different cognitive processes (Kendall & Chansky, 1991). The self-talk accessed through concurrent procedures (e.g. think-aloud) is retrieved from short-term memory, the self-talk accessed through recall procedures (e.g. thought-listing) from longer-term memory (Blackwell et al., 1985; Kendall & Chansky, 1991), while endorsement approaches (e.g. self-statement questionnaires) employ recognition memory. Second, the assessment methods tap different types of self-statements (Kendall & Chansky, 1991; Myszka et al., 1986). Self-statement questionnaires produce *global* statements, while thought-listing and think-aloud produce more *specific* and transitory information (Hurlburt & Melancon, 1987; Kendall & Chansky, 1991; Myszka et al., 1986). Finally production methods (e.g., think-aloud and thought-listing) draw on the children's *unique* experience of the situation, whereas endorsement approaches (self-statement questionnaires) have subjects select, from a set of responses, the self-talk most like their own.

At present, it is unclear which cognitive assessment procedures are most suitable for eliciting self-talk in children of different ages. Rather than simply interpreting low concordance across procedures as evidence for their poor validity researchers need to i) carry out further studies which compare the different cognitive assessment techniques, and ii) identify the specific conditions necessary to optimise the validity of each technique with children, i.e., the effect of instructions, prompts, and mode of presentation (written or oral). We are carrying out studies comparing think-aloud and thought-listing; think-aloud, thought-listing, and a self-statement

questionnaire; and thought-listing and video-mediated recall (Lodge, Harte, & Tripp, submitted, in progress).

#### *Unitizing and Coding Self-Talk Data*

Prior to analysing cognitive data, it is necessary to organise the self-talk in a meaningful way. This is easily achieved with recognition/endorsement procedures, in which separate self-statements representing categories of interest are specified on a questionnaire prior to data collection. For production-type methods (e.g., think-aloud, thought-listing), however, it is necessary to specify precisely how the cognitive data will be divided into separate self-statements ("unitised") and how each self-statement will be interpreted ("coded"). Unfortunately, it is often unclear how researchers have unitised self-talk data obtained via production-type methods. Whereas some researchers (e.g., Fulkerson, Galassi, & Galassi, 1984) clearly state how they have chosen to divide self-talk data into separate "units" for coding, others (e.g., Kendall & Chansky, 1991) fail to specify how unitising has been achieved. The way in which self-talk data are unitised impacts on the *number* of self-statements identified. Thus, different conclusions could be drawn regarding the frequency of self-statement types if researchers choose to unitise their data in different ways.

In addition to the problem of unitising, there is a general lack of uniformity across studies in how data are coded. Many researchers (e.g., Kendall & Chansky, 1991; Prins, 1985, 1986) use positive/negative valence as the basis of their coding system, whereas others define different categories (e.g., "coping" vs. "catastrophising" [Brown et al., 1986] "on-task" vs. "off-task" [Zatz & Chassin, 1983, 1985] "preoccupation", "analytic attitude" [Fox et al., 1983; Houston et al., 1984]). While it is appreciated that different studies vary in the situations/tasks they focus on, and the cognitive assessment methods used, this lack of uniformity in coding is problematic as it hinders generalisability across studies (Kendall & Chansky, 1991).

Clearly, the way in which cognitive data are unitised and coded influences the results of a study which, in turn, impacts on the state of knowledge in a given area. A unitising system should recognise that content and grammatical and paralinguistic cues (e.g., pauses, tone, inflection) are important discriminators of separate self-statements. Coding systems should have their basis in theory, rather than merely specifying convenient ways of grouping self-talk data. Once theoretically-meaningful coding systems have been developed, other researchers should use and/or build upon these systems.

In response to the lack of a standardized system for unitizing and coding children's self-talk data one of us (JL) has developed what we believe to be theoretically based systems for unitising and coding self-talk data. As much as possible, these systems were designed to be consistent with those previously described in the literature. Inter-rater reliability with both the unitizing and coding systems has been uniformly high across studies and raters. Manuals describing both systems, and the inter-rater reliability data, are available from the first author.

continued on page 34

## The Site and Timing of Data Collection

### (i) Site

Most studies on the cognitions of anxious children have looked at the self-talk generated by "normal" or anxious children placed in situations designed to create mild anxiety. The self-talk of children with high levels of situational and/or trait anxiety is then compared with that of children who have low levels of situational anxiety and/or trait anxiety. The relationship between anxiety levels and self-talk type is also examined. To date, there are no published studies comparing the self-talk of anxious and non-anxious children both in, and outside, the laboratory situation. Until such studies are carried out, there is no way to establish if the self-talk generated by non-anxious subjects in the analogue situation resembles that experienced by clinically anxious children.

In response to the call for more studies with clinically anxious children, we are in the final stages of collecting data from a group of children meeting DSM-III-R criteria for an anxiety disorder and an age- and sex-matched non-anxious sample. Think-aloud and thought-listing procedures are being used to collect self-talk data during two separate mildly anxiety provoking tasks. The children's self-talk at other times, including situations nominated as anxiety provoking, is being collected via a home diary (thought sampling).

### (ii) Timing

Researchers interested in the cognitions of anxious children are often able to interact directly with their subjects in anxiety provoking situations. Clinicians working with anxious children seldom have this opportunity. As a consequence, they often rely on children's (and adults') ability to recall or predict their self-talk. The recall approach is clearly open to memory- and reporting-biases (Blackwell et al., 1985), whereas the predictive approach may reflect the child's current thinking. As clinicians we were interested in the accuracy of children's prediction and recollection of their self-talk. Using a thought-listing procedure, we had 9-10 year old school children predict (two weeks prior) and then recall (one week post) their thoughts and feelings during a mildly anxiety provoking task we had them engage in. Coded self-talk from the predictive, actual, and recall conditions was then compared. The children's ability to predict and recall their self-talk was poor. Although similar themes emerged across the three conditions, the overlap in the unitized *self-talk*, between the predictive and actual conditions, and the actual and recall conditions, was low. Prediction and recall of *feelings* were slightly better (Lodge & Tripp, in progress). In light of this result, we urge clinicians to have children record their anxious self-talk as it occurs.

### Concluding Comments

Cognitive models of anxiety, developed to explain adult anxiety, are now being applied to children in an effort to understand and treat their anxiety. The merit of this approach is arguable as there is very little empirical research on the relationship between anxiety and cognitions in children. A small number of studies have identified an increase in

negative self-talk in anxious children. However, as most of these studies have been with situationally anxious children, the generalizability of their findings to clinical populations is questionable. Additional research on the self-talk of clinically-anxious children, and children in anxiety provoking situations is clearly called for.

In planning research on the relationship between anxiety and cognitions in children, researchers should consider the methodological and theoretical issues discussed above. We know that children are capable of reporting their self-talk, but that the reliability of such reports in children under eight may be poor. While a range of techniques are available for assessing children's self-talk there is some evidence that the self-talk reported is method dependent. Wherever practicable existing coding and unitizing schemes should be used to facilitate direct comparison across studies.

Finally, we would like to add that we have found conducting research on the role of cognition in children's anxiety both exciting and frustrating. As it is a new field of enquiry, research strategies are not well established and considerable time is "wasted" working out how to do things. Compensation comes in the form of new knowledge about how to help anxious children, and from our subjects themselves.

### NOTE

- 1 See Appendix 1 for a description of these procedures

### REFERENCES

- Agras, W.S., Chapin, H.N., Jackson, M., & Oliveau, D.C. (1972). The natural history of phobia: course and prognosis. *Archives of General Psychiatry*, 26, 315-317.
- Anderson, J.C., Williams, S., McGee, R., & Silva, P.A. (1987). DSM-III disorders in pre-adolescent children. *Archives of General Psychiatry*, 44, 69-76.
- Ambrose, B. & Rholes, W.S. (1993). Automatic cognitions and the symptoms of depression and anxiety in children and adolescents: an examination of the content-specificity hypothesis. *Cognitive Therapy and Research*, 17(2), 153-171.
- American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders (3rd ed.)*. Washington, DC: Author.
- American Psychiatric Association. (1987). *Diagnostic and Statistical Manual of Mental Disorders (3rd ed. Rev.)*. Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders (4th ed.)*. Washington, DC: Author.
- Astington, J.W., & Gopnik, A. (1991). Theoretical explanations of children's understanding of the mind. *British Journal of Developmental Psychology*, 9, 7-31.
- Bauer, D. (1976). An exploratory study of developmental changes in children's fears. *Journal of Child Psychology and Psychiatry*, 17, 69-74.
- Bauer, D. (1980). Childhood fears in developmental perspective. In L. Hersov & I. Berg (Eds). *Out of School*. New York: John Wiley & Sons Ltd.
- Beck, A.T., Brown, G., Steer, R.A., Eidelson, J.I., & Riskind, J.H. (1987). Differentiating anxiety and depression: A test of the cognitive content-specificity hypothesis. *Journal of Abnormal Psychology*, 96(3), 179-183.
- Beck, A.T., Laude, R., & Bohnert, M. (1974). Ideational

- components of anxiety neurosis. *Archives of General Psychiatry*, 31, 319-325.
- Beidal, D.C. (1991). Social phobia and overanxious disorder in school-age children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30(4), 545-552.
- Beitchman, J.H., Wekerle, C., & Hood, J. (1987). Diagnostic continuity from preschool to middle childhood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 26(5), 694-699.
- Berg, I., & Jackson, A. (1985). Teenage school refusers grow up: a follow-up study of 168 subjects, ten years on average after in-patient treatment. *British Journal of Psychiatry*, 147, 366-370.
- Berstein, G.A., & Borchardt, C.M. (1991). Anxiety disorders of childhood and adolescence: A critical review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30(4), 519-532.
- Blackwell, R.T., Galassi, J.P., Galassi, M.D., & Watson, T.E. (1985). Are cognitive assessment methods equal? A comparison of think aloud and thought listing. *Cognitive Therapy and Research*, 9(4), 399-413.
- Brown, J.M., O'Keeffe, J., Sanders, S.H., & Baker, B. (1986). Development changes in children's cognition to stressful and painful medical procedures. *Journal of Pediatric Psychology*, 11(3), 343-357.
- Cacioppo, J.T., Glass, C.R., & Merluzzi, T.V. (1979). Self-statements and self-evaluations: A cognitive-response analysis of heterosexual anxiety. *Cognitive Therapy and Research*, 3(3), 249-262.
- Cantwell, D.P., & Baker, L. (1989). Stability and natural history of DSM-III childhood diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*, 28(5), 691-700.
- Chambless, D.L., Caputo, G.C., Bright, P., & Gallagher, R. (1984). Assessment of fear of fear in agoraphobics: The body sensations questionnaire and the agoraphobic cognitions questionnaire. *Journal of Consulting and Clinical Psychology*, 52(6), 1090-1097.
- Clark, D.A. (1988). The validity of measures of cognition: A review of the literature. *Cognitive Therapy and Research*, 12(1), 1-20.
- Costello, E.J. (1989). Child psychiatric disorders and their correlates: A primary care pediatric sample. *Journal of the American Academy of Child and Adolescent Psychiatry*, 28(6), 851-855.
- Draper, T.W., & James, R.S. (1985). Preschool fears: Longitudinal sequence and cohort changes. *Child Study Journal*, 15(2), 147-156.
- Esser, G., Schmidt, M.H., & Woerner, W. (1990). Epidemiology and course of psychiatric disorders in school-age children - results of a longitudinal study. *Journal of Child Psychology and Psychiatry*, 31(2), 243-263.
- Ferrari, M. (1986). Fears and phobias in childhood: some clinical and developmental considerations. *Child Psychiatry and Human Development*, 17(2), 75-87.
- Fischer, M., Rolf, J.E., Hasazi, J.E., & Cummings, L. (1984). Follow-up of a preschool epidemiological sample: cross-age continuities and predictions of later adjustment with internalising and externalising dimensions of behavior. *Child Development*, 55, 137-150.
- Flament, M.F., Whitaker, A., Rapoport, J.L., Davies, M., Berg, C.Z., Kalikow, K., Sceery, W., & Shaffer, D. (1988). Obsessive Compulsive Disorder in Adolescence: an epidemiological study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 27(6), 764-771.
- Fox, J.E., Houston, B.K., & Pittner, M.S. (1983). Trait anxiety and children's cognitive behaviors in an evaluative situation. *Cognitive Therapy and Research*, 7(2), 149-154.
- Francis, G. (1988). Assessing cognitions in anxious children. *Behavior Modification*, 12(2), 267-280.
- Fulkerson, K.F., Galassi, J.P. & Galassi, M.D. (1984). Relation between cognitions and performance in math anxious students: A failure of cognitive theory? *Journal of Counseling Psychology*, 31(3), 376-382.
- Gittelman Klein, R., & Klein, D.F. (1988). Adult anxiety disorders and childhood separation anxiety. In M. Roth, R. Noyes Jr, & G.D. Burrows (Eds). *Handbook of Anxiety (Vol 1): Biological, Clinical, and Cultural Perspective*. Elsevier Science Publishers.
- Glass, C.R., & Arnkoff, D.B. (1994). Validity issues in self-statement measures of social phobia and social anxiety. *Behaviour Research and Therapy*, 32(2), 255-267.
- Glass, C.R. & Merluzzi, T.V. (1981). Cognitive assessment of social-evaluative anxiety. In T.V. Merluzzi, C.R. Glass, & M. Genest. *Cognitive Assessment*. NY: The Guilford Press.
- Greenberg, M.S., & Beck, A.T. (1989). Depression versus anxiety: A test of the content-specificity hypothesis. *Journal of Abnormal Psychology*, 98, 9-13.
- Hibbert, G.A. (1984). Ideational components of anxiety: Their origin and content. *British Journal of Psychiatry*, 144, 618-624.
- Hollingsworth, C.E., Tanguay, P.E., Grossman, L., & Pabst, P. (1980). Long-term outcome of Obsessive-Compulsive Disorder in childhood. *Journal of the American Academy of Child Psychiatry*, 19, 134-144.
- Houston, B.K., Fox, J.E., & Forbes, L. (1984). Trait anxiety and children's state anxiety, cognitive behaviors, and performance under stress. *Cognitive Therapy and Research*, 8(6), 631-641.
- Kashani, J.H., Orvaschel, H., Rosenberg, T.K., & Reid, J.C. (1989). Psychopathology in a community sample of children and adolescents: A developmental perspective. *Journal of the American Academy of Child and Adolescent Psychiatry*, 28(5), 701-706.
- Kashani, J.H. & Orvaschel, H. (1990). A community study of anxiety in children and adolescents. *American Journal of Psychiatry*, 147(3), 313-318.
- Keller, M.B., Lavori, P.W., Wunder, J., Beardslee, W.R., Schwartz, C.E., & Roth, J. (1992). Chronic course of anxiety disorders in children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31(4), 595-599.
- Kendall, P.C. & Chansky, T.E. (1991). Considering cognition in anxiety-disordered children. *Journal of Anxiety Disorders*, 5, 167-185.
- Kendall, P.C., & Hollon, S.D. (1981). Assessing self-referent speech: methods in the measurement of self-statements. In P.C. Kendall and S.D. Hollon (Eds). *Assessment Strategies for Cognitive-Behavioural Interventions*. New York: Academic Press.
- Kendall, P.C., Howard, B.L., & Epps, J. (1988). The anxious child: Cognitive behavioural treatment strategies. *Behaviour Modification*, 12, 281-310.
- Kent, G. (1985). Cognitive processes in dental anxiety. *British Journal of Clinical Psychology*, 24(4), 259-264.
- Kent, G., & Jambunathan, P. (1989). A longitudinal study of the intrusiveness of cognitions in test anxiety. *Behaviour Research and Therapy*, 27(1), 43-50.
- King, N.J. (1993). Simple and Social Phobias. In T.H. Ollendick & R.J. Prins. *Advances in Clinical Child Psychology (Vol 15)*. New York: Plenum Press.

- Klein, R.G., & Last, C.G. (1989). *Anxiety Disorders in Children*. Newbury Park, California: Sage Publications.
- Last, C.G., Strauss, C.C., & Francis, G. (1987). Comorbidity among childhood anxiety disorders. *The Journal of Nervous and Mental Disease*, 175(12), 726-730.
- Lodge, J.F. & Tripp, E.G. (in progress). Assessing children's cognitions: The development of practical assessment methods.
- Lodge, J.F., Harte, D.K., & Tripp, E.G. (Submitted). Children's self-talk under conditions of mild anxiety.
- Lodge, J.F., Harte, D.K., & Tripp, E.G. (in progress). Think-aloud, thought-listing, and video-mediated recall: Methods for assessing anxious children's cognitions.
- Marks, I.M. (1987). The development of normal fear: a review. *Journal of Child Psychology and Psychiatry*, 28(5), 667-697.
- Martzke, J.S., Anderson, B.L., & Cacioppo, J.T. (1987). Cognitive assessment of anxiety disorders. In L. Michelson & L.M. Ascher (Eds). *Anxiety and Stress Disorders: Cognitive-behavioural assessment and treatment*. New York: The Guilford Press.
- Meichenbaum, D. & Cameron, R. (1981). Issues in cognitive assessment: An overview. In T.V. Merluzzi, C.R. Glass, & M. Genest. *Cognitive Assessment*. NY: The Guilford Press.
- Mizes, J.S., Landolf-Fritsche, B., & Grossman-McKee, D. (1987). Patterns of distorted cognitions in phobic disorders: An investigation of clinically severe simple phobics, social phobics, and agoraphobics. *Cognitive Therapy and Research*, 11(5), 583-592.
- Morris, R.J., & Kratochwill, T.R. (1983). *Treating Children's Fears and Phobias: A behavioural approach*. New York: Pergamon Press.
- Myszka, M.T., Galassi, J.P., & Ware, W.B. (1986). Comparison of cognitive assessment methods with heterosocially anxious women. *Journal of Counselling Psychology*, 33(4), 401-407.
- Prins, P.J.M. (1985). Self-speech and self-regulation of high-and low-anxious children in the dental situation: an interview study. *Behavior Research and Therapy*, 23(6), 641-650.
- Prins, P.J.M. (1986). Children's self-speech and self-regulation during a fear-provoking behavioral test. *Behavior Research and Therapy*, 24(2), 181-191.
- Prins, P.J.M., Groot, M.J.M., & Hanewald, G.J.F.P. (1994). Cognition in test-anxious children: The role of on-task and coping cognition reconsidered. *Journal of Consulting and Clinical Psychology*, 62(2), 404-409.
- Stone, W.L., & Lemanek, K.L. (1990). Developmental issues in children's self-report. In A.M. LaGreca (Ed). *Through the Eyes of the Child: Obtaining self-reports from children and adolescents*. Boston: Allyn & Bacon.
- Zatz, S. & Chassin, L. (1983). Cognitions of test-anxious children. *Journal of Consulting and Clinical Psychology*, 51(4), 526-534.
- Zatz, S. & Chassin, L. (1985). Cognitions of test-anxious children under naturalistic test-taking conditions. *Journal of Consulting and Clinical Psychology*, 53(3), 393-401.

**Address for correspondence:**

Dr Gail Tripp  
 University of Otago  
 Department of Psychology  
 PO Box 56, Dunedin  
 New Zealand  
 Telephone (64 3) 4797 624, fax (64 3) 479 8335  
 Electronic Mail: gtripp@psy.otago.ac.nz

**Appendix 1: Cognitive assessment procedures: Structure, timing, and description**

Technique	Structure	Timing	Description
Think-aloud	Production / Free report	Concurrent	Requires individual to verbalise his or her self-talk (usually onto audiotape) while concurrently performing a predetermined task.
Thought-sampling	Production / Free report	Concurrent	Involves recording self-talk as it occurs (either onto an audiotape or in a diary) during defined periods of time.
Thought-listing	Production / Free report	Retrospective	Requires individual to retrospectively provide verbal or, more usually written, records of self-talk experienced during a specific time period (i.e in anticipation of, during, or after a task or event).
Thought-dubbing/ Video-mediated recall	Production / Prompted report	Retrospective	Typically an individual is videotaped while engaging in a target behaviour. The videotape is later played back to the individual, who is asked to reconstruct or "dub" his or her self-talk during the situation, using the videotape to aid recall.
Self-statement questionnaires	Endorsement / Recognition	Retrospective	The individual is required to endorse a pre-determined set of items regarding the occurrence and/or frequency of a series of self-statements over a specific time period. Self-statement questionnaires usually target specific problem area (e.g., test anxiety, social anxiety).