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Validity Measures of the Communication Attitude Test

by

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Dedication

For Trevor

Abstract

The purpose of this study was to investigate the content and construct validity of the Communication Attitude Test (CAT) using indices of validity not previously employed. Content validity was investigated through a subjective evaluation by a panel of judges. Construct validity was investigated through factor and item analyses. The CAT was found to have both content and construct validity. Suggestions for a revised CAT are outlined. Considerations for future research are discussed.

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Introduction

Stuttering is a disruption of verbal fluency characterized by involuntary repetitions and or prolongations of sounds, syllables and words. These disruptions are remarkable, usually occur frequently and are not readily controllable. Sometimes stuttering behaviors are accompanied by accessory behaviors and emotional states ranging from tension to embarrassment or fear (Wingate, 1964). Moreover, it is widely believed that emotional states such as embarrassment or fear lead to the development of negative attitudes, which may in turn, contribute to the development and maintenance of stuttering (Bloodstein, 1995; Peters & Guitar, 1991; Silverman, 1992). Thus, assessment procedures should include an evaluation of speech behaviors *and* speech attitudes (Peters & Guitar, 1991). While several scales have been developed to evaluate attitudes of adults who stutter (Andrews & Erikson, 1974; Craig, Franklin & Andrews, 1984, Woolf, 1967), relatively few scales have been developed to evaluate the attitudes of children who stutter. This study focuses on the most commonly used questionnaire designed to assess the speech-associated attitudes of child stutterers.

Attitudes toward speaking can have clinical implications for children who stutter. If it can be determined that a child has negative attitudes about speaking, therapy might address these attitudes. If it can be determined that a child does not have negative attitudes about speaking, minimizing the stuttering behaviors would appear to be the only necessary focus of therapy. Therefore, fluency assessments should include an evaluation of speech attitudes. An assessment of speech attitudes can serve as a baseline to which post-treatment attitudes can be compared and can indicate specific areas to address in therapy. Unfortunately, it may not be obvious during an assessment whether or not a child has developed negative attitudes about speaking. Furthermore, if a child has started to develop negative attitudes about speaking, the degree to which these attitudes are having an impact on the child is often not known.

Sometimes fluency assessments reveal that children are not aware of their stuttering. Children who have not developed an awareness of their stuttering have probably not developed negative attitudes towards their stuttering. Some children, on the other hand, are aware of their stuttering but appear to be unconcerned about it. It would appear to be unnecessary to address speech attitudes with these children. Instead, treatment might focus exclusively on minimizing stuttering behaviors. Treatment may involve parent training and/or speech therapy. Parent training may involve teaching parents to change aspects of their speaking environment and communication style. Parents may be taught to reduce their rate of speech, increase their pause time, and reduce the length and complexity of their utterances when speaking with their child (Culatta & Goldberg, 1995; Peters & Guitar, 1991; Starkweather, Gottwald & Halfond, 1990). Alternatively, parents may be taught to reinforce stutter-

free speech and to administer immediate verbal contingencies (e.g., "Let's say that again.") for stuttering behaviors (Onslow, Andrews & Lincoln, 1994).

In addition to, or in lieu of, parent training, intervention may involve the child participating in speech therapy through individual or small group sessions with a speech-language pathologist (S-LP). Therapy methods vary in degree of directness and in the extent to which the child's speech is manipulated or commented upon. When children are unaware of their stuttering, many clinicians advocate an indirect approach to treatment. Here the clinician may facilitate the child's fluency by providing fluent models, engaging the child in fluency inducing speech tasks (e.g., rhyming, counting) and reinforcing fluency indirectly (Van Riper, 1973). Alternatively, when children are aware of their stuttering, many clinicians use a more direct approach to treatment. Clinicians may help the child learn to stutter more easily with less effort (Conture, 1990). Other clinicians adopting a more direct approach to treatment may use behavior modification principles to systematically increase fluent responses until they replace moments of stuttering (Ryan, 1974; Shine, 1984). Still other clinicians may combine aspects of these approaches (Kully & Boberg, 1991).

If children are aware of *and* bothered by their stuttering, some clinicians might address moments of stuttering and corresponding attitudinal issues. When children are distressed by their dysfluencies, it may be better to acknowledge their speaking difficulties rather than ignore them. Some parents feel that discussing their child's dysfluencies will embarrass the child, so they refrain from commenting on stuttering. However, failure to acknowledge speaking difficulties that are noticed by the child can lead to a conspiracy of silence about stuttering (Starkweather et al., 1990). If parents do not feel comfortable talking about dysfluencies, children, in turn, may not feel comfortable talking about them. Ignoring speaking difficulties may lead a child to believe that stuttering is shameful. How stuttering children feel about their speech may affect their ability to communicate with family and friends in social, recreational and educational settings. Children's attitudes toward speech may affect their ability to deal with teasing, their willingness to participate in speaking activities, and their overall self esteem. It is of clinical importance, therefore, to determine whether or not children who stutter have developed negative attitudes toward speaking.

Two tools that have been developed to evaluate the speech-associated attitudes of children who stutter are: The Problem Profile for Elementary-School-Age Children Who Stutter About Talking (Williams, 1978 cited in Darley & Spriestersbach, 1978) and the Communication Attitude Test (Brutten, 1985). The Problem Profile for Elementary-School-Age Children Who Stutter About Talking is a set of 7 open-ended questions that could be asked of stuttering children. The questions are as follows: Whom do you like to talk to? Who talks the most? Who interrupts? Who are good talkers? When do you want to talk well? Where do you want to talk more than you do? Who listens? These questions constitute a non-standardized measure of speech-associated attitudes of child stutterers. Interpretations of such questions are highly subjective. Clinicians with little experience in child

stuttering might have particular difficulty interpreting the answers to these questions. Thus, a standardized questionnaire, such as the CAT, is a more desirable assessment tool for speech-language pathologists working with children who stutter.

The Communication Attitude Test (CAT) (Appendix A) is the only norm-referenced tool developed to assess the speech-associated attitudes of child stutterers. The CAT was designed to assess the speech-related attitudes of grade school children by directly asking them to evaluate separately each of 35 statements in terms of whether they are true or false for them (Brutten, 1985). The CAT has been shown to consistently discriminate stuttering children from nonstuttering children to a statistically meaningful extent (DeNil & Brutten, 1990, 1991; Vanryckeghem & Brutten, 1992). In addition, the CAT has been shown to have good test re-test reliability (Vanryckeghem & Brutten, 1992), fair to good odd-even correlations, and good inter-item reliability (Brutten & Dunham, 1989).

Although the reliability of the Communication Attitude Test has been studied, its validity has not been adequately established. Validity means that "...information produced from research or testing is an accurate measure of the psychological variable or quality it is intended to measure" (Zimbardo, 1985, p. 33). By definition then, validity should be supported through as much systematic inquiry as possible. If a tool does not possess *both* reliability *and* validity, more caution must be used when interpreting results (McCauley & Swisher, 1984; Plante & Vance, 1994). A reliable self-rating scale will yield the same results over multiple administrations to the same subjects; however, this does not ensure that the test is accurately measuring the constructs it is purporting to measure. Several indices of the CAT's reliability have been ascertained, but no specific efforts have been made to establish its validity. One type of validity, however, can be inferred from previous research on the CAT. The CAT has been shown to consistently discriminate stuttering children from nonstuttering children to a statistically significant extent (Boutsen & Brutten, 1989; DeKort, 1995; DeNil & Brutten, 1990, 1991). However, this type of validity, known as logical construct validity, is not the most compelling type. Furthermore, many studies using the CAT have used either Dutch speaking children or nonstuttering English speaking children. There are no published studies using the CAT with English speaking children who stutter. To this end, this study investigated the validity of this tool using English speaking child stutterers and measures of validity not previously employed.

Literature Review

There is widespread consensus among researchers that adults who stutter tend to have less favorable attitudes about their speech than their normal speaking adult counterparts (Andrews & Erikson, 1974; Bloodstein, 1987; Guitar & Bass, 1978). There is some controversy, however, as to whether *children* who stutter also have negative speech-associated attitudes. This controversy stems, in part, from the lack of a suitable instrument with which to evaluate the speech-associated attitudes of children. When an adequate tool does not exist, it is difficult to measure a phenomenon. The CAT is the best tool available to assess the speech-associated attitudes of children who stutter; however, its psychometric properties require further investigation.

This literature review will be divided into six sections. The first section will provide a definition of attitude. The next section will include an overview of indirect measures that have been used to evaluate the speech-associated attitudes of children who stutter. The third section will include an overview of the direct measures that have been used to evaluate the speech-associated attitudes of children who stutter. A summary of the studies using the CAT will follow. The fifth segment will summarize the reliability measures that have been established for the CAT. The final section will include a discussion of validity.

A Definition of Attitude

The terms "attitude" and "malattitude" appear frequently in the stuttering literature but are seldom defined. Terms such as "perceptions", "beliefs" and "emotions" often have been used synonymously with "attitudes". Rosenberg and Hovland (1960) defined attitudes as "...predispositions to respond in a particular way toward a specified class of objects" (p. 1). Further, they wrote that predispositions were not directly observable or measurable, but inferred. These authors developed a three-dimensional model of attitude based on responses to stimuli. Indices of attitude were grouped into three major categories: cognitive, affective and behavioral. Cognition may include "perceptions, concepts and beliefs" (Rosenberg & Hovland, 1960, p. 4). Affect refers to emotions and feelings and may be inferred from measures of such physiological variables as blood pressure or galvanic responses, or verbal statements about how much one likes or dislikes something. Behavior refers to overt conduct, manners or actions.

For the purpose of this study, attitude has been defined broadly as children's perceptions and feelings as they pertain to speech.

Indirect Measures Used to Evaluate the Speech-Associated Attitudes of Children Who Stutter

Some studies have indirectly measured the speech-associated attitudes of stuttering children by examining aspects related to perceptions and feelings about speech. In particular, these studies have investigated *concern* about speech as well as *awareness* of fluency and stuttering.

Silverman (1970) examined *concern* about speech in *62* stuttering children in grades two through five. In this study, the experimenter asked each child to tell him "three wishes" (p. 361). The children were asked to imagine that a fairy godmother would grant them any three wishes. Of the 62 children, four children made wishes pertaining to speech. These wishes were: (1) "...to have good speech for the rest of my life" (p.362), (2) "my wish would be that I would improve my speech a lot" (p. 362), (3) "...my mother get a new car so that she could bring me up to speech" (p. 362), and (4) "my last wish would be I would wish to go to speech class, forever, as long as I live" (p. 362). For 15 of the children (all of whom had not made a speech wish) the experimenter asked a more specific question by asking the children to tell three ways they would want to change themselves. Two of the 15 children made wishes about their speech. These wishes were: "And my third wish would be I wish I wouldn't stutter so much", and (2) "my three wishes to change myself would be good clothes, and getting good talking and good speech" (p. 363). In total then, six of the children made wishes pertaining to speech. Of these wishes, four appeared to suggest that an improvement in speech would be welcomed. Silverman wrote that the "relatively small number of children" (p. 362) who made a wish pertaining to speech was surprising. He concluded that elementary children who stuttered generally were not highly concerned about their speech. Silverman's statement that the stuttering children as a group were not concerned about their speech appears to be based on a belief about what constitutes a "relatively small number of children". Since there were no controls in this study, it is not possible to compare the stuttering children's wishes to normally fluent peers. If compared to a control group, a significant difference may be found between the number and type of wishes made between stuttering and nonstuttering children. In other words, without a control group, it is impossible to know whether or not the number of wishes made by children in that study suggested an overall concern about their stuttering.

Culatta, Bader, McCaslin & Thomason (1985) used a similar questioning protocol with 12 children in grades Kindergarten through six. Children were told to pretend that they had a fairy godmother who could make their wishes come true. The children were asked to make three wishes. None of the children made wishes pertaining to speech. All of the children were then asked "If you could change any three things about yourself, what would they be?" (p. 88). Only one child made a wish about speech: "To be the cutest boy in the world; have blue eyes; be bigger - don't stutter no more" (p.89). Thus, 1 out of a total of 72 wishes made of 12 elementary school children who stuttered pertained to speech or stuttering. At first glance, one wish out of a total of 72 appears to support the notion that stuttering children generally are not concerned about their speech. However, it is possible that the children in both the Silverman (1970) and Culatta et al. (1985) studies may have been inclined to wish for material things due to the vague and nonspecific nature of the initial questioning. Moreover, that the children *did not* make wishes specific to speech does not establish that the children were unconcerned about their speech. However, both sets of investigators concluded that stuttering

children generally were not concerned about their speech. Perhaps because of these conclusions, research activity in the area of stuttering children's attitudes declined for several years.

Nearly a decade later, a slightly different line of research appeared in the literature. Ambrose and Yairi (1994) examined the presence of *awareness* of both stuttering and fluency in 52 preschool children who stuttered and 36 age- and sex-matched normally fluent children. Children's ages ranged from two to six years. The purpose of that study was to construct a testing procedure for awareness of stuttering in young children and to investigate its development and relationship to age and severity. Data from each child were collected during three visits over a two year period. The children watched a videotape of two identical puppets talking. The puppets appeared simultaneously on the left and right sides of the television screen and engaged in a structured speaking task consisting of three sentences: "The ball is red", "The boy is tall", and "The dog is big". Each sentence was spoken by the puppets as a contrasting pair with one fluent and one dysfluent version. The dysfluencies consisted of sound repetitions of the first sound of each of two stuttered words in a dysfluent sentence. The first stuttered word had two repetitions and the second stuttered word had one repetition. Each sentence pair was presented twice with a random presentation of left-right, first-second, and fluent-dysfluent factors. The awareness task was administered in the presence of only the subject and the examiners. Subjects were instructed to watch the video and to "point to the puppet that talks the way you do". A t-test of the awareness task revealed a significant difference between the control and experimental groups with $t(86) = -2.35$, $p = .02$. These results indicated that the awareness task was capable of statistically distinguishing the experimental group from the control group. The authors also suggested that age appeared to be a factor in the awareness of stuttering and that, for many children, awareness may not become observable or measurable until the age of 5 or 6. The authors, however, stated that the findings must be viewed with caution due to "...modest reliability and to the relatively close proximity of the mean scores to the chance number of identifications" (Ambrose & Yairi, 1994, p.239). Nonetheless, the results of this study did suggest that some pre-school children were aware of their dysfluencies and that their awareness could be measured.

Direct Measures Used to Evaluate the Speech-Associated Attitudes of Children Who Stutter

Studies that have used more direct methods of investigating speech perceptions have suggested that stuttering children were concerned about their speech. Woods (1974) used a speech competence scale to assess more directly stuttering children's' attitudes about their speech. The subjects in this study were 48 stuttering boys and 562 nonstuttering boys in grades 3 and 6. Speaking competence was assessed by means of a scale. Four descriptive paragraphs appeared on the scale with the following headings: (1) best talkers, (2) good talkers, (3) haven't heard enough, and (4) poor talkers. Each boy was asked to put a paragraph number beside the name of each of his classmates that best described how he felt about each of his classmates. Each boy also was asked to assign a paragraph number to his own name based on which he thought best described how most of the other children in

the classroom felt about him. Children were asked to give reasons for assigning a classmate to the "poor talkers" category. Children also were asked to give reasons for the number they had assigned to their own name. Results indicated that both third and sixth grade boys who stuttered *expected* themselves to be rated less favorably, and *were* rated less favorably, than were their normally fluent male counterparts.

In 1985, Gene Brutten developed a tool to assess speech-associated attitudes of child stutterers. The Communication Attitude Test (CAT) is a questionnaire consisting of 35 true/false statements about speech. Children are instructed to read each sentence carefully and indicate whether a statement is true or false as it applies to them. A point is awarded each time an item is marked in a way that indicates negativity towards speaking. For example, the first item on the questionnaire reads, "I don't talk right." If children circle "true" for this statement, they are given one point. The total number of points a child obtains on the questionnaire comprises the CAT score. A higher score indicates a more negative attitude about the respondent's speech (Brutten & Dunham, 1989). Thus, the highest score that could be received is 35.

Summary of Studies using the CAT

Recently, several studies using the CAT have been conducted. Two unpublished studies used the CAT to investigate the speech associated attitudes of English speaking child stutterers. Boutsen and Brutten (1989) administered the CAT to 72 stuttering children and 145 normal speaking children aged 6 to 14. The normal speaking children obtained a mean score of 8.89 (SD = 5.25). The stuttering children obtained a mean score of 19.86 (SD = 6.54) which was significantly higher than the mean score of the nonstuttering children. DeKort (1995) also used the CAT to assess the speech-associated attitudes of child stutterers. The mean score of 36 stuttering children aged 6 to 15 was compared to the mean score of the normal speaking school-aged children in Brutten and Dunham's (1989) normative study. In DeKort's (1995) study, the stuttering children received a mean score of 19.44 (SD = 6.92). The normal speaking children in Brutten and Dunham's (1989) normative study obtained a mean score of 8.24 (SD = 4.71). A one tailed t-test revealed a significant difference, $t(120) = 9.56$, $p = .01$, between the CAT scores of these two groups of children. Thus, the results of two unpublished studies suggest that the CAT can be used to differentiate stuttering children from nonstuttering children.

Turning to the published work, De Nil and Brutten (1990, 1991) administered a Dutch translation of the CAT (CAT-D) to 70 stuttering children, 40 articulation disordered children, 13 voice disordered children, and 271 normal speaking children in Belgium. The purpose of these studies was to determine whether communication attitudes of the four groups, as measured by the CAT, differed to a statistically meaningful extent. Tukey's post hoc comparisons procedure was used to determine where significant differences lay. No significant difference was found between the scores of the stuttering and voice disordered children. As well, no significant difference was found between the articulation disordered and normal speaking children. However, as in the studies by DeKort (1995)

and Boutsen and Brutten (1989), the stuttering children scored significantly higher on the CAT-D than the articulation disordered and normal speaking children. As well, the mean score of the voice disordered children was significantly higher than the articulation disordered and normal speaking children. Due to the relatively small number of voice disordered children used in this study, caution must be exercised when interpreting these results. Nevertheless, these preliminary findings suggest that the Communication Attitude Test may be a useful tool for assessing the speech-associated attitudes of both stuttering and voice disordered children.

Vanryckeghem and Brutten (1996) investigated the relationship between the speech-associated beliefs and the fluency failures of stuttering and nonstuttering children. The CAT-D was administered to 55 Belgian stuttering children aged 6 to 13 and an equal number of age-matched nonstuttering children. In addition, speech measures during oral reading and during a 5 minute conversation were obtained from each child. Communication failures of each subject were counted and classified into one of three categories: category I, category II and category III. Category I behaviors were considered to be clinically significant features that characterize stuttering and included sound repetitions, syllable repetitions and sound prolongations. Category II behaviors were considered to be normal speech dysfluencies and included interjections, broken words, incomplete phrases, whole-word repetitions, phrase repetitions and temporal delays. Category III behaviors encompassed all of the aforementioned forms of fluency failure and measured the extent to which speech disruptions were exhibited by subjects. As might be expected, the stuttering children displayed significantly more behaviors in each of the three categories of speech disruption. In addition, the nonstuttering children rarely displayed category I behaviors. The percentages of each of the three categories of fluency failures for both groups of children were related to their CAT scores by computing Spearman rank order correlations. For the nonstuttering children, the correlations between CAT score and category I, II, and III behaviors were +.20, -.25 and -. 18 ($p \leq .05$) respectively. For the stuttering children, the correlations between CAT score and category I, II, and III behaviors were +.33, +.39 and +.46 ($p \leq .05$) respectively. The authors concluded that there was no relationship between speech disruptions and attitude toward speech for the nonstuttering children. Conversely, for the stuttering children, the authors concluded that there was a low moderate correlation between speech disruptions and attitude toward speech. Perhaps a stronger correlation would have been found if additional speech measures had been obtained from different speaking situations such as the child speaking with a friend, or the child speaking with a parent at home.

Reliability Measures of the CAT

Two studies have investigated the reliability of the CAT, and both suggest that it is a reliable tool. In their study of the CAT's test-retest reliability, Vanryckeghem and Brutten (1992) administered a Dutch translation of the CAT (CAT-D) to 44 Dutch speaking Belgian children, aged 6 to 14, on three

different occasions. The reliability coefficients for the subjects following a hiatus of 1, 11, and 12 weeks was +.83, +.81 and +.76. Thus, the CAT-D has been shown to have good test-retest reliability.

Brutten and Dunham (1989) administered the CAT to 518 normal speaking children in their normative study of grade school children. The purpose of this study was to evaluate the "communication beliefs" (p. 373) of children whose speech was considered to be normal, so that their attitudes could be compared with those of children who stutter or those who display speech disorders of various kinds. Responses of the children to each of the separate CAT items were analyzed to determine if they were concordant with the overall score. Point bi-serial correlations were significantly related to the overall score for all but three items. Items 18 ("The other kids wish they could talk like me"), 30 ("My friends don't talk as well as I do"), and 32 ("I talk better with a friend") did not correlate with the overall score. The authors suggested that these items be removed from the questionnaire. In addition, Pearson product-moment correlations were run between: the odd- and even-numbered items, the statements for which true or false were seen as indicative of negativity toward speech, and the two halves of the scale. The correlations of the odd-even, true-false, and split-half reliability measures were +.70, +.60, and +.65 respectively. Thus, the CAT has been shown to have good test re-test reliability (Vanryckeghem & Brutten, 1992), and fair to good inter-item reliability (Brutten & Dunham, 1989). However, while reliability is a prerequisite for validity, it does not ensure validity (Ventry & Schiavetti, 1986).

Validity

The validity of a test or tool can be defined as the degree to which it measures what it purports to measure (Zimbardo, 1985). Ventry and Schiavetti (1986) outline three types of validity: content validity, criterion validity, and construct validity.

Content validity. Content validation is:

> ...a subjective procedure for logically or rationally evaluating the items on a test to see how well they reflect what the tester wishes to measure. This analysis is usually done by the researcher or by a panel of judges assembled by the researcher for this task. As such, the analysis is not a strictly empirical measure of validity, but more a rational one... (Ventry & Schiavetti, 1986, p.98)

Content validity is sometimes referred to as face validity (Ventry & Schiavetti, 1986). One author, however, defines face validity differently. Zimbardo (1985) defines face validity as the degree to which a test taker can determine what a test is supposed to measure. For the purpose of this study, the term *content validity* will be used instead of the term *face validity*, and the more broadly accepted definition by Ventry and Schiavetti (1986) will be used instead of Zimbardo's (1985) definition.

Criterion validity. Criterion validity is the second type of validity and it refers to "...how well the test or measure correlates with some outside validating criterion" (Ventry & Schiavetti, 1986, p. 98). There are two types of criterion validity: concurrent validity and predictive validity. Concurrent

validity is assessed when a newly developed measure and an outside validating criterion measure are administered at the same time. The degree to which these two measures correlate is the index of concurrent validity for the newly developed tool. Predictive validity is assessed when scores from a newly developed tool are used to predict another validating criterion measure taken later. Thus, predictive and concurrent validity differ only with respect to the time of the administration of the outside criterion measure (Ventry & Schiavetti, 1986).

Construct validity. The third type of validity is construct validity. Construct validity is the "extent to which a test measures some relatively abstract trait or construct based on an analysis of the nature of the trait..."(Nicolosi, Harryman & Kresheck, 1989, p.279). Construct validity can be measured by logical analysis, factor analysis and item analysis. Logical analysis, as a form of construct validity, can be measured if the tool in question can be used to predict that different kinds of subjects (e.g., stuttering versus nonstuttering) will score in different ways (Ventry & Schiavetti, 1986). For example, it is already known that stuttering and nonstuttering children score in different ways on the CAT. Stuttering children tend to score significantly higher on the CAT than do normal speaking children (Boutsen & Brutten, 1989, DeKort, 1995, DeNil & Brutten, 1990, 1991). Therefore, there is evidence that the CAT has construct validity with respect to logical analysis. Construct validity of the CAT also may be investigated through another avenue of logical analysis. If CAT scores varied across age groups, this would be another index of construct validity. However, no studies have directly compared CAT scores across age groups.

Construct validity also may be established using factor analysis. Factor analysis is a statistical technique for reducing a large number of items into clusters, each of which identifies a common underlying trait, concept or construct (Ventry & Schiavetti, 1986).

A final measure of construct validity is item analysis. Item analysis is a statistical technique for correlating each item in the test with the overall test score to determine if each item measures the target construct as well as the overall test does. (Ventry & Schiavetti, 1986).

A summary of the types of validity described above is listed in Appendix B. Ideally, validity should be confirmed through as much systematic inquiry as possible. Thus, a commonly used instrument should have measures of content, criterion and construct validity when possible.

Boutsen and Brutten (1989), DeKort (1995), and DeNil and Brutten (1990, 1991) made no specific reference to the CAT's validity. However, construct validity through logical analysis can be inferred from all four studies, because the CAT was shown to discriminate between stutterers and nonstutterers. Stuttering children consistently obtained significantly higher CAT scores than did nonstuttering children. This is one index of construct validity, but it may not be the most compelling measure of validity. The CAT is the only known measure of speech-associated attitudes that has been shown to consistently discriminate stuttering children from nonstuttering children to a statistically meaningful extent. It would be difficult to investigate the criterion validity of the CAT, because there

is no previously validated measure of speech-associated attitudes of child stutterers to which the CAT can be compared. Therefore, the purpose of this study will be to investigate content and construct validity of the Communication Attitude Test using indices of validity not previously employed.

The research question for this study will be: Is the Communication Attitude Test a valid index of stuttering children's attitudes about their speaking abilities? This study will be a validation study in two phases. The first phase will examine content validity; the second phase will examine construct validity.

Phase 1 Method: Content Validity

Subjects

The subjects for Phase 1 were four professionals who were knowledgeable about child development. These individuals were recruited through personal contacts and included three reading specialists and a junior high school teacher. They comprised a panel of judges three of whom were female (the reading specialists), and one of whom was male (the school teacher). All of the judges had professional experience working with children in elementary and junior high school.

Materials

Materials used in Phase 1 included five items. The first item was the CAT (Appendix A).The second item was a set of instructions for the judges (Appendix C). The third item was the judges' informed consent form (Appendix D). The fourth item was a written abstract of the CAT (Appendix E). The abstract, created by the investigator, was designed to provide the judges with background information on the CAT. Only general information about the purpose of this study was provided in the instructions for judges and the informed consent document. The fifth item was a list of open ended questions and a response protocol designed by the investigator to obtain the judges' opinions about the CAT's validity (Appendix F). The response protocol and open ended questions provided a framework to guide the judges' analysis of each of the statements that appear in the CAT.

Procedures

The goal of Phase 1 was to investigate content validity. Judges were contacted by letter (Appendix G) or phone call, requesting their participation in this study. Five people were contacted and four agreed to participate. One person did not agree to participate due to time constraints. Those who agreed to participate in Phase 1 were given a list of instructions (Appendix C), the abstract (Appendix E) which provided background information about the CAT, the CAT (Appendix A), and the response protocol (Appendix F). After reading all of the materials, judges used the response protocol to categorize each item on the CAT, and to answer a few open ended questions about the CAT. Judges signed an enclosed consent form (Appendix D), and returned it, along with their completed response sheets, to the investigator.

In Phase 1, participation was voluntary and judges were told that they could terminate their participation at any time. Names of judges were known only to the investigator. To ensure anonymity of judges' answers, response sheets were coded by number, and only the investigator had access to the key. Judges' response sheets were kept in a locked cabinet. Data from the judges' response sheets were entered into a computer database and stored on a hard drive and a floppy disk.

Data Analysis

Each judge was asked to assign every statement on the CAT to a category. An item could be assigned to more than one category or to none of the categories. Eight categories - or constructs - (Table 1) were listed on the Response Protocol (Appendix F). These categories were designed by investigator and were provided for the judges' convenience. However judges were given the opportunity to reword existing categories and to create their own categories for statements that did not seem to belong to any of the categories listed. Thus, completed response sheets included a list of the CAT's 35 statements, each of which had been assigned to at least one category by the judges.

Table 1

Constructs Identified for Judges

Constructs Identified For Judges
• How stuttering children feel about their speech
• How stuttering children think adults feel about their speech.
• How stuttering children think other children feel about their speech.
• How stuttering children think people in general feel about their speech.
• How stuttering children feel about physical manifestations of their stuttering.
• How stuttering children feel about talking while they are at school.
• How stuttering children feel about talking on the phone.
• Other

Responses of individual judges were transferred to one master response sheet. An item that was categorized similarly by at least 3 of the 4 judges was said to have content validity with respect to that construct. For example, all of the judges assigned the first item ("I don't talk right") to the first category. Therefore, item 1 was deemed to measure the construct "How stuttering children feel about their speech".

All of the judges used the constructs given. None of the judges reworded the constructs. Judge #3 designed 3 additional constructs and wrote them in the category "Other". These constructs were: (1) how most children feel about their speech. (2) how most children feel about talking at

school. and (3) how stuttering children feel about the impact of their stuttering on others. None of these constructs were used in the analysis because the other judges did not design similar constructs.

Phase 1 Results

The investigator felt that, in order for a construct to be measured, it must have been sampled at least 5 times by five different items. Based on this criterion, four constructs emerged from Phase 1: (1) how stuttering children feel about their speech, (2) how stuttering children think adults feel about stuttered speech, (3) how stuttering children feel about physical manifestations of their stuttering, and (4) how stuttering children feel about talking while they are at school. The following tables summarize the judges' opinions as to what constructs the CAT is measuring.

Table 2

Construct 1

How Stuttering Children Feel About Their Speech
(The following items were assigned to this construct by at least 3 of the 4 judges):
1. I don't talk right
3. Sometimes words will stick in my mouth when I talk
5. It is harder for me to give a report in class than it is for most of the other kids.
7. I like the way I talk.
10. I find it easy to talk to most everyone.
12. It is hard for me to talk to people.
13. I don't talk like other children.
15. I don't find it easy to talk.
17. It is hard for me to talk to strangers.
21. Telling someone my name is hard for me.
22. Words are hard for me to say.
23. I talk well with most everyone.
24. Sometimes I have trouble talking
27. I am not a good talker.
28. I wish I could talk like other children.
29. I am afraid the words won't come out when I talk.
32. I talk better with a friend.
34. I let others talk for me.

Table 3

Construct 2

How Stuttering Children Think Adults Feel About Stuttered Speech
(The following items were assigned to this construct by at least 3 of the 4 judges):
1. I don't talk right
4. People worry about the way I talk.
9. My parents like the way I talk.
23. I talk well with most everyone.
33. People don't seem to like the way I talk.

Table 4

Construct 3

How Stuttering Children Feel About Physical Manifestations of Their Stuttering
(The following items were assigned to this construct by at least 3 of the 4 judges):
3. Sometimes words will stick in my mouth when I talk
12. It is hard for me to talk to people.
15. I don't find it easy to talk.
22. Words are hard for me to say.
28. I wish I could talk like other children.

Table 5

Construct 4

How Stuttering Children Feel About Talking While They are at School
(The following items were assigned to this construct by at least 3 of the 4 judges):
1. I don't talk right
5. It is harder for me to give a report in class than it is for most of the other kids.
12. It is hard for me to talk to people.
19. Some kids make fun of the way I talk.
23. I talk well with most everyone.

In addition, judges were asked to answer a set of open ended questions about the CAT (Appendix F). In the first question, judges were asked to state what the CAT was intended to measure. The judges stated that the CAT was intended to measure: "Children's perception of their speaking ability and their perceptions of others' attitudes toward their speech", "how stuttering children feel about their speech", "stutterers' perception of themselves and their ability to communicate through

speech", and "a child's attitude towards their speech". In the second question, judges were asked if they felt the CAT was measuring what it was intended to measure. Three of the 4 judges believed that the CAT actually succeeded in measuring this phenomenon. One judge did not respond to the question.

In the third question, judges were asked whether any items should be added to the CAT. Three of the four judges said that items could be added to the CAT. These items were: "I don't care what other people think about the way I talk", "With help, I can learn to improve my speech", "I would like help with my talking", "I feel angry when the words won't come out" and "I try not to be noticed when the teacher is asking questions."

In the fourth question, judges were asked if any of the items on the CAT should be deleted. One of the judges suggested that two items be deleted. Items 25 "I would rather talk than write" because "many people feel talking is easier than writing" and 30 "My friends don't talk as well as I do" because it is "confusing, and what's it measuring anyway?"

Finally, judges were asked to make additional comments. One judge suggested that the CAT be read to children with reading difficulties. The same judge noted that the CAT does not allow for elaboration and suggested that open ended questions such as "Stuttering makes me feel..." be added to the CAT. This judge also suggested that Item 5 have the adjective "spoken" added to modify "report".

A summary of the constructs derived from the panel of 4 judges appears in Table 6.

Table 6

Judges Opinions on the Constructs the CAT is Measuring

Construct	Items Measuring Construct (according to 3 or more judges)
1. How stuttering children feel about their speech	1.3.5.7.10.12.13.15.17.21.22.23.24.27.28.29.32.34
2. How stuttering children think adults feel about stuttered speech.	1.4.9.23.33
3. How stuttering children feel about physical manifestations of their stuttering.	3.12.15.22.28
4. How stuttering children feel about talking while they are at school.	1.5.12.19.23

Phase 1 Discussion

The goal of Phase 1 was to assess the CAT's content validity using feedback from a panel of judges. Judges assigned each item to pre-existing constructs. Judges were given the freedom to re-word constructs or to create new ones. Judges also responded to a set of open ended questions regarding the content validity of the CAT.

The judges used different terms to describe what the CAT was intended to measure. Two of the judges said that the CAT was measuring children's "perceptions" of their speech. One judge said that the CAT was measuring children's "attitudes" toward their speech, and the last judge said that the CAT was measuring how stuttering children "feel" about their speech. The terms "perceptions" and "feel" are consistent with Rosenberg and Hovland's (1960) definition of attitude in which affect, cognition and behavior are considered to be dimensions of attitude. In addition, three of the four judges believed that the CAT was measuring what it was intending to measure.

As a group, the judges believed that the CAT was measuring four constructs: (1) how stuttering children feel about their speech, (2) how stuttering children think adults feel about stuttered speech, (3) how stuttering children feel about physical manifestations of their stuttering, and (4) how stuttering children feel about talking while they are at school".

Some items were assigned to constructs by only one or two of the judges, while other items were not assigned to any of the constructs by any of the judges. It would seem then, according to the panel of judges, that some of the items clearly contribute to the CAT's purpose, while other items do not seem to contribute. A type of item analysis can be extrapolated from the judges' opinions. Consensus among judges was not achieved in assigning the following items to constructs: 2, 6, 8, 11, 14, 16, 18, 19, 20, 25, 26, 30, 31, 33, and 35. One possible conclusion is that it may not be necessary for these items to be included in the CAT. When specifically asked whether any items should be deleted from the CAT, one of the judges indicated that items 25 ("I would rather talk than write.") and 30 ("My friends don't talk as well as I do.") should be removed. From the judges' point of view, it appears that, if any items should definitely be removed from the CAT, those items should be 25 and 30.

When asked if any items could be added to the CAT, 3 of the judges offered the following suggestions: "I don't care about what others think about the way I talk.", "with help I can learn to improve my speech", "I would like to get help with my talking", "I feel angry when the words won't come out", and "I try not to be noticed when the teacher is asking questions." These items may be worth considering if the CAT is revised. In addition, one judge suggested that the CAT contain some open ended questions such as "Stuttering makes me feel..." Although it would be difficult to develop norms for open ended questions or statements, they could be added to the CAT with the expectation

that responses would serve as probes and further define specific areas of speech attitudes to address in therapy.

Phase 2 Method: Construct Validity

Subjects

In Phase 2 archived CAT forms from clinic files at the Institute for Stuttering Treatment and Research (ISTAR) were collected for data analysis. The questionnaires were administered in accordance with the instructions outlined by the CAT's developer. Some of the child respondents had completed the CATs with the aid of their parents or clinician, and some had completed the CATs independently.

Child respondents came from the ISTAR and included 36 stuttering children who served as participants in the DeKort (1995) study. Twenty-nine additional CAT forms were collected from clinic files of children who had received intensive and extended therapy at the ISTAR since 1995. Thus, subjects were 65 children aged 6 to 13 years. Of the 65 children, 8 were female and 57 were male. All of the children were considered to have unremarkable reading abilities. Children were considered to have "unremarkable reading histories" if their files did not contain information about reading difficulties. However, children were not explicitly tested for reading ability. Normally, grade 1 children are approximately 6 years old. According to the MSWord Readability Statistics, the CAT has Flesch-Kincaid and Coleman-Liau Grade Levels of 1.7. Thus, the reading level of the CAT is approaching the grade 2 level. Therefore, some 6 year old children who had just started grade 1 at the time they completed the CAT may have had difficulty reading it. Six year old children have been used in previous research (Brutten & Dunham, 1989; DeNil & Brutten, 1990, 1991) and, therefore, were included in this study; however, their data should be interpreted with caution.

An attempt was made to obtain additional CAT forms from other stuttering clinics. The investigator contacted seventeen specialists across Canada and the United States and requested copies of archived CAT forms. The procedures that were followed in this attempt to access additional data and the product of that effort are described below under "procedures".

In summary, Phase 2 subjects were 65 children aged 6 to 13 years who had been diagnosed with stuttering by a certified speech-language pathologist. In addition, subjects had unremarkable reading histories. Only pre-treatment CAT scores were used in this phase.

Materials

Materials in Phase 2 included the following items: the CAT (Appendix A), a Microsoft Excel 5.0 data base (Microsoft, 1994), and an SPSS (Norusis, 1990) computer applications package.

Procedures

The goal of Phase 2 was to investigate construct validity through factor and item analyses. A relatively high N is desirable when conducting factor and item analyses; therefore, as mentioned above, an attempt was made to obtain additional CAT forms from other stuttering clinics. Eleven speech-language pathologists (S-LPs) employed in stuttering therapy clinics across Canada and the United States (Appendix H) were contacted by telephone, fax or electronic mail. A predetermined script (Appendix I) was used during initial conversations with S-LPs. The S-LPs were asked if they were willing to forward copies of completed CATs to the investigator. In addition, they were asked if they knew of other professionals who could be approached with the same request. Six referrals were obtained in this manner. The S-LPs were asked to send CATs that contained information about the age, grade and gender of the respondent. All respondents were to have unremarkable reading histories. If there was any mention of reading difficulties in a respondent's file, a copy of that child's CAT form was not to be sent to the investigator. In order to maintain confidentiality of the respondents, the investigator requested that names of all respondents be removed from the CAT forms. The S-LPs were assured that the information they shared would be used for the purpose of this study only and a preliminary abstract of the findings was offered. In addition, the S-LPs and/or their employing facilities who participated, would be acknowledged in any presentations or publications of the findings.

In total, 17 S-LPs were contacted. Fifteen S-LPs did not use the CAT and, therefore, did not have copies to share. The remaining two S-LPs had archived CATs and agreed to forward copies of them to the investigator. An information packet was sent to those two S-LPs. The information packet included a letter of request (Appendix J) summarizing the purpose of the present study and the need to obtain as many completed CATs as possible in order to perform a factor analysis. In addition, a consent form (Appendix K) was attached to the letter and the speech-language pathologists were asked to sign it and mail it, along with copies of appropriate CATs, to the investigator.

In total, copies of 40 CATs were forwarded to the investigator. Unfortunately, none of them were usable in this study because only the original 35 item CAT was suitable. Those CATs forwarded were the 32 item Children's Attitudes About Talking (CAT-R) (DeNil & Brutten, 1991). Thus, the study proceeded with N=65 rather than N=105.

In Phase 2, names of children from the ISTAR and their corresponding CAT scores were known only to the investigator. Identifying information was treated as confidential. Respondents' names were obliterated on all copies of the CAT. Response sheets were coded by number and only the investigator had access to the key. Data from all subjects were treated with utmost care and respect. Hard copies of CATs were kept in a locked file. Data were entered into a computer database and stored on a hard drive and a floppy disk.

Data Analysis

Scoring was carried out as per instructions in Brutten and Dunham (1989). A point was awarded each time an item was marked in a way that indicated negativity toward speaking. Of the 35 items on the questionnaire, 19 of the statements if marked "true" and 16 if marked "false" are taken as indicative of communication attitudes that are negative. For example if a child marked "true" for the first item, "I don't talk right" one point was awarded. Likewise, if a child marked "false" for item 26, "I like to talk" a point was awarded. The total number of points a child obtained comprised the CAT score. A higher score indicated a more negative attitude about the respondent's speech. The highest score that could be received was 35.

Responses to items on the CAT yielded dichotomous nominal data. Subjects' responses to each item on the CAT were entered into a Microsoft Excel 5.0 database (Microsoft, 1994), then imported into an SPSS (Norusis, 1990) computer database. Responses to some item on the CAT were reverse scored. The nature of the scoring for the CAT is such that a point is awarded for each item that is marked in a way that indicated negativity. Thus, some "True" responses were awarded points and some "False" responses were awarded points. When data were originally entered into the computer database, all "True" responses were coded as a "1" and all "False" responses were coded as "0". However, in order to perform analyses, reverse scoring was necessary. Reverse scoring involved changing subjects' responses to certain items such that negative attitudes were coded as "1" and positive attitudes were coded as "0". These new codings were not dependent on the labels "True" and "False". Descriptive statistics were derived across age, grade and gender. In addition, data underwent 4 factor analyses: (1) principal component analysis, (2) principal component analysis - rotated, (3) principal component analysis - 4 components extracted, and (4) principal component analysis - rotated - 4 components extracted. Item analysis was also completed. Some key terms require discussion.

Factor analysis consists of a number of statistical techniques that aim to simplify complex sets of data into factors. A factor is a construct or phenomenon that can account for the relationships (correlations) among variables. (Kline, 1994). As outlined by Norusis (1990), factor analysis proceeds in four steps: (1) computation of the correlation matrix for all variables, (2) extraction of initial factors, (3) rotation, and (4) computation of factor loadings or scores for each variable within a factor.

Computation of the correlation matrix. The correlation matrix for all variables is computed by correlating each variable with every other variable. Thus, "a correlation matrix is a set of correlation coefficients among a number of variables" (Kline, 1994, p. 4).

Extraction of initial factors. Principal component analysis was the technique chosen to extract initial factors. In principal component analysis the number of factors needed to adequately describe the data is determined (Norusis, 1990). The decision is based on the eigenvalues, which are the sums of squares of the factor loadings of each factor that reflects the proportion of variance explained by each

factor. The larger the eigenvalue the more variance is explained by the factor (Kline, 1994). Factors with eigenvalues ≥ 2 were interpreted.

Rotation. Plotted data derived from initial factor rotation often are uninterpretable. Rotation is used in an attempt to transform the initial matrix so that it is easier to interpret. Transformation is done by rotating X and Y axes of the graphed relationship between individual items and the factor they represent. This rotation at the X-Y intersection is an attempt to find non-overlapping or orthogonal clusters of data points. Orthogonal rotation was used in this study. In orthogonal rotation, the axes are maintained at right angles.

Computation of factor loadings for each variable within a factor. Once the number of factors is known, one must determine which variables belong to each factor. Factor loadings are similar to correlations. They measure the relationship between each variable and the factor to which it probably belongs. Factor loadings of ≥ 4 were considered to represent appreciable relationships between a variable and the factor it was measuring. Thus, items with factor loadings ≥ 4 were interpreted as legitimate indices of the factor

Reliability

Reliability of test scoring (inter-scorer reliability). Scoring reliability of questionnaires was carried out for 15% of the completed CATs. The investigator scored all questionnaires. Fifteen percent of the questionnaires were re-scored by a trained ISTAR employee. Inter-scorer reliability was calculated using point-to-point agreement. Inter-scorer reliability was 100%. During factor analysis, however, data from 7 subjects did not correlate. Upon examination, errors in scoring were noted and corrected. For example, item 6 for subject #15 was erroneously scored as "1". For this subject, item 6 was re-scored as "0". Errors in scoring are outlined in Table 7. Despite the errors that occurred during scoring, scoring reliability for this set of 7 respondents was .96.

Table 7

Corrections in Scoring

Subject #	Item #	Mistakenly scored as	Rescored as	Original Overall Score	Rescored Overall Score
15	6	1	0	23	23
34	22	1	0	20	16
	25	1	0	20	16
	26	1	0		
	27	1	0		
	35	1	0		
44				31	32
46				26	25
48				23	24
49	14	1	0	31	30
55				29	30

There were three reasons for the scoring discrepancies. One discrepancy occurred because one scorer awarded a point of 1 if a child circled both true and false for an item. A decision was made to award a point of zero if a child circled both true and false for an item. This was considered to be a conservative scoring strategy. The second discrepancy in scoring occurred because some items were not circled at all, but mistakenly awarded a point of one. The third reason for discrepancy in scoring occurred due to an error in counting. Questionnaires for these 7 respondents were rescored and all discrepancies were corrected. As an extra precaution, inter-scorer reliability was carried out for an additional 15% of the CATs. Point to point reliability was 100%.

Reliability of data entry. Two people were needed for data entry. One person entered data into the computer database as it was read aloud by the other person. Visual checks for accuracy were made by both people during data entry. Thirteen (20%) of the subjects were randomly selected for a point-to-point reliability check. Every data point for those subjects was read back and compared to the data on the hard copy for exact correspondence. No errors in data entry were found. Thus, reliability of data entry for thirteen randomly selected subjects was 100%. Reliability of data entry for the remainder of subjects was, therefore, considered to be high.

Phase 2 Results

Descriptive Statistics. A summary of scores across sex, age and grade appears in Tables 8 - 10. As outlined in Table 8, there were 57 male respondents and 8 female respondents. The mean CAT score was 18.70 (SD=7.23) for males and 21.25 (SD=7.72) for females. There was no significant difference in scores between males and females. The mean score for all respondents was 19.02 (SD=7.28).

Table 8

Summary of CAT Scores by Sex

	N	Mean CAT Score	SD
Males	57	18.70	7.23
Females	8	21.25	7.72
Total	65	19.02	7.28

A summary of CAT scores across age groups appears in Table 9 and Figure 1. The mean age of respondents was 8.8 years (SD=1.7). Children ranged in age from 6 to 13 years. No standard deviation was reported for the 12 and 13 year olds because there was only one child in each of those age groups.

Table 9

Summary of CAT Scores by Age

Age	N	Mean CAT Score	SD
6	6	14.5	3.62
7	11	19.91	7.23
8	10	16.60	9.07
9	15	19.40	6.8
10	10	17.90	7.64
11	11	22.18	6.72
12	1	20	-
13	1	30	-

Table 9 and Figure 1 reveal an upward trend in mean scores; however, there was no significant difference in CAT scores across age groups.

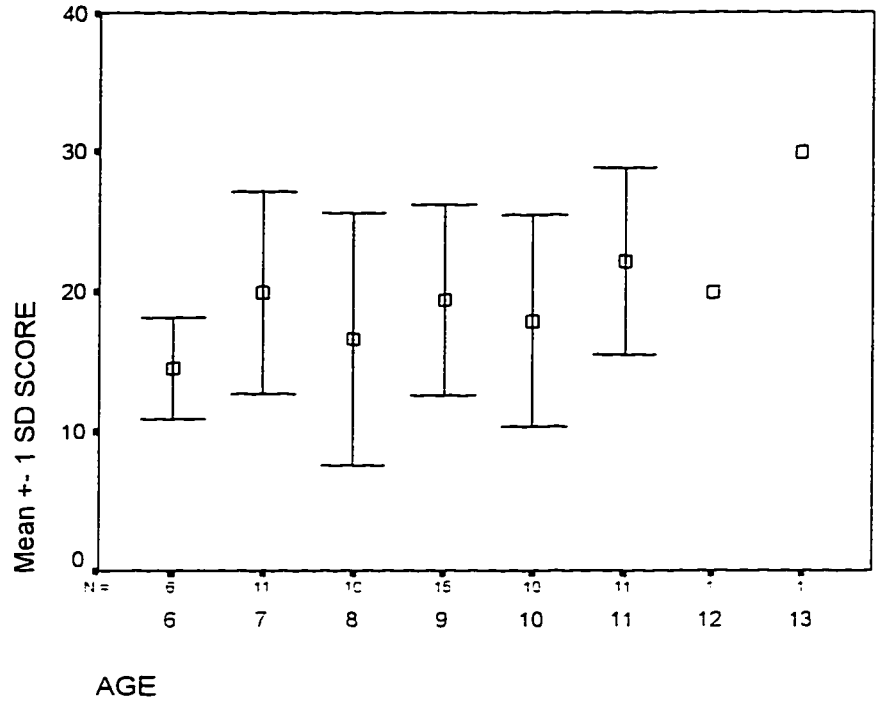

Figure 1. CAT scores across age groups.

A summary of CAT scores across grade levels appears in Table 10. The average grade of respondents was 3.6 (SD=1.67). Grade levels ranged from 1 to 8. No standard deviation was reported for grades 7 and 8 because there was only one child in each of those grade levels. There was no significant difference in scores across grade levels.

Table 10

Summary of CAT Scores by Grade

Grade	N	Mean CAT Score	SD
1	8	16.25	5.06
2	9	18.44	7.78
3	11	17.55	9.93
4	16	20.25	5.46
5	12	17.92	7.34
6	7	20.86	6.57
7	1	32	-
8	1	30	-

Factor Analyses. As noted above, a total of four exploratory factor analyses were conducted. Factor loadings of .4 or higher were interpreted as salient to each factor that emerged. Emerging CAT items were subjectively examined for similarities from which a name was derived for each factor.

The first type of factor analysis performed was principal component analysis (unrotated). This type of analysis yields a principal factor that accounts for the most variance (Gorsuch, 1974). Unrotated principal component analysis revealed one factor containing seven items. Items 10, 12, 20, 22, 23,27 and 28 had factor loadings ≥.6. In general, these items referred to "ease of talking".

Most often, principal factors derived from initial solutions do not answer all of the questions an investigator has. It is generally assumed that data from all unrotated solutions will be rotated. Rotation increases the likelihood of extracting additional factors that are relevant to the purpose of the study. (Gorsuch, 1974; Norusis, 1990; Rummel, 1970). Orthogonal rotations were used in this study. In orthogonal rotations the factors are rotated such that they are always at right angles to each other (Kline, 1994). Rotated principal component analysis revealed two factors. Items 7, 9, 14 and 33 formed a factor with factor loadings ≥.6. Items 12, 15, 16, 20, 22, and 28 formed a second factor with loadings ≥.4. Factor 1 appeared to refer to "liking the way I talk" and factor 2 appeared to refer to "ease of talking".

A further attempt was made to extract additional meaningful factors by performing (unrotated) principal component analysis - 4 components extracted. This too is a type of exploratory factor analysis in which an attempt is made to force data to converge into a specified number of factors. Since four factors were recognized by the panel of judges in Phase 1, an attempt was made to extract 4 factors through principal component analysis. Despite the four component extraction, only two factors emerged. In the first factor, items 10, 12, 20,22, 23, 27 and 28 emerged with factor

loadings ≥ .6. These items seemed to refer to " ease of talking". In the second factor, items 4, 7, 10, 14 and 31 grouped together with correlations ≥.4. These items appeared to refer to "worry about talking".

As mentioned before, it is usually difficult to identify meaningful factors from any unrotated solution. Thus, *rotated* principal component analysis - 4 components extracted was performed. This rotation, however, did not reveal any logical groupings.

In summary, 4 different extraction methods revealed a total of 3 identifiable factors. Unrotated principal component factor analysis revealed one factor, and rotated principal component factor analysis and unrotated principal component analysis - 4 factors extracted, revealed two factors. One extraction method, rotated principal component analysis - 4 components extracted, revealed no factors. The only recurring factor was "ease of talking". The two other factors were: "liking the way I talk" and "worry about talking". A summary of factors derived through these analyses can be found in tables 11 - 13.

Table 11

Results of Principal Component Analysis

Factor: "Ease of Talking"	
CAT Item	Factor loading
10. I find it easy to talk to most everyone.	.637
12. It is hard for me to talk to people.	.700
20. Talking is easy for me.	.651
22. Words are hard for me to say.	.672
23. I talk well most of the time.	.704
27. I am not a good talker.	.682
28. I wish I could talk like other children.	.657

Table 12

Results of Principal Component Analysis - Rotated

Factor: "Liking the Way I Talk"	
CAT Item	Factor loading
7. I like the way I talk.	.706
9. My parents don't like the way I talk.	.695
14. I don't worry about the way I talk.	.736
33. People don't seem to like the way I talk.	.679
Factor: "Ease of talking"	
12. It is hard for me to talk to people.	.450
15. I don't find it easy to talk.	.441
16. My words come out easily.	.816
20. Talking is easy for me.	.447
22. Words are hard for me to say.	.744
28. I wish I could talk like other children	.633

Table 13

Results of Principal Component Analysis - 4 Factors Extracted

Factor: "Ease of Talking"	
CAT Item	Factor loading
10. I find it easy to talk to most everyone.	.637
12. It is hard for me to talk to people.	.700
20. Talking is easy for me.	.651
22. Words are hard for me to say.	.672
23. I talk well most of the time.	.704
27. I am not a good talker.	.682
28. I wish I could talk like other children.	.657

Factor: "Worry About Talking"	
CAT Item	
4. People worry about the way I talk.	.628
7. I like the way I talk.	.583
10. I find it easy to talk to most everyone.	.637
14. I don't worry about the way I talk.	.463
31. I don't worry about talking on the phone.	.403

Item Analysis. Item analysis was performed to see which items did not correlate with the overall score. Correlations of $\leq .3$ were interpreted. Eleven items had correlations of $\leq .3$. These items were: 2, 3, 4, 8, 18, 19, 25, 30, 31, 32, and 34.

Phase 2 Discussion

Descriptive statistics. The typical respondent in this study was a grade 3 boy nearly 9 years of age. The mean score for respondents in this study was 19.02 (SD=7.28). No significant difference in scores was found among age or grade levels. Due to the large variances, or perhaps to the small number of females, no significant difference was found between the mean scores of males and females. The mean score for females, however, was higher than that of males - a finding consistent with previous research.

Factor analyses. The goal of Phase 2 was to investigate construct validity through factor and item analyses. An overview of factors derived through factor analyses appears in Table 14. Three factors emerged through factor analyses: "ease of talking", "liking the way I talk" and "worry about

talking". "Ease of talking" emerged twice: once through unrotated principal component analysis and once through unrotated principal component analysis - 4 factors extracted. Furthermore, "ease of talking" derived from both analyses revealed identical item groupings: 10, 12, 20, 22, 23, 27 and 28. Some items appear in more than one factor. For example, item 10 appears in both "ease of talking" and "worry about talking". This suggests that some items measure more than one factor.

Comparison of Phase 1 and Phase 2 results. A comparison can be made between factors derived from a panel of judges and factors derived from factor analyses (Table 14).

Table 14

Summary of Phase 1 and Phase 2 Factors

Phase 1 Constructs	Items measuring construct	Phase 2 Constructs	Items measuring construct
How stuttering children feel about their speech	1, 3, 5, 7, **10**, **12**, 13, 15, 17, 21, **22**, **23**, 24, **27**, **28**, 29, 32, 34	*Ease of talking	**10**, **12**, 20, **22**, **23**, **27**, **28**
How stuttering children think adults feel about stuttered speech.	1, 4, **9**, 23, **33**	**Liking the way I talk	7, **9**, 14, **33**
How stuttering children feel about physical manifestations of their stuttering	3, **12**, **15**, **22**, **28**	**Ease of talking	**12**, **15**, 16, 20, **22**, **28**
How stuttering children feel about talking while they are at school	1, 5, **12**, 19, **23**	***Ease of talking	10, **12**, 20, 22, **23**, 27, 28
		***Worry about talking	4, 7, 10, 14, 31

* Derived from Unrotated Principal Component Analysis
**Derived from Rotated Principal Component Analysis
*** Derived from Unrotated Principal Component Analysis - 4 Factors Extracted
Note: Items common to both phases appear in bold print.

As can be seen in Table 14, the two phases of this study did not reveal identical factors nor identical item groupings. The panel of judges in Phase 1 identified 4 factors, while the factor analyses in Phase 2 revealed 3 factors. Some similarities of factor names and item groupings, however, can be

found. For example, "how stuttering children feel about the physical manifestations of their stuttering" could also be described as the degree of "ease of talking". Items 12, 15, 22 and 28 are common to both factors. "Ease of talking." (derived by unrotated principal component analysis) may be, perhaps, a more succinct way to write "how stuttering children feel about their speech." Items 10, 12, 22, 23, 27 and 28, which refer to phenomena such as "ease of talking" and "being a good talker", are common to both of these factors.

That three different solutions revealed the factor "ease of talking" is noteworthy. One interpretation is that "ease of talking" is the most robust factor. In other words, it would be difficult to refute the existence of an "ease of talking" construct.

In Phase 2, construct validity was also investigated through item analysis. A type of item analysis was also extrapolated from the judges' responses in Phase 1. Item analysis is a statistical method that determines the correlation of individual items with the overall score. Items that do not correlate with the overall score do not contribute to the overall score. Items that do not contribute to the overall score may be extraneous and, therefore, omitted from the measurement device. An overview of item analyses from Phase 1 and 2 appears in Table 15.

Table 15
Items That Did Not Correlate With the Overall Score

	Items That Did Not Correlate With the Overall Score
Phase 1	**2, 6, 8,** 11, 14, 16, **18, 19,** 20, **25,** 26, **30, 31,** 33, 35
Phase 2	**2,** 3, 4, **8, 18, 19, 25, 30, 31,** 32, 34

Note. Items common to both phases are in bold print.

According to both Phase 1 and 2 item analyses, items 2, 8, 18, 19, 25, 30 and 31 do not contribute to the overall score. Brutten and Dunham (1989) found that items 18, 30 and 32 did not correlate with the overall score. DeNil and Brutten (1991) found that items 27, 30 and 32 did not correlate with the overall score. If items are repeatedly found to not correlate with the overall score they may be omitted from the CAT (M. Vanryckeghem, personal communication, January 15, 1997). Based on the findings of Brutten and Dunham (1989), DeNil and Brutten (1991) and the current study, there is ample support for the removal of items 18, 30, and 32.

Conclusions

The purpose of this study was to investigate the content and construct validity of the CAT using indices of validity not previously employed. This was a validation study done in two phases. Phase 1 examined content validity and Phase 2 examined construct validity.

Through a subjective evaluation, a panel of 4 judges concluded that the CAT had face validity. The judges concluded that the CAT was measuring 4 constructs: (1) how stuttering children feel about their speech, (2) how stuttering children think adults feel about stuttered speech, (3) how stuttering children feel about physical manifestations of their stuttering, and (4) how stuttering children feel about talking while they are at school. Factor analyses revealed 3 constructs: (1) ease of talking, (2) liking the way I talk, and (3) worry about talking. Item analyses suggested that several items did not contribute to the overall score and could possibly be removed from the CAT. In particular, there was ample justification for the removal of items 18, 30 and 32.

Clinical Implications

To the extent that item and factor analyses support construct validity, the findings of this study suggest that the CAT is a valid tool that can be used to gain insight into stuttering children's speech-associated attitudes. Specifically, responses to items on the CAT will provide information about stuttering children's perceptions of how easy it is for them to talk, how much they like to talk, and whether or not they are worried about talking.

Several issues arise from this study. One issue is whether or not clinicians should administer the CAT to young children with questionable reading skills or to older children known to have weak reading skills. If children are not able to complete the CAT independently, one option is to have an adult read the items to them. However, efforts should be made to ensure that children's responses are not influenced by the adults who are assisting them.

A second issue concerns administration protocol. Clinicians should ensure that children read and follow the instructions that appear on the CAT. Furthermore, children should complete the CAT in conditions conducive to testing. As much as possible, children should be free of distractions and complete the CAT in a quiet, well-lit room. In addition, adequate instruction in test administration should be given to adults who read items to children.

Limitations

There are two types of validity to consider when evaluating research efficacy: internal validity and external validity. Internal validity addresses the question of whether the researcher has

accounted for factors that could have a significant effect on the data collected. External validity addresses the generalizability of the findings.

Internal Validity

There are 8 factors that should be considered as potential threats to internal validity (Schiavetti & Metz, 1997): history, maturation, testing, or test-practice effects, instrumentation, statistical regression, differential selection of subjects, mortality and interaction of factors. Of the 8 factors listed above, instrumentation is one factor that may threaten the validity of this study. With respect to Phase 1, the instrumentation issue arises from the "paper and pencil" task of the judges. If judges hastily completed the categorization task, they accidentally may have missed an item or they may have assigned an item to the wrong category. However, it appeared that the categorization task was completed with care because all four of the judges contacted the investigator to get clarification on the task asked of them. Thus, instrumentation for Phase 1 was not considered to be a serious threat to validity.

The instrumentation issues that affect Phase 2 of this study are test administration and test scoring. Although the CAT includes a set of instructions for respondents, there are no standard guidelines for administration. Archived data were used in the second phase of this study; therefore, it is impossible to know the exact conditions under which respondents completed the CAT. For example, some children may have had the instructions read to them and some children may have completed the questionnaire in the presence of their parents. It is possible that children's responses to some or all of the items on the CAT were influenced by their parents. Thus, the lack of a standardized administration protocol may have made it more difficult to find underlying constructs because the children may not have responded accurately or honestly. The lack of detailed scoring procedures also may threaten the validity of this study. For example, it is not clear how to score items that received both "True" and "False" responses. (For the purpose of this study, scoring erred on the side of caution such that all items that were marked "True" *and* "False" received a score of zero.) Instrumentation effects are not considered a serious threat to the internal validity of this study, because all of the CATs were completed and scored in the same clinic and because only a few items in the entire corpus of items were marked both "True" and "False".

Another issue of instrumentation pertains to the fact that the constructs that emerged from Phases 1 and 2 were not identical. The response protocol used in Phase 1 may have predisposed the judges to respond in the way they did. It is possible that, left to their own devices, the judges as a group may have extracted factors that more closely resembled those found in Phase 2. On the other hand, it may be unreasonable to expect a panel of fluent *adult* professional judges to identify constructs in a questionnaire designed for dysfluent *child* respondents. A final issue arises from the fact that item analysis revealed that items 4 and 31 did not contribute substantially to the overall score, yet these items emerged with salient factor loadings during principal component analysis - 4 factors

extracted. One possible explanation for the discrepancy may be that items 4 and 31 contributed to the "worry about talking" factor without contributing to the overall score.

External Validity

There are 4 factors that should be considered as potential threats to external validity (Schiavetti & Metz, 1997): subject selection, reactive or interactive effects of pre-testing, reactive arrangements, and multiple-treatment interference. Of these 4 factors, subject selection is the only one that may threaten the external validity of this study. The threat of subject selection concerns the degree to which the subjects chosen for the study are representative of the population to which the researcher wishes to generalize. The child respondents in this study came from families that *sought* therapy in a fee-for-service clinic. These children may have had different geographical, educational, religious, and socioeconomic characteristics than the general population of children who stutter. It is possible that children who seek and receive therapy at the ISTAR respond differently to items on the CAT than children who are identified and receive therapy elsewhere. However, the children in this study obtained a mean score of 19.02 (SD=7.28) which is similar to the mean scores of 19.86 (SD=6.54) obtained by Boutsen and Brutten (1989) and 16.69 (SD=7.29) obtained by DeNil and Brutten (1990, 1991). Despite differences in subject populations, the mean scores of children in this study were similar to those of children in previous studies. This is one indication that results can be generalized to other stuttering children.

Considerations for Revising the CAT

Based on the findings of this study, other studies of the CAT, and information from test construction and scale development literature, some considerations for revising the CAT are offered.

Revisions Based On Current and Previous Findings

As with all assessment tools, the CAT is subject to revisions based on the findings of research. Revisions to the CAT may be made based on the findings of Phases 1 and 2 of this study and on the findings of previous studies. It may be premature to make revisions based on the findings of Phase 1. As mentioned previously, the results of Phase 1 were based on the ability of a panel of fluent *adult* professional judges to identify constructs in a questionnaire designed for dysfluent *child* respondents. While the findings of Phase 1 provided support for the content validity of the CAT, the results of the quasi-item analysis may not be as robust as the results from a statistical item analysis. Thus, at this time, Phase 1 results should not be used to determine any revisions to the CAT.

Revisions based on the findings of Phase 2 *and* previous research, however, might be considered. Item analysis in Phase 2 revealed that items 2, 3, 4, 8, 18, 19, 25, 30, 31, 32 and 34 did not contribute to the overall score. Brutten and Dunham (1989) found that items 18, 30 and 32 did not contribute to the overall score. DeNil and Brutten (1991) found that items 27, 30 and 32 did not correlate with the overall score. If items are repeatedly found to not correlate with the overall score

they may be omitted from the CAT (M. Vanryckeghem, personal communication, January 15, 1997). Based on the findings of the current study and of Brutten and Dunham (1989), and DeNil and Brutten (1991), there is ample support for the removal of items 18, 30, and 32.

Caution must be exercised when interpreting the results of item analysis. The results of item analysis should be examined within the scope of the study in which it was performed. That an item does not correlate with the overall score is not always grounds for removal of that item from a tool. For example, the results of item analysis in Phase 2 revealed that item 31 did not contribute to the overall score. However, it is reasonable to suggest that this item be retained because it contributed to the "worry about talking" factor.

Revisions Based On Test Construction and Scale Development Literature

Information from the test construction and scale development literature provides guidelines on specific areas of questionnaire construction. Issues specific to the CAT include utility of the true/false format, the use of negatives, the effect of wording, and the balancing of positive-attitude and negative-attitude statements. Each of these issues will be discussed.

Utility of true/false questionnaires. There are several advantages to using a true/false format for a questionnaire designed for children. One of the biggest advantages of a true/false test is that it provides a simple and direct way to measure a phenomenon in a relatively small period of time (Sparzo, 1990). Another advantage of true/false questionnaires is that the *intensity* of a phenomenon can be measured since the middle alternative is omitted (Converse & Presser, 1986). In addition, scoring of true/false questionnaires is relatively quick, objective and reliable. Furthermore, the relative brevity of test items (as compared to multiple choice or short answer test items) is more suitable for young readers and slow or poor readers. (Hopkins & Antes, 1989). There are, of course, some limitations of true/false test formats that should be considered. One limitation is that children are not given an opportunity to expand on a topic or idea (Hopkins & Antes, 1989). Furthermore, children are not given an opportunity to make a "middle of the road" statement. True/false items presume a dichotomous relationship of being absolutely true or absolutely false. In reality, there are degrees of trueness and falseness, but this is not captured with a true/false questionnaire. A variation of a Likert (1932) rating scale is one alternative to a true/false questionnaire. Likert-type alternatives for the CAT might include response classes such as "not at all true", "sometimes true" and "very true". It appears, however, that the advantages of the true/false format for the CAT may outweigh the disadvantages. Therefore, it is recommended that a revised version of the CAT continue to adopt the true/false format of the original CAT.

Use of negatives. Of the 35 items in the original CAT, eleven contain negatives. Words such as "not" or "don't" may be difficult for children to read if they are embedded in a true/false test format. Furthermore, words such as "not" can be easily overlooked by students and therefore should be used sparingly. Thus, when possible, items should be stated positively (Ayers, 1962; Sparzo, 1990).

Wording effects. Converse and Presser (1986) found that small changes in wording can shift the answers of many respondents, but it is often difficult to predict in advance whether a wording change will have such an effect. Converse and Presser (1986) provide the following example of wording effects:

> "'Forbid' and 'allow'... are logical opposites, and thus substituting one for the other in a question "Do you think the United States should [allow/forbid] public speeches against democracy?" might be easily assumed to have no effect. Yet it turns out that many more people are willing to 'not allow' such speeches than are willing to 'forbid' them. On the other hand, referring to something as 'bad or dangerous' would seem to load a question and thus have noticeable impact on respondents." (p.41)

Similarly, the wording of some items on the CAT may predispose respondents to answer in a certain way. For example, the third item on the original CAT is a positive item that reads "I talk well most of the time". This same item could be re-written as a negative item such as "I talk poorly most of the time". The results of the current study did not reveal an aggregation of either positive or negative items on factors. However, a response item bias may exist for young children or children with poor reading skills. In his research on rating scales for preadolescent children, Marsh (1986) found that young children and children with poor reading skills were less able to respond appropriately to negative items. Specifically, he found that these children frequently responded "true" to negative items. The author referred to this phenomenon as a "method/halo effect" (p.37) and cautioned that the effect biases the interpretation of responses. Similarly, Rifkin, Wolf, Lewis and Pantell (1988) found that young children had difficulty responding appropriately to negatively worded items. These researchers opted to remove all negatively worded items from their final version of a child questionnaire designed to asses the perceptions of children's visits to physicians. It is recommended that each item on the CAT be field tested to determine if a method/halo effect for negative items exists.

Balancing positive-attitude and negative-attitude statements. The number of positive-attitude and negative-attitude statements should be balanced across the CAT. If *all* statements reflected either a positive-attitude or a negative-attitude, respondents might develop a response set and respond irrespective of item content (Converse & Presser, 1986). Thus, approximately half of the items on the CAT should be indicative of a negative speech attitude, if the respondent indicates "true", and approximately half of the items should be indicative of a negative speech attitude, if the respondent indicates *"false"*. Furthermore, positive and negative attitude statements should be randomly ordered so that the answer pattern is not predictable.

Future Research

Future research on children's speech-associated attitudes might investigate a method/halo bias with respect to negative items. If a revised CAT is developed, normative information will need to be collected for it. In addition, development of standardized administration and scoring guidelines is recommended, especially as they apply to administration of the CAT to children who do not read.

The speech-associated attitudes of female stutterers may be one area to research more thoroughly. Although no significant difference has been found between CAT scores of males and females, females have consistently obtained higher mean scores. A significant difference may be found, if a larger sample of female stutterers could be studied.

Research using the CAT has demonstrated that negative communication attitudes are present among children who stutter, but little is known about the development of speech attitudes between childhood and adulthood. Furthermore, the most effective ways to address speech attitudes of young stutterers are not known. Thus, future researchers might study the development of communication attitudes and investigate effective ways to minimize negative attitudes.

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Appendix A: Communication Attitude Test

Form A
Gene J. Brutten, Ph.D.
Southern Illinois University

Read each sentence carefully so you can say if it is true or false for you. The sentences are about your talking. If you feel that the sentence is right, circle true. If you feel that the sentence about your talking is not right, circle false. Remember, circle false if you think the sentence is wrong and true if you think it is right.

1.	I don't talk right.	True	False
2.	I don't mind asking the teacher a question in class.	True	False
3.	Sometimes words will stick in my mouth when I talk.	True	False
4.	People worry about the way I talk.	True	False
5.	It is harder for me to give a report in class than it is for most of the other kids.	True	False
6.	My classmates don't think I talk funny.	True	False
7.	I like the way I talk.	True	False
8.	People sometimes finish my words for me.	True	False
9.	My parents like the way I talk.	True	False
10.	I find it easy to talk to almost everyone.	True	False
11.	I talk well most of the time.	True	False
12.	It is hard for me to talk to people.	True	False
13.	I don't talk like other children.	True	False
14.	I don't worry about the way I talk.	True	False
15.	I don't find it easy to talk.	True	False
16.	My words come out easily.	True	False
17.	It is hard for me to talk to strangers.	True	False
18.	The other kids wish they could talk like me.	True	False
19.	Some kids make fun of the way I talk.	True	False
20.	Talking is easy for me.	True	False
21.	Telling someone my name is hard for me.	True	False
22.	Words are hard for me to say.	True	False
23.	I talk well with most everyone.	True	False
24.	Sometimes I have trouble talking.	True	False
25.	I would rather talk than write.	True	False
26.	I like to talk.	True	False
27.	I am not a good talker.	True	False
28.	I wish I could talk like other children.	True	False
29.	I am afraid the words won't come out when I talk.	True	False
30.	My friends don't talk as well as I do.	True	False
31.	I don't worry about talking on the phone.	True	False
32.	I talk better with a friend.	True	False
33.	People don't seem to like the way I talk.	True	False
34.	I let others talk for me.	True	False
35.	Reading out loud in class is easy for me.	True	False

Appendix B: Types of Validity

Type of Validity	Description	Reference
Content Validity:		
Traditional (Sometimes referred to as *face* validity.)	A subjective procedure for logically or rationally evaluating the items on a test to see how well they reflect what the tester wishes to measure. The analysis is usually done by the researcher or by a panel of judges. The analysis is not strictly empirical.	Ventry and Schiavetti (1986)
Face Validity	The degree to which a test taker can determine what a test is supposed to measure.	Zimbardo (1985)
Criterion Validity:	The degree to which a test score correlates with an outside validating criterion.	(Ventry & Schiavetti, 1986)
Concurrent Validity	The degree to which a test correlates with an outside validating criterion that was administered at the same time	
Predictive Validity	The degree to which a test correlates with an outside validating criterion that is administered at a later time.	
Construct Validity:	The "...degree to which a test measures some relatively abstract trait or construct based on an analysis of the nature of the trait..."	(Nicolosi, Harryman & Kresheck, 1989)
Logical	Compares how different kinds of subjects will score.	(Ventry & Schiavetti, 1986)
Factor Analysis	A statistical technique for reducing a large number of items into smaller clusters of items, each of which identifies a common underlying trait.	(Ventry & Schiavetti, 1986)
Item Analysis	A statistical technique for correlating each item in a test with the overall test score to see if each item measures the target construct as well as the overall test does.	(Ventry & Schiavetti, 1986)

Appendix C: Instructions for Judges

Your participation is voluntary and you may terminate your participation at any time. Your name will be known only to the investigator and will not be reported in any presentations or publications of the findings. To ensure anonymity of your answers, your response sheets are coded by number and only the investigator will have access to the key.

Instructions:

1. Read the letter of request to participate. If you agree to participate, please read, sign, and date the informed consent form in the presence of a witness. Please have the witness sign and date the form.
2. Read the paper entitled, "Background Information on the Communication Attitude Test".
3. Read the paper entitled, "Response Protocol" and follow the directions that are on the sheet.

Once you have finished filling out the Response Protocol, please return it, and the signed consent form, to the investigator in the self addressed stamped envelope provided.

Appendix D: Judges' Informed Consent Form

I, _____. voluntarily agree to participate in the study entitled
(Print your name)

"Validity Measures of the Communication Attitude Test" being conducted by Cindy DeKort. I understand that approximately 45 minutes of my time will be required. All of my responses will remain anonymous. My name will not appear any presentations or publications of the findings. Content validity of the CAT will be investigated through analysis and qualitative description of my responses. Data derived from my responses will be kept for 5 years and will be then destroyed. I may withdraw consent and stop my participation at any time without consequence. All of my questions regarding my participation in this study have been answered. If I have any further questions or concerns regarding my participation I may contact the investigator. I have kept a duplicate copy of this consent form for my records.

_____ _____

Signature of Participant Date Signature of Witness Date

_____

Signature of Investigator Date
Cynthia DeKort B.Sc. S-LP(C)
Speech-Language Pathologist
478-0646(H) 492-2619(W)

_____

Signature of Supervisor Date
Paul Hagler Ph.D.
Professor
Department of Speech Pathology and Audiology
University of Alberta
(403) 492-0841 (W)

_____

Signature of Supervisor
Deborah Kully M.Sc. S-LP (C), CCC-Sp/Lang.
Executive Director
Institute for Stuttering Treatment and Research
(403) 492-2619 (W)

Appendix E: Abstract of the Communication Attitude Test

The Communication Attitude Test (CAT) was developed by Gene Brutten in 1985 to assess speech-associated attitudes of child stutterers. The CAT is a questionnaire consisting of 35 true/false statements about speech. Children are instructed to read each sentence carefully and indicate whether it is true or false as it applies to them. Children are given a point each time they mark an item in a way that indicates negativity towards speaking. For example, the first item on the questionnaire reads: "I don't talk right." If children circle "true" for this statement, they are given one point. The total number of points a child obtains on the questionnaire comprises that child's CAT score. Thus, a higher score indicates a more negative attitude about the respondent's speech (Brutten & Dunham, 1989).

Appendix F: Response Protocol

Your job is to decide to which category or categories each statement belongs. The categories are listed here for you. Read each statement on the Communication Attitude Test one at a time. Put a checkmark under the category heading(s) you think each statement belongs to. You may check more than one category for each item. For example, if you think the statement, "I don't talk right" belongs under the first category, put a check mark under the first category heading. If you feel that a statement doesn't belong to any category, mark it for later consideration. Once all the statements that fit under existing categories are assigned, return to those that did not fit under any and write in your own category in the box under the "other" heading. In other words, if you think a particular statement doesn't belong to any of the listed categories, make up a category name for that statement. You may make up as many category names as you feel are needed. In addition, you may re-word pre-existing categories.

Appendix F continued

	How stuttering children feel about their speech.	How stuttering children think *adults* feel about stuttered speech.	How stuttering children think *other children* feel about stuttered speech.
1. I don't talk right.			
2. I don't mind asking the teacher a question in class.			
3. Sometimes words will stick in my mouth.			
4. People worry about the way I talk.			
5. It is harder for me to give a report in class than it is for most of the other kids.			
6. My classmates don't think I talk funny.			
7. I like the way I talk.			
8. People sometimes finish my words for me.			
9. My parents like the way I talk.			
10. I find it easy to talk with most everyone.			
11. I talk well most of the time.			
12. It is hard for me to talk to people.			
13. I don't talk like other children.			
14. I don't worry about the way I talk.			
15. I don't find it easy to talk.			
16. My words come out easily.			
17. It is hard for me to talk to strangers.			
18. The other kids wish they could talk like me.			
19. Some kids make fun of the way I talk.			
20. Talking is easy for me.			
21. Telling someone my name is hard for me.			
22. Words are hard for me to say.			
23. I talk well with most everyone.			
24. Sometimes I have trouble talking.			
25. I would rather talk than write.			
26. I like to talk.			
27. I am not a good talker.			
28. I wish I could talk like the other children.			
29. I am afraid the words won't come out when I talk.			
30. My friends don't talk as well as I do.			
31. I don't worry about talking on the phone.			
32. I talk better with a friend.			
33. People don't seem to like the way I talk.			
34. I let others talk for me.			
35. Reading out loud in class is easy for me.			

Appendix F continued

	How stuttering children think *people in general* feel about stuttered speech.	How stuttering children feel about physical manifestations of their stuttering.	How stuttering children feel about talking while they are at school.	How stuttering children feel about talking on the phone.	Other
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Appendix F continued

Additional Questions:

1. In your words, please state what *you* think the Communication Attitude test is intending to measure.

2. Do you feel that the CAT actually measures what it is intending to measure?

3. Do you think any true/false statements should be added to this questionnaire? If so, please write them in the space provided.

4. Do you think any statements on the CAT should be removed? If so, please indicate which statements and state your reason(s).

Please make any additional comments.

Appendix G: Letter of Request to Participate

Dear _____.

(Name of clinician)

I am writing to request your participation in a study of the validity of the Communication Attitude Test. If you agree to participate you will be asked to read the Communication Attitude Test and answer some questions about it. Approximately 45 minutes of your time will be required. The CAT is the only measure of speech-associated attitudes that has been shown to consistently discriminate stuttering children from nonstuttering children to a statistically meaningful extent. This implies that the CAT has validity with respect to logical analysis. This type of validity, however, may not be the most compelling validity. My study will investigate further the validity of this tool using indices of validity not previously employed. This study has been approved by the Department of Speech Pathology and Audiology Student Research Ethics Committee. All information will be treated as confidential.

Should you choose to participate in this study, your name will be known only to the investigator. To assure anonymity of your answers, your response sheet will be coded by number and only the investigator will have access to the key. Any identifying information will be treated as confidential. If you decide to participate in this study, you have the right to stop your participation at any time.

If you are willing to participate in this study, please sign one copy of the attached consent form and return it in the self addressed stamped envelope provided. The duplicate copy is for your records.

Thank you for considering this request. Please contact me if you have any questions. I look forward to hearing from you.

Sincerely,

Cindy DeKort B.Sc., S-LP (C)
Speech-Language Pathologist
(403) 492-2619 (W) (403) 478-0646 (H)

Deborah Kully, M.Sc. S-LP(C), CCC-Sp.Lang.
Executive Director
Institute for Stuttering Treatment and Research
(403) 492-2619

Paul Hagler Ph.D.
Professor
Department of Speech Pathology and Audiology
University of Alberta
(403) 492-0841 (W)

Appendix H : Names and Addresses of Directors of Stuttering Therapy Clinics in Canada and the United States

Name	Address	Phone number
Lisa Avery	University of British Columbia/Richmond Health Department 406 5900 Dover Crescent Richmond. BC V7C 5R4 Lisa.Avery@audiospeech.ubc.ca	(604) 822-6325
Gene Brutten	Department of Communication Disorders University of Central Florida P.O. Box 25000 Orlando. FL 32816-2215	(407) 823-2367
June Campbell and Diane Hill	Northwestern University Speech and Language Clinic 2299 Sheridan Road Evanston. IL 60208	(708) 491-5012
Sue Christiensen	Calgary Health Services 32 Ranch Estates Road. NW Calgary. AB T3G 1T5	(403) 241-0063
Luc DeNil	Graduate Department of Speech Pathology 6 Queens Park Crescent Toronto. ON M5S 1A8	
Martha Goebel	Annandale Fluency Clinic 4208 Evergreen Ln.. Suite 213 Annandale. VA 22003	
Maria Goncalvez	Capital Health Authority 7525 - 38 Ave Edmonton. Alberta. Canada T6K 3X9	(403) 463-2959
Ellen Kelly	Purdue University Department of Audiology and Speech Sciences Heavilon Hall West Lafayette. IN 477907-1353	(317) 494-3816
Rosalee Shenker	The Fluency Centre McGill University 5735 Monkland Montreal. Que H4A 1E7 rosalee.shenker@mtsg.ubc.ca	(514) 489-2238
Janice Westbrook	Easter Seal Society 5701 Maple ST. Dallas. TX 75235	(214) 358-5261

Appendix I: Script for Telephone Call to Speech-language Pathologists

"Hello, my name is Cindy DeKort. I am a graduate student at the University of Alberta, and I am also an employee of the Stuttering Institute in Edmonton, Canada. I am calling to request your help for a study I am conducting for my Master's thesis. I am conducting a study on the validity of the Communication Attitude Test. I am calling to see if you would be able to share copies of pre-treatment CAT forms with me.

Do you know of anyone else who might have copies of the CAT they might be able to share with me?

Thank you for your time today."

Appendix J: Letter of Request to Forward Archived Copies of the Communication Attitude Test

Dear _____.

(Name of speech-language pathologist)

I am writing to inform you of a study I am conducting for my Master's thesis and to request your help. I am conducting a study on the validity of the Communication Attitude Test. More specifically, I am investigating the construct validity of this tool through factor and item analyses. As you know, both forms of analyses require a large number of subjects. To date, I have 65 questionnaires completed by stuttering children who received therapy at the Institute for Stuttering Treatment and Research (ISTAR).

The CAT is the only measure of speech-associated attitudes that has been shown to consistently discriminate stuttering children from nonstuttering children to a statistically meaningful extent. This implies that the CAT has validity with respect to logical analysis. This type of validity, however, may not be the most compelling validity. My study will investigate further the validity of this tool using indices of validity not previously employed. This study has been approved by the Department of Speech Pathology and Audiology Student Research Ethics Committee. All information will be treated as confidential.

If you are able to share copies of your collection of the Communication Attitude Test with me, I would be very grateful. I require copies of pre-treatment CAT forms that have been completed by English speaking child stutterers. It would be very helpful if information such as age, grade and sex are marked clearly on each test. However, to ensure anonymity of subjects, it will be necessary to delete the names of the respondents. In addition, all child respondents must have "unremarkable reading histories". If a child's file contains any information that implies that there is a reading problem, a copy of that child's CAT form *should not* be sent. If a child's file does not contain any information regarding the respondent's reading ability, the child can be assumed to have an "unremarkable reading history" and a copy of his or her CAT form can be sent to the investigator.

If you are able to share copies of the Communication Attitude Test, please sign and date the attached consent form and mail it, and copies of any appropriate completed questionnaires, to me. In order for the data to be used in my study, your consent form and copies of questionnaires should be mailed back to me within 3 weeks of receiving my request.

Appendix J continued

Any contribution you can make to my study would be greatly appreciated. If you are able, please forward copies of CATs by March 15, 1997. If you are interested, an abstract of the findings will be forwarded to you. If you have any questions or concerns please do not hesitate to call me. Thank you for your consideration. I look forward to hearing from you at your earliest convenience.

Sincerely,

Cindy DeKort, B.Sc. S-LP (C)
Speech-Language Pathologist

Paul Hagler Ph.D.
Professor
Department of Speech Pathology and Audiology
University of Alberta
(403) 492-0841 (W)

Deborah Kully M.Sc. S-LP (C), CCC-Sp/Lang.
Executive Director
Institute for Stuttering Treatment and Research
(403) 492-2619 (W)

Appendix K: Consent to Share Information Form

I, _____, voluntarily agree to share copies of the Communication
(Print your name)

Attitude Test with Cindy DeKort. I understand that data derived from the CAT will be used for the sole purpose of conducting the study entitled: Validity of the Communication Attitude Test. I understand that data from the forwarded CATs will undergo statistical analyses so that validity of the CAT can be investigated. To ensure anonymity of subjects, I will delete respondents' names from all questionnaires. I am sending copies of CAT forms completed by child respondents with unremarkable reading histories. This means that no mention of reading problems was present in the respondents' files. In addition, age, grade and sex of respondents are included. I understand that this study has been approved by the Department of Speech Pathology and Audiology Student Research Ethics Committee at the University of Alberta and that Ms. DeKort will use these data in a manner that respects their confidential nature. Copies of CATs will be stored in a locked cabinet. Data will be entered into a computer for analysis will be stored on a hard drive and floppy disk. All data will be destroyed after five years. All of my questions about this study have been answered. If I have any further questions or concerns regarding my participation in this study, I may call the investigator. I may withdraw consent of the use of my copies of the CAT at any time without consequence. If I have any questions or concerns regarding my participation I may contact the investigator. I have kept a duplicate copy of this consent form for my records.

Signature of Speech-Language Pathologist	Date	Signature of Witness	Date
Signature of Investigator Cynthia DeKort B.Sc. S-LP(C) Speech-Language Pathologist 478-0646(H) 492-2619(W)	Date	Signature of Investigator Paul Hagler Ph.D. Professor Department of Speech Pathology and Audiology University of Alberta (403) 492-0841 (W)	Date
Signature of Investigator Deborah Kully M.Sc. S-LP(C), CCC-Sp/Lang. Executive Director Institute for Stuttering Treatment and Research (403) 492-2619 (W)	Date		