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VALIDITY AND RELIABILITY OF THE PROSODIC CUES TEST

CHRISTINA COLESON GARLAND

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Validity and Reliability of the Prosodic Cues Test

A Thesis

Presented for the

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Degree

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Christina Coleson Garland

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DEDICATION

This thesis is dedicated to my mother,
who always believed I could achieve my dreams.

Abstract

The current study was designed to obtain reliability and validity data for the Prosodic Cues Test, an instrument developed to examine an individual's ability to perceive prosodic cues in language. Prosody is the use of variations of vocal tone, pitch, stress, timing, loudness, and rate of speech to lend emotion to human vocalizations. Mood and attitude of the speaker can be determined by prosodic cues in speech. Participants in the current study were 96 college students (females=83, males=13), drawn from classes at Austin Peay State University. The participants were administered the Prosodic Cues Test, Seashore Rhythm Test, Speech-Sounds Perception Test, and a behavioral self-report measure. The results of the current study have been used to determine the reliability and validity of the Prosodic Cues Test to assess an individual's ability to perceive prosodic cues in human speech. Based on the data gathered in the current study, a script for a shorter, revised version of the instrument has been created. The Prosodic Cues Test, Revised script contains 30 statements. The 5 most valid and reliable portrayals of each emotion were included in the script for the revised instrument. The ultimate use of the Prosodic Cues Test is to assess whether school-age children with behavior disorders have more difficulty perceiving prosodic cues in speech than a comparison group of normal children.

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CHAPTER I

Introduction

A recent review of the literature revealed that the study of prosody represents a significant frontier. The word “prosody” is derived from the Greek word “prosoida” which means “song sung with accompaniment” (Merewether & Alport, 1990). Prosody is also known as “the melody of speech” (Baltaxe & Simmons, 1985). Prosodic features carry information regarding the speakers’ emotional state or the context of a vocalization (Merewether & Alport).

Studies of prosodic perception began with Dimitrovsky in 1964. Since then, most research has focused on the development of prosodic perception abilities in children and how to create prosodically appropriate synthesized speech. Prosody is a complex area of investigation and views differ on a number of issues, including the best methods of study (Baltaxe & Simmons, 1985). Research in this area is limited partially because no commercially available measure currently exists to assess participants’ perception of prosodic cues in content-neutral vocalizations. As a result, researchers are forced to create their own measures, which somewhat limits comparison of measures of prosody in the historical and current research literature.

A review of the literature revealed conflicting evidence on which emotions are most accurately identified by participants in studies on prosody. It is unclear if negative emotions (sadness, anger) or positive emotions (happiness) are more accurately identified. This could be due to structural differences in the measures, for example: how many emotions were portrayed; the number of vocalizations in the measure; if male

and/or female voices were used; if vocalizations were portrayed by professionally trained actors; and if vocalizations were content-neutral. Since no measure in the literature is the same on each of the above variables, it is possible that results gathered by researchers may differ not because of the construct measured but because of confounding variables.

Definition of Terms

Prosody-the use of variations in vocal tone or pitch, stress, timing, loudness, and rate in speech used primarily to denote emotional emphasis.

Objective

The objective of the current study was to obtain initial reliability and validity data for components of the Prosodic Cues Test, an instrument designed to examine an individual's ability to perceive prosodic cues in content-neutral sentences. After reliability and validity data for the Prosodic Cues Test was obtained and evaluated, the test was revised to delete those items found to be least appropriate. In the future, the Prosodic Cues Test will be used to assess children with behavior problems, to determine if they have more difficulty perceiving prosodic cues in speech than normal children. Based on the literature, it appears that children with behavior problems may possess deficits in emotional understanding (Cook, Greenberg, & Kusche, 1994). If it is found that some children with behavior problems have deficits in emotional understanding, prevention and treatment programs could be developed for children with significant behavior problems or at-risk for such problems based on prosodic deficits. Such programs

might teach children about emotions and emotional understanding, as well as provide them with the necessary monitoring skills to adequately perceive emotions, which might in turn improve behavior.

CHAPTER II

Review of the Literature

Measurement of prosody

According to Baltaxe and Simmons (1985), it is difficult to determine how a listener uses prosodic cues and combinations of cues to identify particular emotional states, such as happiness, sadness, or anger. What is certain is that utterances without prosody are impossible (Cutler & Swinney, 1987).

Scherer (as cited in Frick, 1985) noted that anger, happiness, and fear are all characterized by a fast rate of speech, increased loudness, and increased pitch. Frick (1985), in a review, found sadness to be correlated with low pitch and slow rate. Anger was found to correlate with higher pitch in some studies, and lower pitch in other studies. Frick suggested that the discrepancy was a result of two different prosodic vocalizations being labeled as angry, frustration and threat. According to Frick, the frustration type of anger appears to be expressed with a higher pitch. Frick also noted that the threat type of anger appears to be expressed with a normal pitch that is often perceived as lower pitch. Frick postulated that utterances expressing a lack of emotion (i.e., neutral) may be spoken more quickly than vocalizations expressing emotions. Frick concluded that the act of expressing emotion may slow speech.

Dimitrovsky (1964) developed an instrument for her study on perception of prosody that consisted of 24 items spoken by a male and a female speaker. Three examples of each emotion (anger, happiness, love, and sadness) were expressed in a

standard paragraph of verbal content by the speakers. Similarly, Bonebright, Thompson, and Leger (1996) used three trained actors and three trained actresses to each read two stories of neutral content while portraying the emotions of fear, anger, happiness, sadness and neutrality. Dunn, Brown, and Beardsall (1991), in their study of perception of emotion, used the Rothenberg Test of Social Sensitivity. The Rothenberg Test of Social Sensitivity consisted of four audiotape recorded interactions of a man and a woman displaying the emotions of happiness, anger, anxiety, and sadness. Participants were instructed to concentrate on the woman in two of the scenarios and the man in two of the scenarios and then decide which emotion was being portrayed by the person on which they were concentrating.

Several studies used female voices to generate emotional vocalizations. Baltaxe (1991) used one college educated female speaking 10 different phrases. The phrases were spoken four times each by the speaker who used the emotions of anger, happiness, neutrality, and sadness. Marcell and Jett (1985) created an instrument involving 12 samples of emotional speech generated by six female college students. The same passage was spoken in French with a happy, angry, sad, or fearful tone. Johnson, Emde, Scherer, and Klinnert (1986) developed an instrument that had a single actress speaking the same semantically neutral sentence with four different emotions (joy, sadness, anger, and fear.)

In another study that used a female speaker, four vignettes depicted interactions between a mother and child. The vignettes ended with a neutral phrase depicting the mothers' response, which was expressed with either anger, happiness, or neutrality. In half the vignettes, the situation and vocal tone were consistent, and in half the situation

and vocal tone were inconsistent (Dunn et al., 1991).

Courtright and Courtright (1983) used only male voices in the development of their instrument, the Measurement of Vocalic Sensitivity. In the Measurement of Vocalic Sensitivity, three actors spoke three complete sentences of emotional content with four different emotions (happiness, anger, love, and sadness).

Another study on perception of emotion utilized the Kusche Affective Interview-Revised (Cook et al., 1994). The Kusche Affective Interview-Revised asks participants to identify five emotions (happiness, sadness, anger, fright, and jealousy) in themselves and others by means of the questions "How do you know when you are feeling _____?" and "How do you know when someone else is feeling _____?"

In all of the studies described, measures were developed to suit the needs of researchers investigating perception of emotion. As a result, no two measures depicted emotions in the same way.

Developmental Issues

Knowledge of prosodic development is somewhat limited (Baltaxe & Simmons, 1985). In a review of the literature, Baltaxe and Simmons noted that some researchers argue that there is a biological basis for perception of prosody, while others feel that prosodic perception is learned from the social environment. In support of the biological view, Baltaxe and Simmons noted that, from birth, infants are sensitive and reactive to the quality of other's feelings, especially those expressed in the voice. Children's identification of emotional meaning in vocal-verbal expression appears to become more

accurate with age (Dimitrovsky, 1964; Hortacsu & Ekinici, 1992). Whether this is due to biological or social factors is not clear. As children mature, perceptions of emotions by prosodic cues become more salient than perception by context (Baltaxe & Simmons). The presence of emotional and behavioral problems, learning disabilities, or language impairments may influence the perception of affect expressed prosodically (Baltaxe, 1991; Cook et al., 1994; Trauner, Ballantyne, Chase, & Tallal, 1993).

Differences in children's abilities to recognize and understand other's feelings are important, yet we know relatively little about the development of this ability. While early influences within the family have a major impact, the nature of the influence is not well understood (Cassidy, Parke, Butkovsky, & Braungart, 1992).

Courtright and Courtright (1983) compared children with language disorders and normal children in terms of their ability to interpret emotional meaning from the vocal cues of an adult speaker. This study noted that it is impossible to communicate orally the content of a message without the concomitant use of vocal cues. Forty-nine children (33 boys, 16 girls) ages 3 to 7 years, participated in the study. Twenty-five of the participants were diagnosed with a language disorder. The instrument, the Measurement of Vocalic Sensitivity, was developed by the authors for the purpose of this study. The Measurement of Vocalic Sensitivity (MOVS) used three male voices speaking one complete sentence with neutral content, and vocal cues of happiness, anger, love, and sadness, for a total of 12 versions of the same sentence. Three professional actors were hired to record the tapes. Participants pointed to a photograph which matched their perception of the recorded emotional expressions. The photographs were of three males, and were

developed for training people in recognizing emotions from facial expressions. Content validity of the MOVS was assessed by pretesting a group of undergraduates. The pretest participants were adult, native English speakers. Based on the results of the pretest, the MOVS was found to be a valid indicator of ability to interpret vocal cues of emotion.

Courtright and Courtright (1983) found that children with diagnosed language disorders were less sensitive to vocal cues of emotion than were their peers without language disorders. The authors tentatively explained the differences with a theory that children with language disorders may perceive vocal cues accurately but do not possess the ability to associate the cues with the appropriate emotion. Courtright and Courtright discovered that children's ability to accurately identify the vocal cues of emotion varied greatly depending on which emotion was being expressed. Both groups of participants were relatively accurate at identifying emotions with a negative valence (anger, sadness) and less successful in recognizing happiness. In a review of the literature, Courtright and Courtright found that children of all ages have a tendency to accurately identify emotions of a negative valence, such as sadness and anger, more frequently than they accurately identify happiness.

In a review of the literature, Courtright and Courtright (1983) noted that research to date suggests that adults do not have the tendency to more accurately identify negative emotions. Interestingly, these results are somewhat in conflict with Baltaxe (1991), who found that while anger was accurately identified to a significant degree, happiness was as well. The conflicting findings could be a result of the gender of the actors and actresses

portraying the emotions in the different studies. Courtright and Courtright used male voices for the vocalizations, while Baltaxe used a female voice.

Bonebright et al. (1996) studied 104 undergraduates who listened to 120 content-neutral passages recorded by six trained actors and actresses (three males, three females). The actors and actresses portrayed the emotions of fright, anger, happiness, sadness, and neutrality. Results of the study indicated that participants accurately predicted actors' anger statements and actresses' happy statements. Courtright and Courtright's (1983) finding that anger was more accurately identified than happiness may be a result of their use of male actors. Similarly, Baltaxe's (1991) use of a female actress may have resulted in her finding of happiness being perceived to a significant degree.

Baltaxe (1991) studied 10 children, ages 39 to 48 months, to determine if young children perceived affective intonation patterns in speech expressing the emotions of happiness, anger, sadness, and neutrality. Ten vocalizations for each emotion were recorded by a female speaker. Participants were pretested by accurately identifying normal (neutral), happy, sad and angry expressions in black and white, two-dimensional drawings of male and female faces. Once all participants could accurately identify all expressions, the study was continued. Participants matched the emotional tone of the sentences to the appropriate facial expression in the drawings of the male and female faces. All four emotions were perceived with a significant degree of accuracy, however, angry and happy were identified correctly more accurately than neutral and sad. The tape-recording was stopped after each utterance to give participants time to make a decision as to which emotion was being portrayed. Finally, more than half of all

misperceived intonation defaulted into the happy category. The authors hypothesized that children view the world around them in an optimistic light, and may therefore perceive what they hear more often as happy. Another explanation could be that when doubtful about identifying a specific intonation pattern, children may have simply preferred the happy face. This study found no significant differences on overall test performance in relation to gender. Hortacsu and Ekinci (1992) found results similar to Baltaxe, with children in kindergarten, second and fifth grades who identified happiness most accurately, followed by anger.

In an early study of prosody, Dimitrovsky (1964) studied 224 children, ages 5 to 12, using audiotape-recordings of sentences delivered in a voice expressing anger, happiness, love and sadness. The participants were asked to select a stick figure drawing, depicting facial expressions and bodily gestures, of "the man that it sounds like." Five-year olds performed poorly but above chance levels. Gradual improvement paralleled the children's increases in age. Baltaxe and Simmons (1985), in a review of available literature, concluded that prosodic development does not reach optimal refinement until about age 12.

Dunn et al. (1991) investigated individual differences in children's conversations with their mothers and later ability to recognize emotions. Participants were 41 children and their mothers who were observed in their homes when the children were 36 months old. Data was collected on discussions of feeling states (sad, happy) between mothers and children. When the children were 6 ½ years old, they were assessed using the Rothenberg Test of Social Sensitivity. The Rothenberg Test of Social Sensitivity consists

of four audiotape-recorded interactions of a man and a woman displaying the emotions of happiness, anger, anxiety, and sadness. Participants were instructed to concentrate on the woman in two of the scenarios and the man in two of the scenarios. The participants then looked at photographs of a man and a woman depicting the four feeling states and were instructed to select the one that corresponded to the feeling the actor they had been concentrating on was experiencing. The results indicated that children who grew up in families in which feeling-state talk was frequent were better at making judgements about the emotions of unfamiliar adults. However, the authors noted that skill at understanding another's feelings does not guarantee prosocial behavior.

Cook et al. (1994) studied 229 first and second grade children to examine the relationship between individual differences in emotional understanding and disruptive behavior problems. Seventy-five percent of the participants were in regular education classes and 25% were in special education. To avoid confounding factors, children who were developmentally delayed, mildly mentally retarded, and multiply handicapped were excluded from the sample. Disruptive behavior was assessed using the Child Behavior Checklist-Parent Report Form. The measure of emotional understanding used was the Kusche Affective Interview-Revised, an instrument shown to have good reliability and validity. The Kusche Affective Interview-Revised assesses children's ability to identify five specific emotional states in themselves and other people. The task required that the participant give verbal responses when identifying the emotional states. The verbal responses were coded within a cognitive developmental framework, with a higher score indicating a more advanced level of emotional understanding.

Participants rated as high in behavior problems provided lower-level responses for cues used to recognize feelings in oneself and others than did their moderate and low behavior problem peers. The group rated as having moderate behavior problems fell between the problem and non-problem groups for cues used to recognize feelings in oneself and others but did not differ from either group significantly. According to the authors, a methodological weakness encountered in this study included a heavy reliance on verbal responses from the participants. Although participants had to have an IQ of at least 85 to be included in the study, it is highly possible that some participants were lacking in verbal skills, and accurately identified the emotion but were unable to express it verbally.

Marcell and Jett (1985) compared 66 individuals with mental retardation (mean age = 14.5) and 40 nonretarded individuals (mean age = 5.8) on their ability to identify an intended emotion (happy, sad, angry, or fearful) from nonverbal qualities (tone, pitch, rate) in an actress' voice on an audiotape. Patterns of emotional identification for the groups were similar, with an overall tendency for both groups to confuse fear with happiness. The similar patterns of emotional identification between the participants with mental retardation and normal participants was significant because, although the nonretarded participants were younger than the participants with mental retardation, the groups were matched by mental age.

Johnson et al. (1986) investigated recognition of emotion (joy, sadness, anger, and fear) among a group of resident psychiatrists and clinical psychology interns. Participants listened to a tape of an actress speaking the same semantically neutral sentence and giving

it each of the four emotions. The authors employed two different judgement procedures, forced-choice labeling and free-response labeling. Within the forced-choice condition, the four emotions were correctly identified 99% of the time. In the free-response condition, sadness and anger were correctly identified over 90% of the time. Fear and joy were correctly identified 50% of the time. According to the authors, sadness was recognizable over 90% of the time due to its characteristic nonverbal cues of slow tempo and little pitch variation, which indicate low energy or passive style of speech. The authors indicated that anger was consistently recognized due to its fast tempo, high pitch, and little pitch variation. Participants had the most difficulty identifying fear.

With regard to gender, Bonebright et al. (1996) did find significant differences in the perception of vocal affect between genders in an undergraduate sample. In their study, females perceived fear, sadness and happiness more accurately than males. Males identified anger more accurately than the females in the sample.

Summary

The current body of literature on prosody and understanding of vocal expression of emotions reveals that the most significant methodological problem is obtaining a valid and reliable measure of prosody. Since no prosody measure is currently commercially available, researchers are forced to create their own. Due to the lack of availability of a standard instrument, it is difficult to make meaningful comparisons between results from studies of prosody in the literature.

It is often difficult to obtain real-life recordings of vocal expressions of specific

emotions. Researchers have ethical concerns about inducing strong emotional states in a laboratory where they could be recorded. In addition, ethical considerations limit researchers' ability to eavesdrop on naturally occurring vocal affect expressions, for example, in a restaurant. Movie and television utterances would be difficult to find with no background music to aid in perception of emotional tone, or which were content-neutral. Unfortunately, vocal expressions of emotion are subject to a high degree of social control and are often difficult to replicate in a controlled setting (Scherer, Banse, Wallbott, & Goldbeck, 1991). A possible solution would be to use actors trained in vocal expression when creating a measure of prosody. Such actors would be experienced in expressing emotions vocally, which would lend validity to such a measure.

The current study was designed to create and validate a measure of prosody using male and female Speech/Communication/Theater professors. The professors were chosen because they have been trained in how to use their voices to convey emotions.

CHAPTER III

Method

Participants

Participants were 96 students (female=83, male=13, age range 18-46) enrolled in classes at Austin Peay State University. Participation was voluntary and each participant completed an Informed Consent Statement (Appendix A).

Measures

Participants in the current study filled out a demographic questionnaire and answered a series of questions about previous behavioral problems (Appendix B). The Seashore Rhythm Test (Appendix C), Speech-Sounds Perception Test (Appendix D), and Prosodic Cues Test were administered to participants.

Prosodic Cues Test

Participants were assessed with the Prosodic Cues Test, an unpublished instrument, developed by Whitten, VonPalko, Prather, Lowrance and Garland. The Prosodic Cues Test was designed to measure the ability of participants to identify emotions expressed in content-neutral sentences solely from the prosodic cues in the speaker's voice. The Prosodic Cues Test consisted of an audiotape and answer booklet. One hundred and eight sentences that are neutral in content were spoken by the second and third authors of the Prosodic Cues Test, who are Speech/Communication/Theater

professors. In addition, six sentences made up the lie scale. On sentences that made up the lie scale, the specific emotion being portrayed was stated within the sentence. The lie scale can help determine if participants were intentionally marking incorrect answers or not paying attention. The speakers alternated speaking the sentences, which were given emotion by the prosodic cues in their voices. The emotions used in the pilot were anger, shame, frustration, happiness, sadness, neutrality, and fright. The pilot test began with fourteen examples, in which each speaker read a sentence for each emotion being examined, and then stated which emotion was being expressed. Once the actual test began, the content-neutral sentences were spoken with at least three different emotions by the speakers. The sentences were randomly arranged with respect to content and emotion contained within the sentence (Appendix E). The sentences were developed by the other authors, a special education professor, school psychology professor, and a school psychology graduate student. The sentences were designed to be developmentally appropriate for children ages 6 to 11, who will ultimately be assessed with the Prosodic Cues Test.

The answer booklet consisted of a series of faces in numbered lines (Appendix F). There was a numbered line for each sentence being read by the speakers. The speaker stated the number of the sentence before actually reading the sentence. The faces consisted of circles with no features other than eyes, nose, and mouth. Each face was given expression by the eyes and mouth. The features of the face were derived from Missaghi-Lakshman and Whissell (1991) who stated that effective decoding of facial expressions requires familiarity with a widely accepted symbol system of emotions. The

symbol system is not random, but reflects and sometimes exaggerates aspects of facial expression. For example, an upturned mouth symbolizes happiness; a wrinkled brow, slanted eyebrows, and exposed teeth symbolize anger; and wide eyes symbolize fear.

In addition, each face on the answer sheet was labeled with the appropriate, corresponding emotion. The emotion faces were gender-neutral. Participants were given 10 seconds to mark the appropriate emotion-face on their answer sheet after the speaker read the emotion-sentence, eliminating any need for verbal response by the participants.

Speech-Sounds Perception Test

The Speech-Sounds Perception Test is part of the Halstead-Reitan Neuropsychological Battery. The Speech-Sounds Perception Test consisted of 60 standardized test items (Reitan & Wolfson, 1992). Participants listened to a series of nonsense syllables presented by a cassette tape recording and matched them with alternatives on an answer sheet. The test measured a participant's ability to match a spoken word to the correct alternative among a group of similar printed sounds. The score consisted of the number of errors or omissions among the 60 items.

Seashore Rhythm Test

The Seashore Rhythm Test is part of the Halstead-Reitan Neuropsychological Battery. The Seashore Rhythm Test measured participant's ability to discriminate variations in rhythmic patterns (Reitan & Wolfson, 1992). Thirty pairs of rhythmical patterns were presented via a standardized tape recording. Participants judged whether

the second stimuli in each pair was the same or different than the first, and wrote “S” or “D” on an answer sheet. The score consisted of the number correct among the 30 items (Reitan & Wolfson).

Both the Speech-Sounds Perception Test and Seashore Rhythm Test are considered to be measures of auditory perception and processing (Leckliter, Forster, Klonoff, & Knights, 1992; Sherer, Parsons, Nixon, & Adams, 1991). Therefore, both instruments were used in the current study to screen participants’ levels of auditory perception and processing to determine if there was adequate functioning in these areas in the pilot sample.

Procedure

Testing took place in a group setting, with approximately 10 participants per session. Informed consent form; demographic information sheet and behavioral questionnaire; and answer sheets for the Speech-Sounds Perception Test, Seashore Rhythm Test, and Prosodic Cues Test were stapled together and distributed as a single packet to each participant. Participants completed the Informed Consent Form; the demographic information sheet and behavioral questionnaire; Speech-Sounds Perception Test; Seashore Rhythm Test; and the Prosodic Cues Test. After completing all instruments, participants were thanked for their time and participation in the study. Some participants received extra credit in their psychology classes for participating in the study.

Analysis

A chi square analysis was performed on each statement of the Prosodic Cues Test to determine if any emotion was perceived as intended by a significant portion of participants. If a statement was perceived to relay a specific emotion to a significant degree the statement was evaluated to determine which emotion was most often chosen to be reflected by the utterance. In order to be considered for retention in the revised version of the Prosodic Cues Test, at least 50% of participants had to correctly perceive the intended emotion. Questions retained, based on data from this study, have been consolidated into a revised version of the script for the Prosodic Cues Test.

CHAPTER IV

Results

Participants (N=96; females=83; males=13; age range 18-46) listened to the Prosodic Cues Test, an instrument designed to measure the ability of participants to identify emotions expressed in content-neutral sentences solely from the prosodic cues in the speaker's voice. In addition, participants' levels of auditory perception and processing were screened with the Speech-Sounds Perception Test and the Seashore Rhythm Test.

The Speech-Sounds Perception Test and Seashore Rhythm Test were used as a screening device to ensure that participants possessed adequate levels of auditory perception and processing. The majority of participants made three or less errors on the Seashore Rhythm Test and six or less errors on the Speech Sounds Perception Test, which is considered by the author of the tests to be a 90% accuracy rate. No participants achieved less than a 70% accuracy rate on either the Seashore Rhythm Test or Speech Sounds Perception Test. For the purpose of the current study, all participants were judged to display adequate levels of auditory perception and processing. No participants were dropped from the study due to inadequate auditory perception or processing.

A chi square was performed on each of the statements on the Prosodic Cues Test. All chi-squares were found to be statistically significant ($\alpha \leq .05$).

Within the Prosodic Cues Test, neutrality was most often correctly perceived by participants. Out of 26 statements intended to convey neutrality, 21 were correctly perceived by at least 50% of participants. Anger was correctly perceived by at least 50%

of participants in 8 out of 13 statements. Out of 12 statements intended to convey sadness, 7 of the statements were perceived as intended by at least 50% of participants. Over half of the statements intended to convey happiness (10 out of 18 statements) and fright (7 out of 13 statements) were perceived as intended by at least 50% of participants. Less than half of the statements intended to convey frustration (6 out of 17 statements) and shame (2 out of 12 statements) were perceived as intended by at least 50% of participants.

Participants' overall performance was examined by comparing the number of statements perceived as intended by at least 50% of participants on the first and second halves of the Prosodic Cues Test. Overall performance did not differ significantly, with 31 statements on the first half and 30 statements on the second half perceived as intended by at least 50% of participants.

CHAPTER V

Discussion

The purpose of the current study was to obtain initial reliability and validity data for the Prosodic Cues Test. The instrument originally contained 114 statements, depicting seven different emotions. The intent was to select the five most accurately perceived statements for each emotion and revise the test to contain 35 statements. The Prosodic Cues Test was developed to ultimately be used with children with behavior problems, to determine if they have more difficulty perceiving prosodic cues in speech than normal children. The literature indicates that children with behavior problems may possess deficits in emotional understanding (Cook et al., 1994). If this is found to be true, prevention and treatment programs could be developed for children with significant behavior problems, or children at-risk for such problems based on prosodic development.

Since no commercially available measure currently exists to assess participants' perception of emotion in content-neutral vocalizations, researchers have been forced to create their own measures to suit the specific needs of their studies. Unfortunately, such studies are often subject to a number of methodological shortcomings which render the evaluation of the results rather difficult, and often prevents accumulation and generalization of findings. The current study attempted to overcome some of the methodological problems encountered by studies found in the literature.

Methodological Improvements

Sometimes a single actor or actress was used for the portrayal of emotion, making it difficult to evaluate the effects of individual differences (Baltaxe, 1991; Courtright & Courtright, 1983; Cutler & Swinney, 1987; Johnson et al., 1986; Trauner et al., 1993). The Prosodic Cues Test used both male and female voices to portray the different emotions. Research indicated that participants in similar studies more accurately identified actors' anger statements and actresses' happy statements (Baltaxe; Bonebright et al., 1996; Courtright & Courtright). The current study revealed similar results. Out of eight anger vocalizations perceived as intended by at least 50% of participants, six were spoken in a male voice. Similarly, out of 12 vocalizations intended to convey happiness that were perceived as intended by at least 50% of participants, 7 were spoken in a female voice. As an additional advantage over some prior studies, the current study used an actor and actress professionally trained to convey emotions with their voices.

The current study used the Speech Sounds Perception Test and Seashore Rhythm Test as a screening device to determine whether participants possessed adequate auditory perception. The use of these instruments as a screening device was important because it ensured that participants were accurately perceiving the sounds that they heard. It also helped to eliminate inadequate auditory perception as a source of variance in the results of the study.

As an additional improvement over a previous study (Courtright & Courtright, 1983), the Prosodic Cues Test contained statements that were neutral in content. With this format, participants were unable to use context clues in determining the intended

emotion. Instead, participants had to rely solely on prosodic cues in the speaker's voices in order to determine the intended emotion.

The Prosodic Cues Test contained a wider range of emotions (seven) than instruments in most other studies. The average number of emotions portrayed in the studies reviewed was four (Baltaxe, 1991; Bonebright et al., 1996; Cook et al., 1994; Courtright & Courtright, 1983; Dimitrovsky, 1964; Dunn et al., 1991; Johnson et al., 1986; Marcell & Jett, 1985). In addition, the number of emotion statements was larger than in most other studies, allowing the researchers to select those statements found to be more highly reliable and valid for inclusion in the revised instrument.

The current study using the Prosodic Cues Test included 96 participants, more than some other studies that pretested prosodic perception instruments (Baltaxe, 1991; Hortacscu & Ekini, 1992). A larger sample provided results that are considered more representative of the population at large, and as a result, more valid and reliable.

Comparison of Current Results With Results of Studies Found in the Literature

Results from the current study indicate that neutrality was most often correctly perceived by at least 50% of participants (21 out of 26 statements). This data conflicts with another study that found anger and happiness to be most highly identified (Baltaxe, 1991). However, participants in that study were children, who have been found to have a tendency to identify emotions of a negative valence more accurately. In a review of the literature, Baltaxe noted that adults do not have the tendency to identify emotions of a negative valence more accurately.

A possible explanation for the high accurate perception rate of neutral statements was suggested by Frick (1985), who postulated that utterances expressing a lack of emotion may be spoken more quickly than statements expressing other emotions. The quickness of speech may have indicated neutrality to a high number of participants. Alternatively, it is possible that neutrality was most often correctly perceived by a significant portion of participants because, if unable to discern a specific emotion, they simply defaulted to the neutral category.

Anger, sadness, happiness, and fright, respectively, were the next most accurately identified emotions, with between 62% to 54% of all statements for these emotions identified as intended by at least 50% of participants. These results coincide with previous research (Baltaxe, 1991) that indicated a high rate of identification for these emotions. Baltaxe suggests that these emotions were more highly accurately identified because they are considered stronger, or more indicative of strong feelings.

Frustration and shame were accurately identified by at least 50% of participants in 35% and 16% of statements, respectively. Participants' relative inability to accurately identify shame and frustration may have been due to inaccurate portrayal by the speakers portraying the emotions verbally on the audiotape. Due to the low rate of accurate identification, shame has been dropped from the revised version of the Prosodic Cues Test. Shame will also be deleted from the emotion-faces on the answer sheet.

Misidentification of Emotions

With regard to the misidentification of emotions, no real pattern emerged. Sadness and neutrality were most often confused for each other. This is of note, considering the slow pace that characterizes sad vocalizations and the quickness of speech believed to be characteristic of neutrality. Once again, this could be a result of inaccurate portrayal by the speakers, or participants may have simply defaulted to the neutral category if the emotion portrayed was unclear. The largest number of misidentified emotions were labeled as sad, followed by neutral.

Limitations

It is important to note that although all participants were of college age and judged to possess adequate auditory perception and processing, it is possible that some participants may not yet have attained a mature level of emotional understanding, and therefore failed to accurately identify the emotions portrayed on the Prosodic Cues Test.

Another limitation of the current study is that emotions in vocalizations on the Prosodic Cues Test were taken out of the context of human interaction in which they usually function, which may have limited participants' accurate perception and interpretation.

Retained Statements

Statements retained for the revised version of the Prosodic Cues Test were considered to be valid and reliable indicators of the specific emotion being portrayed.

Retained statements were considered reliable due to the significance of the chi-square performed, indicating that responses were skewed towards a particular emotion, not evenly distributed across categories.

In order to be considered for retention in the revised version of the Prosodic Cues Test, a statement had to be perceived as intended by at least 50% of participants. Five statements for each emotion (with the exception of shame) which had the highest percentage of correct identification by participants were retained for the revised version of the test (Appendix G). If a statement was intended to convey a specific emotion, and was found to portray that emotion as judged by agreement of at least 50% of participants, then that statement was considered a valid indicator of that emotion. Conversely, if a statement was intended to convey a specific emotion, but actually tapped into other emotions to a significant degree, then the statement was obviously an invalid indicator of the intended emotion.

Qualitative Information

Although participants' performance on the latter part of the Prosodic Cues Test did not differ significantly from performance on the first half of the test, participants showed and expressed signs of boredom and fatigue. Participants exhibited the following behaviors during the testing session: sighing, shifting in seat, putting head down on table, standing up, and flipping to the back of the test booklet to see how many questions remained. Several participants commented that the test was too long, and should be shortened. Participants were told that shortening the test was the purpose of the research.

In addition, participants commented that some statements were hard to hear due to poor tape quality. Such items have been eliminated from the revised version of the Prosodic Cues Test.

Future Directions

Now that initial reliability and validity data has been obtained for the Prosodic Cues Test, a shorter, revised version of the Prosodic Cues Test script has been created using the 30 statements, five for each emotion, judged to be the most valid and reliable, based on the results of the current study. The next step is to edit the Prosodic Cues Test audiotape to reflect the revisions, as well as renumber the statements in sequential order. Eventually, this instrument will be validated on a group of normal children, ages 6 to 11, before it is used with children with behavior problems. In the future, after standardization of the Prosodic Cues Test is complete, the authors hope to publish the instrument and make it commercially available.

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APPENDIXES

Appendix A

Pilot Study of Prosodic Cues Test
Informed Consent Form: Adult Volunteer
Austin Peay State University

The purpose of the current research study is to validate a new instrument to use to determine a person's ability to infer emotion by the prosodic cues in speech. If you agree to participate in the study you will listen to or watch a series of 114 neutral sentences that will be spoken with different emotional tones. You will be asked to mark one of a series of faces that match the emotion you think the person is feeling. You will also be asked to fill out a demographics sheet. You will not be asked to reveal your name or other identifying information. Occasionally other members of the scientific community may request information. Such requests will be honored. However, your name will never be revealed nor associated with your responses in any way.

There are no legal, social or psychological risks anticipated in this study. You may stop at any time by simply laying down your pencil and leaving the room. The test will be administered in a group and your answers will not ever be linked to this permission slip.

Your participation is entirely voluntary. You are free to terminate your participation at anytime until your responses are turned in. It will be impossible to remove your responses after that time for there will be no way to identify your protocol.

Specifically you are being requested to:

_____ Listen to an audio tape or watch a video of two commentators speaking 114 neutral sentences using different emotional tones and marking an answer sheet with the emotion you feel was portrayed.

_____ Fill out a demographics questionnaire that asks about age, race, gender, and previous behavioral problems.

_____ Take two tests designed to measure ability to differentiate tones and to understand the sounds of human speech normal used for neuropsychological evaluation.

Your answers will then be analyzed with the rest of the participants so that the sentences with the highest correct answer rate can be chosen for the final version of the test. You will be part of the standardization study.

We are hoping that this instrument will allow psychologists and educators to determine which children experience behavior problems because they do not understand the

emotion in human speech.

If you have any questions concerning this study please feel free to contact Dr. Janice D. Martin 931-648-7488.

Pilot Study of Prosodic Cues Test
Informed Consent Form: Adult Volunteer
Austin Peay State University

I agree to participate in the Pilot Study of the Prosodic Cues Test as explained to me.

Specifically I agree to:

_____ Listen to an audio tape or watch a video of two commentators speaking 114 neutral sentences using different emotional tones and marking an answer sheet with the emotion you feel was portrayed.

_____ Fill out a demographics questionnaire that asks about age, race, gender, and previous behavioral problems.

_____ Take two tests designed to measure ability to differentiate tones and to understand the sounds of human speech normal used for neuropsychological evaluation.

I have been informed verbally and in writing of the procedures to be followed and about any discomfort that may be involved in participation in this project. I understand that this research project is being directed by Christina Garland under the direction of Dr. Janice Martin of the Psychology Department at Austin Peay State University. Ms. Garland and Dr. Martin has agreed to answer any further questions that I may have and will be available after the project is over to answer any questions that I may have. I understand that I am free to terminate my participation at any time. I understand that there will be no penalty of any kind for choosing to withdraw from this project. I have also been told of the benefit to myself and others from my participation.

Name (please print)

Signature

Appendix B

Prosodic Cues Test Validation Study
Demographics: Adults

age _____ yrs _____ mo

race _____

gender _____

When you were in elementary school would you consider your behavior:

1	2	3	4	5
excellent	better than average	Average	Problematic	Seriously Problematic

When you were in elementary school were you disciplined:

1	2	3	4	5
never	hardly ever	Average	Frequently	Very Often

When you were in elementary school did you have:

1	2	3	4	5
more friends than most	many friends	some friends	few friends	very few friends

Appendix C

SEASHORE RHYTHM TEST

Name _____ Date _____ Examiner _____ Raw Score _____
Ranked Score _____

	Column A	Column B	Column C
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Appendix D

Adult Form

Speech-sounds Perception Test

Name _____

Date _____

Examiner _____

Score _____

Directions: Underline the syllable which you hear.

- | Series A | Series B | Series C |
|------------------------------|--------------------------------|----------------------------|
| 1. cheeks reeks theets zeets | 1. peen been peen been | 1. deald deal beald beal |
| 2. weach yeach weej yeej | 2. theer theerr feer feerr | 2. weev heev veef heef |
| 3. leeg bleeg leeng bleeng | 3. sheesh sheer zeesh zeer | 3. thee fee theer feer |
| 4. peer peest teer teest | 4. veef veef veeth veeth | 4. neeld neel meeld meel |
| 5. freeb fleeb freep fleep | 5. theel feel theild feild | 5. seed teed seet zeet |
| 6. pleeb preeb pleed proed | 6. peet peent beet beent | 6. yeeg yeek heeg heek |
| 7. seek seech sheek sheech | 7. treep treeb teep teeb | 7. neen neen neen neen |
| 8. neek neenk meek meenk | 8. steets speets steeks speeks | 8. theerd theer teard teer |
| 9. wheech heech wheesh heesh | 9. beert beard peert peerd | 9. heer wheer heev wheev |
| 10. preet preekt peet peekt | 10. sheed teed sheend zeend | 10. neep teep neet teet |
| Series D | Series E | Series F |
| 1. heep heet wheep wheet | 1. seeng sheeng seen sheen | 1. yeen yeen heen heen |
| 2. keev keen feev feen | 2. geerd keerd gear kear | 2. leern theern lear thear |
| 3. neek neeg meek meeg | 3. keen geen keen geen | 3. feeth fees theeth thees |
| 4. cheem cheen sheen sheen | 4. veen veeng heen heeng | 4. reeg treeg reek treek |
| 5. feep theep feet theet | 5. teed teet peed peet | 5. yeed yeet veed veet |
| 6. heeld weild heel weel | 6. keets keer teets teet | 6. neep neet deep deet |
| 7. deed teed deend taend | 7. theet theent zeet zeent | 7. deez dees beez bees |
| 8. teesh peesh teer peer | 8. beep peep beet peet | 8. teald teel peald peel |
| 9. veef veef wev veev | 9. tee pee teer peer | 9. neel neer feel feer |
| 10. leen heen leeng heeng | 10. beeb bead deeb deed | 10. veen when veen when |

Appendix E

Prosodic Cues Test

Prosody is the tone of voice we use to give emotion to our sentences. We use prosody to make our sentences sound happy, sad, angry, afraid, frightened or frustrated. In this test you are going to hear a series of sentences. They will be spoken by a male voice or a female voice. You will hear many of the sentences more than once but they will be spoken differently. The voices will vary in the tone of voice used.

On the paper in front of you will notice a series of faces in numbered lines. The faces express an emotion. Under each face is written an emotion. For each sentence you hear you are to "X" the face that corresponds to the emotion you hear. Remember it is not the words but the tone of voice that determines the emotion.

Look at your answer page.

First we will try some examples: Listen carefully. The first sentence is:
The Redskins beat Dallas 22 to 0. (NEUTRAL)

The first face on your answer sheet is ANGRY. Listen to the first sentence ANGRY.
The Redskins beat Dallas - 22 to 0. (ANGRY)
Put an X through the angry face next to the number 1 under examples.

The second face next to example 1 is ASHAMED. Listen to the first sentence ASHAMED.
The Redskins beat Dallas - 22 to 0. (ASHAMED)
Put an "X" through the ashamed face next to number 1 in the examples.

The third face on the line is FRUSTRATED. Listen to the first sentence FRUSTRATED.
The Redskins beat Dallas - 22 to 0. (FRUSTRATED)
Put an "X" through the frustrated face next to number 1 in the examples.

The next face on your answer sheet is FRIGHTENED. Listen to the first sentence FRIGHTENED.
The Redskins beat Dallas - 22 to 0. (FRIGHTENED)
Put an X through the frightened face next to the number 1 under examples.

The fifth face next to example 1 is NEUTRAL. Listen to the first sentence NEUTRAL.
The Redskins beat Dallas - 22 to 0. (NEUTRAL)
Put an "X" through the neutral face next to number 1 in the examples.

The next face on the line is HAPPY. Listen to the first sentence HAPPY.
The Redskins beat Dallas - 22 to 0. (HAPPY)
Put an "X" through the happy face next to number 1 in the examples.

The last face on the line is SAD. Listen to the first sentence SAD.
The Redskins beat Dallas - 22 to 0. (SAD)
Put an "X" through the sad face next to number 1 in the examples.

Let's try another example. Look on your answer sheet and find the second row of faces under EXAMPLES.

Listen carefully the second sentence is:
My friend Rebecca's father married a tattooed lady he met in Las Vegas. (NEUTRAL)

The first face on your answer sheet is ANGRY. Listen to the second example sentence ANGRY.
My friend Rebecca's father married a tattooed lady he met in Las Vegas. (ANGRY)
Put an "X" through the angry face.

The second face next to example 2 is ASHAMED. Listen to the second sentence ASHAMED.
My friend Rebecca's father married a tattooed lady he met in Las Vegas. (ASHAMED)
Put an "X" through the ashamed face.

The third face on the line is FRUSTRATED. Listen to the second sentence FRUSTRATED.
My friend Rebecca's father married a tattooed lady he met in Las Vegas.
(FRUSTRATED)
Put an "X" through the frustrated face.

The next face on your answer sheet is FRIGHTENED. Listen to the second sentence FRIGHTENED.
My friend Rebecca's father married a tattooed lady he met in Las Vegas.
(FRIGHTENED)
Put an "X" through the frightened face.

The fifth face next to example 2 is NEUTRAL. Listen to the second sentence NEUTRAL.
My friend Rebecca's father married a tattooed lady he met in Las Vegas. (NEUTRAL)
Put an "X" through the neutral face.

The next face on the line is HAPPY. Listen to the second sentence HAPPY.
My friend Rebecca's father married a tattooed lady he met in Las Vegas. (HAPPY)

Put an "X" through the happy face.

The last face on the line is SAD. Listen to the second sentence SAD.

My friend Rebecca's father married a tattooed lady he met in Las Vegas. (SAD)

Put an "X" through the sad face.

NOW WE WILL BEGIN THE TEST. YOU WILL HEAR A NUMBER TO LET YOU KNOW WHICH LINE TO MARK YOUR ANSWER. YOU WILL HEAR A SENTENCE. WHEN THE VOICE STOPS MARK THE FACE OF THE EMOTION THE VOICE USED FOR THAT SENTENCE. THERE IS ONLY ONE EMOTION FOR EACH TIME YOU HEAR A SENTENCE. REMEMBER YOU MAY HEAR A SENTENCE MORE THAN ONCE AND YOU TELL THE EMOTION FROM THE VOICE NOT THE WORDS.

- 1.) (FRUSTRATED) Look at this ketchup on my shirt. Kevin squirted the bottle real hard. I don't think it will ever come out.
- 2.) (SAD) Our cat has been gone for 16 days. Today I found the cat.
- 3.) (HAPPY) Your Dad's going to Memphis tomorrow. He will be gone 2 weeks.
- 4.) (FRUSTRATED) Math was my father's favorite subject. This year I am taking algebra and geometry with Mr. McKenzie the hardest teacher at my school.
- 5.) (HAPPY) No. My sister can't take reading with us. She's in special ed.
- 6.) (FRIGHTENED) My father's new secretary didn't recognize my voice. So I pretended to be a customer from Dallas. I ordered a 100 computers and gave her a phoney phone number.
- 7.) (NEUTRAL) What is that smell from the kitchen? Smells like Ms. Flynn is cooking today. Probably one of her famous "original" recipes we'll be having for lunch.
- 8.) (ASHAMED) The movie I've been waiting to see is in town. I need \$6.00.
- 9.) (FRUSTRATED) Ms. Jones is out today with the chicken pox. We've got Ms. Smith as a substitute teacher. Remember what happened before.
- 10.) (FRUSTRATED) I have posted a list of chores on the refrigerator. When you are done we can go to the mall.
- 11.) (NEUTRAL) There were 20 cookies on this plate. Now they are gone. Do you

know anything about them?

12.) (ANGRY) Take out the trash. The dog will tear into it if you don't.

13.) (FRUSTRATED) I can hear you out there. Who are you? Who's there?

14.) (FRUSTRATED) I don't see anyone. Would you please come here and hold the flashlight while I look?

15.) (ANGRY) Did you see Billy and Mary on the bus? They were kissing and holding hands.

16.) (HAPPY) Why are you playing with the soccer ball? Its recess and its raining outside. We are playing with the watercolors.

17.) (ASHAMED) Sit right here. I have to go clean the bathroom right now.

18.) (NEUTRAL) I was outside playing basketball on the driveway, when a big dog came running up. I am playing inside for the rest of the afternoon.

19.) (NEUTRAL) I am going to show my report card to my dad right after supper.

20.) (ASHAMED) I don't need to go to the dentist. My teeth are fine.

21.) (ANGRY) Mr. Martin, the janitor, saw me changing my clothes after gym.

22.) (FRIGHTENED) I have to go to Principal Smith's office because I ditched school on Friday. He calls your parents, doesn't he? I starting to get frightened.

23.) (HAPPY) My Aunt Martha got married to a professional boxer. He's 6 years older than she is and he has a moustache.

24.) (ASHAMED) Close the door. I do not want you to see me in the bathroom.

25.) (NEUTRAL) Johnny doesn't like me anymore.

26.) (NEUTRAL) I spilled milk on the floor and mom is on her way home.

27.) (HAPPY) There is no school on Friday because of a teacher's meeting, I am so happy because now we can go to Opryland.

28.) (NEUTRAL) Your Dad's going to Memphis tomorrow. He will be gone 2 weeks.

29.) (SAD) Johnny doesn't like me anymore.

- 30.) (NEUTRAL) My Aunt Martha got married to a professional boxer. He's 6 years older than she is and he has a moustache.
- 31.) (ANGRY) I waited for you for an hour after school. Why didn't you tell me you were going over to Mark's house. I am so angry with you.
- 32.) (NEUTRAL) I can hear you out there. Who are you? Who's there?
- 33.) (FRIGHTENED) I don't see anyone. Would you please come here and hold the flashlight while I look?
- 34.) (HAPPY) Ms. Jones is out today with the chicken pox. We've got Ms. Smith as a substitute teacher. Remember what happened before.
- 35.) (HAPPY) I have posted a list of chores on the refrigerator. When you are done we can go to the mall.
- 36.) (HAPPY) My father's new secretary didn't recognize my voice. So I pretended to be a customer from Dallas. I ordered a 100 computers and gave her a phoney phone number.
- 37.) (FRUSTRATED) I have been trying to call my girlfriend for two hours but her line is busy. That is so frustrating.
- 38.) (HAPPY) Who picked Johnny as captain? He's from Canada. Does he know anything about football? I wonder if he will pick me?
- 39.) (FRIGHTENED) Look at this ketchup on my shirt. Kevin squirted the bottle real hard. I don't think it will ever come out.
- 40.) (FRUSTRATED) I don't need to go to the dentist. My teeth are fine.
- 41.) (HAPPY) I was outside playing basketball on the driveway, when a big dog came running up. I am playing inside for the rest of the afternoon.
- 42.) (SAD) My best friend Jill is moving to Atlanta. Her dad got a new job and they are leaving next week. I am feeling very sad.
- 43.) (FRIGHTENED) I spilled milk on the floor and mom is on her way home.
- 44.) (FRUSTRATED) Mom isn't home. No one is here but us. So why do I hear water running?

- 45.) (FRUSTRATED) Did you see Billy and Mary on the bus? They were kissing and holding hands.
- 46.) (HAPPY) He looks much bigger in person than he does on TV. Does he like kids? Can I pet him?
- 47.) (ANGRY) Why are you playing with the soccer ball? Its recess and its raining outside. We are playing with the watercolors.
- 48.) (SAD) My father's new secretary didn't recognize my voice. So I pretended to be a customer from Dallas. I ordered a 100 computers and gave her a phoney phone number.
- 49.) (ANGRY) Who picked Johnny as captain? He's from Canada. Does he know anything about football? I wonder if he will pick me?
- 50.) (FRIGHTENED) My Aunt Martha got married to a professional boxer. He's 6 years older than she is and he has a moustache.
- 51.) (HAPPY) Johnny doesn't like me anymore.
- 52.) (FRIGHTENED) I can hear you out there. Who are you? Who's there?
- 53.) (NEUTRAL) Why are you playing with the soccer ball? Its recess and its raining outside. We are playing with the watercolors.
- 54.) (NEUTRAL) Put your books away.
- 55.) (SAD) Look at this ketchup on my shirt. Kevin squirted the bottle real hard. I don't think it will ever come out.
- 56.) (FRIGHTENED) I was outside playing basketball on the driveway, when a big dog came running up. I am playing inside for the rest of the afternoon.
- 57.) (ASHAMED) Mr. Martin, the janitor, saw me changing my clothes after gym.
- 58.) (ANGRY) Look at this ketchup on my shirt. Kevin squirted the bottle real hard. I don't think it will ever come out.
- 59.) (FRUSTRATED) Math was my father's favorite subject. This year I am taking algebra and geometry with Mr. McKenzie the hardest teacher at my school.
- 60.) (HAPPY) I am going to show my report card to my dad right after supper.

- 61.) (FRUSTRATED) Sit right here. I have to go clean the bathroom right now.
- 62.) (HAPPY) Did you see Billy and Mary on the bus? They were kissing and holding hands.
- 63.) (NEUTRAL) Mom isn't home. No one is here but us. So why do I hear water running?
- 64.) (FRUSTRATED) My Aunt Martha got married to a professional boxer. He's 6 years older than she is and he has a moustache.
- 65.) (ASHAMED) I spilled milk on the floor and mom is on her way home.
- 66.) (ASHAMED) Why did you hit your sister? I am so ashamed of you, go to your room right now and stay there until I tell you to come out. You need to think about what you did!
- 67.) (NEUTRAL) Who picked Johnny as captain? He's from Canada. Does he know anything about football? I wonder if he will pick me?.
- 68.) (SAD) What is that smell from the kitchen? Smells like Ms. Flynn is cooking today. Probably one of her famous "original" recipes we'll be having for lunch.
- 69.) (NEUTRAL) I have posted a list of chores on the refrigerator. When you are done we can go to the mall.
- 70.) (ANGRY) The movie I've been waiting to see is in town. I need \$6.00.
- 71.) (ASHAMED) My Aunt Martha got married to a professional boxer. He's 6 years older than she is and he has a moustache.
- 72.) (FRIGHTENED) Mr. Martin, the janitor, saw me changing my clothes after gym.
- 73.) (ASHAMED) I was outside playing basketball on the driveway, when a big dog came running up. I am playing inside for the rest of the afternoon.
- 74.) (SAD) Your Dad's going to Memphis tomorrow. He will be gone 2 weeks.
- 75.) (NEUTRAL) Look at this ketchup on my shirt. Kevin squirted the bottle real hard. I don't think it will ever come out.
- 76.) (SAD) Math was my father's favorite subject. This year I am taking algebra and geometry with Mr. McKenzie the hardest teacher at my school.

- 77.) (HAPPY) I don't need to go to the dentist. My teeth are fine.
- 78.) (NEUTRAL) Sit right here. I have to go clean the bathroom right now.
- 79.) (NEUTRAL) Mr. Martin, the janitor, saw me changing my clothes after gym.
- 80.) (HAPPY) Our cat has been gone for 16 days. Today I found the cat.
- 81.) (NEUTRAL) I don't see anyone. Would you please come here and hold the flashlight while I look?
- 82.) (HAPPY) Math was my father's favorite subject. This year I am taking algebra and geometry with Mr. McKenzie the hardest teacher at my school.
- 83.) (FRUSTRATED) Take out the trash. The dog will tear into it if you don't.
- 84.) (NEUTRAL) My father's new secretary didn't recognize my voice. So I pretended to be a customer from Dallas. I ordered a 100 computers and gave her a phoney phone number.
- 85.) (SAD) Who picked Johnny as captain? He's from Canada. Does he know anything about football? I wonder if he will pick me?
- 86.) (NEUTRAL) The movie I've been waiting to see is in town. I need \$6.00.
- 87.) (ASHAMED) I am going to show my report card to my dad right after supper.
- 88.) (FRIGHTENED) I don't need to go to the dentist. My teeth are fine.
- 89.) (FRUSTRATED) Your Dad's going to Memphis tomorrow. He will be gone 2 weeks.
- 90.) (ASHAMED) Look at this ketchup on my shirt. Kevin squirted the bottle real hard. I don't think it will ever come out.
- 91.) (ANGRY) Close the door. I do not want you to see me in the bathroom.
- 92.) (HAPPY) What is that smell from the kitchen? Smells like Ms. Flynn is cooking today. Probably one of her famous "original" recipes we'll be having for lunch.
- 93.) (NEUTRAL) No. My sister can't take reading with us. She's in special ed.
- 94.) (NEUTRAL) Take out the trash. The dog will tear into it if you don't.

- 95.) (SAD) No. My sister can't take reading with us. She's in special ed..
- 96.) (FRIGHTENED) Ms. Jones is out today with the chicken pox. We've got Ms. Smith as a substitute teacher. Remember what happened before.
- 97.) (NEUTRAL) He looks much bigger in person than he does on TV. Does he like kids? Can I pet him?
- 98.) (NEUTRAL) Ms. Jones is out today with the chicken pox. We've got Ms. Smith as a substitute teacher. Remember what happened before.
- 99.) (FRIGHTENED) Take out the trash. The dog will tear into it if you don't.
- 100.) (NEUTRAL) Our cat has been gone for 16 days. Today I found the cat.
- 101.) (ASHAMED) Johnny doesn't like me anymore.
- 102.) (NEUTRAL) I don't need to go to the dentist. My teeth are fine.
- 103.) (FRUSTRATED) What is that smell from the kitchen? Smells like Ms. Flynn is cooking today. Probably one of her famous "original" recipes we'll be having for lunch.
- 104.) (FRIGHTENED) Mom isn't home. No one is here but us. So why do I hear water running?
- 105.) (NEUTRAL) Close the door. I do not want you to see me in the bathroom.
- 106.) (ANGRY) Johnny doesn't like me anymore.
- 107.) (ANGRY) Your Dad's going to Memphis tomorrow. He will be gone 2 weeks.
- 108.) (FRIGHTENED) He looks much bigger in person than he does on TV. Does he like kids? Can I pet him?
- 109.) (FRUSTRATED) There were 20 cookies on this plate. Now they are gone. Do you know anything about them?
- 110.) (SAD) I am going to show my report card to my dad right after supper.
- 111.) (NEUTRAL) Did you see Billy and Mary on the bus? They were kissing and holding hands.
- 112.) (ANGRY) Mom isn't home. No one is here but us. So why do I hear water

running?

113.) (SAD) Sit right here. I have to go clean the bathroom right now.

114.) (ANGRY) There were 20 cookies on this plate. Now they are gone. Do you know anything about them?

Appendix F

PROSCOCLES TEST

JANICE D. WHITTEN, DAVID VON PALKE, LARRY LOVEANCE, YVETTE M. PRATZER

Please listen to the sentences or watch the videos and mark one of the first seven faces, the face that represents the emotions you hear. Remember it is the tone of voice and not the words that will tell you the emotion of the sentences.

Practice

1. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD
2. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD

Test

1. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD
2. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD
3. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD
4. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD
5. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD
6. 
- ANGRY ASHAMED FRUSTRATED FRIGHTENED NEUTRAL HAPPY SAD