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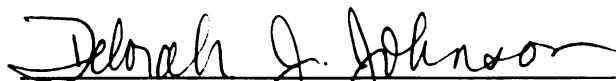
**THE ROLE OF CULTURE AND AGE IN THE IDENTIFICATION
AND PROCESSING OF NONVERBAL FACIAL EXPRESSIONS OF
EMOTION**

presented by

Adrienne Ratliff Herron

has been accepted towards fulfillment
of the requirements for the

M.A. degree in Department of Family and Child
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**THE ROLE OF CULTURE AND AGE IN THE IDENTIFICATION AND
PROCESSING OF NONVERBAL FACIAL EXPRESSIONS OF EMOTION**

By

Adrienne Ratliff Herron

A THESIS

**Submitted to
Michigan State University
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ABSTRACT

IDENTIFICATION AND PROCESSING OF NONVERBAL FACIAL EXPRESSIONS OF EMOTION

By

Adrienne Ratliff Herron

Recently, emotion recognition studies have suggested that anger, disgust, fear, happiness, sadness and surprise are universally recognized (Hejmadi, 2000). However, research has demonstrated that individuals perceive nonverbal communication from members of their own ethnic group more accurately than they do from members of another ethnic group (Weathers et al., 2002).

This study examines the effect of cultural differences on the ability to process facial expressions of emotions in children will also be addressed in this study. Furthermore, the study will consider how accurate emotion identification of children's faces is related to internalizing and externalizing behaviors of children and adults.

For both the child and adult participants the study found that Caucasian participants were significantly more accurate than African American participants at the identification of emotions.

When examining the issue of emotional competence, for the child participants, the correct identification of emotions does not appear to be related to internalizing or externalizing behaviors. For the adult participants, when happy is identified correctly the participants reporting aggressive behavior decreases.

DEDICATION

I would like to dedicate this thesis to my parents, Robert and Gloria Herron, who have scarified so much so that I could have the best. Making you proud is very important to me!

To Geania Lee' Ann Capler and Talia Harlem Mims, my two intelligent, caring and beautiful nieces who think that "Te-Te can do anything". I pray that I am not just your aunt, but an inspiration and friend as well.

I would like to thank all of my family and friends for supporting me and believing in me, even when I did not believe in myself. You gave me strength, confidence, shoulders to cry on, and ears to which I could vent.

Finally, I would also like to dedicate this work in loving memory of my grandfathers Rev. George Edward Sanders and Chester Arthur Jones Jr., my grandmother Essie Mae Herron-Jones, and my friend-guru L. Annette Abrams.

I love you all more than words can say!

"And one standing alone can be attacked and defeated, but two can stand back-to-back and conquer!" Ecclesiastes 4:12

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Introduction

Human beings make extensive use of vocal information to describe the emotional state of others. When a person conveys an emotion, he/she begin an exchange of ideas, which are based solely on nonverbal communicative intent. In spite of our ability as humans to develop an increasingly complex verbal language, nonverbal communication remains important because of its power to convey unique and valid information about emotional states (Nowicki and Duke, 1992).

Ninety-three percent of communication is nonverbal. Nonverbal communication refers to information that is transmitted from one person to another through a means other than words (Nowicki and Duke, 1992). In the face-to-face encounters of everyday life, each person monitors the emotional reactions of others. When one person observes the emotional reaction of another, a variety of sources of information are available (Carroll and Russell, 1996). There are various types of nonverbal expressions of emotion (tone of voice (prosody), postures, gestures, emotion eliciting situations (contextual cues and facial expressions) and they combine to express emotions in very complex and complicated ways. Fifty-five percent of nonverbal communication is through facial expression, posture, and gesture; thirty-eight percent is through prosody; and the other seven percent consists of contextual cues and various combinations.

Everyday, individuals make a variety of complex conclusions about others based on physical characteristics. For social interactions, faces are probably the most important visual stimulus to humans, but understanding the development of the ability to readily recognize and interpret faces remains limited (Taylor, Batty, and Itier, 2004). The face is a rich source of affective information that can be communicated in a brief amount of time

(Nowicki and DiGirolamo, 1989). There have been studies that explored competence of facial processing in adults versus the incompetence of facial processing in children. These studies have shown that there is a gradual increase in facial recognition task performance with age. Children and adults use configural and featural information, and the age differences in performance are likely due in large part to children's gradual, quantitative improvement in general perceptual and cognitive skills (Baenniger, 1994).

Facial expressions allow a group to easily understand the opinions and attitudes of others, thus constituting a powerful tool in social coordination (Batty and Taylor, 2003). Over the past several years, emotion recognition studies have suggested that anger, disgust, fear, happiness, sadness, and surprise are universally recognized (Hejmadi, 2000). Expressions of emotion were thought of as a God given, universal language that revealed passions such as love and hate, virtues (courage), and vices (sloth) (Russell, Bachorowski, and Fernandez Dols, 2003). Universal and cultural dissimilarity in expression of emotion have been and more than likely will continue to be fervently argued. The scientific study of how people express emotion has been intertwined with the question of whether or not emotions are universal across cultures and species (Elfenbein, 2003).

In today's society we encounter individuals from other cultures frequently. Our ability to understand others, and the responses that we make to them, are based largely on our ability to effectively use the nonverbal behavior that is displayed in any interpersonal interaction (Nowicki and Mitchell, 1998). Effective interpersonal relationships and social performance require that individuals accurately receive, process, and decode nonverbal expressions of emotion in others (Baum and Nowicki, 1998). The ability to interpret

emotional communications has an important influence on how we perceive and interact with others (Buck, 1984).

This study will examine the level of competency in children and adults regarding their ability to process facial expressions of emotions in children. The effect of cultural differences on the ability to process facial expressions of emotions in children will be addressed in this study as well. The study will also consider how accurate emotion identification of children's faces is related to internalizing and externalizing behaviors of children and adults.

Chapter 1 Literature Review

The findings of several researchers now support the view that, with age, emotions become increasingly important features of people's cognitive appraisals of interpersonal events (Thompson, Aidinejad, and Ponte, 2001). The ability to interpret features in individuals develops early in life and continues to advance and increase as we grow. Along with age, culture plays a powerful role in determining the perception and interpretation of interpersonal events.

Development of Perceptions of Facial Expression of Emotions

Processing nonlinguistic vocalizations plays an essential role in maintaining successful relationships and healthy psychological functioning. Nonlinguistic vocalizations are a primary means of communication, as they appear early in ontogenesis; newborns express and understand emotions vocally long before learning language (Fecteau, Armony, Joannette, and Belin, 2005).

Children as young as a few months old have been shown to be able to discriminate happy and sad faces from surprised faces, and also to discriminate between different intensities (Herba and Phillips, 2004). The recognition of facial expressions develops slowly over the first 2 years of life, and the infant's understanding of facial expressions is still quite rudimentary (Nelson, 1987). The preschool age appears to be an important time during which many emotional skills develop, such as identification and labeling of emotions (Smith and Walden, 1998).

Young children's understanding of emotion constitutes a key early component of their social cognition, because they so frequently draw on this understanding in the course of social interaction (Denham, Zoller, and Couchoud, 1994). The difficulty that

young children experience in producing and judging some of the more basic facial expressions may be due to the child's inability to comprehend the full social meaning of the facial expression and its corresponding label (Shields and Padawer, 1983).

Nevertheless, children are not as proficient as adults at processing faces (Mondlock, Geldart, Maurer, and Le Grand, 2003).

Sociocognitive theories propose that with age there is an increased ability to understand and regulate emotions, because of increasing optimization of positive mood states and increased skill at understanding cues to emotional meaning (Phillips, MacLean, and Allen, 2002). Adults are experts in face processing; they can recognize thousands of individual faces rapidly and accurately, they can easily decipher various cues, such as emotional expression and direction of gaze (Mondlock, Geldart, Maurer, and Le Grand, 2003). Research on adults suggests that misinterpretation of nonverbal cues such as facial expression may contribute to such social impairments in patients with mood anxiety disorders (McClure, Pope, Hoberman, Pine and Leibenluft, 2003).

Discrimination of Facial Expressions and Social Interactions

Behavior Regulation

Emotions play a central role in the organization of individual behavior and social interaction because emotions expressed by a partner suggest the need to alter, maintain, or terminate a particular behavior (Garner, 1997). When individuals interact with one another, it is vital that they are able to accurately interpret other people's nonverbal cues. Nonverbal behavior is essential to social interaction because it offers dependable information about how individuals are feeling (Collins and Nowicki, 2001). A person who experiences difficulties in processing nonverbal cues increases the chances of

consistently experiencing negative social interactions. Learning to affectively read the nonverbal expression of others will help to facilitate more positive interactions.

Facial expressions provide important clues about emotions in the absence of information about the situation, or in the case of display rules, when the actual meaning of the emotion is disguised by verbal content (Garner, 1999). The ability to read emotions in facial expressions and tones of voice are skills necessary for children to develop “healthy” interactions and successful relationships (Nowicki and Mitchell, 1998). The importance of accurately identifying facial expressions of emotion begins early in life. The identification of emotion in facial expressions and tones of voice has been found to be associated with social competence in children from 2 to 12 years of age (Collins and Nowicki, 2001). Emotion knowledge may influence behavior, especially in emotionally arousing situations that require behavioral regulation (Smith and Walden, 2001).

Some children, adolescents, and adults with various psychological and psychiatric disorders recognize facial expressions less proficiently than their peers in the general population (Ellis, 1997). Studies have found that higher rates of social anxiety were predictors of diminished accuracy in children’s classifications of images of other children’s expressions of emotions (Battaglia, 2004). Other studies with adults also have found that adults with anxiety disorders or depression exhibit deficits in identification of facial expressions.

Some researchers have found that there are no significant differences between the capability of children with externalizing disorders versus internalizing disorders in correctly identifying the emotions anger, fear, surprise and happiness in facial displays

(Ellis, 1997). Children with externalizing disorders were more accurate in the identification of sadness and disgust (Ellis, 1997). Overall, research has found that children with mood disorders are more accurate at identifying sadness and anger than children with no mood disorders.

Interpreting and responding appropriately to facial expressions of emotion are important aspects of social skills (Ellis, 1997). There are several constructs (e.g., temperament, emotion knowledge, social problem-solving skills, and emotion socialization) that are linked conceptually and empirically to behavioral regulation (Smith and Walden, 2001). Behavior regulation has been shown to involve the aptitude to act in response to the constant demands of the circumstance in a socially acceptable way. Consequently, behavior regulation could be related to the development of social problem-solving skills. If children are better equipped to decipher others' nonverbal cues, they will be more able to respond to peers and engage in social interaction in an appropriate manner (Grinspan, Hemphill and Nowicki, 2003).

Social problem solving

Individuals who are deficient in emotional understanding are deprived of important social information which makes it difficult for them to respond to others and less likely that others will respond to them in a positive way (Garner, 1997). Children's social problem-solving skills appear to be related to their general level of emotional competence as well as to more specific intrapersonal factors (Smith and Walden, 1998). Children who do not interpret nonverbal information accurately must handle accumulated negative reactions that may predispose them to develop personal and interpersonal difficulties (Nowicki and Duke, 1992).

The control that children gradually gain over their emotional expression has important consequences for communication between children (Gosselin, 2002). Understanding emotion allows children to state their own feelings, to understand feedback on these feelings, and to more completely process causal associations between events and emotions (Hesse, 1982). Difficulties decoding emotional facial expressions and vocal prosody have been shown, for instance, to relate positively to low peer-rated sociometric status among preschoolers (McClure, 2001). Children who have learned to process nonverbal information have an advantage over less nonverbally adept peers in beginning and maintaining relationships (Nowicki and Mitchell, 1998).

Measures of social information processing have been developed and found to correlate with antisocial behavior both at the level of the single aggressive act as well as at the level of enduring individual differences (Dodge, 1997). Students who have difficulty with social skills because they do not understand nonverbal communication tend to have family relationship problems, trouble with teacher interactions, fewer friends, and low self-esteem (Sprouse, Hall, Webster, and Bolen, 1998). Nonverbal processing difficulties increase the likelihood that children's social interactions will fail and will produce negative self-evaluation and feelings (Nowicki and Carton, 1997).

Age will affect the ability to understand emotions; however, the direction of the predicted age effect is different depending on which theoretical stance is adopted. Sociocognitive approaches suggest that there should be age-related improvement in the ability to understand others' emotions. The ability to decode facial expressions is an important component of social interaction because of the significant role of facial information in the appropriate modification of social behaviors (Herba and Phillips,

2004). The ability to interpret emotional cues has been argued to play an important role in maintaining successful relationships and healthy psychological functioning (Phillips et al., 2002).

Cultural Characteristics

Early pioneers focused on documenting aspects of universality in emotional judgments rather than on exploring the cultural differences that emerge in these same data. Rather than arguing for universality or cultural specificity in the communication of emotions, to the exclusion of the other, recent work has incorporated some elements of both into an interactionist perspective (Elfenbein and Ambady, 2003). When looking at the expression and recognition of emotion, there may be aspects of universality as well as cultural differences. Just as emotional expression may be a universal “language,” different “accents” or “dialects” may vary in subtle ways across cultures (Elfenbein and Ambady, 2003).

Researchers studying emotion recognition have extensively documented both cultural similarities and differences (Elfenbein, 2002). Although cultural differences may be described in terms of forms of expression, they also may be described in terms of accuracy with which such expressions are interpreted (Weathers, Frank, and Spell, 2002). Therefore, it is not a contradiction to say that the expression of emotion is largely universal but there are subtle differences across cultures that can create a challenge for effective communication (Elfenbein, 2003).

Cultural variations

It seems that emotions are recognizable at above-chance levels across cultures, but there also are cultural variations in emotion recognition accuracy (Elfenbein and

Ambady, 2003). There are a number of reasons why individuals may generally be more accurate at recognizing expressions by members of their own ethnic group (Beaupre and Hess, 2005). According to dialect theory, there are cultural differences in the appearance of emotional expressions resulting from the specific affect (Elfenbein, 2003). Similarly, other research also has demonstrated that individuals perceive communication of affect from members of their own ethnic group more accurately than they do from members of another ethnic group (Weathers et al., 2002). Individuals tend to interpret another individuals' behavior in terms of what they would have intended if they had used the same expression (Elfenbein, 2003).

In-group advantage

The definition of the in-group advantage is that perceivers' emotion judgments are more accurate with culturally matched than culturally mismatched materials (Elfenbein, 2003). Members of the same race (i.e., Caucasians) accurately interpreted the affective expressions of members of their own race, whereas the members of another racial group (i.e., African Americans) did not interpret the same stimuli with the same degree of accuracy (Weathers et al., 2002). This in-group advantage has been seen across a range of experimental methods and nonverbal channels of communication, as well as across each of the basic emotions, both positive and negative (Mandal and Ambady, 2004).

Just as there is an in-group advantage for understanding speech, cultural differences could lead to an in-group advantage in emotion recognition. Specific appearances of facial expressions may differ among cultures, as is the case for other forms of nonverbal behavior (Marsh, 2003). There may be subtle differences in

expressive style between members of different cultural groups that make it more difficult to decode expressions by cultural out-group members (Beaupre and Hess, 2005). Subtle differences in expressive behavior across cultures can lead to greater ability in understanding emotions expressed in a familiar style (Elfenbein and Ambady, 2003). Certain components of emotion identification and recognition are universal; however some expressions of emotion may lose their meaning across cultural boundaries. Individuals generally pay attention to the cues that are particularly diagnostic for members of their own ethnic group. However, these same cues may not assist as clearly in distinguishing among faces of out-group members (Elfenbein and Ambady, 2003).

Some researchers have found evidence that emotions may be more accurately understood when they are judged by members of the same national, ethnic, or regional group that had expressed the emotion. This in-group advantage indicates that culture can have an important role in shaping our emotional communication (Elfenbein and Ambady, 2002). The in-group advantage is lower when groups are nearer geographically or have greater cross-cultural contact with each other, and over time participants appear to learn how to understand the emotions of people from foreign cultures (Elfenbein, 2003).

Culture plays a role in understanding expression of facial emotion and expressions of emotion are a natural outgrowth of cultural learning (Mandal and Ambady, 2004). There is a relationship between how culture influences a person's capacity to identify emotion. Stevens, Charman and Blair (2001) found that children with psychopathic tendencies showed impaired ability to recognize sad and fearful facial expressions. MacLeod and Matthews (1988) found that social anxious adults had problems in decoding facial expressions of emotions.

Research Hypotheses

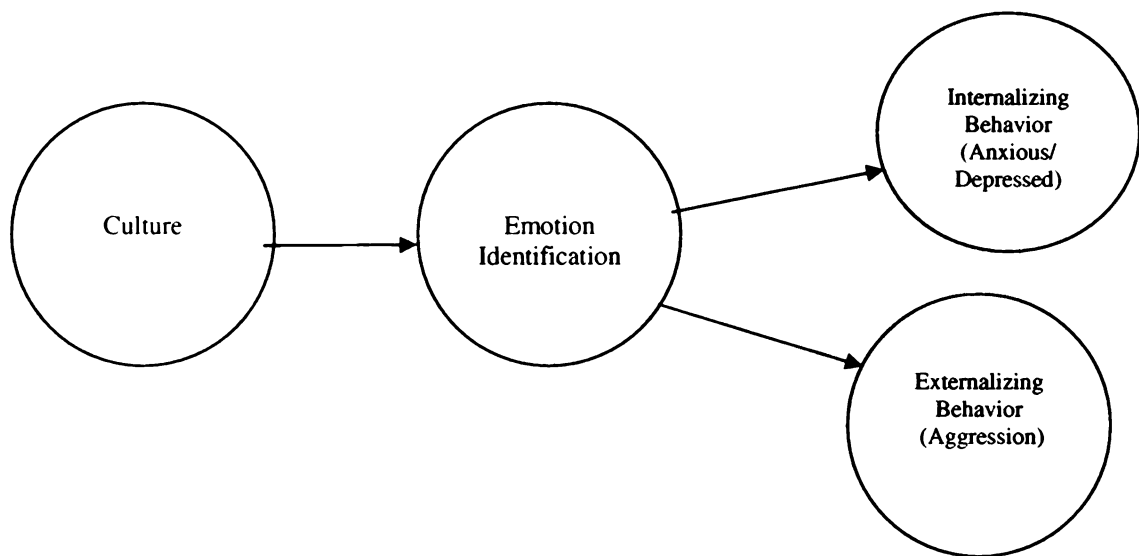
This study utilizes the Diagnostic Analysis of Nonverbal Accuracy (DANVA) in order to attempt to answer two research objectives. As a part of the DANVA, there are a set of African American faces and Caucasian faces. The African American faces portion of the DANVA does not have an answer key. Therefore, in order to utilize both portions of the DANVA, this study must first create an accurate answer key for the African American faces portion of the DANVA.

Based on the literature, researchers now believe that there may be aspects of universality as well as cultural differences in emotion recognition. We also know that the identification of sadness and fear develop later than happiness and anger. This study would first like to explore if there are cultural differences and/or an in-group advantage in the perception of emotions. Hypothesis 1a; among adults and children no differences in identification by ethnicity were expected for the emotions, happiness and anger. Hypothesis 1b; Adult and child identification of the emotions sadness and fear will vary by ethnicity, such that in-group accuracy will be greater. Hypothesis 1c; Adult identification of emotions will demonstrate greater accuracy than child identification of emotions irrespective of ethnicity.

Furthermore the literature tells us that a number of children, adolescents, and adults with an assortment of psychological and psychiatric disorders identify facial expressions less skillfully than their peers. Hypothesis 2; among both children and adults, poor performance in identifying emotions will be positively related to disruptive and/or impaired behavior

Based the literature, the model that I propose for this study looks at the relationship between culture and emotion identification and how internalizing and externalizing behavior (i.e. anxious/depressed behavior and aggressive behavior) are affected by emotion identification. This relationship is illustrated in figure 1.

Figure 1 Emotion Identification Model



Chapter 2 Methodology

Data Sources

This study uses two separate data sets; one data set contains preschool aged children involved in a program called Passport. The second data set contains college aged students who participated in an online study. The preschool aged data source for this study comes from evaluation research of the Ready, Set, Grow, Passport program in Flint, Michigan (Barnes, 2003). The primary caregiver (usually the mother) and their 3-4 year old children were interviewed at their home by Michigan State University graduate and undergraduate students (see Appendix A).

In the online dataset, adult participants signed up by going to the “Human participants in research” web page for the Department of Psychology at Michigan State University (MSU). In undergraduate psychology classes, research participation is required and/or an opportunity for extra class credit. Once participants enter the Department of Psychology research website, they sign up to complete an online study (see Appendix B).

Participants

In the Passport dataset, participants were 105 three to five year-old children 53 (51%) boys, 52 (49%) girls) and their caregivers. The child participants’ ages ranged from 43 to 64 months. The average age was 52.6 months. Eight children were excluded from the analyses because of prior brain injury, clinical psychiatric disorder, language difficulty, and refusal to complete tasks.

Table 1

Sample Characteristics of Child Participants (Passport Dataset)

	<u>N</u> = 97	%
<u>Ethnicity</u>		
Caucasian/non-Hispanic	44	45.4
Black/non-Hispanic	50	51.5
Other	3	3.1
<u>Gender</u>		
Male	47	48.5
Female	50	51.5
<u>Age</u>		
43-47 months	18	18.5
48-52 months	31	32
53-64 months	48	49.5

The adult participants in the online sample consisted of undergraduate students at Michigan State University, who were enrolled in various undergraduate level psychology classes. Data were collected from 1,312 students ranging in age from 18 to 31. There were 336 (26%) males and 976 (74%) female participants. With one participant not reporting there age, the average age was 20.4 years old. The students who participated in the study were asked to select the race that best fit them. The racial breakdown consisted of 1,083 Caucasian/non-Hispanic, 111 Black/non-Hispanic, 73 Asian, 41 Hispanic or Latino, 13 Native Hawaiian or Pacific Islander, 27 Native American, 16 Indian, and 21 Middle Eastern. For this project, analyses were only run on the Caucasian/non-Hispanic and Black/non-Hispanic groups, due to low number of participants in the other racial groups.

Table 2

Sample Characteristics of Adult Participants (Online study Dataset)

	<u>N = 1312</u>	<u>%</u>
<u>Ethnicity</u>		
Caucasian/non-Hispanic	1082	82.5
Black/non-Hispanic	111	8.5
Asian	73	5.6
Hispanic or Latino	41	3.1
Native Hawaiian or Pacific Islander	13	1.0
Native American	27	2.1
Indian	16	1.2
Middle Eastern	21	1.6
<u>Gender</u>		
Male	336	25.5
Female	976	74.4
<u>Age</u>		
18-21	1215	92.7
22-25	84	6.4
26-31+	12	0.9

Procedures

Passport interviews were conducted in the homes of families with young children. One graduate student and one undergraduate student worked simultaneously with the mother and child. Passport interviewers explained the content of the interview and the research objectives to the mother. Mothers were informed of the voluntary nature of participation and the confidentiality of data. Informed consent was obtained from all participants prior to interviewing. The interviewers completed multiple training sessions (a total of 10 hours) to ensure consistent administration of the interview.

The online study could be completed from the students' personal computer or on the MSU campus. They were asked to identify emotions from photographs of children

producing facial expressions of happy, sad, mad, and scared. They were asked questions concerning adaptive functioning, substance use, internalizing behavior problems, and externalizing behavior problems. Students participated in this study in order to fulfill research requirements or to receive extra credit for class.

Measures

The primary purpose of this study is to construct an accurate answer key for the African American faces portion of the DANVA. The study also seeks to examine if an individuals' behavior related to their ability to correctly identify expressions of emotion. The study also seeks to gain knowledge of cultural variations in the ability to understand the adult and child responses to facial expressions.

The Diagnostic Analysis of Nonverbal Accuracy (DANVA) is a screening tool for determining nonverbal processing capability. A unique feature of the DANVA is that it presents stimuli that can be recognized by most as communicating a particular emotion. Scores are calculated according to the accurate or inaccurate recognition of the emotion presented. A low score indicates less frequent accurate identification of emotions and reduced nonverbal processing ability. The DANVA consists of receptive and expressive subtests that measure nonverbal processing in children. There are four receptive sections: facial expressions, postures, gestures and tones of voice. There are three expressive sections: facial expressions, gestures and tones of voice. The subtests sample emotions (happiness, sadness, anger, and fear) necessary for daily interpersonal functioning.

In this study, the Child Faces portion of the DANVA was used; this consists of 48 (24 Caucasian and 24 African American) color photographs of children displaying four emotions: happiness, sadness, anger, and fear. Each emotion grouping encompasses six

photographs (for each individual race), with three photographs showing high intensity expressions and three showing low intensity expressions. In order to make sure that items worked across age groups, an 80% agreement rate for older and younger participants was required.

The *Child Behavior Checklist* (CBCL) (Achenbach and Edelbrock, 1981) was generated from the Revised Behavior Problem Checklist (Quay and Peterson, 1987) and other behavior checklists. It is composed of 112 items that each significantly differentiates clinically-referred from non-referred children.

The CBCL/1½-5 assesses parents' perceptions of 99 problem items plus descriptions of problems, disabilities, what concerns parents most about their child, and the best things about the child. In this study, the internalizing sub-scale and the externalizing sub-scale were used. For the Internalizing group, this study focused on the Anxious/Depressed sub-scale. For the Externalizing group, this study focused on the Aggressive Behavior sub-scale.

Individual item intraclass correlations (ICC) of greater than .90 were obtained "between item scores obtained from mothers filling out the CBCL at 1-week intervals, mothers and fathers filling out the CBCL on their clinically-referred children, and three different interviewers obtaining CBCLs from parents of demographically matched triads of children." Stability of ICCs over a 3-month period was .84 for behavior problems and .97 for social competencies. Test-retest reliability of mothers' ratings was .89. Several studies have supported the construct validity of the instrument. Tests of criterion-related validity using clinical status as the criterion (referred/non-referred) also support the

validity of the instrument. Importantly, demographic variables such as race and SES accounted for a relatively small proportion of score variance.

The Adult Behavior Checklist (ABCL) has 127 items that describe specific behavioral and emotional problems. The profiles for scoring the ABCL include normed scales for adaptive functioning, empirically based syndromes, substance use, Internalizing, Externalizing, and Total Problems. The Internalizing group problems include those within the individual, such as anxiety, depression, somatic complaints (without medical cause) and social withdrawal. The Externalizing group includes problems that arise between the individual and others, such as aggression, rule-breaking, and intrusive behavior.

In this study, the internalizing sub-scale and the externalizing sub-scale were used. In the Internalizing group, this study focused on the Anxious/Depressed sub-scale. This sub-scale consists of eighteen items that ask questions about feelings of loneliness, nervousness and thoughts of suicide. The total possible scores for this scale range from 18 to 36. For participants who are 18-35 years of age, the clinical range begins with a score of 20. For participants who are 36-59 years of age, the clinical range begins with a score of 19. For the Externalizing group, this study focused on the sub-scale Aggressive Behavior. This sub-scale consists of fifteen items that ask questions about behavior changes, temper and impatience. The total possible scores for this scale range from 15 being the lowest possible score to 30 being the highest possible score. For participants who are 18-35 years of age, the clinical range begins with a score of 18. For participants who are 36-59 years of age, the clinical range begins with a score of 14.

The test-retest reliability for the adult forms was between .80 and .90 for most scales, with none less than .71. Good internal consistency was found for most scales, with the average alpha coefficients on the ABCL of .83 and .85 for empirically based problems scales and .78 and .79 for the DSM-oriented scales. The mean Q correlation between ABCL problem items was .30. Substantial long-term stability of scores was indicated by rs ranging from .69 over a 2-year interval, to .58-.60 over 39-44 months, and .43-.53 over 10 years.

Analysis Strategy

In order to create an accurate answer key for the African American faces portion of the DANVA, the construct validity process used by the creators of the DANVA was used. The photos also were coded using Izard's AFFEX system (Izard, Huebner, Risser, and Dougherty, 1980) in order to identify and rate intensity for the twenty-four African American photos (see Appendix C for the rating sheet).

For the identification of happy (Enjoyment-Joy in AFFEX), the experimenter looked for eyebrows in a normal or resting position, raised cheeks, and a mouth drawn up and back. If the child displayed three of the three facial movements, the expression was rated as *very detectable*. If the child produced two of the three facial movements, the expression was rated as *somewhat detectable*. If the child produces only one of the facial movements, the expression was rated as *barely detectable*.

For the identification of angry/mad (Anger-Rage in AFFEX), the experimenter looked for eyebrows that were drawn down and together, broadened nasal root, narrow or squinted eyes, raised cheeks, and a closed mouth with lips pressed tightly together or clenched teeth. If the child displayed all of these facial movements, the expression was

rated as *very detectable*. If the child produced three or four of the five facial movements, the expression was rated as *somewhat detectable*. If the child produced only one or two of the facial movements, the expression was rated as *barely detectable*.

For the identification of sad (Sadness-Dejection in AFFEX), the experimenter looked for inner corners of the eyebrows that were raised and eyebrows triangular, narrowed nasal root, upper eyelid pulled up at the inner corners with narrowed/squinted eyes, open or closed mouth with lips drawn downward and outward, upper lip pushed upward. If the child displayed all of these facial movements, the expression was rated as *very detectable*. If the child produced three or four of the five facial movements, the expression was rated as *somewhat detectable*. If the child produced only one or two of the facial movements, the expression was rated as *barely detectable*.

For the identification of afraid/scared (Fear-Terror in AFFEX), the experimenter looked for straight or normally shaped eyebrows that were slightly raised and together, narrowed nasal root, raised eyelids with eyes wide open, and an open mouth with the corners of the lips retracted straight back. If the child displayed all of these facial movements, the expression was rated as *very detectable*. If the child produced three of the four facial movements, the expression was rated as *somewhat detectable*. If the child produced only one or two of the facial movements, the expression was rated as *barely detectable*.

Although judgments based on AFFEX are not completely free of subjective factors, careful training in applying AFFEX allows the researcher to apply a systematic method of identifying emotion. Once the rating sheet was created, three AFFEX trained researchers individually rated each photo using the form. The three researchers then

came together and reevaluated any photos that did not have complete agreement. The next chapter will contain the results of the analysis for both the child and adult data relative to the DANVA. The individual results for the participants will be divided by race and each of my hypotheses will be tested.

Chapter 3 Results

In this chapter, I will present analyses of my research objectives as described in the previous chapter. For the first research objective: identifying and possible cultural differences and/or an in-group advantage in the perception of emotions. There was a comparison done between the African American and Caucasian students' ability to correctly identify the emotions happy, sad, mad and scared. Because of their small sample sizes, other ethnicities were not a part of the data analyses. Using the African American code sheet that was created as well as the Caucasian Code sheet, that was provided; the students' answers were recoded as correct or incorrect for the forty-eight DANVA photos. Then a total score for each emotion category was computed and put into two groups of pictures. Finally, in order to compare the sample means a One-way ANOVA was used for each set of photos.

Regression analyses were run for identifying if emotion is related to internalizing (anxiety/depression) and externalizing (aggression) behaviors in young adults. First, the student's internalizing (anxiety/depression) scale and externalizing (aggression) scale scores were totaled. Next, a regression analysis was run for the African American faces, which included race and the total score for each emotion scale score. Then the regression analysis was then run a second time, using the Caucasian faces.

African American Faces Code Sheet

An answer key for the African American faces portion of the DANVA was created using Izard's AFFEX system. Based on the AFFEX system ratings, there were three photos that were identified as sad/mad ambiguous photos. Due to the ambiguity of these the three photos, they were not computed in the total score. Also, one happy face

photo was not computed in the total scores, in order to balance the instrument (see Appendix D). For the Caucasian faces, there is one photo that used an Asian child for the happy face. This photo was not used in order to not bias the results of the sample (see Appendix E).

The following three figures will show a graphical representation of the average correct identification of emotion percentages for the child sample. The first graph for will look at how Caucasian and African American participants did overall for all of the DANVA photos. The second and third graph for each sample compares how Caucasian and African American participants scored on Caucasian only and African American only photos. When looking at both figure 2 (black/white children viewing entire DANVA) and figure 4 (black/white children viewing only Caucasian photos) there appears to be a large difference between the correct identification of the sad emotion.

Figure 2 *Average Correct Identification of Emotion by Race: Child Sample*

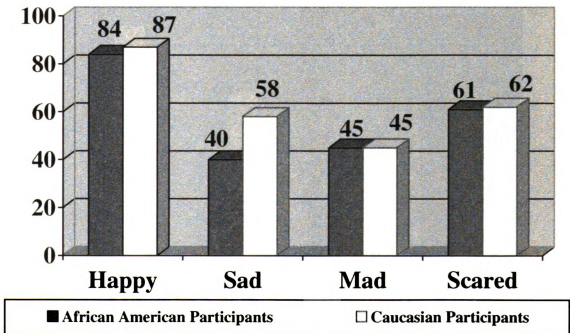


Figure 3 *Correct Identification of Black Faces by Race: Child Sample*

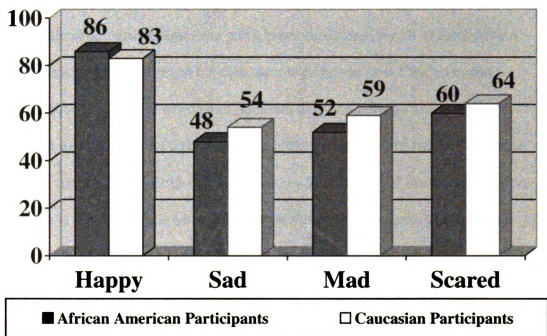
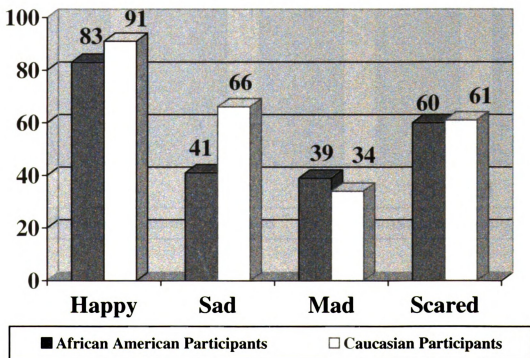


Figure 4 *Correct Identification of White Faces by Race: Child Sample*



The next three figures will show a graphical representation of the average correct identification of emotion percentages for the adult sample. The first graph for will look at how Caucasian and African American participants did overall for all of the DANVA photos. The second and third graph for each sample compares how Caucasian and African American participants scored on Caucasian only and African American only photos. When looking at figure 6 (black/white children viewing only African American photos), there appears to be a large difference in the identification of the scared emotion. When looking at figure 7 (black/white children viewing only Caucasian photos), there appears to be a large difference in the identification of the mad emotion.

Figure 5 *Average Correct Identification of Emotion by Race: Adult Sample*

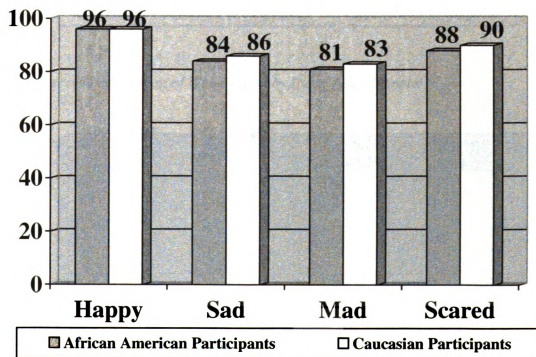


Figure 6 *Correct Identification of Black Faces by Race: Adult Sample*

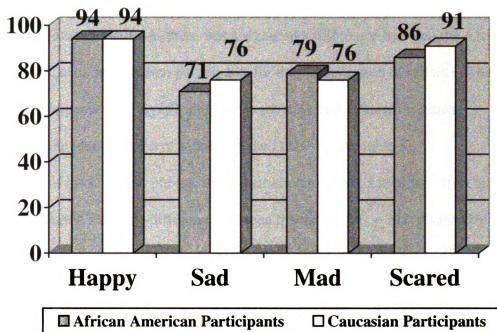
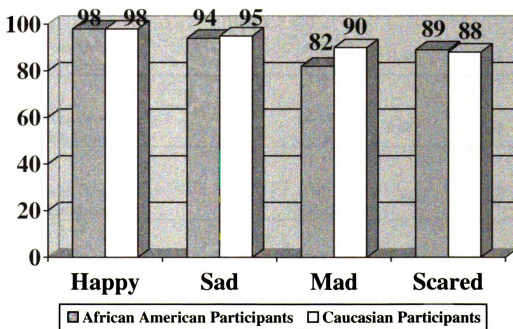


Figure 7 *Correct Identification of White Faces by Race: Adult Sample*



Cultural differences and in-group advantages

Child Sample

For the overall DANVA, there was a significant difference between the African American and Caucasian children participants for the identification of sadness. The Caucasian participants were significantly more accurate than African American participants at the identification of sadness in the DANVA (see table 3).

For all of the DANVA photos, the sad emotion total had a medium effect size (Cohen's *d*). Cohen's *d* is the difference between the means, $M1 - M2$, divided by standard deviation, *s*, of either group. Cohen defined effect sizes as "small, $d = .2$," "medium, $d = .5$," and "large, $d = .8$ " (Cohen, 1988).

Table 3

Analysis of Variance of Child Sample by Race: DANVA All Photos

Source	Df	SS	F	Effect Size
Happy				
Between Groups	1	4.87	1.49	.27
Within Groups	77	251.73		
Sad				
Between Groups	1	64.57	8.48*	.64
Within Groups	81	617.10		
Mad				
Between Groups	1	1.40	.16	.09
Within Groups	73	628.28		
Scared				
Between Groups	1	.17	.02	.03
Within Groups	73	773.11		
All Emotions				
Between Groups	1	126.08	2.86	.43
Within Groups	61	2688.15		

Note. * $p < .05$, Effect size used was Cohen's *d*

In the results from the One-Way ANOVA for the African American faces, there were no significant differences found between the African American and Caucasian participants for any of the emotion totals (see table 4).

Table 4

Analysis of Variance of Child Sample by Race: DANVA African American Faces

Source	Df	SS	F	Effect Size
Happy				
Between Groups	1	.19		
Within Groups	81	73.33	.21	.11
Sad				
Between Groups	1	2.63		
Within Groups	82	227.51	.95	.21
Mad				
Between Groups	1	3.61		
Within Groups	83	260.08	1.15	.23
Scared				
Between Groups	1	.04		
Within Groups	78	209.95	.01	.03
All Emotions				
Between Groups	1	13.04		
Within Groups	71	889.49	1.04	.24

Note. * $p < .05$, Effect size used was Cohen's d

For the Caucasian faces portion of the DANVA, there were significant differences between the African American and Caucasian participants for the identification of the emotions happy, sad and the overall emotion total. The Caucasian participants were significantly more accurate than African American participants at the identification of these three emotion totals in the Caucasian faces (see table 5).

Both the happy emotion total and the overall emotion total have medium effect sizes (Cohen's d). For the sad emotion total, there is a large effect size.

Table 5

Analysis of Variance of Child Sample by Race: DANVA Caucasian Faces

Source	Df	SS	F	Effect Size
Happy				
Between Groups	1	5.34	5.28*	.52
Within Groups	80	81.05		
Sad				
Between Groups	1	42.41	19.92*	.97
Within Groups	82	174.58		
Mad				
Between Groups	1	.95	.33	.13
Within Groups	74	213.30		
Scared				
Between Groups	1	.27	.07	.06
Within Groups	76	287.02		
All Emotions				
Between Groups	1	68.24	4.77*	.53
Within Groups	66	944.63		

Note. * $p < .05$, Effect size used was Cohen's d

Adult sample

For the overall DANVA, there was a significant difference between the African American and Caucasian adult participants for the identification of the sad, scared and overall emotion totals. The Caucasian participants were significantly more accurate than African American participants at the identification of the sad, scared and overall emotion totals in the DANVA (see table 6). For all of the DANVA photos, the small effect size (Cohen's d) indicates that the significant difference in this group is due primarily to the large sample size.

Table 6

Analysis of Variance of Adult Sample by Race: DANVA All Photos

Source	Df	SS	F	Effect Size
Happy				
Between Groups	1	.186		
Within Groups	1176	572.23	.38	.07
Sad				
Between Groups	1	9.32		
Within Groups	1177	2153.14	5.09*	.23
Mad				
Between Groups	1	6.92		
Within Groups	1176	2624.95	3.10	.15
Scared				
Between Groups	1	5.74		
Within Groups	1173	1732.59	3.89*	.17
All Emotions				
Between Groups	1	72.55		
Within Groups	1173	10036.63	8.48*	.27

Note. * $p < .05$, Effect size used was Cohen's d

In the results from the One-Way ANOVA for the African American faces, there was a significant difference between the African American and Caucasian participants for both the sad and scared emotion totals. The Caucasian participants were significantly more accurate than African American participants at the identification of sad and scared in the African American faces (see table 7). There are no other significant differences in emotion identification for any of the other three emotions totals (happy, mad and overall) for the African American faces.

This significant difference is due primarily to the large sample size. There is a significant difference, but it is not a practical difference.

Table 7

Analysis of Variance of Adult Sample by Race: DANVA African American Faces

Source	Df	SS	F	Effect Size
Happy				
Between Groups	1	.003	.008	.00
Within Groups	1176	369.86		
Sad				
Between Groups	1	5.204	4.25*	.21
Within Groups	1177	1442.78		
Mad				
Between Groups	1	3.13	2.46	.15
Within Groups	1176	1499.38		
Scared				
Between Groups	1	8.329	14.28*	.33
Within Groups	1176	685.79		
All Emotions				
Between Groups	1	12.13	3.365	.17
Within Groups	1175	4234.46		

Note. * $p < .05$, Effect size used was Cohen's d

For the Caucasian faces portion of the DANVA, there was a significant difference between the African American and Caucasian participants for the identification of both the mad and overall emotion totals. The Caucasian participants were significantly more accurate than African American participants at the identification of the mad and overall emotion totals in the Caucasian faces (see table 8). The significant differences in this group can also be explained by the large sample size.

Table 8

Analysis of Variance of Adult Sample by Race: DANVA Caucasian Faces

Source	Df	SS	F	Effect Size
Happy				
Between Groups	1	.144	1.64	.08
Within Groups	1176	103.514		
Sad				
Between Groups	1	.595	1.68	.13
Within Groups	1177	416.199		
Mad				
Between Groups	1	19.359	25.89*	.46
Within Groups	1176	846.529		
Scared				
Between Groups	1	.321	.51	.07
Within Groups	1174	733.910		
All Emotions				
Between Groups	1	26.034	9.16*	.28
Within Groups	1174	3337.659		

Note. * $p < .05$, Effect size used was Cohen's d

When examining the data from the child participants, the only significant differences that were found, were for the Caucasian faces and the overall DANVA. Caucasian participants were significantly more accurate than African American participants at the identification of the emotions sad, scared and the overall emotions.

When examining the data for the adult participants Caucasian participants were significantly more accurate than African American participants at the identification of various emotions. However, after reviewing the effect size, it was found that these differences were primarily an artifact of sample size.

Emotional Competence

Multiple regression was performed for both the internalizing scale (anxiety/depression) and the externalizing scale (aggression). The independent variable race was placed alone, in the first block of the model. The independent variables (happy total, sad total, and mad total) were placed together in the second block of the model, because these are the first emotions that children become proficient in. Finally, the independent variable scared total was placed alone in the third block, because this is one of the more difficult emotions for children to learn. Each model was tested to see which would contribute to a significant change in R^2 .

Child sample

In the child sample, the correct identification of emotions does not appear to be related to either the internalizing scale: anxious/depressed (see table 9) or the externalizing scale: aggression (see table 10).

Table 9

Hierarchical Regression Analysis for Child Sample: Anxious/Depression

Variable	R ²	R ² Change	Beta
Block 1			
Race	.007	.007	-.086
Block 2			
Race			-.077
Happy Total			-.054
Sad Total	.042	.035	.001
Mad Total			.201
Block 3			
Race			-.069
Happy Total			-.063
Sad Total	.045	.003	.023
Mad Total			.215
Scared Total			-.057

Note. *p < .05

Table 10

Hierarchical Regression Analysis for Child Sample: Aggression

Variable	R ²	R ² Change	Beta
Block 1			
Race	.007	.007	-.081
Block 2			
Race			-.113
Happy Total			-.215
Sad Total	.063	.056	-.064
Mad Total			.170
Block 3			
Race			-.105
Happy Total			-.225
Sad Total	.066	.003	-.041
Mad Total			.184
Scared Total			-.060

Note. *p < .05

Adult sample

For the internalizing scale (anxious/depressed), when controlling for ethnicity, there is no significant change. The only factor that has any significance is race. On the race variable, there is a significant Beta value of .064 (see table 11). For the adult sample, the participant's race is related to how they will score on the anxious/depression subscale of the ABCL.

Table 11

Hierarchical Regression Analysis for Adult Sample: Anxious/Depression

Variable	R ²	R ² Change	Beta
Block 1			
Race	.004	.004*	.064*
Block 2			
Race			.065
Happy Total			-.045
Sad Total	.009	.005	-.041
Mad Total			.036
Block 3			
Race			.066
Happy Total			-.042
Sad Total	.009	.000	-.038
Mad Total			.039
Scared Total			-.016

Note. *p < .05

For the externalizing scale (aggressive behavior) the correct identification of the happy emotion was significant, when controlling for ethnicity. For the model with happy there is a significant change in the Beta value of -.097. As the correct identification of happy increases, the probability of reporting aggressive issues decreases (see table 12).

Table 12

Hierarchical Regression Analysis for Adult Sample: Aggression

Variable	R ²	R ² Change	Beta
Block 1			
Race	.001	.001	-.035
Block 2			
Race			-.031
Happy Total			-.097*
Sad Total	.014	.013*	-.050
Mad Total			.025
Block 3			
Race			-.030
Happy Total			-.089
Sad Total	.016	.002	-.041
Mad Total			.035
Scared Total			-.048

Note. *p < .05

Summary

In the children who participated in this study, the correct identification of emotions was not related anxious/depression behaviors and/or aggressive behavior. For the adults who participated in this study, the correct identification of emotions was not related to anxious/depression behaviors. The race of the participant does appear to be a significant factor to the internalizing scale (anxious/depression). For aggressive behavior, the correct identification of happiness was related to a decrease in aggressive behavior.

Chapter 4 Discussion

In this Chapter I will discuss the findings of the results of my study that were shown in the previous chapter.

African American Faces Code Sheet

The objective to complete a code sheet for the African American Faces portion of the DANVA was successful. Using the AFFEX system, an answer key was developed for the African American Faces portion of the DANVA. The degree to which each of the individual affects were expressed based on the presence or absence of appearance changes in the faces. Each face was given an intensity level rating of high, moderate or low. After identification of each photo was completed, four photos were removed from the African American Faces scale.

Cultural differences and in-group advantages

When examining the data from the child participants, there were no significant differences found in the rate of accurate identification of emotion for the African American faces portion of the DANVA. For the Caucasian faces and the overall DANVA, there were significant cultural differences identified. In all of the differences found, Caucasian participants were significantly more accurate than African American participants at the identification of the emotions sad, scared and the overall emotions.

When examining the data for the adult participants there were several significant cultural differences identified. In all of the differences found, Caucasian participants were significantly more accurate than African American participants at the identification of various emotions. After calculating the effect size using Cohen's *d*, it was found that these differences were primarily an artifact of sample size.

These findings suggest that there are some variations between ethnic groups in relations to the correct identification of some emotions. This study has brought additional reservations to the idea that the “basic emotions” are completely universal.

Emotional Competence

For the child participants, the correct identification of emotions does not appear to be related to either the internalizing scale (anxious/depression) or the externalizing scale (aggressive behavior). There were no significant changes found for any of the models that were run. This lack of significance could be due to the sample size or the young age of the children.

For the adult participants, the correct identification of emotions does not appear to be related to the internalizing scale (anxious/depression). The race of the participant does appear to be a significant factor related to the internalizing scale (anxious/depression). Regardless of the correct or incorrect identification of any of the four emotions does not determine the participants reporting of anxious/depression behavior. The correct identification of happiness does appear to be related to the externalizing scale (aggressive behavior). When the happy emotion is identified correctly the participants reporting aggressive behavior decreases.

Chapter 5 Conclusion

A number of personal and social factors combine to shape an individual's perceptions and actions during the nonverbal interaction process; Patterson (1995) terms these factors determinants (e.g., the individual's biology, culture, gender, personality), social environment (e.g., the setting, partner characteristics), and cognitive affective (mediators goals, affect, expectancies, cognitive resources) (McClure, 2001). Emotion expressions may not be expressions and may not be related to emotions in any simple way (Russell et al., 2003).

From a developmental standpoint this study has found agreement with the current literature. The children in this study were not as proficient as the adults in correctly identifying emotions. This finding supports work of researchers such as (Phillips, MacLean, and Allen, 2002) and (Mondlock, Geldart, Maurer, and Le Grand, 2003). Their work found that with age comes an increased skill at understanding cues to emotional meaning; therefore, the ability to understand and regulate emotions improves. In short, adults are better equipped than children to recognize individual faces quickly, decode an assortment of cues, and correctly identify emotional expressions. This understanding may allow preschool teachers to better facilitate positive interactions when children have conflict or problems with peers.

From a cultural perspective, in both the child and adult samples, it was found that Caucasian participants were significantly more accurate than their African American counterparts at the identification of various emotions. This finding contributes to the theory that identification of emotion is not completely universal. Beaupre and Hess's

(2005) theory that there may be subtle differences between groups is relevant. The issue of universal emotion identification is complex and needs further exploration.

Overall, the research on nonverbal behavior proposes that the perceived accuracy of a person's behavior will persuade the decisions of other individuals towards that person. In order to contribute to a greater understanding of the bases of normal and abnormal social development, future studies will need to consider confounding factors and sex differences (Herba and Phillips, 2004).

In this study I was able to successfully develop an answer key was developed for the African American Faces portion of the DANVA. The answer key developed for the African American Faces portion of the DANVA will contribute to the literature and future research. Because this study was able to successfully develop a coding system for this measure, it can now be used in future work with children and adults. This also will extend the entire DANVA measure, by allowing all of the child photos to be utilized.

Several limitations were identified in this study. Given the secondary data analysis approach, modification to questions were not possible. In addition, participants were forced to choose emotions from a predetermined list (happy, sad, mad, or scared); as a consequence, the participant was not allowed to judge the photos for any other possible emotion. Another limitation for the adult sample, is the racial breakdown; there are substantially more Caucasian/non-Hispanics than any other ethnicity. Also, there are significantly more female subjects than male subjects. Furthermore, because the adult sample contains only college students, the study may not be generalizable to a diverse adult population.

There are several modifications that could have been useful to this study. First, it may have been useful to also add adults outside of the Michigan State University community. This would have allowed for a sample that could be generalized to the entire population. Also, the use of families (children and parents) would have allowed us to look more intensely at how a child's ability to identify emotion is related to their parent's ability.

Furthermore working with young children and their parents could give us an insight into the development and learning process of emotion identification. For future research on cultural differences and similarities issues, research should account for observed differences in emotional communication across cultures. Also, using a longitudinal design rather than cross-sectional one may possibly shed additional light on these findings.

Appendix A
Child Interview: DANVA and CBCL

Please answer the following questions for each item that describes the child now and within the past month.	Not True	Somewhat or Sometimes True	Very True or Often True
1. Aches or pains (without medical cause; <i>do not</i> include stomach or headaches)	☐	☐	☐
2. Acts too young for age	☐	☐	☐
3. Afraid to try new things	☐	☐	☐
4. Avoids looking others in the eye	☐	☐	☐
5. Can't concentrate, can't pay attention for long	☐	☐	☐
6. Can't sit still, restless, or hyperactive	☐	☐	☐
7. Can't stand having things out of place	☐	☐	☐
8. Can't stand waiting; wants everything now	☐	☐	☐
9. Chews on things that aren't edible	☐	☐	☐
10. Clings to adults or too dependent	☐	☐	☐
11. Constantly seeks help	☐	☐	☐
12. Constipated, doesn't move bowels (when not sick)	☐	☐	☐
13. Cries a lot	☐	☐	☐
14. Cruel to animals	☐	☐	☐
15. Defiant	☐	☐	☐
16. Demands must be met immediately	☐	☐	☐
17. Destroys his/her own things	☐	☐	☐
18. Destroys things belonging to his/her family or other children	☐	☐	☐
19. Diarrhea or loose bowels (when not sick)	☐	☐	☐
20. Disobedient	☐	☐	☐
21. Disturbed by any change in routine	☐	☐	☐
22. Doesn't want to sleep alone	☐	☐	☐
23. Doesn't answer when people talk to him/her	☐	☐	☐
24. Doesn't eat well (please describe on attached supplemental form)	☐	☐	☐
25. Doesn't get along with other children	☐	☐	☐
26. Doesn't know how to have fun; acts like a little adult	☐	☐	☐

27. Doesn't seem to feel guilty after misbehaving	☐	☐	☐
28. Doesn't want to go out of home	☐	☐	☐
29. Easily frustrated	☐	☐	☐
30. Easily jealous	☐	☐	☐
31. Eats or drinks things that are not food— <i>don't</i> include sweets (please describe on attached supplemental form)	☐	☐	☐
32. Fears certain animals, situations, or places (please describe on attached supplemental form)	☐	☐	☐
33. Feelings are easily hurt	☐	☐	☐
34. Gets hurt a lot, accident-prone	☐	☐	☐
35. Gets in many fights	☐	☐	☐
36. Gets into everything	☐	☐	☐
37. Gets too upset when separated from parents	☐	☐	☐
38. Has trouble getting to sleep	☐	☐	☐
39. Headaches (without medical cause)	☐	☐	☐
40. Hits others	☐	☐	☐
41. Holds his/her breath	☐	☐	☐
42. Hurts animals or people without meaning to	☐	☐	☐
43. Looks unhappy without good reason	☐	☐	☐
44. Angry moods	☐	☐	☐
45. Nausea, feels sick (without medical cause)	☐	☐	☐
46. Nervous movements or twitching (please describe on attached supplemental form)	☐	☐	☐
47. Nervous, high-strung, or tense	☐	☐	☐
48. Nightmares	☐	☐	☐
49. Overeating	☐	☐	☐
50. Overtired	☐	☐	☐
51. Shows panic for no good reason	☐	☐	☐
52. Painful bowel movements (without medical cause)	☐	☐	☐
53. Physically attacks people	☐	☐	☐
54. Picks nose, skin, or other parts of body (please describe on attached supplemental form)	☐	☐	☐
55. Plays with own sex parts too much	☐	☐	☐
56. Poorly coordinated or clumsy	☐	☐	☐

57. Problems with eyes (without medical cause; please describe on attached supplemental form)	O	O	O
58. Punishment doesn't change his/her behavior	O	O	O
59. Quickly shifts from one activity to another	O	O	O
60. Rashes or other skin problems (without medical cause)	O	O	O
61. Refuses to eat	O	O	O
62. Refuses to play active games	O	O	O
63. Repeatedly rocks head or body	O	O	O
64. Resists going to bed at night	O	O	O
65. Resists toilet training (please describe on attached supplemental form)	O	O	O
66. Screams a lot	O	O	O
67. Seems unresponsive to affection	O	O	O
68. Self-conscious or easily embarrassed	O	O	O
69. Selfish or won't share	O	O	O
70. Shows little affection toward people	O	O	O
71. Shows little interest in things around him/her	O	O	O
72. Shows too little fear of getting hurt	O	O	O
73. Too shy or timid	O	O	O
74. Sleeps less than most children during day and/or night (please describe on attached supplemental form)	O	O	O
75. Smears or plays with bowel movements	O	O	O
76. Speech problem (please describe on attached supplemental form)	O	O	O
77. Stares into space or seems preoccupied	O	O	O
78. Stomachaches or cramps (without medical cause)	O	O	O
79. Rapid shifts between sadness and excitement	O	O	O
80. Strange behavior (please describe on attached supplemental form)	O	O	O
81. Stubborn, sullen, or irritable	O	O	O
82. Sudden changes in mood or feelings	O	O	O
83. Sulks a lot	O	O	O
84. Talks or cries out in sleep	O	O	O
85. Temper tantrums or hot temper	O	O	O
86. Too concerned with neatness or cleanliness	O	O	O

87. Too fearful or anxious	☐	☐	☐
88. Uncooperative	☐	☐	☐
89. Under active, slow moving, or lacks energy	☐	☐	☐
90. Unhappy, sad, or depressed	☐	☐	☐
91. Unusually loud	☐	☐	☐
92. Upset by new people or situations (please describe on attached supplemental form)	☐	☐	☐
93. Vomiting, throwing up (without medical cause)	☐	☐	☐
94. Wakes up often at night	☐	☐	☐
95. Wanders away	☐	☐	☐
96. Wants a lot of attention	☐	☐	☐
97. Whining	☐	☐	☐
98. Withdrawn, doesn't get involved with others	☐	☐	☐
99. Worries	☐	☐	☐

100. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

101. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

102. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

103. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

104. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

105. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

106. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

107. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

108. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

109. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

110. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

111. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

112. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

113. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

114. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

115. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

116. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

117. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

118. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

119. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

120. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

121. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

122. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

123. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

124. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

125. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

126. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

127. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

128. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

129. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

130. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

131. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

132. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

133. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

134. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

135. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

136. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

137. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

138. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

139. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

140. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

141. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

142. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

143. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

144. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

145. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

146. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

147. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

Appendix B
DANVA Online Experiment Survey

Please answer the following questions for each item that describes the child now and within the past month.	Not True	Somewhat or Sometimes True	Very True or Often True
1. I am too forgetful.	☐	☐	☐
2. I make good use of my opportunities.	☐	☐	☐
3. I argue a lot.	☐	☐	☐
4. I work up to my ability.	☐	☐	☐
5. I blame others for my problems.	☐	☐	☐
6. I brag.	☐	☐	☐
7. I have trouble concentrating or paying attention for long.	☐	☐	☐
8. I have trouble sitting still.	☐	☐	☐
9. I am too dependent on others.	☐	☐	☐
10. I feel lonely.	☐	☐	☐
11. I feel confused or in a fog.	☐	☐	☐
12. I cry a lot.	☐	☐	☐
13. I am pretty honest.	☐	☐	☐
14. I am mean to others.	☐	☐	☐
15. I daydream a lot.	☐	☐	☐
16. I deliberately try to hurt or kill myself.	☐	☐	☐
17. I try to get a lot of attention.	☐	☐	☐
18. I damage or destroy my things.	☐	☐	☐
19. I worry about my future.	☐	☐	☐
20. I break rules at work or elsewhere	☐	☐	☐
21. I don't eat as well as I should.	☐	☐	☐
22. I don't get along with other people.	☐	☐	☐
23. I don't feel guilty after doing something I shouldn't	☐	☐	☐
24. I am jealous of others.	☐	☐	☐
25. I get along badly with my family.	☐	☐	☐
26. My relations with opposite sex are poor.	☐	☐	☐
27. I am afraid I might think or do something bad.	☐	☐	☐
28. I feel that I have to be perfect.	☐	☐	☐

29. I feel that no one loves me.	☐	☐	☐
30. I feel that others are out to get me.	☐	☐	☐
31. I feel worthless or inferior.	☐	☐	☐
32. I accidentally get hurt a lot.	☐	☐	☐
33. I get in many fights.	☐	☐	☐
34. My relations with neighbors are poor.	☐	☐	☐
35. I hang around people who get in trouble.	☐	☐	☐
36. I am impulsive or act without thinking.	☐	☐	☐
37. I would rather be alone than with others	☐	☐	☐
38. I lie or cheat.	☐	☐	☐
39. I feel overwhelmed by my responsibilities.	☐	☐	☐
40. I am nervous or tense.	☐	☐	☐
41. I lack self-confidence.	☐	☐	☐
42. I am not liked by others	☐	☐	☐
43. I can do certain things better than other people.	☐	☐	☐
44. I am too fearful or anxious.	☐	☐	☐
45. I feel dizzy or lightheaded.	☐	☐	☐
46. I feel too guilty.	☐	☐	☐
47. I have trouble planning for the future.	☐	☐	☐
48. I feel tired without good reason.	☐	☐	☐
49. My moods swing between elation and depression.	☐	☐	☐
50. I have aches or pains (not stomach or headaches) without known medical cause	☐	☐	☐
51. I have headaches without known medical cause.	☐	☐	☐
52. I experience nausea or feel sick without known medical cause.	☐	☐	☐
53. I have rashes or other skin problems without known medical causes.	☐	☐	☐
54. I have stomach aches without known medical cause.	☐	☐	☐
55. I experience vomiting, throwing up without known medical cause.	☐	☐	☐
56. I experience numbness or tingling in body parts without known medical cause.	☐	☐	☐
57. I physically attack people.	☐	☐	☐
58. I fail to finish things I should do.	☐	☐	☐

59. There is very little that I enjoy.	☐	☐	☐
60. My work performance is poor.	☐	☐	☐
61. I am poorly coordinated or clumsy.	☐	☐	☐
62. I would rather be with older people than with people of my own age.	☐	☐	☐
63. I have trouble setting priorities.	☐	☐	☐
64. I refuse to talk.	☐	☐	☐
65. I have trouble making or keeping friends.	☐	☐	☐
66. I scream or yell a lot.	☐	☐	☐
67. I am secretive or keep things myself.	☐	☐	☐
68. I am self-conscious or easily embarrassed.	☐	☐	☐
69. I worry about my family.	☐	☐	☐
70. I meet my own responsibilities to my family.	☐	☐	☐
71. I show off or clown.	☐	☐	☐
72. My behavior is irresponsible.	☐	☐	☐
73. I have trouble making decisions.	☐	☐	☐
74. I stand up for my rights.	☐	☐	☐
75. My behavior is very changeable.	☐	☐	☐
76. I steal.	☐	☐	☐
77. I am easily bored.	☐	☐	☐
78. I am stubborn, sullen or irritable.	☐	☐	☐
79. My moods or feelings change suddenly.	☐	☐	☐
80. I enjoy being with people.	☐	☐	☐
81. I rush into things without considering the risks.	☐	☐	☐
82. I drink too much alcohol or get drunk.	☐	☐	☐
83. I think about killing myself.	☐	☐	☐
84. I talk too much.	☐	☐	☐
85. I tease others a lot.	☐	☐	☐
86. I have a hot temper.	☐	☐	☐
87. I think about sex too much.	☐	☐	☐
88. I threaten to hurt people.	☐	☐	☐
89. I like to help others.	☐	☐	☐
90. I dislike staying in one place for very long.	☐	☐	☐
91. I stay away from my job even when I'm not sick and not on vacation.	☐	☐	☐
92. I don't have energy.	☐	☐	☐

93. I am unhappy, sad, or depressed.	☐	☐	☐
94. I am louder than others.	☐	☐	☐
95. People think I am disorganized.	☐	☐	☐
96. I try to be fair to others.	☐	☐	☐
97. I feel that I can't succeed.	☐	☐	☐
98. I tend to lose things.	☐	☐	☐
99. I like to try new things.	☐	☐	☐
100. I wish I were the opposite sex.	☐	☐	☐
101. I keep from getting involved with others.	☐	☐	☐
102. I worry a lot.	☐	☐	☐
103. I worry about my relations with the opposite sex.	☐	☐	☐
104. I fail to pay my debts or meet other financial responsibilities.	☐	☐	☐
105. I feel restless or fidgety.	☐	☐	☐
106. I get upset too easily.	☐	☐	☐
107. I have trouble managing money or credit cards.	☐	☐	☐
108. I am too impatient.	☐	☐	☐
109. I am good at details.	☐	☐	☐
110. I drive too fast.	☐	☐	☐
111. I tend to be late for appointments.	☐	☐	☐
112. I have trouble keeping a job.	☐	☐	☐
113. I am a happy person.	☐	☐	☐
114. I hang out with people from different racial/ethnic backgrounds.	☐	☐	☐

115. In the past 6 months, about how many cigarettes did you smoke per day?

- ☐ None
- ☐ Less than 1 per day
- ☐ 2-5 per day
- ☐ 6-10 per day
- ☐ 11-20 per day
- ☐ 21-30 per day
- ☐ 31 or more per day

116. In the past 6 months, on average, how often did you drink alcohol?

- ☐ None
- ☐ Once a month
- ☐ Once every other week
- ☐ 1-2 days a week
- ☐ 3-5 days a week
- ☐ 6-7 days a week
- ☐ More than once a day

117. In the past 6 months, about how many times did you use marijuana?

- ☐ None
- ☐ Once a month
- ☐ Once every other week
- ☐ 1-2 days a week
- ☐ 3-5 days a week
- ☐ 6-7 days a week
- ☐ Once a month

118. Education

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Graduate

119. Age

- ☐ 18
- ☐ 19
- ☐ 20
- ☐ 21
- ☐ 22
- ☐ 23
- ☐ 24
- ☐ 25
- ☐ 26
- ☐ 27
- ☐ 28
- ☐ 29
- ☐ 30
- ☐ 31 or older

120. Sex

- ☐ Male
- ☐ Female

121. Do you describe yourself as White or Caucasian (non-Hispanic)?

- ☐ Yes
- ☐ No

122. Do you describe yourself as Black or African American (non-Hispanic)?

- ☐ Yes
- ☐ No

123. Do you describe yourself as Asian?

- ☐ Yes
- ☐ No

124. Do you describe yourself as Native Hawaiian or Pacific Islander?

- ☐ Yes
- ☐ No

125. Do you describe yourself as Hispanic or Latino/Latina?

- ☐ Yes
- ☐ No

126. Do you describe yourself as Indian (from India)?

- ☐ Yes
- ☐ No

127. Do you describe yourself as Native American?

- ☐ Yes
- ☐ No

128. Do you describe yourself as Middle Eastern?

- ☐ Yes
- ☐ No

129. Are you a United States citizen?

- ☐ Yes
- ☐ No

130. Marital Status

- ☐ Never Married
- ☐ Married – living with spouse
- ☐ Married – separated from spouse
- ☐ Divorced
- ☐ Widowed
- ☐ Living together with partner

131. Experience with children ages birth–1 year.

- ☐ Virtually None
- ☐ A little
- ☐ Some
- ☐ Quite a bit
- ☐ A lot

132. Experience with children ages 1-2 years.

- ☐ Virtually None
- ☐ A little
- ☐ Some
- ☐ Quite a bit
- ☐ A lot

133. Experience with children ages 3-5 years.

- ☐ Virtually None
- ☐ A little
- ☐ Some
- ☐ Quite a bit
- ☐ A lot

134. Experience with children ages 6-8 years.

- ☐ Virtually None
- ☐ A little
- ☐ Some
- ☐ Quite a bit
- ☐ A lot

135. Experience with children ages 9-12 years.

- ☐ Virtually None
- ☐ A little
- ☐ Some
- ☐ Quite a bit
- ☐ A lot

136. Which hand would you use to write a letter?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

137. Which hand would you use to throw a ball to a friend?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

138. Which hand would you use to cut paper with scissors?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

139. Which arm would you use to carry a heavy book?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

140. Which arm would you use to hold a large paper bag of groceries?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

141. Which foot would you use to kick a soccer ball to a friend?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

142. Which foot would you use to balance on one foot?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

143. Which foot would you use to step up onto a chair?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

144. When you hug another person on which side is their head?

- ☐ Left Always
- ☐ Right Always
- ☐ Both Equally
- ☐ Left Usually
- ☐ Right Usually

145. Imagine that you are holding a three month old baby in your arms. Try to visualize the baby's face, its eyes, mouth, arms, and body. To help you imagine, put your arms in the position you would use to support the baby's head and body. Look directly at the baby's face. Now, on which side are you holding the baby's head?

- ☐ On your left side
- ☐ On your right side
- ☐ In the middle

146. For the same situation (#145), how close is the baby to your body?

- ☐ Cradled touching your body
- ☐ Cradled not touching your body
- ☐ Held out far away from your body

147. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

148. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

149. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

150. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

151. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

152. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

153. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

154. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

155. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

156. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

157. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

158. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

159. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

160. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

161. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

162. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

163. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

164. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

165. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

166. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

167. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

168. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

169. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

170. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

171. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

172. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

173. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

174. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

175. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

176. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

177. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

178. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

179. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

180. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

181. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

182. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

183. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

184. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

185. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

186. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

187. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

188. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

189. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

190. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

191. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

192. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

193. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

194. Is this child:

- ☐ Happy
- ☐ Mad
- ☐ Sad
- ☐ Afraid

195. In the past 6 months, on average, how often did you use MDMA (ecstasy)?

- ☐ None
- ☐ Once a month
- ☐ Once every other week
- ☐ 1-2 days a week
- ☐ 3-5 days a week
- ☐ 6-7 days a week
- ☐ More than once a day

196. In the past 6 months, on average, how often did you use inhalants (things you sniff, hug or breathe to get high)?

- ☐ None
- ☐ Once a month
- ☐ Once every other week
- ☐ 1-2 days a week
- ☐ 3-5 days a week
- ☐ 6-7 days a week
- ☐ More than once a day

197. In the past 6 months, on average, how often did you use other drugs (such as cocaine, Meth, PCP)?

- ☐ None
- ☐ Once a month
- ☐ Once every other week
- ☐ 1-2 days a week
- ☐ 3-5 days a week
- ☐ 6-7 days a week
- ☐ More than once a day

Appendix C

Production of Emotions Identification and Rating Scale

1. Fill in number of picture (located on back of photo): G or W #____
2. Circle the emotion that this picture displays.
3. Mark an (x) next to each expression(s) displayed in the emotion.

Happy	
	Eyebrows in a normal or resting position
	Raised cheeks
	Mouth drawn up and back

Very Detectable (high intensity): 3 of 3

Somewhat detectable (moderate intensity): 2 of 3

Barely detectable (low intensity): 1 of 3

Sad	
	Inner corners of the eyebrows that were raised and eyebrows triangular
	Narrowed nasal root
	Upper eyelid pulled up at the inner corners with narrowed/squinted eyes
	Open or closed mouth with lips drawn downward and outward
	Upper lip pushed upward

Very Detectable (high intensity): 5 of 5

Somewhat detectable (moderate intensity): 3 or 4 of 5

Barely detectable (low intensity): 1 or 2 of 5

Angry/Mad	
	Eyebrows that were drawn down and together
	Broadened nasal root
	Narrow or squinted eyes
	Raised cheeks
	Closed mouth with lips pressed tightly together or clenched teeth

Very Detectable (high intensity): 5 of 5

Somewhat detectable (moderate intensity): 3 or 4 of 5

Barely detectable (low intensity): 1 or 2 of 5

Afraid/Scared	
	Straight or normally shaped eyebrows that were slightly raised and together
	Narrowed nasal root
	Raised eyelids with eyes wide open
	Open mouth with the corners of the lips retracted straight back.

Very Detectable (high intensity): 4 of 4

Somewhat detectable (moderate intensity): 2 or 3 of 4

Barely detectable (low intensity): 1 of 4

Appendix D
DANVA Code Sheet: African American Faces

#	Emotion	Intensity	Comments
G01	Mad	Low	
G02	Sad/Mad	Low	Photo is ambiguous and will not be used in analyses
G03	Scared	Moderate	
G04	Scared	Moderate	
G05	Happy	High	
G06	Mad	Moderate	
G07	Mad	Moderate	
G08	Scared	Moderate	
G09	Sad	Moderate	
G10	Sad/Mad	Low	Photo is ambiguous and will not be used in analyses
G11	Sad	Moderate	
G12	Sad	Moderate	
G13	Sad/Mad	Low	Photo is ambiguous and will not be used in analyses Will not use this photo in the analyses, in order to have an equal number of photos for each emotion in the scale
G14	Happy	High	
G15	Happy	High	
G16	Sad	Moderate	
G17	Happy	High	
G18	Scared	High	
G19	Scared	Moderate	
G20	Sad	Moderate	
G21	Mad	Moderate	
G22	Mad	Moderate	
G23	Happy	Moderate	
G24	Happy	High	

Appendix E
DANVA Code Sheet: Caucasian Faces

#	Emotion	Intensity (as provided by DANVA manual)	Intensity (as rated by AFFEX system)	Comments
W01	Mad	Low	High	This photo contains the only Asian child in the 24 photos. It will not be used in the analyses
W02	Happy	High	High	
W03	Happy	Low	High	
W04	Scared	Low	High	
W05	Sad	High	Moderate	
W06	Sad	High	Moderate	
W07	Mad	High	Moderate	
W08	Happy	High	High	
W09	Mad	Low	Moderate	
W10	Sad	Low	Low	
W11	Scared	Low	Moderate	
W12	Happy	Low	Moderate	
W13	Sad	High	Moderate	
W14	Mad	Low	Low	
W15	Scared	Low	Moderate	
W16	Happy	High	High	
W17	Sad	Low	Moderate	
W18	Scared	High	High	
W19	Scared	High	High	
W20	Mad	High	Moderate	
W21	Sad	Low	Low	
W22	Scared	High	Moderate	
W23	Happy	Low	Moderate	
W24	Mad	High	High	

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