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AN EXPLORATORY MIXED METHODS STUDY OF STUDENT AWARENESS IN
EXPRESSING EMOTIONS AND IDENTIFYING THE EMOTIONS OF OTHERS:
THROUGH THE MIRROR LOOKING GLASS

by

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A dissertation submitted in partial fulfillment of the requirements
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ABSTRACT

The goal of this research was to determine how the self-awareness process of expressing emotions and identifying emotions of others was impacted during a mirror-based intervention for first grade students from inclusive classrooms. The study investigated the extent that a two-way mirror display helped eight students increase their level of awareness when expressing emotions and identifying the emotions of others. Traditional assessment measures for assessing empathy and accuracy in perception of emotions of others have relied on binary, forced choice responses that have not addressed a student's level of awareness, or increased awareness in identifying the emotions of others. Further, binary tests of theory of mind (ToM) and empathy that provide 'either/or' assessment do not account for an individual's level of ToM or empathy in identifying emotions of others, when 100% accuracy is not achieved 100% of the time. A two-way mirror served to provide a real time, real world opportunity for students to examine their own expression of a given emotion, while the student on the non-reflected side simultaneously evaluated the accuracy of that emotion. The accuracy of the projected emotion was evaluated and results indicated an increase in accuracy of expressing emotions. This research study introduced a three choice assessment measure, 'The Emotion Word Assessment (EWA) that provided students choices in identifying their peers' emotion, and was used to assess accuracy and increases in correct choices, with concomitant changes in student own awareness of their emotion expression and the awareness of others' emotions. Constructs of ToM, empathy, cognitive empathy and affective empathy, cognitive processing, compassion, and sympathy were examined and recommendations for future empathy and emotional assessment provided.

ACKNOWLEDGMENT

“If I have seen further, it is by standing on the shoulders of giants” is a quote attributed to Issac Newton centuries ago, yet acknowledgement of the seminal scholars who have gone before us and our present professors whose shoulders we stand on that is timeless. In 1902, Charles Horton Cooley first described the importance of the self-other relationship in development and awareness of ourselves and others. In 1985, Simon Baron-Cohen, Leslie and Frith first attributed the inability of individuals with autism spectrum disorder (ASD) to take the perspective of others as an inability a lack of theory of mind. Baron Cohen (1997) expanded the construct of mindblindness and ToM, to empathy. The present research study sought to increase understanding of empathy by examining the interdependency of self-awareness and other awareness related to ToM and empathy.

This research study would not have been possible or had a successful outcome without numerous individuals that must also be acknowledged. I want to thank my Dissertation Chair, Dr. Rebecca Hines and my Advisor, Dr. Lisa Dieker for their guidance and for allowing me to explore and challenge academic boundaries. My committee is outstanding, I want to thank Dr. R. Hines, Dr. L Dieker, Dr. M. Reyes, and Dr. S. Kent Butler for your academic and emotional support. I want to thank UCF scholar Celestial Willis-Jackson for her assistance with data collection, and Dr. Kathleen Becht for going above and beyond – answering my endless questions about what needs to be where, when, and picking me up and getting me where I needed to be when my car broke down! I want to thank my good friend and writing partner John Flattery, for the many “so what...what if” discussions around self and other awareness. Finally, I want to thank my family and my extended family for their unwavering support.

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LIST OF ACRONYMS

Child Behavior Checklist (CBCL)

Emotion Word Assessment (EWA)

Empathy and Critical Skills (ECS)

Reading the Mind in the Eyes Test (The Eyes Test)

Reading the Mind in Films Test (The Films Test)

Sanford Harmony (SH)

Empathy and Critical Skills (ECS)

Specific Affective Coding Assessment (SPAFF)

Teacher Report Form (TRF)

The Child Affective Facial Expression Set (CAFE)

Theory of Mind (ToM)

CHAPTER ONE: INTRODUCTION

Background of Study

The primary purpose of the study was to examine how the process of expressing emotions and the process of identifying emotions of others was impacted during a mirror-based intervention for eight first grade students from inclusive classrooms. The study also investigated whether a two-way mirror display helped students increase their level of awareness when expressing emotions, and their level of awareness in identifying the emotions of others.

Many schools understand the need for a positive behavior support (PBS) plan and the school in the present study implemented the Sanford Harmony (SH) social skills program across classrooms in the 2016-2017 school year. The first grade teachers in the present study had provided their students with specific empathy curriculum contained within the SH social skills program and saw the mirror intervention as an enhancement of their first grade PBS plan curriculum. This study sought to provide important information about how students learn to recognize the emotions of others and if increases in the accuracy of expressing emotion and in identifying the emotions in others could be measured.

The central research question posed in this study was whether a student's awareness in expressing emotions and identifying the emotions of others established and changed through a mirror-based intervention. Three sub questions were addressed related to the primary research question of: (1) What is the relationship between a student expressing emotions correctly and identifying emotions correctly? (2) Do increases in the accuracy of expressing emotions also lead to increases in third, second or first choices in correctly

identifying the emotions of others? (3) What emotions are least likely or most likely to be expressed and/or identified correctly? These questions were addressed through a mixed methods design focused on the use of traditional measure of empathy and a new measure created by the researcher validated in an earlier research study.

Why is Empathy Important?

Empathy has been recognized as a theoretical construct necessary for social development, and requisite for prosocial behavior toward others. Walter (2012) defined empathy as “the ability to share another’s internal world of thoughts and feelings” (p. 9). Expression of empathy is “a multidimensional construct consisting of cognitive (inferring mental states) and emotional (empathic concern) components” (Dziobez, Rogers, Fleck, Bahnemann, Heekeren, Wolf, & Convit, 2007, p. 464). When individuals are void of empathy, they have “inability to feel what another person is feeling...have an outright lack of concern and disregard for others...evil... capable of causing extreme hurt to others...and treating others as objects” (Baron-Cohen 2011, p. 4).

Rhee, Friedman, Boeldt, Corley, Hewitt, Knafo, ... and Young (2013) reported “a lack of concern and disregard for others assessed as young as 14-36 months was a strong predictor for antisocial behavior in middle childhood and adolescence” (p. 157). Walker, Schwarz, Nippold, Irvin, and Noell (1994) stated, “social skills allow individuals to develop positive relationships with others; cope successfully with the behavioral demands of specific settings; and communicate desires, needs, and preferences effectively...providing a foundation for competent performance in a range of academic, personal, vocational, and community contexts” (p. 70).

Pre-school children are expected to have developed social skills prior to entering school. “The capacity to develop positive social relationships, to concentrate and persist on challenging tasks, to effectively communicate emotions, and to problem solve are just a few of the competencies young children need to be successful as they transition to school” (Hemmeter, Ostrosky, & Fox, 2006, p. 583). Despite the importance of developing social awareness of others, many young children are not equipped to get along with their peers or others, prior to their starting school. Hemmeter et al. (2006) asserted, “within a preschool setting serving children with and without disabilities, there could be as many as a third of the children with significant problem behavior and even more who are at risk for problem behavior” (p. 584). Campbell (1995) reported 10% to 15% of typically developing preschoolers have chronic mild to moderate levels of behavior problems (p. 120).

What is Empathy?

Definitions in the literature of empathy were noted by Kalisch (1973) with empathy defined as the “ability to understand others but never losing your own identify” (p. 1548), and Eisenberg (1988) stated the definition of empathy is “the ability to enter into the life of another person, to accurately perceive his current feelings and their meanings” (p. 15). Spiro (1992) defined empathy as the "almost magical" emotion that persons or objects arouse in us as projections of our feelings” (p. 843).

Expression of empathy is “a multidimensional construct consisting of cognitive (inferring mental states) and emotional (empathic concern) components” (Dziobez et al., 2007, p. 464). Schulte-Ruther, Markowitsch, Fink, and Piefke (2007) stated “empathy allows emotional psychological inference about another person’s mental states and feelings

in social contexts” (p.1354). Walter (2012) defined empathy as “the ability to share another’s internal world of thoughts and feelings” (p. 9). Empathy has been defined as the awareness of what others are feeling *and* the ability to demonstrate the appropriate emotion response (Baron-Cohen, 2011).

“A longstanding problem with the study of empathy is the lack of a clear and agreed upon definition” (Coplan, 2011). Coplan explained in the following quote:

What we need in order to better understand empathy is a narrower conceptualization, not a broader one. I propose that empathy be conceptualized as a complex, imaginative process through which an observer simulates another person’s situated psychological states while maintaining clear self–other differentiation (p. 40).

Bloom (2016) and Segal, Gerdes, Lietz, Wagaman and Geiger (2017) reported the importance for a clear self-other boundary within the constructs of their definitions of empathy. Segal et al. reported on three stages of cognitive processing necessary for empathy that included first “the ability to identify with another while maintaining a clear sense of self” (p. 17); the second stage of metacognitive perspective taking that “allows one to maintain self-other while at the same time making meaning out of another person’s experiences” (p. 18); and the third stage called emotional regulation that requires “the ability to react to another’s experiences without becoming overwhelmed or swept up in another person’s emotion” (p. 19). Segal et al. acknowledged that while deconstructing empathy to include the three stages of cognitive processing, defining empathy is “a moving target” (p. 21), and “there is no instrument to measure the components required for empathy” (p. 111).

The importance of cognitive empathy and conflicting definitions of cognitive empathy have led to the question of whether empathy is something to be for, or something to be against. Bloom (2016) asserted that “cognitive empathy is overrated as a force for good...

the ability to accurately read the desires and motivations of others is a hallmark of the successful psychopath and can be used for cruelty and exploitation” (p. 3).

Ang and Goh (2010) investigated the role of affective and cognitive empathy, and gender on cyberbullying for adolescents ages 12 through 18 in Singapore, China. “Affective empathy was defined by Ang et al. as the “ability to experience and share the emotions of others and cognitive empathy the ability to understand the emotions of others” (p. 388). A three-step hierarchical multiple regression analysis with cyberbullying scores as the dependent variable was used for the students’ self-reports. Results indicated that girls and boys who had low cognitive empathy reported higher scores on cyberbullying than those who had high cognitive empathy. Boys with low affective empathy were more susceptible to cyberbully than boys with high affective empathy; however, for girls, no differences in cyberbullying between high or low levels of affective empathy were found. If boys understood their behavior was impacting the feelings of another person, they were less likely to cyberbully, yet when girls knew their behavior was impacting the feelings of another person they were just as likely to bully as girls that did not know how their cyberbullying impacted others’ feelings. Females appeared to be more adept at reading the emotions of others and in the study, being female predicted cyberbullying and not the level of affective empathy in girls. Bloom might point out the girls that cyberbullied should have had less empathy and more compassion.

It is the impact of empathy, according to Bloom, that produces the negative effect of ‘empathetic arousal’ (in self) that is especially found within asymmetric relationships with others, for example helping professionals are more vulnerable to burn out, anxiety and depression due experienced empathetic distress. Bloom argued empathy is destructive, that

having compassion for others is more productive than having empathy for others and the world would be better if there was more compassion and less empathy.

In addition to the construct of having compassion for others, the notion of having sympathy for others also has been defined relative to empathy. Martin and Fabes (2009) provided the following example “When Erin felt sad at the sight of her father’s sadness, she was displaying empathy. When Erin felt sorry for him, she was displaying sympathy. Sympathy frequently, but not always results from empathy” (p. 313). Cognitive empathy, affective empathy, cognitive processing of empathy, compassion, and sympathy are interrelated and interdependent factors in defining the construct of empathy. Difficulty in empathy assessment may be due to conflicting operationalizing of terms and empathy construct terms and variances. Morin, Eaman, and Famira (2015) illustrated several construct inconsistencies in the following quote:

When referring to ToM, terms such as mentalizing, metacognition, metarepresentation, and mindblindness tend to be used interchangeably. Self awareness is no different, with additional terminology such as self-reflection, self-consciousness, theory of own mind, etc. There are nuanced differences between these terms, and the practice of using them interchangeably may create challenges as the more a concept is relabeled, the less distinct it becomes (p. 75).

Difficulties in Assessing Empathy

Recognizing Basic Emotions

Ortony and Turner (1990) stated “a widespread assumption in theories of emotion is that there exists a small set of basic emotions... out of which all other emotions are built” (p. 315). In a study to determine basic emotions, Tracy, Robbins, and Shriver (2009) reported six basic emotions including anger, disgust, fear, happiness, sadness, and surprise (p. 554). Baron-Cohen (2011) stated there are four basic emotions that include happy, sad, angry, and

disgusted (p. 23) with four distinct areas of the brain responding to each of those four emotions. Utilizing functional magnetic resonance imaging (fMRI), Baron-Cohen (2011) reported “disgust felt as a result of a disgusting taste or seeing someone else in disgust was processed in the anterior insula (AI) and the caudal anterior cingulate cortex (cACC), also called the middle cingulate cortex (MCC), was activated when one is in pain, or observes others in pain” (p. 23), and “damage to these (brain) areas can interfere with the ability to recognize emotions” (p. 24). Correlating neurological regions of the brain however, is not proof that an individual is actually processing emotion or has conscious awareness of a given emotion. Further, Izard (2010) stated although “psychological scientists and behavioral neuroscientists affirm emotion influences thinking, decision-making, actions, social relationships, well-being, and physical and mental health, yet there is no consensus on a definition of emotion” (p. 360).

Wierzbicka (1992) asserted “basic emotions such as happiness, fear or anger, are in fact cultural artifacts of the English language” (p. 285). In their study to determine whether American culture and education impacted emotion word choice, Trauffer, Widen and Russell (2013) asked university-educated and non-university-educated Americans to label emotions of happiness, sadness, anger, fear, surprise, and disgust. Results indicated “participants with no university education were significantly more likely to identify fear as scared and more accurately identified anger and sad, with education found to be related to disgusted and angry - an effect that might help explain differences in labeling faces” (p. 237).

In addition to culture and level of education, gender typing differences were found to impact accuracy in assessing empathy. A study by Hampson, Van Anders, and Mullin (2006) reported that women were faster than men at recognizing both positive and negative

emotions from facial cues, and men were more accurate in recognizing negative emotions. Earlier results from Boyatzis, Chazan, and Ting, (1993) identified gender differences in preschool children with “girls significantly more accurate than preschool boys in identifying emotions of others and three-year-old girls level of accuracy in identifying emotions equal to five-year-old boys” (p. 375).

Dynamics of human interaction impact how accurately self perceives self, how self perceives expression of other, and how self expresses receipt of observed emotion must also be considered in the assessment of empathy. We can infer from someone’s behavior response that they have empathy, yet if an individual is incapable (through disability or inability) of demonstrating the ‘appropriate’ empathetic behavior response, it is therefore assumed they must not have empathy. Empathy assessment is complicated; how can we truly know what another person is thinking or feeling? Confounding variables of ethnicity and culture, education, gender, and age should be weighted within empathy assessment because how an individual projects and identifies emotions can be accurate for that individual only. Universality of 100% accuracy in projecting and identifying emotion has not been attained and may not be attainable.

The need for a new paradigm in how emotional perception is measured was suggested by Barrett, Mequita, and Gendron (2011)

Visual scenes, bodies, voices, other faces, cultural orientation, and even words shape how emotion is perceived in a face, calling into question the still common assumption that the emotional state of a person is written on a page and can be read from the face like words on a page (p. 286).

Theory of Mind and Empathy Awareness

Baron-Cohen, (1997) described having awareness of others’ mental states as a theory

of mind (ToM) and not having a ToM was a type of ‘mindblindness’. Difficulty with ToM was initially ascribed to individuals with Autism Spectrum Disorder (ASD), alleged to explain the “impaired ability of people with autism to attribute mental states (beliefs, knowledge) to other people due to lack of perspective taking (Baron-Cohen, 2000; Baron-Cohen, Leslie, & Frith, 1985), mindreading, mentalizing, and mind blindness” (Baron-Cohen, 1997, 2000, 2001). Difficulty in awareness of others and expression of empathy however, is not exclusive to individuals with ASD. Inability to see that another person has a different mindset or point of view could result in any individual having difficulty with feeling empathy for others.

Historical Assessment Related to ToM and Empathy

The Reading the Mind in the Eyes Test (The Eyes Test) and the Reading the Mind in the Films Test (The Mind in Films Test) are popular measures of ToM and empathy (Olderbak, Wilhelm, Olaru, Geiger, Brennehan, & Roberts, 2015, p. 1). Presupposing no language deficit, according to the Mind’s Eye Test, correct match of an emotional word to the picture reportedly demonstrates both ToM and empathy. The Eyes Test has been translated into Spanish, Italian, Greek, German, Polish, Portuguese, French, and Hungarian (The Autism Research Center, n.d.), indicative of the high level of acceptance of these paper and pencil measures of ToM and empathy for others.

Figure One is an example from The Eyes Test where a student chooses the best word to match a picture of an emotion by looking at the eyes of that other person. In the example in Figure One, a student chooses the best match of the four emotion words (cross, kind surprised, hate) to the picture based upon the student’s perception of the emotion projected

by the eyes of the other person (the correct matching word of ‘kind’ is indicated).



Figure 1: The Eyes Test
(used with permission, see Appendix A)

Although The Eyes Test can be useful in providing a relative measure of accuracy toward assessing ToM and empathy, the difficulty with binary tests of ToM and empathy is that an incorrect match response indicates a complete absence of ToM and empathy while every correct response indicates evidence of ToM and empathy. It may be problematic if an individual with an intact ToM and empathy does not get every response correct. In addition, even when response error is factored in, any correct response would indicate evidence of ToM and empathy and any incorrect response would indicate no evidence of ToM or empathy. A mix of incorrect and correct response matches would further suggest that at least some of the time an individual has some level of ToM and empathy.

The Mind in Films Test

Golan, Baron-Cohen, and Golan (2008) created the ‘Reading the Mind in Films Task’ now known as The Films Test as evidential measurement of ToM, and a “more ecologically

valid” measurement of ToM (p. 1534). Figure Two is an example of a video clip test item in which an individual watches the scene and makes a choice of the best emotional word that best describes the freeze frame. The Films Test is more representative of real life and adds ‘context’ or a reference point to guide an individual’s response; however, Golan et al. (2008) did not state why The Films Test was a more valid measure than The Eyes Test.

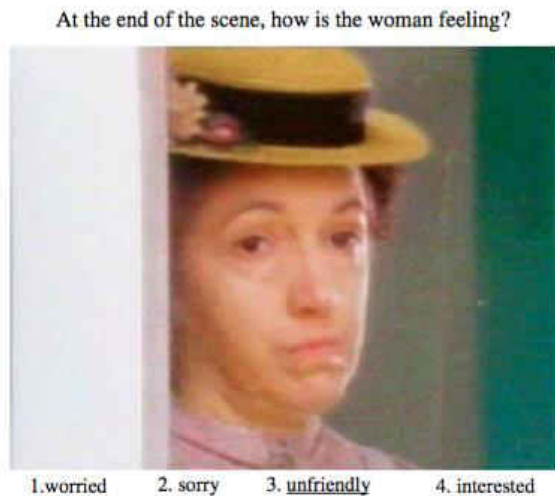


Fig. 1 An item from the child version of ‘Reading the Mind in Films’, showing only one frame out of the full clip. Screenshot taken from Anne of Green Gables - The Sequel (1987), Courtesy of <http://www.sullivanmovies.com>

Figure 2: The Films Test
(used with permission, see Appendix A)

Construct Validity Issues with The Mind’s Eye Test and The Mind in Films Test

The correct answer from the example in Figure Two is “unfriendly”. Results reported by Golan et al. (2008) indicated a total of 48% of a group with ASD labeled the emotional state correctly, compared to 83% of the control (non-Group with ASD). Restated, almost half of the group with ASD evidenced ToM and almost 20% of the non-Group with ASD evidenced no ToM. These numbers point further to the difficulty in the position of 100% universality on these measures (an individual with ToM should get all items correct and no

ToM would mean none were correct). If purpose of The Eyes Tests was/is to make a criterion decision “D” (for example a correct match is evidence of ToM, an incorrect response would indicate absence of ToM – then ALL individuals in the control/normed non-ASD group should score every item correctly because they have ToM, and all individuals with ASD would consistently score all items incorrectly (absence of ToM).

Generalizability (G) theory, first posited by Cronbach, Gleser, and Rajaratnam (1963), is a statistical theory for evaluating the dependability and reliability between observed score to true score variances to determine if facets or factors within each test item coincide to the particular construct that item is intending to measure. The observed to true score variance of each item, in turn, then determines if the overall test is a reliable and valid measure of the overall construct the test is purporting to measure (Crocker & Algina 1986, p. 158-160). The authors of The Films Test or The Eyes Test have not articulated in the literature how matching an emotion word to a picture is a valid indicator of perspective taking for any of the test item constructs, or the overall test construct. In order for each test item and the overall test to be considered valid, factors or facets within each item must first be identified and then analyzed through an exploratory factor analysis (EFA). Principal axis factoring or principle component factoring is then used to determine whether there is a consistent and high eigenvalue relationship of the items, relative to the overall test construct validity. If construct facets within an item’s eigenvalues do not correspond, the item is not a valid measurement of the construct that item purports to measure (Crocker & Algina, 1986, p. 160), and therefore, the test also is not a valid measurement of the construct it purports to measure.

A psychometric analysis completed by Olderbak et al. (2015) concluded The Eyes

Test lacked single factor solutions with low item correlation, unrelated items correlation, and negatively correlated items. Olderbak et al. stated

The EFA identified five weakly correlated factors and many items did not load on any factor. In a component factor analysis (CFA) a single factor solution did not adequately fit the data, with large residual variances remaining for a majority of the items... the test is not homogeneous. The analysis determined vocabulary level was positively and significantly correlated to increased correct response word and there was no difference between construct responses of cognitive empathy, emotional perception, emotion specific empathy, or perspective taking... the effect of the target word did not predict performance in any meaningful way (pp. 10-11).

Additional Validity Issues for ToM Tests to Assess Empathy

Despite the wide scale use of the Mind in Eyes and The Mind in Films Test instruments to measure ToM and empathy there remains concern related to the assessment purpose. If the purpose of The Eyes Test and The Mind in Films Test is to make a criterion decision “D” to assess ToM, that would indicate a correct emotion word match would be evidence of ToM, and an incorrect response would indicate absence of ToM. Similar to the 100% universality of response accuracy problem, all individuals should score every item correctly all the time and all individuals without ToM would score all items incorrectly all the time.

The aforementioned example of The Eyes Test reported forced response emotion words of kind, cross, hate, surprise. The example also highlighted the difficulty with culturally specific tests of ToM and empathy. The Eyes Test was created in the United Kingdom, where the word “cross” is typically used; however, individuals unfamiliar with United Kingdom vernacular would typically not understand the meaning of the word ‘cross’, convoluting word choice is a further issue as cross becomes a vocabulary distractor.

In an effort to explain incorrect responses of the individuals within the group with

ASD, Golan et al. (2008) stated “since the protagonist in this scene did not speak, participants who chose this distracter may have relied on what the other character said (“I’m sorry, I know you’re closed”) rather than using the context set up by this utterance and the protagonist’s facial expression” (p. 1535). The authors then used the “central coherence theory of autism” (Frith, 1989; Happé & Frith, 2006, p. 5) to explain why children with ASD were not able to answer the example correctly. Central coherence theory explains the tendency in individuals with ASD to focus on details or parts of a picture or face rendering the individual unable to integrate the parts into a coherent whole (Golan, Simon Baron-Cohen & Golan, 2008, p. 1541).

Rationale for a New Intervention to Assess ToM

The Eyes Test and The Films Test were the first tests to recognize, and attempt to quantify, ToM and therefore empathy differences in individuals with ASD. The difficulty in using these instruments to assess students with ASD lies in that neither test appears to be valid and both tests are based upon the assumption that individuals with ASD completely lack ToM and empathy. Neither test accounts for the possibility of ToM and empathy levels in individuals with or without ASD.

The Importance of Self and Self-Other Awareness

The importance of understanding self is important for all individuals but is a well-documented missing component for students with ASD. George Herbert Mead (1962) stated “the self is not initially present at birth, and is something which has to be developed; self arises through the process of social experience and activity, and as a result of the relationship

to that process as a whole and to the individuals within that process” (p. 135). Duval and Wicklund (1972) posited that self-awareness can be divided into two distinct classifications depending upon whether an individual’s attention and state of consciousness is directed internally or externally. Cooley, in 1902 first theorized the “looking glass self” culminates in development of self. Cooley posited three elements: the imagination of our appearance to another person; the imagination of their judgment of that appearance; resulting in a feeling of pride, or mortification in the self (Cooley 1964, p. 184). Essentially, the social psychological construct of the looking glass self, posits the development of self is predicated on that self’s awareness of how others’ judge the self. One’s self must first be developed through that self’s individual process of being able to focus his/her attention both internally and externally, and both subjectively and objectively (Duff & Flattery, 2014). Theory of mind is comprised of self-other processes and according to Baron-Cohen (1997) individuals with ASD lack a ToM have a mindblindness that prevents them from seeing another person’s point of view or another person’s emotions.

How Development of Self Relates to Developing a Theory of Mind

Theoretical framework of social learning began with social learning theory, proposed by Albert Bandura. Bandura (1977) stated perceptions of one’s self impacts and drives one’s behavior, and individuals must become aware of their ‘self’, prior to self-reflecting and self-regulating behavior. Bandura asserted cognitive processing was contingent to behavior response and others’ behavior was learning via ‘social learning’, thus it was through observation of others and subsequent modeling and imitating behavior, that behavior was learned and demonstrated. It should be noted however, if an individual has ToM difficulties,

that individual might be unaware of how their own self perceives the behavior of another and would consequently be a disadvantaged self in ‘socially’ learning from others.

Children need opportunities to develop and examine their theory of self, relative to their theory of other, and that can only be realized through self’s awareness of self and self’s awareness of other. Young children's development of ToM can be viewed as a direct consequence and may be proportionate to their awareness and development of their own self and their own ‘other’ awareness efficacy and competencies. One must first possess awareness within their own self, prior to attributing a mental or emotional state to another. Theory of Mind therefore necessitates conscious awareness of one’s (self) own viewpoint while simultaneously holding awareness of another’s (other) viewpoint. In addition, one must possess an internalized ability to judge if/how another’s viewpoint or emotions/feelings is different or similar to his or her own viewpoint.

The Importance of the Mirror

Mirrors have been studied by cognitive psychology in order to understand self-recognition, self-identity, and self-consciousness” (Gallup 1970, Spiker & Ricks 1984; Rochat, 2003, Duff & Flattery, 2014). Carl Jung considered a mirror as the quintessential tool to obtain knowledge of self. Jung realized the mirror must be looked into in order to destroy error and illusion, allowing one to arrive at a true understanding and knowledge of self (Jung, 1944). Joseph (1997) also recognized the power of the mirror on the self, evidenced in the following quote:

The psychical image of the mirror is an image of the core nature of psyche... more than merely a metaphor for psyche...the mirror is not just one way among many other equally good ways of representing psyche; it is the primary symbol of psyche, and in

Jung's precise sense, namely a best possible representation of an otherwise unknown (and unknowable) reality (p. 140).

The capacity for the mirror as indicator of true self was also demonstrated by Caputo (2014) when he reported "mirrors are virtually perfect imitators of the observer's own bodily face, since mirror feedback is instantaneous in time...the reflected mirror image of facial emotions and expressions is completely coherent in space with respect to the original visual stimulus of perceptual and spatial characteristic" (p. 2-3). Further description of the greater impact of the reflected 'self' as compared to a digital self, and rationale for a mirror intervention was exemplified in the following additional quote from Caputo (2014):

The subject becomes a spectator when it recognizes its mirrored image: seeing itself in the mirror is seeing itself as others see it. Therefore, mirror self-recognition exemplifies a troubled form of self-knowledge, since the mirror facilitates the subject's alienation into its double. The decisive and unsettling impact of mirror self-recognition is the realization that the subject exists in an inter-subjective space. This finding strongly distinguishes mirror self-recognition from self-identification in photos. The uncanny character of the mirrored image is due to intermingling of self and other representations within the subject - a process that is completely absent when identifying photos (p. 30).

Digital Stimuli and ToM Awareness

Digitally produced stimuli presented as virtual reality remain digitally produced reality and as such are not in true sense, true virtual reality. Experiential difference in the impact of digitally produced reality, compared to true virtual reality, could explain why it may be difficult for an individual to transfer a given social behavior demonstrated with ease in a digital world gaming or software learning condition environment - to a very real, true-virtual world. Further, as the construct specificity of exercise mandates an individual train under the conditions of competition, a true-virtual reality presented via a mirror intervention

may increase likelihood of identification of self's and others' emotions, and transference to more similar real world opportunity. An individual's real life face may be more easily discerned than a sketch or a picture of another person projecting an emotion.

A digitally produced virtual reality experience may also account for possible cognitive dissonance as some people reported feel sick from digitally produced virtual reality experiences. LaViola, Jr. (2000) states that symptoms some "users report are similar to the common symptoms found when people get motion sick except users who exhibit these type of virtual motion sickness-like symptoms suffer from a malady called cybersickness" (p. 47).

Williams, Gray, and Tonge (2012) examined the effect of the popular 'Transporters' digital video program on emotion recognition as individuals with autism match faces to emotion words. Contrary to findings by Golan, Ashwin, Granader, McClintock, Day, Legget, and Baron-Cohen (2010) and Young and Posselt (2012) who reported that children with autism improved their performance across identifying emotions, the Williams et al. (2012) replication study reported results of increase in the word 'anger' only and the increases were not sustained.

Lastly, digitally produced stimuli are limited by an inherent external locus of control. Traditional assessments and assessments of ToM expect an internalized response without recognition that an internalized process between self and other must occur from within one's self. The mirror intervention has an internal locus of control and differs because the perceived reality is internally driven from the self, with the individual literally reflecting internally on his or her own (self's) emotional state, prior to making judgment of their emotion projection. Alternatively, the individual on the receiving end of the emotion word expressed has opportunity to hold their own viewpoint in place, while considering another's

emotion or perspective, essentially developing and evidencing the process of ToM and empathy.

The company Memorex used a popular catch phrase to illustrate the closeness of video to real life in 1971. In a commercial, Ella Fitzgerald was recorded singing a note that shattered a wine glass. The recorded tape was then played back so the viewer saw the wine glass shattering again. Could the viewer tell whether the performance was a live performance or a recording? Memorex queried “Is it live or is it Memorex?” (Ukclassictelly, 2012).

Research has discerned there is a difference between engaging in live experiences compared to watching a recorded “live” experience. A study by Suddendorf, Simcock, and Nielsen (2007) investigated if children would attend to a mark that was placed on their leg (variation of the classic rouge test by Gallup, 1970). Suddendorf et al. substantiated an increased awareness of the mark in the reflected mirror image than video image with “an increased awareness of 24-month-olds mirror self-recognition at a rate of 90% (18/20), contrasted to 35% (7/20) of 24-month-olds for the live-video version of the task” (p. 192). The mirror can be a more powerful and ‘live’ real world teaching tool to help students to develop awareness of emotions within their own selves and recognize emotions in others.

Anderson and Pempek (2005) found that children in their second year of life learned less from television video than from real life contexts, subsequently terming the discrepancy between live and recorded results a “video deficit” (p. 511). Results reported by Anderson et al. indicate virtual reality or real life experiences and images can be more conducive to learning, suggesting the appropriateness of a virtual mirror intervention to measure and increase ToM and empathy.

The importance of recognizing self and other is evidenced in the practice of digital video modeling (VM). Similar to emotion flash card interventions, VM also presupposes intact awareness of self (for example, look at you washing your hands) and of other (look at him washing his hands), yet individuals with ASD struggle with awareness and perceptions of self and of other (Duff & Flattery, 2014). Physical photographic replicas, or digital representations of another individual engaged in an action or expressing an emotion are past tense and may be a less effective assessment or teaching methodology compared to a real time, virtual, mirror observation.

The Two-Way Mirror as a Social Intervention

Figure Three demonstrates how a two-way mirror works. Using a two-way mirror in the present study allowed the student sending the expression to see his/her reflected expression but not the student on the darker side of the panel display, while the student on the darker side was able to see the sender's expression.

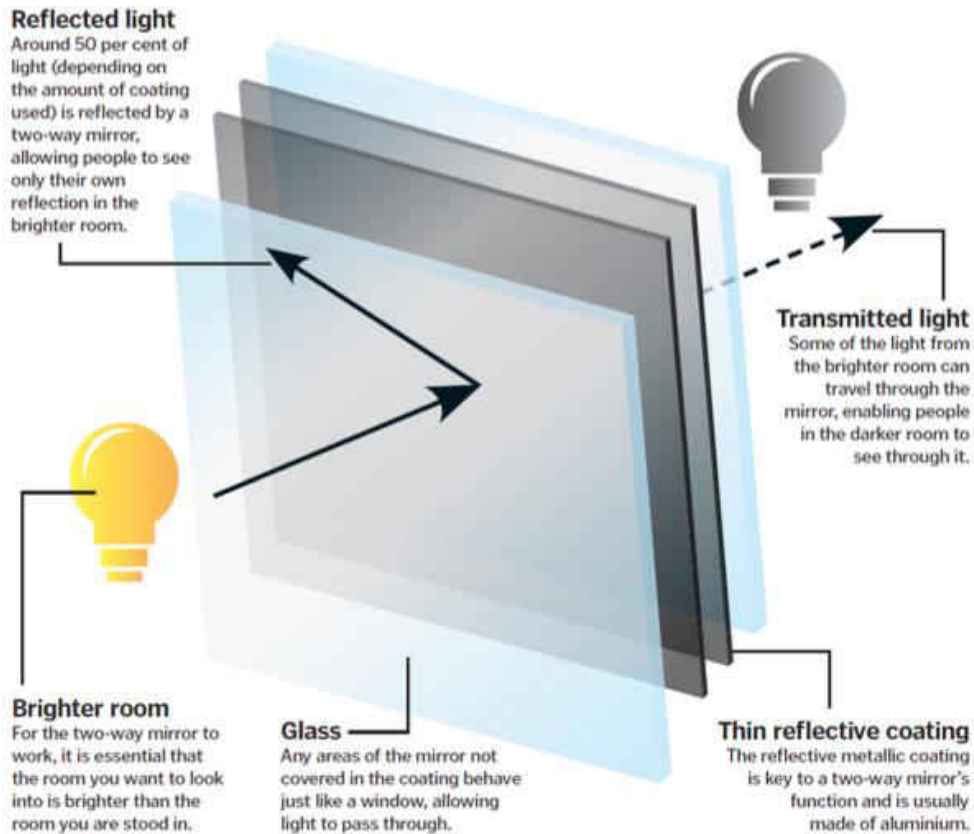


Figure 3 How a Two-Way Mirror Works
How it Works, 2015, p. 36.

Statement of the Problem

Traditional social skill and SEL social skill programs have attempted to remediate and increase ToM though they have not implicitly recognized or addressed how individuals acquire or increase ToM. Theory of Mind and empathy tests and interventions are traditionally physical sense (matching words to eyes or flash cards) or digital sense (software program emotion graphics) mediums used to help students make judgments of how others are thinking and feeling.

Lastly, traditional classroom interventions to increase awareness of self and other (essentially ToM and empathy) need to evolve from the presupposition that if a student does not have ToM or an awareness of other's feelings as evidenced by an incorrect matching of emotion flashcards, then the student must be shown emotion flashcards as an intervention. Only when responses are correct will the student have evidenced ToM and empathy. Arguably, a successful match of emotion word to emotion flashcard or picture intervention could be the result of a conditioned stimulus-response or simply a student's correct memorization of what the "happy" picture flash cards looks like. In this circumstance, a correct match may not be the most valid evidence of awareness of a construct such as what "happy" looks like in others.

Significance of the Study

Use of a test such as The Eyes Test or emotion flashcard interventions do not take into account the interdependent process of how an individual self perceives an 'other'. If increasing ToM and empathy is the goal, and ToM and empathy are predicated on self's awareness of self and self's awareness of other, it is reasonable to begin by first assessing whether an individual has difficulty with self and/or other awareness of emotions. Not unlike any academic intervention, a social skill intervention to increase ToM and empathy for others must be data driven.

Traditional social skill and social emotional learning (SEL) programs have attempted to remediate and increase ToM and empathy but have not implicitly recognized or addressed how individuals actually acquire or increase ToM for others. Assessing emotion in others is complicated. One must first possess awareness of their own construct of what an emotion

like fear looks like before they can ascertain what ‘fearful’ might look like in another person’s projection. Only after identifying one’s own emotion or viewpoint, can one cognitively judge if/how another person’s emotion expression (or viewpoint) is different from or similar to theirs. The old axiom goes, ‘if it isn’t caught, it must be taught’. Educators should provide opportunities for students to experience and increase their awareness of self and of others in order to facilitate development or increases in empathy for others.

The mirror intervention will provide students with a real-time truly virtual environment, juxtaposed to the traditional physical flashcard or digitally-produced emotion faces computer stimuli. The mirror intervention also provides the opportunity for students to process their judgement of their self-projecting emotion, in addition to opportunity to assess and judge another individual’s real-time projected emotion. A real life, real time emotion assessment may be a more effective approach to increasing ToM and emotion recognition of another’s emotions than current digital or physical flashcard interventions.

Binary Tests of Theory of Mind and Empathy

The example of The Eyes Test is indicative of the traditional ‘all or nothing’ ToM and empathy. Recalled from Figure One, the word choice of ‘kind’ was correct and evidential of ToM and empathy. Conversely, any response other than ‘kind’ would be evidence of no ToM and no empathy for others. Traditional match-match assessments and interventions are an either/or proposition with one choice and one correct answer. As such, any progress a student makes toward increasing their awareness and increasing their accuracy in recognizing and identifying another’s emotion expression is not taken into account. The

present study asked students to choose their first, second, and third responses to each emotion word, and if the student did not see the word from the list of eight words from the Emotion Word Assessment (EWA) list, the student had opportunity to provide a word they felt best represented the observed emotion expression. The study also provided a mechanism by which a student projecting a given emotion could literally ‘reflect’ on the accuracy of his/her reflected mirror image. The two-way mirror was set up to ensure the student projecting the emotion could not see the individual on the other (receiving) side of the mirror, yet still see their own reflected image as they would in a usual mirror reflected image.

Mixed Methods Study Design

The study reported quantitative results of students’ correct identification of the emotions of others through the EWA instrument for both mirror intervention and the pre and post CAFE photo set. Student choices were assigned three points for a correct first choice, two points for a correct second choice, and one point for a correct third choice response for the pre and post CAFE response set. Student accuracy in expressing emotion was measured by the SPAFF coding with student’s expression of seven emotions per session, and were judged as correct or incorrect by the R and RA based upon with SPAFF coding system, included in Figure Four. The arrows in the figure below highlight examples of the major action units (AUs) involved in expressing emotion. The upper face is AU’s1-9, and lower face is 10-20. Physical cues (body movements) are indicated for AU23-27. The facial action units detailed in the following lists may occur singly or in combination (Coan & Gottman 2007, p. 272-276). Additional student comments, students’ free response emotion words,

and behavior observations were recorded by the R and RA and were qualitatively reported through a case study narrative.

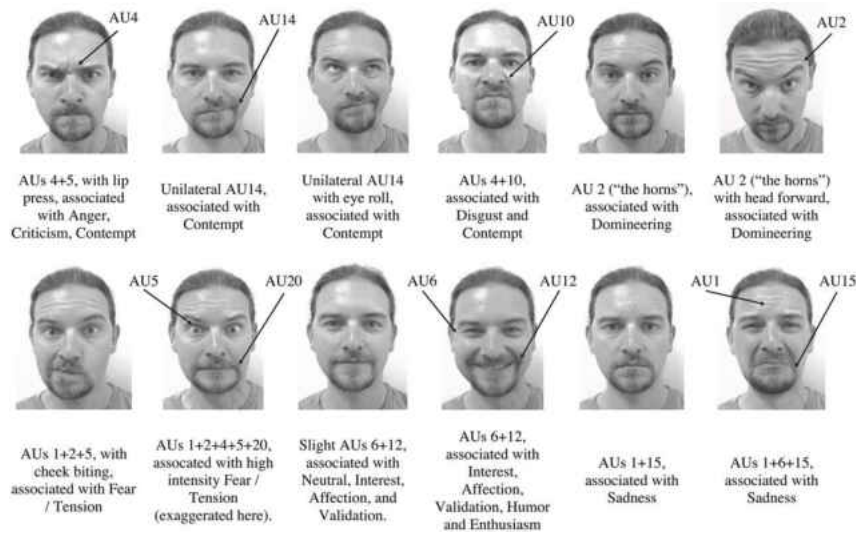


Figure 4 The Specific Affect Coding System (SPAFF (used with permission, see Appendix H)

The purpose of the study was to determine how the self-awareness process involved in expressing emotions, and awareness of others process in identifying emotions was impacted through students expressing emotions and identifying emotions of others through utilization of a two-way mirror. The study identified difficulties with current binary assessment measures of empathy that have not accounted for or addressed the basic processes of self and other awareness, specifically involved in ToM. In addition to providing a mirror-based methodology that isolated, yet considered, the interdependence of self and other awareness involved in identifying the emotions of others, the study also provided a non-binary assessment measure as students were given opportunity to report their first, second, and third choice of what they thought the expressed emotion was. Increases in first choice, second choice and third choice accuracy in identifying the emotions of others is reported along with concomitant increases in accuracy of self expression of emotions.

Chapter One Summary

Chapter One highlighted the history and difficulty in the assessment of ToM and empathy for others, and school SEL interventions to address ToM and empathy for others. This chapter discussed problems inherent in current binary assessment and teaching practices of matching emotion words and proposed a new intervention and assessment methodology (the EWA and SPAFF coding) for determining accuracy in identifying emotion in one's own emotion projection, and evaluation of that same projection by others. Providing students with three choices of what emotion feeling word they think is being expressed is an alternative to historical binary assessments of ToM and empathy and may provide information about stages or accuracy development in the process of identifying the emotions of others.

Other limitations are computer and digitally produced SEL activities, in addition to the problem of accurate assessment of whether a correct identification of another person's emotion via flashcard has been internalized. Rationale for a 'real world', in real time mirror based intervention to assess and facilitate increase in one's awareness of self and other as feelings are projected and reflected was presented. Lastly, this chapter outlined the research questions and research design, sampling, and study limitations.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents a literature review beginning with the construct and importance of ToM, and empathy. The literature interchangeably uses ToM and empathy; however, there is a subtle difference, if empathy is a result of ToM. This difference is discussed, along with the two types of empathy. The development of ToM, empathy, and recognizing emotions in others is presented as first related to social cognition and social learning theory, and then through pictorial representations of emotions. The importance of providing social skill programs and early intervention is highlighted. A case is made for a mirror intervention that may increase emotion recognition as evidenced by the accuracy of feelings projected and identified by the Emotion Word Assessment (EWA), the Child Behavior Checklist (CBCL) and Teacher Report Form for eight first grade from inclusive classrooms, participating in the SH empathy curriculum.

Empathy

Empathy is a multidimensional construct consisting of cognitive (inferring mental states) and emotional (empathic concern) components (Dziobez, et al., 2008, p. 464). Schulte-Ruther, et al. (2007) stated, “empathy allows emotional psychological inference about another person’s mental states and feelings in social contexts” (p.1354). Social psychologists have conceptualized empathy as having two main strands of cognitive empathy: the intellectual/imaginative apprehension of another’s mental state and emotional empathy, an emotional response to the emotional responses of others.

Emotional empathy has also been labeled ‘affective’ empathy. Emotional responses to others’ mental states were classified as follows: (1) parallel – the response matches that of

the target, for instance, feeling fear at another's fright, or (2) reactive – involving going beyond a simple matching of affect – such as a demonstration of sympathy or compassion (Davis, 1994). The reactive response occurs when someone has a self-orientated (internalized) state of “personal distress in response to another individual's distress” (Lawrence, Shaw, Baker, D., Baron-Cohen, & David, 2004).

Davis (1983) reported individuals who most took the perspective of others reported less social dysfunction and higher interpersonal functioning and social competence (p. 120). In addition to impacting feelings of social competence, empathy has been correlated to prosocial behavior toward others. However, Eisenberg and Miller (1987) cautioned that varying definitions of empathy can impact the association between empathy and “some forms of prosocial behavior” (p. 115).

Cognitive empathy was described by Walter (2012) as “an affective theory of mind (ToM), with abilities to mentalize the emotions of others, and affective empathy was described as ability to share emotions with others” (p. 9-10). Freeman (1984) found a significant positive correlation between cognitive and affective empathy in preschoolers with more preschoolers able to demonstrate cognitive, rather than affective empathy for others (p. 235). The affinity to exhibit more cognitive than affective empathy in the Freeman study may in part be explained by early preschoolers' egocentrism of the self, although it should be noted many adults are egocentric and may also have more cognitive than affective empathy.

Cognitive and Affective Empathy Responses Are Subjective

It is commonly held that interpersonal communication is cultural, selective and situationally dependent. As such, it may not be a problem for an individual to prefer a cognitive rather than an affective empathetic response. One may have cognitive and affective empathy awareness of a particular response in a given social situation or a given social norm, but may simply choose not to engage in that behavior response, without causing any harm to self, property or another person. For example, if there is a building on fire and an individual prefers to call 911 rather than entering, does that make the individual void of empathy? Most would say, “No,” as logically what good would come of two people getting burned? Cognitive empathy over affective empathy becomes problematic only if that individual wanted to help but “did not know how” to help (ex. how to call 911, had no awareness of the danger of fire).

Neurodiversity

Opposition to medically defined disorders and socially constructed and sanctioned barriers to inclusion drove the social movement called neurodiversity. Although the notion of accepting diversity is logically applicable and should be extended to each individual with any disability, the position of neurodiversity holds that verbal, high functioning individuals (previously known in the DSM-IV as individuals with Asperger syndrome) have a brain difference that should be viewed as a “variation in functioning rather than a disorder to be cured” (Siberman, 2015, p. 16). Neurodiversity now accepts all neurological differences regardless of the level of functioning, with the notion neurological differences do not need medical treatment or a cure. Accordingly, neurodiversity posits individuals with ASD should

be treated similarly to individuals (for ex. Deaf culture/community) and viewed as a socially distinct, and supportive community, analogous to a “Neurotribe” (Siberman, 2015, p. 17).

It should be noted that having a low personal distress on a given empathy scale may not be problematic and could be advantageous in some social situations or careers. For example, it would be dangerous if a surgeon began to feel a patient’s (or patient’s family member’s) distress when operating. Given the choice between emotional affective hand holding empathy or the cognitive emotional detachment described by Davis (1994) and the low personal distress rating described by Lawrence et al. (2004), may prefer the ‘bad bed side manner’ that brings precision surgery, despite appearance of a lack of empathy.

The Interdependence of Theory of Mind and Empathy

Theory of Mind is considered to be conceptually similar to empathy because both constructs (ToM and empathy) involve inferring the mental state of another person (Lawrence et al., 2004). Accordingly, if individuals lack ToM, they must also lack empathy. Völlm, Taylor, Richardson, Corcoran, Stirling, McKie, and Elliott (2006) illuminated a difference between empathy and ToM when they purported “ToM is the ability to attribute mental states to others, and empathy is the ability to infer emotional experiences” (p. 90). Although an individual can accurately understand how another person may be feeling, some emotional responses are not considered to be empathetic, i.e. happiness at another’s misfortune or, less obviously, ‘personal distress’ (Davis, 1980; Eisenberg et al., 1987). Arguably, an individual might possess a cognitive understanding of what another person was feeling, but be unable to demonstrate what might be considered an empathetic response. Inability of an individual to appropriately express or demonstrate that they understand what

another person is feeling would not negate accurate assessment of what another person was feeling, although empathy has been defined as the awareness of what others are feeling and the ability to demonstrate the appropriate emotion response (Walter, 2012; Dziobez et al., 2007; Baron-Cohen, 2011).

The Development of Theory of Mind

Piaget (1962) asserted social cognition proceeds in a series of hierarchical stages that included the following: sensorimotor period before the development of language from birth until age two; the preoperational period, from age two to seven years; the stage of concrete operations from seven years to 12 years and the stage of formal or propositional operations after 12 years (Piaget 1962, 1965). According to Piaget (1962), a child progresses through each stage and each stage must be achieved prior to advancing to the following stage. A child's egocentrism prevents him/her from seeing someone could have another point of view until the concrete operational stage of seven to 12 years (p. 120). Essentially, Piaget asserted children are not capable of developing empathy and possessing ToM until at least age seven.

Not all theorists however, agree that children are completely egocentric and unable to feel what others are feeling. Case (1974, 1993) argued Piaget's stages did not take into account social cognition or an individual's interaction with their environment placing them in and out of stages at one time. Case (1993) stated that unlike the Piagetian whole construct stage model, the construct of a central conceptual structure results from the child's active reworking of an experience (not the experience itself) under a given individual's constraints imposed by level of development and existing specific structures" (p. 230). Case and others that followed attempted to fill the gap in Piaget's theory of child development, becoming

known as neo-Piagetian theorists, they reasoned, “Piaget’s whole stages model did not account for individual levels of social and cognitive development, cultural influences, theory, or linguistics” (Case, Okamoto, & Griffin, 1996, p. 4). Case et al. (1996) reported that children at four years of age possess an inner slate or a theory of mind schema that permits them to infer the thoughts or feelings of others (p. 10).

Other researchers have reported ToM develops by three and four years old. A study by Harris, Johnson, Hutton, Andrews, and Cooke (1989) of 20 three year olds and 20 five year olds, reported both three and five-year-old groups were able to predict a character’s emotion based upon whether that character opened a container that held a pre desired item, or a different item. Harris et al. concluded, “preschool children deploy a theory-like conception of mind in predicting emotional reactions ...understanding that people will engage in actions that move them closer to a realization of those desires, and that they will react positively or negatively depending on whether they succeed in doing so” (p. 397). Borke (1971) reported “children as young as three years of age showed an awareness of other people's feelings and could identify the specific situations that evoke different kinds of affective responses... suggesting very young children are not totally egocentric but have some capacity for empathetic response toward another person's perspective and point of view” (p. 263).

Intact awareness of others and evidence of ToM was reported by Wimmer and Permer (1983) as they stated “around the ages of four to six years the ability to represent the relationship between two or more persons’ epistemic states emerges, and becomes firmly established within these two years” (p. 126). In a study to investigate cognitive intentionality of seven two-year-old children, Wellman and Woolley (1990) found that two-year-old children discerned that “if story character Sam lost his bunny and found a dog, Sam would be

unhappy and if story character Johnny desired to find a dog and found a dog, Johnny would be happy” (p. 257).

Awareness of others may develop much younger than two years old. Researchers DeCasper and Fifer (1980) found evidence of awareness of others in newborns under age of three days and younger, when they found newborns preferred their own mother’s voice to another female’s voice. They concluded “infants younger than three days not only can discriminate its mother’s voice but will also work to produce her voice in preference to the voice of another female” (p. 1175). Accordingly, even very young children could benefit from social skill interventions designed to develop, if not increase ToM and empathy.

School Social Skills Programs to Teach Empathy and Theory of Mind

“Virtually every aspect of early human development, from the brain's evolving circuitry to the child's capacity for empathy, is affected by the environments and experiences that are encountered” (Phillips & Shonkoff, 2001, p. 6). The necessary experiences to help students develop and expand their capacities for empathy could be provided by schools. Walker et al. (1994) stated “social skills allow individuals to develop positive relationships with others; cope successfully with the behavioral demands of specific settings; and communicate desires, needs, and preferences effectively... and provide foundation for competent performance in a range of academic, personal, vocational, and community contexts” (p.70). Jones and Bouffard (2012) asserted “children need to not only learn academic subjects in school but also develop their ability to get along, regulate their emotions, and successfully manage social dilemmas in order to be successful in life” (p. 2).

Although recognized as important, few-school based social skill programs have been assessed for rigor or consistency and are usually deficit driven (Ladd & Mize, 1983, p. 61). Dulak, Weissberg, Dymnicki, Taylor, and Schellinger (2011) looked at 213 studies of 270,034 students, limited to the following: “published prior to 2007, for students from five years to 18 years of age without any identified adjustment or learning problems, included a control group, reported sufficient information so that effect sizes could be calculated, follow-up data were collected, at least six months following the end of intervention” (p. 409). Although studies in the Dulak et al. analysis did not report effect sizes, focus on prevention oriented programs (did not look at students with problematic social behaviors), and relied on student self-report, the analysis still correlated increases in social emotional learning skills with increases in social adjustment and academic performance on standardized tests.

In a study of 97 four to eight-year-old children with early-onset conduct problems, Webster-Stratton and Taylor (2001) randomly assigned families of the children to one of four conditions that included a parent training treatment group (PT), a child training group (CT), a combined PT and CT group, or a wait list control group (CON). Webster-Stratton et al. found children in the CT and PT/CT groups showed “significant improvement in problem solving, conflict management (as measured by observations of their interactions with a friend), and child conduct problems had decreased” (p. 165) and the CT group maintained improvement when reassessed after one year.

A school based quasi-experimental empathy training intervention for 57 first and fourth grade students by Sherman (2008) measured student self-reported empathy, teacher-reported social skills, teacher-reported problem behaviors, and fourth-graders' self-reported social skills. Although findings did not indicate any significant difference for pre-post

effects on quantitative measures of empathy, social skills or problem behaviors, when first grade students receiving the empathy training were compared to the first grade group not receiving empathy training, teacher reported social skills were maintained and social skills of the first grade students not receiving the empathy intervention declined.

The Importance of Early Intervention

The construct of early intervention has been referred to as a “broad array of activities designed to enhance a young child's development” (Ramey & Ramey 1998, p.110).

Research pertaining to social and emotional interventions in the early childhood years has indicated a positive impact on maladaptive social behavior. Vaughn, Kim, Sloan, Hughes, Elbaum, and Sridhar (2003) looked at the effect of social skill interventions in 23 group designs from 1975 through 1999 on three to five-year-old children with disabilities and concluded “positive outcomes were associated with a range of interventions that included modeling, play-related activities, rehearsal/practice, and/or prompting” (p. 2). In a 2006 meta-analysis, Hemmeter et al. (2006) reported the positive outcomes of early childhood interventions included decreased aggression and noncompliance, improved peer relationships, increased academic success, and increased self-control, self-monitoring, and self-correction (p. 583).

Campbell, Shaw and Gilliom (2000) identified specific externalized toddler behavior problems from the literature and then correlated those behavior variables to 279 low-income mothers and their infants recruited from the Women, Infants, and Children (WIC) Nutritional Supplement Program of Allegheny County, PA. Children were seen at age one to one and one half years, age two and age six (with 10% attrition). Mothers completed questionnaires

on child and maternal functioning and family circumstances at each visit, and at age six, 189 teachers completed questionnaires on the child's behavior. Results from the study indicated boys with externalized risk factor behaviors such as high levels of early hyperactivity and aggression, along with high levels of negative parenting and family socio-demographic and neighborhood stress were most likely to evidence continuing problems at school entry (p. 2). "The capacity to develop positive social relationships, to concentrate and persist on challenging tasks, to effectively communicate emotions, and to problem solve are just a few of the competencies young children need to be successful as they transition to school" (Hemmeter et al., 2006, p. 583).

Furlong, McGilloy, Bywater, Hutchings, Smith, and Donnelly (2013) reviewed numerous studies pertaining to the importance of early intervention. Furlong et al. determined behavioral and cognitive-behavioral group-based parenting programs that focused on teaching positive parenting strategies such as praise, modeling replacement behaviors, planned ignore, limit setting and negative reinforcement. Parent behaviors were more effective and led to extinction of negative behaviors more often than those in control groups with the conditions of a waiting list, treatment as usual, or no treatment (p. 4-5).

Although parenting behavior may be a contingent factor toward precipitating their child's resilience to overcome (the child's) behavioral difficulties, the idiom 'terrible twos' reminds parents that toddler behavior is normal for toddlers, and that toddlers will simply transcend their challenging behaviors to become socially adjusted individuals. Growing up and growing out of toddler behavior is something toddlers will do and without lasting difficulty. A longitudinal study completed by Campbell (1995) revealed, "externalized symptoms in early childhood such as marked noncompliance, aggression toward peers, high

activity level, and poor regulation of impulses are considered typical behaviors of toddlerhood and the preschool period, [and] had few long-term implications for later adjustment” (p. 113). Although parenting behavior could be considered as a limitation in the present study, parents may notice their child becoming more empathetic and as a result, modify their parenting behavior to be more supportive and positively reinforcing to their child.

Identifying Emotions through Photographs

Longmore, Liu, and Young (2008) reported the importance for research studies examining face learning to include more than one image of each face (emotion) to be learned because “in daily life, faces are usually learned from multiple encounters” (p. 20). Longmore et al. conducted six experiments on face learning and determined face recognition accuracy was always “highest for the image studied and performance fell across transformations between study and test images” concluding “the relative roles of pictorial and structural codes in mediating learning faces from photographs need to be reconsidered.” Longmore et al. stated “most experimental designs to assess accuracy do not distinguish between picture recognition and face recognition. Whilst picture recognition only requires the recognition of a previously seen picture, true face recognition would imply that the face could be recognized from a different image” (p. 25).

Ryan and Charragain (2010) accepted the common descriptor of individuals with autism avoiding eye contact and focusing on the mouth, but acknowledged that increasing repeated flashcard interventions even if a whole face is pictured might not be sufficient to teach the skill of identifying emotions or ToM (p. 1509). Castelli (2005) investigated facial

expression of anger, fear, disgust, happiness, sadness, and surprise in 20 typically developing children and 20 children with autism finding “children with autism were as able as controls to recognize all six emotions with different intensity levels, and made the same type of errors” (p. 428).

In his query of whether recognition of facial expressions is universally understood, Russell (1995) concluded there is a minimal universality (that people everywhere can infer the same something from other’s facial behavior). However, Russell cautioned in the following quote

Because anger, sadness, and other semantic categories for emotion are not pancultural (western culture assumes smile for happiness, crying face for grief, wide-open mouth and eyes for surprise, frown for anger; and wrinkled nose or tongue protrusion for disgust), emotions can occur without facial expressions, and facial expressions can occur without emotions (p. 379).

Russell (1995) suggested there is an unrealistic continuum of 100% universality in all people recognizing all facial emotions at all times, and 0% universality of no one recognizing any facial emotion at any time (p. 382), yet the current practice of determining whether individuals can identify emotions in others or possess a ToM (through The Eyes Test or flashcard emotion identification tests) essentially demands 100% universality. The problem in the assumption of complete universality was addressed in the present study because students were able to choose their top three emotion word choices that best represented what they thought the other person was feeling, in addition to the opportunity of offering another word of their own for each of the seven emotions.

The EWA addressed legitimate concern noted by Ekman (2016) in that “those who study emotion using a qualitative approach may hold very different views about the nature of emotion than what was found for those using a quantitative approach” (p. 33). Many

scientists and researchers operationalize ‘emotion’ by quantification via a correct (although arguably arbitrary or decided by others) word response set which is more easily computed than an open ended response set for an individual to identify the emotion of another. This kind of data arguably may be skewed and may not be a realistic response. The process of identifying emotion becomes further convoluted when a sender projects an incongruent facial expression with what they are truly feeling. For example, a person may present a deceptive ‘lie’ smile, or a receiver’s perception may be clouded as they attend to conflicting focal points of an even slightly furrowed brow (due to aging process), while simultaneously observing that the smile is turned up.

The premise that emotions can easily and accurately be read is misleading. Barrett et al. (2011) stated “visual scenes, voices, bodies, other faces, cultural orientation, and even words shape how emotion is perceived in the face, calling into question the still common assumption that the emotional state of a person is written on and can be read from a face like words on a page” (p. 286). Accuracy of emotions is further complicated by forced choice response. In an experiment to determine emotion recognition, investigation by Gendron, Lindquist, Barsalou, and Barrett (2012) used a process of providing and removing emotion words to determine whether words available contributed to increased accuracy when photos were morphed to be ambiguous, compared to when no words were available to choose from. Sixty college students (33 women and 27 men) were shown facial portrayals from 12 identities (seven females, five males) of the emotions fear, anger, sadness, disgust, and neutral facial actions from the Friesen and Ekman, (1976) black and white adult photograph set. The study also used an earlier adult and adolescent color photograph set by Tottenham, Borscheid, Ellertsen, Marcus, and Nelson (2002), and the NimStim set of Facial Expressions

(Tottenham, Tanaka, Leon, McCarry, Nurse, Hare... and Nelson (2009). The Gendron et al. (2012) study revealed “perceptual priming of emotional faces (e.g., a scowling face) was disrupted when the accessibility of a relevant emotion word (e.g., anger) was temporarily reduced, demonstrating that the exact same face was encoded differently when a word was accessible versus when it was not” (p. 314). A study by Grossman, Klin, Carter, and Volkmar (2000) also used a semantic or receptive measure toward identifying emotions where children and adolescents with Asperger syndrome were shown each of five emotion faces on a computer screen and then indicated their choice of the emotion word provided via touch pad. When given mismatched emotion choice words, individuals with Asperger’s “performed significantly worse than the control group at recognizing emotions when faces were paired with mismatching words” (p. 369).

History of Flashcard Assessment and Intervention to Teach and Assess ToM and Empathy

The first facial emotion recognition test was developed by Friesen and Ekman (1976) who created a collection of 110 black and white photographs of adult models displaying six basic facial expressions that included happiness, sadness, anger, fear, surprise, and disgust, and then based upon those accepted basic emotion words, operationalized the correctness of expressed emotions (Ekman & Friesen, 1978) in the Facial Coding System (FCS). Based upon the Ekman et al. photographs, The NimStim Set of Facial Expressions (Tottenham et al., 2009) attempted to operationalize universal attributes of emotions by applying the Specific Affect Coding System (SPAFF) first developed by Ekman et al. and then Gottman and Krokoff (1989) in an effort to identify affective behavior within the context of marital conflict. The SPAFF is now used in coding interactions (head placement, eye wide open to

indicate surprise, furrowed brow) among children and their parents, and children and peers; (Coan et al., 2007). The NimStim evolved from Friesen et al. photos, yet were viewed as more contemporary because models in the NimStim were not adults (NimStim included youth models ages 10 years through 17 years) and the NimStim photographs were in color, unlike the Friesen black and white photographs.

The Child Affective Facial Expression (CAFE) Photograph Set

The Child Affective Facial Expression (CAFE) by LoBue and Thrasher (2015) followed the NimStim and similarly, used SPAFF codes and color photographs. The CAFE models differed from NimStim in that CAFE set children were aged from two through eight years, compared to NimStim photo models were 10 years through 17 years. The CAFE set, illustrated in Figure Five, was most appropriately used for baseline and posts intervention purposes as the photograph models' ages were most aligned to the ages and sample characteristics of the present mirror awareness study participants.



Figure 5 The CAFE Set
(used with permission, see Appendix B)

Emotion Recognition Flashcards and Best Practices in School Settings

Figure Six is an example of commonly used practices to teach students how to recognize emotions in themselves. In ‘match-match’ interventions, children match emotional words to the correct picture of that word’s emotional face. Similar to The Eyes Test, a child capable of successfully matching the correct emotion word to the correct emotion picture is evidenced to have awareness of his/her own emotions and the emotions of others (ToM). “How are you feeling today?” is featured on the left and the popular Boardmaker program, commonly used in classrooms and homes of students with communication and processing difficulties is on the right.

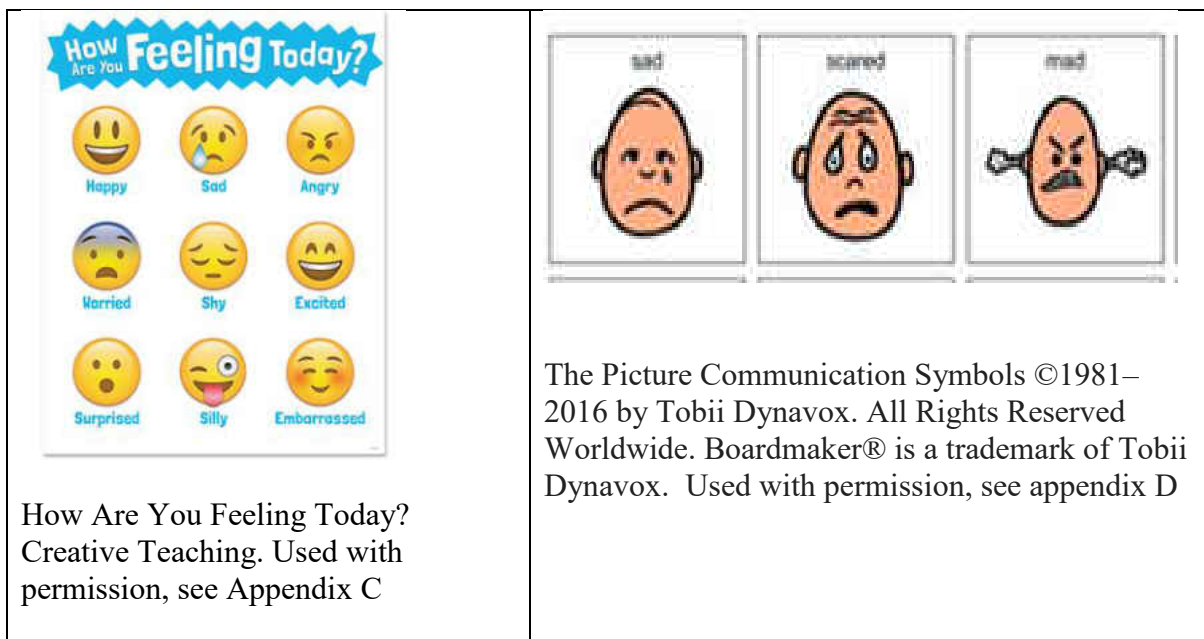


Figure 6: Animated Emotion Cards

Initially used as interventions for teaching individuals with ASD to recognize emotion and teaching individuals with emotional behavior disorders (EBD) to regulate their emotion, emotion flashcards also are now used for teaching language vocabulary to English language learners (ELL). Despite such common usage, emotion flashcards have not been

specifically recognized as one of the evidence based practices as identified by the National Standards Project or its predecessor, the National Professional Development Center (NPDC) for ASD (Wong, Odom, Hume, Cox, Fetting, Kucharczyk and Schultz, 2015). The What Works Clearinghouse for Reviewed Research (2011) for individuals at risk for an emotional disturbance has not approved them, nor has the Association for Supervision and Curriculum Development (ASCD, 2011) for ELLs.

A simple Google search of “Emotion Flash Cards” on November 25, 2016 provided over 1,000 emotion and teacher kit flashcards with various sketches, drawings, cartoon characters (green faces representing sick, blue faces representing cold, red faces to represent mad), and various photographs of a given creator’s impression of ex. happy or surprised. Such a wide variety of images could become problematic for classroom teachers searching for emotion card resources. Figure Seven demonstrates some of the variability of popular emotion cards used by teachers and board certified behavior analysts (BCBAs). The left illustration, from Do2Learn resources that provides color photographs of individuals engaged in a range of emotions. The middle illustration includes the Language Builder Emotion Cards, designed with a BCBA, with the suggested use of teaching five basic emotions: happy, sad, angry, surprised, and disgusted. Scenarios are provided to illicit student responses to “what are they feeling” and “why are they feeling”. The right side depicts the Facial Expression Cards published by Carson Dellosa


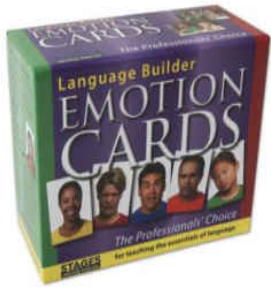

		
<p>Do2Learn Emotion Cards (n.d.) Used with permission, see Appendix E</p>	<p>Language Builder Emotion Cards (n.d.). Stages of Learning. Used with permission, see Appendix F</p>	<p>Facial Expression Cards (n.d.). Carson Dellosa. Used with Permission, see Appendix G</p>

Figure 7: Identifying Emotions

Traditional drill and skill flashcard methods of teaching multiplication tables have been augmented with concrete, three-dimensional teaching materials such as base ten manipulatives. Increasingly, determining student understanding of mathematical constructs has transformed beyond student memorization of algorithms to a more process oriented query of “How do you know, you know?” and the “How and why are particular steps applied” within a given algorithm. As academic flashcard learning has evolved to a more process oriented assessment, so must social skill flashcard learning evolve.

The Sanford Harmony Empathy and Critical Thinking Curriculum

Philanthropist T. Denny Sanford envisioned a social skills program for young children and gender relations researchers Martin Fabes and Carol Martin subsequently developed the SH social skills program. The University of Arizona currently disseminates the SH program, citing “the goal of the SH is to create classrooms where pre-K to sixth grade

students felt more connected to their teachers and peers” (Taylor, 2014). The Sanford Harmony curriculum has components that includes Buddy Up/Meet Up activities and specific lesson plans for a unit titled Empathy and Critical Thinking. School wide classrooms participated in Buddy Up/Meet Up and the two first grade classroom teachers also facilitated the ECT curriculum lessons. The SH curriculum continued after study completion as part of a school-wide positive behavior support program.

Empathy and Critical Thinking Curriculum Cassel and Common Core Alignment

The following includes the description of reading and writing activities (ex. peers not wanting to go out in the rain) of the ECT curriculum that align with Florida Standards for Literature as seen in the following Figure Eight. The ECT curriculum lessons provide students the opportunity to draw and write about social stories (ex. How do you think the person who does not want to go out in the rain feels?). Activities are aligned to the 2015 Florida Language Arts standards for drawing and writing.

Strand: READING STANDARDS FOR LITERATURE	
Cluster 1: Key Ideas and Details	
STANDARD CODE	STANDARD
LAFS.1.RL.1.1	Ask and answer questions about key details in a text. <i>Cognitive Complexity:</i> Level 2: Basic Application of Skills & Concepts
LAFS.1.RL.1.2	Retell stories, including key details, and demonstrate understanding of their central message or lesson. <i>Cognitive Complexity:</i> Level 2: Basic Application of Skills & Concepts
LAFS.1.RL.1.3	Describe characters, settings, and major events in a story, using key details. <i>Cognitive Complexity:</i> Level 2: Basic Application of Skills & Concepts
Cluster 2: Craft and Structure	
STANDARD CODE	STANDARD
LAFS.1.RL.2.4	Identify words and phrases in stories or poems that suggest feelings or appeal to the senses. <i>Cognitive Complexity:</i> Level 2: Basic Application of Skills & Concepts
LAFS.1.RL.2.5	Explain major differences between books that tell stories and books that give information, drawing on a wide reading of a range of text types. <i>Cognitive Complexity:</i> Level 2: Basic Application of Skills & Concepts
LAFS.1.RL.2.6	Identify who is telling the story at various points in a text. <i>Cognitive Complexity:</i> Level 2: Basic Application of Skills & Concepts

Figure 8: Florida State Standards

The ECT curriculum also follows the 2013 Guide for Effective Social and Emotional Learning Programs (CASEL) for overall social skills, with the ECT aligned to the five CASEL areas of cognitive, affective, and behavioral competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making.

Specific targeted areas include the following:

- To learn to identify and demonstrate the physical signs of different emotions
- To encourage self-confidence in sharing feelings and ideas

- To describe how it feels to be included and excluded
- To foster a feeling of being valued and accepted as a group member
- To foster awareness that emotions have internal and external cues
- To promote recognition of own and others' emotions
- To identify reasons for emotions based on situational cues
- To generate reasons for different emotions
- To increase understanding of causes of emotions (Sanford Harmony & Common Core Alignment Guide, p. 2).

Additional Common Core Self Awareness and Empathy Alignment (SLK 1, 2)

- 1.1 Promote the importance of getting to know each other. Emphasize the value of peer relationships.
- 1.2 Promote an awareness of commonalities with others.
- 1.3 Encourage an appreciation of diversity.
- 1.4 Promote a sense of connection and community.
- 2.3 Increase understanding of causes of emotions. Promote an awareness of situational cues in understanding emotions.
- 2.4 Promote understanding of others' perspectives and feelings. Promote empathetic responding to others.
- 2.5 Foster increased understanding of variability and similarity within social groups.
(Sanford Harmony & Common Core Alignment Guide n.d., p. 4-6).

The point of this curriculum is to support all students in a better understanding of self and others to build more positive relationships in life. This need to create a society built upon

harmony is an excellent goal, but the challenge in today's classrooms are compounding through the rise in the number of students who struggle with the emotional aspect of life by turning to social media, the rise in the number of students with ASD turning exclusively to digital social media for social interaction and the influx of the use of various social media tools that can increase interactions yet require an increasing level of social sophistication that they may not possess and consequently may leave students vulnerable. Moreover, 'safe' social relationships that are digitally controlled and configured may do more to negatively impact a student's real world social behavior.

ASD, Social Media, and the Selfie Phenomenon

Real world relationships call for real world interventions to facilitate stronger understanding of self, empathy and of reading the emotions of others, and this is especially applicable for students with ASD. As more and more students with ASD are in the general education setting, there is increasing demand on all students to understand their own and their peer's emotional responses, with consideration that the majority of communication is nonverbal. Today 39.5% of students with ASD are educated in the general education classrooms 80% or more of the day (Snyder, de Brey, & Dillow, 2016). ASD is at the center of large funding initiatives, such as the Combating Autism Act in 2006 which has dedicated close to \$50 million in funding for this population. The ongoing challenge related to the social-emotional needs of this population in the classroom and society is one that is at the forefront of research to find practices that are both practical to implement in the general education setting and impactful on learning outcomes. The increase in the number of

students with ASD reported by the Center for Disease Control and Prevention (CDC) has risen by 119.4% since 2000.

Autism and Social Emotional Difficulties

Autism was not differentiated from childhood schizophrenia until 1979. Schopler, Rutter, and Chess (1979) first announced the title and scope change of *The Journal of Autism and Childhood Schizophrenia*, to *The Journal of Autism and Developmental Disorders* to include a “broadened and wider range of developmental disorders related to autism and the developmental factors that shape the autistic symptom picture” (p. 1). The *Diagnostic and Statistical Manual of Mental Disorders (DSM) III* followed suit, and delineated Autism as a distinct and separate condition from Schizophrenia in 1980, and in 1987, the DSM-III-R specified criteria for diagnosing autism.

In 1994, the DSM IV categorized subgroups under the umbrella of Pervasive Developmental disorders that included; Autistic Disorder, Asperger’s Syndrome, Pervasive Developmental Disorder (PDD), Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), and Rhetts’s Syndrome. The DSM-IV-TR included an expanded category in the offshoot of Asperger syndrome.

The current DSM V listed the following as descriptors and incidence of ASD as follows;

A. Persistent deficits in social communication and social interaction, deficits in nonverbal communicative behaviors used for social interaction, abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.

3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.
- B. Restricted, repetitive patterns of behavior, interests, or activities, such as stereotyped or repetitive motor movements, use of objects, or speech, insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior
3. Highly restricted, fixated interests that are abnormal in intensity or focus, excessively circumscribed or perseverative interest.
4. Hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment
- C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).
- D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.
- E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. (DSM-V, 2013, p. 50-51).

Dramatic Shift in Diagnosis and Treatment of ASD.

The biggest changes from the DSM IV to DSM V was creation of the Social (pragmatic) Communication Disorder (social use of verbal and nonverbal communication) category for individuals with deficits in social communication that are not otherwise attributed to ASD; removal of Rhetts's syndrome; and the exclusion of Asperger's syndrome.

The DSM V grouped the remaining pervasive developmental disorders (PDDs) within the umbrella of the new category - Autism Spectrum Disorders. Despite the many changes from the DSM III through the DSM V, hallmark descriptors of individuals with ASD have remained the same, historical difficulty with real world social emotional skills.

View of Self and Popular Social Media

The first version of the popular social media site Instagram was launched on October 6th, 2010 and 25,000 people signed up on that first day (Instagram Press, n.d.). On December 8th, 2011 it was reported to be the App Store iPhone App of the Year, and in 2012, with 30 million users, Instagram founder Kevin Systrom sold Instagram to Facebook founder Mark Zuckerberg for one billion dollars cash and stock. Instagram was reported to have up to 700 million active users at this time (Constine, 2017; Jackson, 2017). Jackson posed “ask anyone under the age of 15 if they use Facebook and you’ll get laughs, Instagram and Snapchat though? All the time”. There is increasing pressure on students to engage in digitally mastered social relationships and combined with the rise in the number of images to represent “self” begin at the core of societal norms today in social media, this issue of knowledge of self is a twofold challenge for students with ASD.

The Selfie

The ‘selfie’ (noun, informal; also selfy; and plural: selfies) was named Oxford Dictionary’s Word of the Year for 2013 (Oxford Dictionaries, 2013) which defined selfie as “a photograph that one has taken of oneself, typically one taken with a smartphone or

webcam and uploaded to a social media”. A selfie is a digital representation or digital photograph of one’s self.

Selfie Behavior

Researchers have investigated the relationship between selfie postings and gender differences, personalities and psychological difficulties. Sorokowski, Sorokowska, Oleszkiewicz, Frackowiak, Huk, and Pisanski (2015) investigated 1296 men’s and women’s selfie posting behaviors and found narcissistic traits (vanity, leadership, and admiration) were more likely associated with men than with women’s selfie posting behavior, and women’s selfie behavior was unrelated to narcissism scores. In a later study correlating men’s and women’s selfie posting behavior to histrionic personality disorders, Sorokowski, Sorokowska, Frackowiak, Karwowski, Rusicka, and Oleszkiewicz, (2016) found in the online selfie posting behaviors (selfie alone, selfie with a group, or selfie with romantic partner) of 355 women and 393 men that the “postings of men predicted histrionic personality scores but did not predict in women, and women’s postings related to self-presentation, which is higher among women than men” (371).

In an online self report qualitative questionnaire of 42 ‘avid selfie posters’ in Vancouver, Canada, Warfield (2015) reported women describing their preferences for selfie posting. Most women stated they do not like fake ‘photo smiles’ because they do not look like their authentic or real self. Some women reportedly used the mirror app on their phone to know if their hair and make-up is fresh, yet digitally enhance their authentic self portrait by using filter, lighting and drawing on the digital images of their self. Mehita and Schroeder (2016) reported similar findings with “digital self-portraits seemingly controlled by the

user/photographer on almost every level. We get to choose how to frame and capture our images, how to crop and filter them, and where to post them” (p. 412).

A few women in the Warfield study reported they do not always post their ‘best selfie’, preferring instead to save that digital pic only for themselves to “boost self-confidence” to which Warfield termed this phenomenon the “digital Taliswoman”.

Our culture may have developed a social dependency on digital representations to construct and validate projected/posted images ourselves and of others, whether those images are shared. Considering the illustration in Figure Eleven of the Awareness representation; if self (1) is defined based upon feedback from other (2) and then self adjusts behavior (3) to adapt to the evolving self, the difficulty is that if a false digital self is projected and reinforced in the digital world, that self becomes further and further isolated from their true virtual self. Relying on the digital world to define one’s self presents additional danger of negative comments from the ubiquitous internet troll and cyberbullying that may not have happened in the face-to-face true virtual world.

The need for a better understanding of self and others is clearly a social norm in today’s society. How this norm is understood and taught to all students is a current challenge that needs further discussion and investigation. How the direct instruction of these skills to students with disabilities, such as those with ASD is one that is just beginning to emerge and is in need of further investigation.

Chapter Two Summary

Chapter Two discussed the importance of empathy for prosocial behavior and social adjustment in identifying the emotions of others, or having ToM. Past and current SEL

program results were presented, along with social skill interventions that although promising, have lacked rigor. Social emotional intervention strategies that rely on flashcard emotion identification were discussed with the lens of lacking standardization in picture identification and face or emotion recognition tests. The need for both a modernized version of teaching these emotional recognition skills, the phenomenon of social media and the rise in ASD was also discussed.

Chapter Two pointed out that although researchers no longer use a one card per emotion (shown repeatedly) test response, and recognize several photographs should be presented for targeted emotion to be recognized, there is not an available test to determine if an individual truly understands the emotion they are identifying or are merely identifying the flashcard. The inconsistency of researchers' results in determining emotion recognition may in part be related to reticence in addressing the process of recognizing emotions in others, and acknowledgement that recognition of emotions in others is followed by recognizing those emotions in ourselves first.

Universality of defining and recognizing emotion is problematic because researchers that design pictorial representations of emotions must assert their emotion representation/s are 100% accurate. To be less than 100% would contradict the accuracy of emotion representations leading to an acknowledgment of the possibility that emotion representation and thus accuracy and validity of a given picture or digital representation may be subject to one individual's expression of a given emotion and another individual's interpretation of that emotion. The present study aimed to take a step closer to closing the gap toward determining how individuals best learn to recognize the emotions of others.

CHAPTER THREE: METHODOLOGY

The primary purpose of the study was to examine how the process of identifying emotions of others was impacted during a mirror-based intervention for eight first grade students from inclusive classrooms. The study also investigated whether a two-way mirror display helped students increase their level awareness when expressing emotions, and their level of awareness in identifying the emotions of others. The researcher aimed to design a methodology that would address gaps in the literature of binary forced choices in identifying emotions of others and sought inquiry into how students might learn to recognize emotions in themselves and in others. Student self-awareness was measured by the SPAFF code and student awareness of the emotions of others was measured by the EWA.

Central Research Question

The central research question for the study was how is a student's awareness in expressing emotions and identifying the emotions of others established and changed through a mirror-based intervention?

Sub Question One

What is the relationship between a student expressing emotions correctly and identifying emotions correctly?

Sub Question Two

Do increases in the accuracy of expressing emotions also lead to increases in third, second or first choices in correctly identifying the emotions of others?

Sub Question Three

What emotions are least likely or most likely to be expressed and/or identified correctly?

Student Demographics

the present study, six out of eight students were identified as ASD or neurodiverse and included Alpie, Brock, Charles, Dawn, Frederick, and Harris. The remaining two students were identified as neurotypical and they included Gregory and Eve (although Eve was identified as having ADD), and Gregory. There was a total of six boys and two girls in the study and reported demographics included African American, Middle Eastern, Latino, and Caucasian, with reported reading levels far below grade level, below grade level, at grade level, above grade level and far above grade level. Language difficulties were reported by teachers.

All students were seven or eight years old, typical for the first grade, none of the students had repeated any grades or had previous exposure to any mirror type intervention. Ethnicity included three Caucasian students, two Middle Eastern students, two African American students, and one Latino student. Reading levels for students ranged from below grade level, on grade level, and above grade, as reported by the students' teachers.

Research Design

The study design was mixed methods. Student responses were measured by the EWA with three points for a first choice response that was correct, two points for a correct second choice, and one point for a correct third choice in identifying each of the seven emotions during each session. Each pair had the opportunity to express and identify emotions.

Emotions expressed were tallied and the researcher and research assistant used the SPAFF code to quantify the accuracy of expressed emotions. The qualitative aspect of the study included individualized case study reports of each student's awareness levels with overall student awareness themes presented and discussed. The additional assessment measure of the CAFE set of the EWA seven emotions given for each student prior to participating in the mirror awareness intervention and after participating in the mirror intervention sought to compare differences in awareness or identification of emotions of others.

A wide variance in the amount of time or number of sessions required for a study to be valid is found in the literature. O'Connor, Bellamy, and Spring (n.d) reported five data points (or sessions) is sufficient if the data points have been achieved and maintained stability. In this study two sessions per week were observed for four weeks, with a total of eight sessions reflecting a common amount of time reported in the literature.

Population and Sampling Procedures

Purposive, convenience sampling was used to recruit study participants. Demographic student information of age, grade, gender, ethnicity, reading level and disability were obtained through completion of the TRF by teachers, and the CBCL by parents.

Instruments

The Child Affective Facial Expression (CAFE) Set

The CAFE set by LoBue and Thrasher (2015) of photographs for the seven emotions was used to ascertain baseline and post intervention emotion identification accuracy. The

CAFE was most appropriate for the purposes of this study, because unlike earlier emotion flashcard sets (Friesen & Ekman, 1976; Tottenham, et al., 2009), the CAFE uses photographs of children two through eight years which was more aligned to the proposed study's first grade participants. Students were not given a response set from the choice of the seven words for baseline and post intervention. Rather, students were encouraged to write their own choice of what they thought when asked, "What is this person feeling?" after looking at the seven emotion words projected in the CAFE card set. An example of the CAFE set was first illustrated in Figure Three.

Validity of the CAFE Subset Photographs

The CAFE instrument was validated using 100 undergraduate students at Rutgers University. These students were asked to identify the CAFE child expressions. Results indicated a variance for students who were more likely to accurately identify positive rather than negative emotions. Researchers concluded there were "significant differences in accuracy for the seven categories of facial expressions (happy, sad, disgust, surprised, neutral/calm, angry, and fearful)". They continued, only "31% of participants correctly identified the correct face as angry, 33% identified it as disgusted, and 26% identified it as fearful, suggesting that the negative emotion portrayed by the face is quite ambiguous" (LoBue et al., 2015, p. 5). Results corresponded to a "high variability in identifying negative emotions" (p. 6), consistent with negative emotion validity and "much higher accuracy of identifying happy emotion expressions and less accuracy identifying negative emotion expressions such as sad, fear, and surprised, disgust" (Tottenham et al., 2009, p. 247). The

CAFE set photographs were chosen for the study because the images used in the set most resembled the ages of the students in the study (first graders).

The Emotion Word Assessment (EWA)

Table One contains the EWA instrument was used by students to record the first, second and third choices of the emotion they perceived was projected by the individual on the reflected side of the mirror. The EWA provided students an alternative to binary or forced response sets for identifying emotions and a “none of the above” choice as suggested by Tottenham et al. (2009) to illicit and gauge student accuracy in identifying emotions. In providing an option for students to write their own choice of emotion word, the design of the EWA addressed criticism that “forced choice of emotion like those commonly used in validating face expressions sets, can inflate accuracy because these procedures bias the participant towards a particular hypothesis” (Tottenham, 2009, p. 247).

Students completed an EWA card for each of the seven emotions during each session and students’ free response emotion words were recorded, along with student comments, and observations by the Researcher (R) and Research Assistant (RA). The R read the following directions for completing the EWA to students at the beginning of each session, “As you look through the mirror, you will see the person expressing emotion. Put a checkmark in the box of the emotion word that best describes your first, second, and third choice for what you think the person is feeling. If you do not see the feeling that matches what you think the person is feeling, circle the X, and if you would like, write you own word”.

Table 1 The Emotion Word Assessment

Word	Most Likely My 1st Choice	Could Be My 2nd Choice	Might Be My 3rd Choice	None	My New Word
Emotion 1	<input type="checkbox"/> surprised	<input type="checkbox"/> surprised	<input type="checkbox"/> surprised	X	
	<input type="checkbox"/> sick	<input type="checkbox"/> sick	<input type="checkbox"/> sick		
	<input type="checkbox"/> scared	<input type="checkbox"/> scared	<input type="checkbox"/> scared		
	<input type="checkbox"/> hurt	<input type="checkbox"/> hurt	<input type="checkbox"/> hurt		
	<input type="checkbox"/> happy	<input type="checkbox"/> happy	<input type="checkbox"/> happy		
	<input type="checkbox"/> disgusted	<input type="checkbox"/> disgusted	<input type="checkbox"/> disgusted		
	<input type="checkbox"/> tired	<input type="checkbox"/> tired	<input type="checkbox"/> tired		
	<input type="checkbox"/> calm	<input type="checkbox"/> calm	<input type="checkbox"/> calm		
	<input type="checkbox"/> sad	<input type="checkbox"/> sad	<input type="checkbox"/> sad		

Validity of The Emotion Word Assessment (EWA)

The seven words in the study were based upon words determined to be “basic emotion” words by Baron-Cohen (2011), Bretherton and Beeghly (1982), and Lane, Quinlan, and Schwartz (1990). The words angry, happy, sad, surprised, sick, scared, hurt, and tired were reported to be understood at a 28-month-old developmental level (Bretherton et al., 1982; Lane et al., 1990). The seven mirror assessment emotions through the EWA were based upon recognized “basic emotions of happy, sad, surprised, neutral (calm), scared, angry, and disgusted.

The Child Behavior Checklist (CBCL) and Caregiver-Teacher Report Form (C-TRF)

The CBCL and C-TRF are rank order scales designed to obtain a standardized measure of a child’s behavior toward assessing and identifying behavior and emotional

difficulties based upon parent and teacher observations for students from ages 6 through 18 years of age. The CBCL and C-TRF were used to obtain a measure of social validity from parent and teacher comments pertaining to problematic behaviors that indicate inability to see how others might feel. Therefore, subset facets of the CBCL and TRF for the construct of empathy were aligned to construct factors taught to students from the SH, Empathy and Critical Skills curriculum facilitated by the first grade teachers such as aggression to others, stealing, damaging property, teasing, bullying, hurting animals and lying. Parents and teachers completed the CBCL and TRF prior to the mirror intervention and after the mirror intervention. Students individual and collective empathy subset scores also were recorded and reported.

The CBCL and TRF each contain 113 behavior items for parents and teachers to rank from zero for not true, one for sometimes true, and two for very true. Items that indicated empathy behavior toward other individuals were ranked before and after the mirror intervention. Subset empathy behavior items from the TRF included #16, bullying; # 21, Destroys property belonging to others; #25 Doesn't get along with other pupils; #57, Physically attacks people; #82, Steals; #Teases and #97 Threatens people. Subset empathy behaviors from the CBCL included #15, Cruelty to animals; #16; Bullying; #21 Destroys things belonging to other family members; #57, Physically attacks people; #81 Steals; #94, Teases; #97 Threatens people; and #106, Vandalism. Both the CBCL and TRF were coded on a scale from zero as not true, one as somewhat or sometimes true, and two for very true or often true. Parents rated their children on whether they thought their child spent less than average, average or more than average time on computers and playing video games.

Validity for Child Behavior Checklist and Caregiver-Teacher Report Form

The CBCL and TRF “reflect actual patterns and empirically based behavior syndromes scored from problems derived from factor analyses coordinated between the two instruments with parallel internalizing and externalizing observed behaviors. Data from nationally representative samples of children was reportedly used to construct norms that were age-specific, gender-specific, and instrument-specific” (ASEBA n.d. Validity and Reliability Data). Appendices M and N include the CBCL and TRF instruments, respectively.

The SPAFF Coding for Student Accuracy and Interrater Agreement Card

The accuracy of each emotion expression was judged based upon the Specific Affect Coding System (SPAFF), first developed by Gottman and Krokoff (1989) to identify affective behavior in the context of marital conflict. The SPAFF is now used in coding interactions (head placement, eyes wide open to indicate surprise, furrowed brow) among children and their parents, and children and peers (Coan & Gottman, 2007). Figure Nine gives an example of SPAFF criteria for evaluating mirror reflected emotion expression that was used to evaluate the accuracy of each emotion projected by the student in the mirror.

Emotion	Action Unit (at least one)	Demonstrated	Physical Cues Description of Emotion
Angry	4+5	<input type="checkbox"/> Yes <input type="checkbox"/> No	The brow is lowered (furrowed) The upper eyelid is raised
Sad	1+15	<input type="checkbox"/> Yes <input type="checkbox"/> No	The inner brow raised, forehead is crinkled The lip corners are turned downward
Calm	6+12	<input type="checkbox"/> Yes <input type="checkbox"/> No	The brow is lowered The cheek is raised and eyelids are compressed
Disgust	4+10	<input type="checkbox"/> Yes <input type="checkbox"/> No	The brow is lowered The upper lip is raised
Happy	6+12	<input type="checkbox"/> Yes <input type="checkbox"/> No	The cheek is raised and eyelids are compressed The lip corner is pulled (parentheses smile)
Scared	5+2	<input type="checkbox"/> Yes <input type="checkbox"/> No	The upper eyelids are raised (angled) The lip is stretched
Surprise	1+2+6+12+24	<input type="checkbox"/> Yes <input type="checkbox"/> No	The inner or outer brow is raised The brow could be lowered The lip corner is pulled (parentheses smile) Leaning forward

Figure 9 The SPAFF Emotion Accuracy Code

Study Materials

The following materials were used in the study to construct the mirror activity and to conduct the overall research study. The items used consisted of (a) one red and white 36" x 48" three-panel display panel board, (b) one white 36" x 48" three-panel display board, (c) one 8" x 10" paper picture frame, (d) one 8" x 10" two-way mirror, (e) box cutter used to cut each side of the red and white display to enable fold down, (f) packing tape, (g) Five sharpened pencils for students to indicate response on the EWA card, (h) iPhone 6S camera, (i) ASEBA Child Behavior Checklist, (j) ASEBA Caregiver-Teacher Report Form, (k)

Emotion Word Assessment (EWA) 8x5 Cards, and (l) The CAFE set of students expressing emotions.

Study Procedures

Appendix I includes a copy of the informed student consent that was distributed and collected by teachers, and forwarded to the researcher for recording prior to the study beginning. Appendix L includes the Institutional Review Board permission notice. A total of eight students from two first grade classrooms were given parent permission to participate in the study. The teacher consent is included in Appendix J. The Sanford Harmony Empathy and Critical Skills program component of this study was facilitated by classroom teachers for 15 minutes prior to the 25-minute mirror sessions. The sessions were held Mondays and Wednesdays, for four weeks, and occurred in the cafeteria directly after the SH program. The eight students involved in the study were escorted, two students at a time, to and from the cafeteria where the intervention displays and data cards were set up on a table prior to the students arriving. See Appendix K for the Mirror Fidelity Checklist, completed by the R and the RA at each session.

Set Up of the Mirror Display

When the eight students entered the cafeteria, the mirror display was set up prior to the students entering the cafeteria. The mirror display panel had two colors (red and white). To ensure the receiver was on the darker side of the panel, the 'red' side faced that student and the top of the panel display was cut 12 inches on each side and folded down in order to decrease and block some of the light, providing a darker area on that side of the panel as

indicated in Figure Ten to ensure the sender was on the lighter mirror reflective side, the white side of the panel faced that student in an effort to increase light by reflecting and refracting light.



Figure 10 Mirror Display Design

Procedure for the EWA Cards

The classroom teachers reported that all eight students could not identify the seven emotion words by sight, and therefore, student responses to the emotions from the CAFE set were reviewed, and completed individually and privately. Some students had receptive and expressive language difficulties and initially required prompting with the words repeated several times until they indicated they understood the words and the emotions represented on the EWA card. The mastery of these emotions was critical as students were to display these images in a photograph during the intervention in expression of emotions and in identification of the emotions of their peers. Therefore, all students were trained and assessed to have mastery of these images prior to starting the mirrored intervention. The words on the EWA represented more than a word identification or reading test, students were provided

with a review of the EWA seven words prior to each session to the start of each session and all students were able to independently identify all eight emotion words listed on the EWA (seven basic emotions plus the emotion ‘hurt’) by the end of the second week or the fourth session.

Procedures for Photographs

The student sitting on side A projecting the feeling emotion word was digitally photographed using an iPhone 6S at the three second interval, which as cited by Coan and Gottman (2007) is best for behavior observer coding of emotion. Student photographs were not uploaded to “the cloud” and all parents gave permission for their child to be photographed in the study. Students’ reflected expression of the seven emotion words (surprised, scared, angry, disgusted, sad, calm and happy) were coded with a student ID number from one to eight, with a code for either mirror or flashcard. For example, based upon student number one and “angry” as the first emotion projected word for that session, the code would be 1-1 (the first student in the mirror group). The students’ reflected expression of the accuracy of the seven emotion words was then evaluated for accuracy by the R and RA, based upon SPAFF coding used for judging the accuracy of the emotion projected in the mirror reflection. The emotion word ‘hurt’ was used as a distractor in the study and was not expressed or coded.

Procedures for the Mirror Intervention

In addition to reviewing the words and reminding students of the three choices they had to guess what the other person was feeling, the students were cued before each emotion

projection: “Look in the mirror at your reflection. What do you look like when you are feeling _____?” The word was then privately whispered in the student’s ear by the R. Students were reminded to hold their feeling expression until the R had taken the picture and the other student made all three of the choices or had chosen another word. The RA asked the student completing the EWA card for each emotion projected a question such as “What do you think Billy is feeling?” The RA assisted students in choosing/circling their top three choices of seven words from the eight emotion words from the EWA until students were able to recognize the words and complete their choices independently. The RA advised the R when the receiving student had completed the EWA card after the three choices for each emotion were selected. Upon completion of the seven EWA cards (one for each emotion with the three choices on each card) the students switched sides and the procedure began again. After both students had completed all EWA cards, they were escorted back to their classroom by the RA.

Procedures to Protect Student Data

Students were assigned an identification number to link identifying information but for security, only the R had access to the word document for cross-reference. The laptop computer was owned and retained by UCF. At no time were student data stored in ‘the cloud’. The laptop computer was secured in an overhead cabinet at UCF, which also required a security code to enter.

The digital photographs were uploaded to the laptop computer each Monday and Wednesday after each of the eight sessions. Once photographs were uploaded, all photograph pictures were deleted from the iPhone 6S. At the end of the study, all computer

photographs were securely disposed of by deletion though parents had signed consent indicating approval for the use of written or public domain presentation of photographs related to the study.

Trustworthiness of Data and Percentage Agreement Between R and RA

Interrater reliability by the R and RA was calculated based upon each assessing each student's projected emotion, and judging that emotion based upon the SPAFF Coding. There was 95% agreement between the R and the RA on the accuracy of emotions projected by students during the first through eighth sessions. Rather than indicating a student was half correct in expressing a response, the student's response was coded as a 'no' if the student did not accurately express the emotion as standardized by the SPAFF emotion coding system. Student comments and observations by the R and RA were recorded during the sessions and the comments and observations were discussed at the end of each session with both the R and RA in 100% agreement about recorded student comments and observations.

Chapter Summary

This chapter presented the rationale for creation of the EWA that was based upon the literature of basic emotions, necessity of identifying emotion in others, having empathy for what others may be feeling, and choice of instruments including the CBCL and C-TRF. This chapter also indicated the procedural steps for data collection in the study and referenced the creation of the mirror fidelity checklist included in Appendix K. Lastly, this chapter provided rationale for chosen mixed method study design with quantitative increases in the EWA and SPAFF coding completed by both R and RA, and student comments, photographs,

and observations by the R and RA recorded and qualitatively presented through a phenomenological short case study contextual and structural awareness report for each student.

CHAPTER FOUR: RESULTS

Student tables related to SPAFF accuracy in expressing emotions were constructed and coded to include each student's accuracy in expressing and identifying the emotions of others on the first, second, and third choices. Tables also were created to indicate student absenteeism, and whether responses were accepted as responses that did not have interrater agreement of the emotion matching the SPAFF accuracy code, or because the student vocalized the emotion they were projecting or identifying. Tables include pseudonyms of names for each student using the first eight letter of the alphabet, A-H. A summary of each the student's overall responses is provided as well as a discussion of the student's progress and their overall results related to their self-awareness and self-other-self-awareness development.

Additional data are reported from the pre-mirror and post-mirror CAFE photograph set with student choices each assigned three points for every first choice correct, two points for every second choice correct response, and one point for every third choice correct. The EWA for the pre and post did not include the word bank as students provided their own free choice of the emotion they thought the model in the CAFE set photo was expressing. Each student's score out of a possible score of 21 points for seven words correct on first choice for both pre and post mirror intervention is reported.

Alphie

Alphie was identified as a seven-year-old neurodiverse male of Middle Eastern decent, having ASD and was at a below grade level reader. Alphie's parent rated Alphie at a one for cruelty to animals on the pre mirror intervention CBCL. Alphie's parent did not

complete a post CBCL. Alpie's parent reported he spent more than average time on computers and average time on video games. Alpie's teacher rated Alpie at zero for all subset empathy indicators both pre and post mirror intervention.

Table Two indicates Alpie's randomly paired student was absent during the first session and Alpie was absent during the seventh and eighth session. Alpie's awareness of the correct self-expression of happy and sad led to increased awareness and accuracy in correctly identifying the emotions of happy and sad in others. Alpie correctly expressed the emotion of angry in all but one session and was able to correctly identify his peers' expression of anger in all but one session; yet his pair in session two, four and six were not able to correctly express angry. Alpie's self-awareness in the correct expression of anger in himself, contributed to his awareness of the emotion of angry when expressed by others. Conversely, Alpie was unable to correctly express the emotion of disgusted during any of the sessions, and this inability contributed to his difficulty in recognizing the emotion of disgusted in others. If Alpie could not identify the emotion of disgusted in himself, he would be unable to identify the emotion of disgusted in others. That said, he may have intuitively known when two of his peers were feeling disgusted on a deeper conscious awareness of self and others or he may have correctly guessed the pairs were feeling disgusted.

Alpie correctly expressed the emotion of surprised in only one session and did correctly identify the emotion of surprised in any of his pairs in any of the sessions. Alpie correctly expressed the emotion of scared in only one session, and it was in this session that he correctly identified the emotion of scared in his pair, yet the pair did not express the

Student EWA Tables

Tables Key

The student's pair correctly expressed the emotion to the student: PC

The student correctly identified their pair's emotion on the first choice: I-1

The student correctly identified their pair's emotion on the Second choice: I-2

The student correctly identified their pair's emotion on the third choice: I-3

The student correctly expressed the emotion to their pair: SC

The student did not correctly express or correctly identify the emotion: -

The student or the student's pair was absent: A

The student's pair was absent: M

SPAFF interrater disagreement, or canceled out due to pair expressed or identified emotion chatter: C

Student provided word: Wd

Table 2 Alphie

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
	-	M	M	SC	PC	I-1	SC	-	I-3	SC	-	-	-	PC	I-2	SC	-	I-1	A	A	A	A	A	A
Angry	-	M	M	SC	PC	I-1	SC	-	I-3	SC	-	-	-	PC	I-2	SC	-	I-1	A	A	A	A	A	A
Calm	-	M	M	-	PC	I-2	SC	-	-	-	-	I-1	SC	PC	-	SC	PC	I-3	A	A	A	A	A	A
Disgusted	-	M	M	-	-	I-2	-	PC	-	-	-	-	-	-	I-1	-	PC	-	A	A	A	A	A	A
Happy	SC	M	M	SC	PC	I-1	SC	PC	I-2	SC	PC	I-1	SC	-	I-3	SC	PC	I-1	A	A	A	A	A	A
Sad	SC	M	M	SC	PC	I-1	SC	PC	I-2	SC	PC	-	SC	PC	I-1	SC	-	I-1	A	A	A	A	A	A
Scared	-	M	M	SC	-	I-2	-	-	-	-	-	-	-	PC	-	-	-	-	A	A	A	A	A	A
Surprised	SC	M	M	SC	-	-	-	-	-	-	PC	-	-	PC	-	SC	PC	-	A	A	A	A	A	A

emotion scared correctly. Alpie correctly identified the emotions of others when he was able to correctly express those emotions himself. When Alpie correctly identified the emotion on his second choice, he reported his first choice as the emotion sad and when he did not identify the emotion on first, second or third choice he reported the emotion as sad, the distractor emotion hurt, or scared.

In his pre-mirror CAFE set emotion flashcard identification, Alpie scored six points out of a possible 21. Alpie had two first choices of emotion correct responses (angry and sad). Alpie offered emotions such as sad, bad, and sick, in addition to his descriptions of the models in the photographs such as “his mouth is open, looking, crying, teeth, and air”. Alpie’s post mirror CAFE emotion identification increased to nine points with his correct first choice identification of sad, happy, and angry. Alpie did not use any appearance word descriptors for the models in the CAFE set.

Brock

Brock was identified as a seven-year-old neurodiverse Caucasian male with a developmental delay, and cerebral palsy. He had a previous traumatic brain injury at the age of two. He has a speech and language delay also was also identified as reading far below grade level by his teachers. Also indicated on the TRF, was a rating of one for sometimes destroying property of others, teasing others, and physically attacking others. Post TRF scores indicated Brock increased physically attacking people and teasing from sometimes to often and remained stable for destroying property of others. Brock parent indicated on the pre CBCL that Brock prefers to play with cars and look at books, then engage in computers or video games. Brock’s parent on both pre and post mirror intervention reported all zeros for all empathy

subset behaviors. Table Three provides a summary Brock's level of self and other awareness in expressing and identifying the emotions of others.

Brock was absent for the first session but attended all of the other sessions. In all sessions Brock correctly expressed the emotion of happy and correctly identified the emotion of happy in all but one session. Brock did not correctly express the emotion of scared, yet he was able to correctly identify the emotion scared in four sessions. He correctly expressed the emotion of disgust in one session and correctly expressed three emotions that included happy, calm, and sad in the eighth session. He correctly expressed the emotions happy, sad, and calm. He also correctly identified the emotions happy, sad, and scared on his second choice and calm on his first choice in the eighth session. Brock's paired student in the eighth session correctly expressed all seven emotions.

Out of the seven emotions in that last/eighth session, Brock only missed angry and surprised, two emotions that he was not able to correctly express himself. Of the emotions identified correctly in the last session, Brock had expressed all five either during that last session, or in one other session. For example, Brock had correctly expressed disgusted and scared one time, happy in all sessions, and calm and sad in that last session. When Brock correctly identified an emotion on his second choice, he always stated the emotion sad for his first choice. When other emotions were not correctly identified, Brock choose sad, the distractor hurt, scared, and angry. All students perceived Brock had difficulty in expressing and identifying emotions and demonstrated empathy by telling Brock the emotion they were projecting, giving hints such as body language (arms folded across chest, or verbal ("humph" for angry, whining vocalization while expressing sad). Brock needed reminders to not say the emotion he was going to project although this was not a problem after the second session

when the PR asked Brock to meet about 20 feet back from the mirror display table and Brock learned to whisper the word, rather than saying the word aloud. The researcher discerned that repeating what he heard was likely due to his reported disability. On one occasion Brock's pair overhead the emotion Brock had chosen and that pair stated "but I wasn't angry". That students' behavior was thought to be messaging to Brock (other) and to self (maybe my expression indicated that I was angry, so I will be more aware of how I am expressing that emotion).

Brock's pre-mirror score for the CAFE set was three as he correctly identified the emotion of happy, for three points. Brock described models as "underline circle, open his eyes, doing her hair, and mom said she can't go to the park", rather than emotions during the pre-mirror intervention CAFE set emotion identification. Brock correctly identified the emotions of sad and angry on his first choice in the post CAFE set, and happy and disgusted in his third choice of identifying emotions for a total of eight points, an increase in five points.

Table 3: Brock

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
	A	A	A	-	-	-	-	PC	I-1	-	-	-	-	PC	-	A	A	A	-	PC	-	-	C	-
Angry	A	A	A	-	-	-	-	PC	I-1	-	-	-	-	PC	-	A	A	A	-	PC	-	-	C	-
Calm	A	A	A	-	-	-	-	-	-	-	PC	-	-	PC	I-1	A	A	A	-	-	-	SC	PC	I-1
Disgusted	A	A	A	-	-	-	-	-	-	SC	PC	-	-	-	I-3	A	A	A	-	-	-	-	PC	I-2
Happy	A	A	A	SC	PC	I-1	SC	PC	-	SC	PC	I-2	SC	PC	-	A	A	A	SC	PC	I-2	SC	PC	I-2
Sad	A	A	A	-	-	I-1	-	PC	I-1	-	-	-	-	PC	-	A	A	A	-	PC	I-1	SC	PC	I-2
Scared	A	A	A	-	-	-	-	-	I-3	-	-	I-2	SC	-	I-3	A	A	A	-	-	-	-	PC	I-2
Surprised	A	A	A	-	-	C	-	-	-	-	PC	-	-	PC	I-1	A	A	A	-	-	I-3	-	PC	-

Charles

Charles was identified as a seven and a half-year-old neurodiverse male of Latino decent. He had speech and language difficulty, and read somewhat below grade level pre mirror intervention and at grade level post mirror intervention. On the pre and posts TRF, Charles was rated as all zeros for the empathy subsets. His teacher indicated she thought he played video games “obsessively”. Charles’s parent rated his pre mirror CBCL as playing video games more than average for children his age and rated all subset empathy behaviors as zero. Charles parent did not complete a post CBCL.

Table Four indicates that during Charles’s first session he correctly expressed happy, scared, and surprised and correctly identified happy, scared, and surprised on his first choice of emotion. In addition to happy, scared, and surprised, he also correctly identified the emotions sad, angry and disgusted on his first choice for a total of six out of seven emotions correctly identified. The only emotion he did not identify correctly was calm and it should be noted that the pair that expressed calm did not express calm correctly either. Although his pair did not correctly express the emotion of calm, Charles correctly identified the emotion of calm and he correctly identified emotions of sad, angry, and disgusted on his first choice, even though his pair did not accurately express those emotions.

When Charles incorrectly identified emotions of others, he stated emotions of disgusted, the distractor hurt, and calm as his first, second, and third choices. Charles needed reminders not to say aloud the emotion he thought his pair was expressing at the time his pair was expressing the emotion. He was reminded, “This is not a test”, although Charles’s vocalizations were

Table 4: Charles

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
Angry	SC	-	I-1	SC	-	I-3	SC	PC	I-1	SC	-	I-1	SC	PC	I-3	-	PC	I-1	SC	PC	-	C	-	-
Calm	-	-	-	SC	-	I-1	SC	PC	I-2	-	PC	I-1	SC	PC	I-2	SC	PC	-	SC	PC	-	SC	PC	I-3-
Disgust	-	-	-	SC	-	-	SC	PC	I-3	SC	-	-	SC	PC	-	SC	-	I-2	SC	-	I-3	SC	-	-
Happy	SC	PC	I-1	SC	PC	I-1	SC	-	-	SC	PC	I-1	SC	PC	I-3	SC	PC	I-1	SC	PC	-	SC	PC	I-1
Sad	SC	-	I-1	SC	-	I-1	SC	-	I-3	-	PC	I-1	SC	PC	-	SC	-	I-1	SC	PC	I-1	S/C	PC	I-1
Scared	SC	PC	-	SC	-	-	SC	-	I-1	SC	-	I-2	SC	-	-	SC	-	I-1	SC	-	-	SC	-	-
Surprised	SC	PC	I-1	SC	-	I-1	SC	PC	I-1	SC	-	-	SC	-	-	SC	PC	-	SC	PC	I-1	SC	-	I-1

indicative of his wanting others to understand what he was expressing and helping his pair correctly identify his emotion (It is unknown if this was due to Charles' desire to be viewed as correct or Charles wanting to correct other's incorrect choices).

Charles had a total of three first choice CAFE emotions correct for a total of nine points and one third choice correct for an additional point for a total of 10 points in his pre mirror CAFE emotion identification. In his post emotion identification, Charles correctly chose the emotions scared, surprised, mad, disgusted on his first choice for 12 points, and happy on his second choice for a total 14 points, an increase in four points from pre to post.

Dawn

Dawn was identified as a seven-year-old female of Middle Eastern decent, reading far below grade level on the pre TRF and below grade level on the post mirror TRF. Although Dawn had been identified as having a 'Other Health Impairment', discussion with Dawn's teacher confirmed Dawn exhibited hallmark behaviors for individuals with ASD within the classroom, however her primary diagnosis was OHI. Dawn's parent did not complete a pre or post CBCL. Dawn's teacher rated Dawn as "too shy" and "needs continual prompting to complete work", although none of the empathy subsets were rated higher than zero.

Table Five shows Dawn correctly identified the emotions angry, calm, happy on her first choice, and surprised on her third choice in her first session although she was able to correctly express the emotions of happy and surprised. Dawn correctly identified the emotion of happy in all pairs and more accurately recognized the emotions of surprised and disgusted, compared to her first session expressing emotions.

Table 5 Dawn

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
Angry	-	PC	I-1	-	PC	I-2	-	-	-	-	PC	I-1	SC	-	-	SC	-	I-3	-	PC	I-1	A	A	A
Calm	C	-	I-1	-	PC	I-1	-	PC	-	SC	-	-	SC	PC	I-2	SC	PC	I-1	SC	PC	I-1	A	A	A
Disgust	-	-	-	-	PC	-	-	-	-	SC	PC	I-2	-	-	I-2	SC	-	I-3	SC	PC	C	A	A	A
Happy	SC	PC	I-1	SC	PC	I-1	SC	PC	I-1	SC	PC	C	SC	PC	I-1	SC	PC	I-1	SC	PC	I-1	A	A	A
Sad	-	PC	-	-	PC	I-1	-	-	I-2	-	-	I-3	SC	PC	I-1	-	PC	I-1	SC	PC	-	A	A	A
Scared	-	PC	-	-	PC	-	-	PC	-	-	PC	I-2	-	-	-	-	-	-	-	-	-	A	A	A
Surprised	SC	-	I-3	-	PC	I-1	-	-	-	SC	PC	I-2	SC	PC		SC	PC	I-1	SC	PC	I-1	A	A	A

During the fourth session Dawn was observed to increase her ‘attending’ to her reflected images with increased eye contact with herself. It was also during the fourth session that Dawn identified five out of seven emotions correctly despite her pair expressing only three of the emotions correctly and she correctly identified the emotions of disgusted and scared for the first time. In session five, Dawn commented, “I have a pimple on my nose” and when asked if she had noticed the pimple before she stated, “That was the first time I really looked at myself.” In the sixth session, she identified six out of seven emotions correctly. Dawn’s increase in correctly identifying six words in the sixth session may have been due to her being paired with Eve (who expressed all emotions except angry correctly), or an increased self-awareness (more attentive to her own appearance ex. pimple on nose and more attentive to her pair’s expressions that would indicate an increased awareness of others).

In the seventh session Dawn identified all emotions but sad and scared (there was not interrater agreement and the emotion disgusted was canceled out). Dawn did not correctly express the ‘negative’ emotions of angry, disgusted, sad, and scared in the first session compared to the sixth and seventh session when she correctly expressed all emotions with the exception of scared. Dawn did not correctly express the emotion of scared in any of the sessions and only one time correctly expressed the emotion of sad. Dawn was absent during the last session.

Dawn had the most dramatic increase from her pre to her post identifying CAFE emotions. In the pre mirror session, she correctly identified happy and angry for six points. Similar to Dawn’s increase in her SPAFF expression of emotions, in the post CAFE emotion identification, Dawn correctly identified six out of the seven emotion words on her first choice for a total of 18 points. Dawn chose the word “gassy” for disgusted in the post session.

Eve

Eve was identified as a seven-and-a-half-year old neurotypical Caucasian female that read on grade level at both pre and post TRF assessments. In the pre mirror TRF, Eve's teacher reported a two or very true for Eve to bully or be mean to others, and a one or sometimes for physically attacking people, stealing, and teasing. On the post TRF, Eve's teacher reported Eve no longer bullied from the level of very often true at the pre mirror assessment to a to not true at all TRF post mirror assessment. Eve remarkably also dropped from a one or somewhat true for physically attacking people, stealing, and teasing, to a post mirror teacher assessment of zero or not true for physically attacking, stealing or teasing. On the pre mirror CBCL, Eve's parent reported cruelty to animals at a sometimes level, destroying property of others and stealing at a very often level of three for both inside and outside the home. In the post mirror CBCL assessment Eve's parent ranked Eve at an increased level from sometimes to very often for cruelty to animals and a decrease from very often destroying things belonging to family member to sometimes. Eve maintained a very often stealing things at home at very often level, however decreased stealing outside the home from very often to sometimes. She increased threatening others behavior from pre mirror not true to sometimes true in the post mirror CBCL assessment.

Table Six illustrates Eve was the most expressive and often exaggerated her expressed emotions to increase likelihood of others identifying her emotions correctly and help her peers by making it 'easier' for her peers to correctly identify her expressed emotions. Eve also made vocalizations such as "humpf" when she was expressing angry and she folded her arms across her chest. By the end of the second session she was able to express all emotions correctly and

Table 6 Eve

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
Angry	SC	-	I-1	SC	-	I-3	SC	PC	I-1	SC	-	I-1	SC	PC	I-3	-	PC	I-1	SC	PC	-	C	-	-
Calm	-	-	-	SC	-	I-1	SC	PC	I-2	-	PC	I-1	SC	PC	I-2	SC	PC	-	SC	PC	-	SC	PC	1-3-
Disgusted	-	-	-	SC	-	-	SC	PC	I-3	SC	-	-	SC	PC	-	SC	-	I-2	SC	-	I-3	SC	-	-
Happy	SC	PC	I-1	SC	PC	I-1	SC	-	-	SC	PC	I-1	SC	PC	I-3	SC	PC	I-1	SC	PC	-	SC	PC	1-1
Sad	SC	-	I-1	SC	-	I-1	SC	-	I-3	-	PC	I-1	SC	PC	-	SC	-	I-1	SC	PC	I-1	S/C	PC	I-1
Scared	SC	PC	-	SC	-	-	SC	-	I-1	SC	-	I-2	SC	-	-	SC	-	I-1	SC	-	-	SC	-	-
Surprised	SC	PC	I-1	SC	-	I-1	SC	PC	I-1	SC	-	-	SC	-	-	SC	PC	-	SC	PC	I-1	SC	-	I-1

throughout sessions continued to do so which made her peers more likely to correctly identify an emotion when Eve was expressing that emotion.

Although Eve was able to correctly express emotions to her pairs, she was not able to identify her pair's emotions with the same level even when her pair correctly expressed the emotions of disgusted and sad in session five and calm in session six. Eve's awareness of herself correctly expressing emotions was not congruent with identifying when others, in this case, her pairs were correctly expressing an emotion. It was in session six that Eve stated, "I have a white thing on my tongue" and began to scrape off the tiny white dot, with her index finger fingernail. Similar to Dawn, Eve stated she had noticed "the white thing" for the first time, during that sixth session. Eve was the student that teachers might choose to pair up and help a student that may be struggling in identifying their own and/or others emotions.

Eve identified the emotions of happy and surprise correctly on her first choice, and mad on her second choice in the pre mirror CAFE emotion set for a total of eight points. In the post session, Eve identified sad, scared, surprised, happy, mad and disgusted on her first choice for a total of and 15 points, and increase of seven points.

Frederick

Frederick was identified as a six year and 11 month neurodiverse Caucasian male. His pre mirror TRF indicated he read far below grade level and post TRF indicated he was reading somewhat below grade level and had an expressive language difficulty with a speech delay. Fredericks' pre and post TRF indicated all empathy subset areas were not true. His pre mirror intervention CBCL parent assessment also indicated a not true ranking for all empathy behaviors.

Frederick's parent indicated he played video games more than average when compared with others his age. His parent also indicated he had a colloid cyst on the third ventricle (within his brain).

As indicated in Table Seven, Frederick had difficulty correctly expressing the emotions calm, disgusted, or surprised in the first session although he correctly identified his pair's emotions of calm and disgusted. During sessions five through seven, Frederick correctly expressed the emotion of disgust and in session eight, Frederick offered his own emotion word of "nervous" to describe the pair's incorrect expression of disgusted. During the sixth and seventh sessions Frederick was able to correctly express all emotions correctly, except for scared. Frederick was observed in the sixth session to place his open hands along the sides of his face and keenly observe himself in his reflection as he opened and closed his mouth and pushed his cheeks together. Rather than 'clowning', this was considered to be more of an awareness check of his reflection as his eyes looked intense and inquisitive and his demeanor serious.

Frederick was the student that identified the emotion of scared as "she saw a ghost", in the pre mirror CAFE session. Also in the pre mirror session, Frederick described the models appearances more than he did their emotions, offering, "opening his mouth, eyes look freaky, closing his eye, hair is long, and sticking out tongue". Frederick correctly chose the emotions happy, angry, and sad on his first choice for nine points and in the post mirror CAFE session, he correctly identified scared, happy, angry on his first choice, sad on his second choice and calm on his third choice for a total of 12 points.

Table 7 Frederick

Emotion	First Session			Second Session			Third Session			Fourth Session			*Fifth Session			Sixth Session			Seventh Session			Eighth Session		
Angry	SC	-	I-1	-	PC	I-1	-	-	-	SC	PC	I-1	SC	PC	I-1	SC	M	M	SC	-	-	SC	PC	I-1
Calm	-	C	I-3	SC	PC	I-3	SC	-	-	-	-	-	SC	PC	-	SC	M	M	SC	SC	I-2	SC	PC	-
Disgust	-	-	I-2	-	-	-	-	-	-	-	PC	I-2	SC	PC	-	SC	M	M	SC	SC	I-2	SC	-	W d
Happy	SC	PC	I-1	SC	PC	I-1	SC	PC	-	SC	PC	I-1	SC	PC	I-3	SC	M	M	SC	SC	I-1	SC	PC	I-1
Sad	SC	-	I-1	SC	PC	I-1	-	-	-	SC	PC	-	SC	PC	I-1	SC	M	M	SC	SC	I-1	-	PC	I- 1-
Scared	SC	-	-	-	-	I-1	SC	-	-	-	-	-	-	PC	I-2	-	M	M	-	-	-	-	PC	-
Surprised	-	PC	-	SC	-		-	-	-	-	-	I-2	-	PC	I-3	SC	M	M	SC	SC	-	SC	PC	I-2

Gregory

Gregory was identified as a seven-and-a half-year-old neurodiverse male of Middle Eastern and African American decent. He read at the somewhat above grade level for both pre and post mirror TRF assessments. Parent reported on both pre and post mirror CBCL assessment that Gregory played video games the average amount of time. There were no empathy subset behaviors reported in the sometimes or often range, all empathy behavior were reported at a zero ranking for the TRF and CBCL assessments.

Table Eight indicates that in the first session, Gregory correctly identified angry, happy, and surprised. When Gregory was presented with the emotion calm to express, he placed his thumbs and index fingers together in an ‘ok’ sign with back of his hands facing outward and his three fingers (not thumb or index finger) facing toward the mirror, as if he were meditating. He closed his eyes and hummed. Almost all peers understood that Gregory expresses calm in this way and correctly discerned he was expressing calm, as one peer stated, “Oh, he always does that to calm himself down”. The first time Gregory was able to correctly identify the expression of calm was in the fifth session, and he correctly identified the emotion calm in all remaining sessions. He correctly identified the emotion disgusted only one time in session six, and in session seven he correctly identified angry, sad, scared and surprised. Gregory opened his eyes and did not hum in the sixth session or the eighth session (he was absent during the seventh session), curious to see what he looked like when he was expressing calm.

Gregory was the only student that did not increase SPAFF accuracy in expressing emotions or from pre to post mirror CAFE emotion identification. In the pre mirror CAFE

Table 8 Gregory

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
Angry	SC	-	I-3	SC	-	I-1	SC	-	I-2	-	PC	I-1	SC	-	I-1	-		I-1	A	A	A	SC		I-1
Calm	SC	-	-	SC	PC	-	-	-	-	SC	-	I-1	SC	PC	I-2	SC	PC	I-2	A	A	A	SC		-
Disgusted	-	-	-	-	-	-	-	-	C	-	PC	-	-	C	-	SC	-	I-1	A	A	A	-		-
Happy	SC	PC	I-1	SC	PC	I-1	SC	SC	I-1	SC	PC	I-1	SC	PC	I-1	SC	PC	I-1	A	A	A	-	PC	I-1
Sad	SC	PC	-	SC	PC	-	SC	-	I-1	SC	-	I-1	SC	PC	I-1	-	PC	-	A	A	A	SC	PC	I-1
Scared	SC	PC	-	-	-	I-2	-	-	-	-	PC	-	-	-	-	-	-	I-1	A	A	A	-		I-2
Surprised	-	-	I-3	-	PC	-	-	-	-	-	PC	I-1	-	-	I-1	SC	PC	-	A	A	A	-	PC	-

session he correctly chose happy mad, sad and scared on his first choice for a total of 12 points and correctly identified happy and angry on his first choice and calm and disgusted on his third choice for a total of eight points, a decrease of four points. Gregory may have lost interest and did not do his best on the post CAFE pictures, or he could have experienced some sort of awareness that he was less sure of what he thought an emotion like scared looked like as he increased his own construct of what a given emotion can look like in himself or others. It should be noted the Gregory did increase his third choice accuracy in the post session.

Harris

Harris was identified as a ten year old-neurotypical Hispanic and African American male with expressive language speech delay, who read somewhat below grade level on the pre mirror TRF and at grade level on the post mirror TRF assessment. Although Harris was older than his peers it was reported by his teacher that he had not repeated any grades. Neither pre or post TRF or pre CBCL indicated any area of empathy subset behaviors that were not true. The parent did not complete the post CBCL.

Table Nine indicates Harris correctly identified four emotions correctly in the first, third, fifth, and sixth sessions, however, the emotions varied. He correctly identified angry in five sessions, calm in two sessions and surprised on his third choice in session two and session four. He correctly identified three emotions angry, happy, and sad in the eighth session although his pair in that eighth session did not correctly express the emotion happy. He correctly identified the emotion of sad in all his pairs across sessions. Harris was the only student that did not

increase his correct identification of emotions in others and was able to express only three or four emotions correctly in each session.

Table 9 Harris

Emotion	First Session			Second Session			Third Session			Fourth Session			Fifth Session			Sixth Session			Seventh Session			Eighth Session		
Angry	-	PC	I-1	-	-	C	-	PC	-	SC	PC	-	-	PC	I-1	-	PC	I-3	SC	-	I-3	-	PC	I-1
Calm	-	PC	C	-	-	-	-	PC	I-1	-	-	I-2	SC	PC	C	SC	PC	-	-	-	-	-	PC	-
Disgusted	-	-	I-1	-	-	C	S C	-	I-1	SC	-	I-3	C	-	-	SC	-	-	-	-	-	-	-	-
Happy	SC	PC	I-1	SC	PC	I-2	S C	PC	-	SC	PC	I-1	SC	PC	I-1	SC	PC	-	SC	PC	I-1	SC	-	I-1
Sad	SC	PC	I-1	-	-	I-1	S C	PC	I-1	SC	PC	I-1	SC	PC	I-1	-	PC	I-1	SC	-	I-3	SC	PC	I-3
Scared	SC	PC	-	-	-	-	-	-	I-3	-	-	-	-	-	I-1	-	-	I-2	-	-	-	-	-	-
Surprised	-	-	-	-	-	I-3	-	-	-	-	-	I-3	-	-	-	SC	PC	I-1	-	-	-	SC	-	-

Harris correctly identified the emotion of mad on his first choice in the pre mirror CAFE session for three points. Harris also described what he thought the model in the picture was wearing or what they had eaten. For example, he stated, “hurt his ear, feeling his shirt, he feels orange, she’s hungry and had juice”. He was not able to provide third choices for any of the CAFE emotion photographs and provided only one second choice with none of the second or third choices correct. Harris increased his score in the post mirror CAFE session to 16 points and was able to provide an emotion and not a description in the post session. Harris correctly chose scared, happy, surprised, angry, and disgusted on his first choice and chose sad correctly on his third choice.

Overview of Mirror Awareness Themes

Figure Eleven depicts the Awareness process outlining the dynamic of self (1), the self-to-other- and other-back-to self dynamic (2), and the self-to-self (3) reflection of how self might better represent self (express emotion), toward beginning the process of (1) and (2) over again and again as self increases awareness with every alliteration. The Awareness graphic recognizes and expands on the earliest work of Cooley (1902, 1922 reprinted 1964), Jung (1944), and Mead (1962), later work by Kalisch (1973) and more recent work of Bloom (2016) and Segal et al. (2017) that decried the importance of having one’s own self intact, in order for the self to correctly see another. Duff and Flattery also referred to the awareness of the boundary of the self as distinctive from other analogous to self having a ‘self-permanence’ much like Piaget referred to an object permanence, because one must realize the self does not disappear and self must continue to be aware of the presence of self as self discerns and evaluates how self is

different or similar to other. Self then integrates that newer awareness of self (based upon how self thinks about how other perceives self) and integrates that increased awareness into self's future behavior (ex. expression of emotion). If self is not aware of self's expression of an emotion, how can self discern the emotions of others?

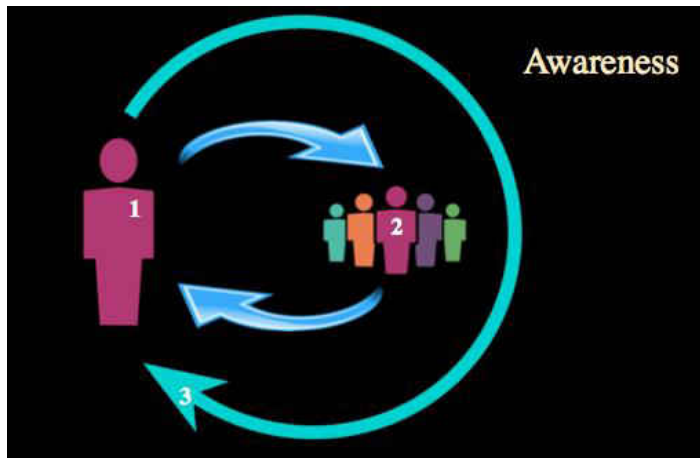


Figure 11 Self and Other ToM Awareness

Overview of Overall Themes

Seven of the eight students increased accuracy in identifying the emotions of others and all increased accuracy in the expression of emotions. Students increased awareness of themselves as evidenced in the increased SPAFF accuracy scores, and awareness of other as indicated in identifying pair's emotions. Awareness of others could also be the result of the increased pre and post scores of the CAFE photograph set, although increase in other awareness in the pre and post CAFE (flashcard) set could be a result of the mirror intervention because the mirror intervention had increased awareness of self and awareness of others emotions.

In addition to expressing emotions to their peers and identifying the emotions of their peers, all students participated in identifying the emotions of children that they did not know, the

children in the CAFE flashcard set. This was given to students two times, once before the mirror intervention first session and once after the eighth session of the mirror intervention. During the first EWA CAFE set, all students, especially students with neurodiversity, were more likely to describe the model in the photograph more easily than the emotion the model was expressing. This may have been due to the change in the EWA card to students having free choice for all emotions, without a word bank provided, which is consistent with the literature about free choice and individuals with ASD. Students had learned the eight emotion words for the EWA word bank during the mirror intervention and as such, were more apt to state one of the eight emotions from their memorized word bank from which they could choose the emotion they thought best described the model's emotion in the flashcard and would have positively skewed responses. Nevertheless, student results indicated increases in identifying the emotions of others in the CAFE set flashcards and increases could be attributed to increases in self and other awareness, facilitated by the mirror awareness experience.

Social Validity and Perception

The pre and post intervention parent and teacher rank ratings (0, 1, 3), subset measures related to empathy behaviors included the following behaviors: physically attacking people, teases a lot, bullying, threatens people, steals, vandalism, cruelty to animals, hitting others and not getting along. Pre to post behavior changes reported by teacher and parent agreement for the four pre and post CBCL and TRF included two students identified as not exhibiting any subset behaviors. One student decreased from two to one for bullying, teasing, and stealing, and one

student increased from one to two for cruelty to animals and that student also decreased their stealing from others from two to one, yet stealing from the home was unchanged at two.

Although self-report by teachers and parents may become skewed (teachers may have a bias in showing improvement for how well the empathy program was facilitated and parents may be reticent to share their child's negative behavior), the positive results reported by teachers and parents indicated the empathy skills program and the interventions were of some value. Students reported they enjoyed participating in both interventions, as evidenced by comments such as, "Do we get to go to the mirror today?" "We like going to the cafeteria in pairs" and "getting three chances" to identify emotions. Although stated earlier, it should be noted that all students, including students with expressive and receptive language difficulties, were able to independently identify all eight emotion words and feelings by the end of the fourth session. The ability to identify all eight emotion words on sight speaks to the validity of the mirror intervention as an academic as well as critical social intervention.

Central Research Question and Sub Questions

The central research question in the study was how is a student's awareness in expressing emotions and identifying the emotions of others established and changed through a mirror-based intervention. The study provided a mirror intervention that saw measurable increases in identifying the emotions of others.

Sub Question One

What is the relationship between a student expressing emotions correctly and identifying emotions correctly? As students increased accuracy in expressing emotions, seven out of eight students increased accuracy in identifying the emotions of others.

Sub Question Two

Do increases in the accuracy of expressing emotions also lead to increases in third, second or first choices in correctly identifying the emotions of others? All students increased their second and third choice accuracy in identifying the emotions of others. Increases in second and third choice accuracy would not have been realized nor were expected to be achieved with such a small sample size or in a traditional binary emotion assessment.

Sub Question Three

What emotions are least likely or most likely to be expressed and/or identified correctly? Students in the study had the most difficulty identifying the ‘negative’ emotions of angry, surprised, and disgusted, similar to the literature and results reported by LoBue et al. (2015). Emotion expression can vary and is not universal (Russell 1994, 1995). However, as students began to recognize their peers’ negative emotions in the present study, they increased identification accuracy of the emotions of their peers. Some students were able to identify an emotion correctly in their pair even when their pair had not expressed the emotion (according to SPAFF code) correctly. Perhaps there was another level of consciousness and awareness, that a student intuitively knew their pair was expressing ‘surprised’ or ‘sad’ on some unknown level of

conscious awareness level that could not be identified at this time using the instruments in this study. The level of student intuition is not only limited in being measured, but is not one being studied in alignment with the reading of emotions as typical emotional identification responses from flashcards or images of strangers, yet the students in this study did know (had personal awareness) their peers and this may have been a factor in this study.

Chapter Four Summary

Chapter four provided the results of the mirror intervention related to students' correct identification of emotions in others, and in themselves. Seven out of eight students increased their SPAFF scores and pre and post CAFE emotion identification scores. The most dramatic improvement was evidenced by increased mirror attention to self, resulting in increased expression of emotions as measured by SPAFF coding, and identifying the emotions of others through the EWA, as well as the EWA free choice during the pre and post CAFE emotion identification flashcards. Students enjoyed being paired with their peers and genuinely enjoyed expressing emotions and identifying the emotions of their peers. There were no behavior issues observed or reported by the students and they enjoyed getting to know their classmates and themselves on a deeper level of awareness.

CHAPTER FIVE: DISCUSSION

This chapter discusses the results of the study and highlights current and future implications for the mirror intervention toward fostering a healthy sense of self in students, and students' perceptions of others. The selfie phenomenon is discussed as it relates to presenting one's self in the best digital presentation of that self and continually being scrutinized on social media in highly visual digital world. The importance for face-to-face, #real human connections through providing students true virtual or real world experiences is discussed. Lastly, the mirror intervention as a social emotional learning skills curriculum is provided to build classroom community and to provide students with a real life experience to increase awareness of themselves and the gender, ethnic, cultural, and unique abilities of their peers. A student that gaining awareness of his peers through the mirror intervention would feel more connected to class peers, and for example could be thinking, "Oh, I remember Joey looked like that when we were in the mirror and now I think he might be making that same face because he is scared or mad. I think my friend might be upset so I will ask him if he is".

Measurable Changes in Emotion Awareness

All students were able to independently and accurately identify all emotion words on the EWA by the end of the fourth session. The EWA measured total accuracy scores by assigning three points for each first choice response correct, two points for each second choice correct, and one point for each third choice correct for a possible total of 21. The decrease in Gregory's accuracy in self-expression of emotions as measured by the SPAFF, and identification of the emotions of others as measured by the EWA, suggests some sort of shift in self and/or self-other

awareness occurred as he decreased the number of first correct choices from the first CAFE set emotion identification compared to the post mirror intervention CAFE EWA.

Teaching Empathy Through Self Awareness and Awareness of Others

Davis (1990) stated, “empathy occurs when we ourselves are experiencing it, rather than directly causing it to happen. This is the characteristic that makes the act of empathy unteachable” (p. 707). Perhaps empathy cannot be taught directly (how does one teach an emotional feeling), however the present study provided an indirect teaching of empathy through a mirror-based methodology that provided opportunity for a student to express a feeling and evaluate the correctness of that feeling, while that feeling was simultaneously being identified by a peer. Including the two-way mirror intervention at the beginning of the school year may augment or replace the two dimensional “All About Me” posters, commonly used as an icebreaker at the beginning of the school year. The ability to teach empathy from known peers and authenticate images is an untapped avenue that needs further exploration but is important consider with students with ASD often being educated with their nondisabled peers. This need to read emotions of peers is something that could be a positive investment for teachers to consider the use of the mirror intervention to better understand self and others in inclusive settings.

Building Community in the Classroom

Teachers commonly understand the importance of building an inclusive community within the classroom. The mirror intervention can be a fun activity for all students to get to know their classmates including students of other genders, diversities, ethnicities, differences and

unique abilities. Students with physical and communication challenges can feel especially isolated from peers. As non-disabled students are paired with students with ability challenges, students can learn about each other and truly ‘see’ one another. For example, a child might learn “Mickey has a wheelchair and is not able to run around the room, but after looking at him through the mirror, I learned that Mickey’s eyes will open bigger and he lifts his head when he is really excited about something.” The implications for opposite gender pairing can break down stereotypes and increase student awareness of gender differences as some and not all girls are more expressive and some and not all boys are less expressive. Cultural awareness and understanding can be more meaningful when experienced in real life and in real time and the mirror intervention can provide a fun opportunity for increasing cultural and ethnic diversity. The mirror intervention can also provide an opportunity for teachers to increase awareness of their students and that increased teacher awareness might lead to more individualized academic strategies and decreased problematic behaviors.

Emotion Awareness Drives Emotion Behavior

Increasing awareness of emotions through flashcards or digital media is just that – an increased awareness of flashcard emotions and digital emotions. With respect to emotion flashcards, apart from the difficulty with match-match intervention producing a conditioned stimulus-response or a memorization of what a “happy” picture flashcard looks like, any increased awareness of flashcards is likely to be transferable to real world awareness of what “happy” looks like in the real world. Bandura (1977) stated “evidence that elementary performances can be increased through reinforcement without the mediating effects of awareness

does not mean that people can learn to respond in accordance with relatively complicated principles” (p. 5). It is not enough to simply reinforcement correct response in match-emotional-word-to-picture scenarios without checking student awareness to determine student thinking process of how the student knows the emotion is correct or why they thinking lead to an incorrect response.

Executive functioning (EF) impairment can present difficulties with “higher order cognitive skills such planning, organizing, synthesizing, initiating, prioritizing, time management, and multitasking” (Wolf and Ventola, 2013, p. 199). Supports to accommodate and/or overcome EF difficulties in individuals with ASD include; daily schedules, electronic device (smartphone, tablet), lists of reminders, alarms, color-coding, and graphic organizers (Wolf et al., 2013, p. 292); Meltzer, 2007, p. 143; Gilotty, Kenworthy, Sirian, Black, & Wagner, 2002, p. 242). The real EF difficulty lies within teaching students to respond to external EF clues and cues without regard for the student’s internal processing. In the example, “a student must learn to start and/or stop when the timer indicates” (Meltzer, 2007, p. 143), is the student stopping because they externally heard a bell, or because they internally and cognitively understand time is up? A student must have an internal awareness of self, other, and given situation if expected to ‘self monitor’ and independently transfer EF skills across settings, time, and circumstance. In the same way when teaching students how to identify the emotions of others, teaching to the outcome behavior without awareness of each student’s internal processes of awareness of how the emotion feels and looks in ourselves and feels like and looks like in others is analogous to conditioning a basic stimulus-response set with no appreciation or respect to the integral interdependent awareness components involved in identifying emotions.

Baron-Cohen, Lombardo, and Tager-Flusberg (2013) aptly stated “empathic experience likely contributes to our mentalizing abilities by teaching us the meanings of specific affective cues” (p. 196).

Digital Awareness Difficulties

Teaching emotion awareness through red-faced cartoon characters or misshaped twisted ear caricature emotion flashcards or photographed flashcards of unknown and unconnected others may have individuals looking for someone with red face or twisted cartoon ears to know that individual is angry or the archetypical model of a given emotion. The following quote from an individual with ASD illustrates the same difficulty that lies within the digital gaming world. “It is really hard to pick up sarcasm over text. But if someone has a smiley face with its tongue sticking out [emoticon] or something like that, it is a little bit of a red flag that something is going on” (Gallup & Serianni 2017, p. 126). Gamers have described using emoticons and online conversations as tools to interpret what others may have been feeling (Gallup et al., p. 126). Although it would be easier to determine emotions if an individual’s ears were twisted like a cartoon, or another individual held up an emoji to indicate sarcasm or other emotion – this is unrealistic in the real world. Increased dependence on digital world relationships has potential to compromise real world interpersonal and intrapersonal relationships across the lifespan.

It may better serve individuals to increase their awareness of their own and others emotions within a real world context, especially if the expectation is that skill is to be demonstrated in the real world. Although there is value in social gaming, presupposing emotion awareness can be easily transferred from a highly controlled digital world to the unpredictable

real world may be a leap and may be detrimental. As an individual becomes more comfortable in the false, digital world and less comfortable in the real world, they may isolate their social communication exclusively to the digital world, spending more and more time in the digital world and less and less time in real world socializing. A study by Ko, Liu, Hsiao, Yen, Yang, Lin...& Chen (2009) found that “the neural substrate of cue-induced gaming urge/craving in online gaming addiction is similar to that of the cue-induced craving in substance dependence” (p. 739). Lastly, the outlook for successful demonstration of real world ‘soft skills’ that employers increasingly demand (team work and working together in the real world, reading non-verbal body language and the awareness of expressing emotions and identifying emotions of others of others, would be challenging for an individual confined to digital world expression and identification.

Teacher Emotion Awareness

Educators must provide students opportunity to integrate and build on their own emotion awareness within themselves and within their students. Social skills interventions that provide opportunity for experience and self-reflection are vital for any individual building construct of self, and of other. “The brain perceiving the actions of others’, through their own (self) simulation - meaning of ‘others’ actions is inferred as we understand others’ affective states only by recruiting the same networks that represent our own (self) affective states, was termed “the shared network hypothesis of empathy” (Baron-Cohen, Lombardo, and Tager-Flusberg, 2013, p. 199). An individual, therefore, must have consciousness and awareness of self, then other, then self – in order to know any reflexive understanding of what other may be thinking or feeling.

With self-projection we imagine what others' mental states could be like by considering how we would experience them ourselves. We project our own mental states on to others. One must therefore be aware of his/her own self's mental/affective state in order to understand or have awareness of another's mental or affective state. Social skills programs providing opportunities for individuals with ASD to experience their affective and mental state, and another/others' affective and or mental state would be more beneficial toward increasing ToM than social skills programs constructed around teaching memorization of what others could or might be feeling. As with the myriad of emotion flashcards available to teachers for interventions, there are also many computer programs available to 'teach' emotion awareness (the reference to vehicle to teach emotions referenced earlier on pages 18, 19. Teachers must be able to discern whether external computer programs or flashcard interventions truly serve and best serve the needs of their students when a simple classroom mirror intervention such the present study can help students to develop their emotion awareness in a meaningful, real world way.

Teachers could use the 'selfie' phenomenon as way to increase student awareness of the image of his/her self that he/she is projecting into the digital world. Discussion pertaining to "What image of yourself are you projecting into the digital world?", and "What does your digital footprint say about you and your friends?", along with 'stranger danger' dialogue that could increase student awareness around what to post (student names, activities and locations), that could leave students vulnerable to internet trolls or child predators. This could be done during morning circle time, before or after the mirror intervention to enable students to increase their awareness of self, relative to a safe known other (classmate) or unknown other (internet stranger).

Increased Teacher Awareness Can Positively Impact Classroom and School Climate

In addition to a tool to build classroom community, the mirror intervention is an effective tool for teachers to build their own awareness in how they express emotions and identify the emotions of their students. Richardson and Shupe (2003) reported “helping youth with emotional and behavioral disabilities begins with understanding ourselves, particularly our own emotional processes” (p. 9), and Englehart (2013) stated “self-awareness is crucial for teachers in order to consciously and deliberately monitor and regulate their own behavior processes” (105).

In addition to building classroom community and increasing classroom student and teacher emotional awareness, the two-way mirror intervention could be incorporated into a small group social emotional skills program, or a school improvement plan objective. One twenty-minute mirror session two times a week for four weeks has the potential to increase positive relationships and decreased problematic behavior associated with negative relationships within the classroom and school wide.

Study Limitations

The low number of eight students in the study prevents the reporting of effect size and study generalizability to the larger population. Nevertheless, the study aimed to increase the body of knowledge about how children learn ToM and empathy, and explore whether an inexpensive, low tech, high student interest mirror intervention can increase awareness of emotions in others. Parents of the students in the study may not share the same parenting approaches or strategies with one parent’s use of positive reinforcement or rewards their child when that child demonstrates empathy or awareness for others. Another parent may feel that

instilling in their child the notion that some emotions should not be expressed (ex. “stiff upper lip”) will help their child navigate social emotional relationships. Another limitation of the study was teacher report. One teacher began a leave of absence during the study and the replacement teacher did not obtain any of the CBCLs returned from parents. Out of the four post parent CBCLs that were returned and compared to baseline parent CBCLs, two parents of students in the mirror group reported a decrease in stealing from others and in bullying others. The two remaining students did not report any concerns of bullying, vandalizing, aggression, stealing, teasing, or cruelty to animals. Teachers did not report the fidelity of implementation of the SH Empathy and Critical Skills Curriculum and the SH program was not evaluated through this research study although the SH program may have increased benefit for students when implemented alongside the mirror intervention.

Recommendations for Research

The present study aimed to investigate the relationship between self and other awareness toward increasing correct expression and identification of emotions in others. Empathy definitions and interventions have primarily relied upon empathy as an observable behavior. Individuals with communication challenges may have difficulty in expressing empathy, and one cannot assume another individual lacks empathy. It makes rational sense that we must see evidence of empathy to know if someone has empathy, however the definitions of empathy are an all or nothing proposition. The present study sought to measure increases in empathy, to provide evidence that thinking about others was occurring and quantify the approximations in

increase from third to second, second to first and first choice accuracy in identifying others, that binary tests have not measured.

Researchers have attempted to identify areas of the brain involved in emotion recognition evidenced through the brain ‘lighting up’ in specific areas when recognizing emotion (Baron-Cohen, 2011; and empathy (Völlm et al., 2006) and may provide clues to how we know what a person is feeling, and eventual possibility in determining self and other awareness levels. Future research pertaining to the present study might look at EEG patterns of individuals with and without ASD to determine if and where in the brain there are corresponding increases in self and other awareness when accuracy in identifying emotions in self and others also increases.

Additional research could isolate factors that may be more or less likely to contribute to accurately identifying emotions in others, and in our selves. Covariates of ASD, gender, culture, and ethnicity could provide insight into what students and under what condition (gender opposite pair, ethnicity difference pair, non-disabled and disabled pair) that would serve to increase a student’s awareness and subsequent increases in a student’s emotion identification bank, similar to academic interventions that build on student schema to integrate new experiences into learning.

Researchers and educators are not alone in their interest in identifying emotions of others. Identifying the emotions of others has taken on national importance with corporations such as Humintell (2017) positioned to provide “scientifically validated, emotion recognition training tools feature images of individuals portraying the seven basic emotions of anger, contempt, fear, disgust, happiness, sadness and surprise, for individuals in law enforcement, attorneys,

psychotherapists, counselors, therapists, life coaches and social workers.” Identifying the emotions of others is becoming more important in schools, communities and the workplace.

Concluding Thoughts

When an individual has demonstrated an ability or skill in one environment and is able to demonstrate that same skill in a different or new environment, that individual has generalized the skill and the new environment should afford that transfer of skills. Many individuals, especially with ASD, are able to demonstrate many problem solving and emotionally savvy skills in the digital medium playing online and other video games, yet are unable to transfer and demonstrate those skills in the real life true-virtual world. Arguably, ability to demonstrate a social skill in a highly controlled environment remains ability to demonstrate that particular skill in that highly controlled environment. The difficulty in expecting a transfer of skills from the predictable, low stakes digital world of ex. gaming to the true-virtual world where real human people are less predictable in an environment that is less controlled is problematic.

Alternatively, repetition of flashcard and student accuracy rate may have more to do with memorizing flashcard model’s emotion expressions and less to do with increasing awareness of others emotions. Emotion flashcards are two dimensional and as such might not be as helpful as a real life, real world, three dimensional intervention such as the two-way mirror in the present study, especially if the goal is for students to identify others’ emotions in the three dimensional world. The two-way mirror intervention provides students the opportunity to self-reflect in real time and adjust their expression based upon self-directed, internalized feedback. That is more likely to increase accuracy and elicit positive social feedback from others (if one’s self becomes

more accurate in projecting emotions accurately, others will positively reinforce that self's accuracy and consequently, that self will feel more competent. Understanding the interdependency of the self-other-asserted by Segal et al., and Mead's assertion that self is developed through perception of how self perceives other is perceiving self, that develops self is specifically relevant any self expressing and identifying the emotions of others.

The construct and law of specificity should and must be recognized when designing social emotional learning interventions. The mirror intervention provided students with a real time, true-virtual representation of their own self's expression of emotions, and emotions of others. The mirror intervention occurred in the environment in which teachers and employers expect the skill to be demonstrated. Providing an intervention in one environment medium and expecting the behavior to be transferred under the conditions of a completely new environment may not be realistic, or fair. A student may demonstrate social emotional evidence in one environment and arguably that is evidence that an individual has some ability to demonstrate a given skill set under the conditions of an externally controlled environment digital medium as in gaming or physical medium such as the flashcard medium. Earles-Vollrath, Tapcott-Cook, Robbins and Ben-Arieh stated "a priority for any education program should be to promote independent use of acquired skills across natural environments, in multiple contexts, and with a variety of individuals" (p. 146).

The increases in self and other awareness evidenced in the present study could be evidence of self awareness and awareness of others (Segal et al., 2017) and self-other-self or 'looking glass self' by Cooley (1902, revised 1922). Empathy has been defined and redefined in the literature. Future considerations toward refining the construct of empathy may expand to

include additional methodologies and instruments to measure the awareness level of emotions in ourselves and awareness level of emotions of others that might include a highly engaging, low technology, teacher friendly, inexpensive, looking glass mirror intervention.

Empathy, compassion, and sympathy are feelings and unless and until we see ‘evidence’ of those feelings, we can only assume. Student responses have historically been judged as positive for ToM and empathy for others based upon a correct or incorrect response from an instrument that is more research friendly as easily quantified than student friendly as open or choice response. Binary measures can provide useful information but are limited by design. Additionally, Russell (1994) stated, “ecological, convergent, and internal validity of forced-choice response format, within-subject design, preselected photographs of posed facial expressions, and other features of method are each problematic” (p. 102). The present study reported gaps in the literature and identified the difficulties in defining and assessing empathy without assessing levels of awareness. Rather than a traditional two dimensional virtual computer image or flat flashcard drills of unknown models or cartoon characters, the study provided an opportunity for students to explore the experience of identifying emotions of their own self, and their peers in the real time, three dimensional, real world.

APPENDIX A: THE EYES TEST AND THE FILMS TEST PERMISSION

6/19/2017

RE: Autism Research Centre Tests - Christine Duff

RE: Autism Research Centre Tests

Gemma Giove-Hunt <gg434@medschl.cam.ac.uk> on behalf of
Douglas House Admin <dh-admin@medschl.cam.ac.uk>

Tue 5/30/2017 6:46 AM

To: Christine Duff <Christine.Duff@ucf.edu>;

Dear Christine,

Thank you for contacting the ARC. Permission is not required to use any of our tests. However, we do ask that you use the test responsibly and reference our work where appropriate. We wish you the best of luck with your dissertation.

Best wishes,

Gemma Giove-Hunt

Receptionist/Administrator

Tel: 01223 465180 (Ext: 65180) Fax: 01223 465270 | www.psychiatry.cam.ac.uk

Department of Psychiatry
University of Cambridge
Douglas House | 18B Trumpington Road
Cambridge | CB2 8AH

Hours: Monday 9:00 – Wednesday 13:30

From: Christine Duff [mailto:Christine.Duff@ucf.edu]

Sent: 29 May 2017 23:46

To: admin@autismresearchcentre.com

Subject: Autism Research Centre Tests

Autism Research Centre
University of Cambridge Department of Psychiatry,
Douglas House, 18b Trumpington Road
Cambridge CB2 8AH UK

Dear Administrator,

I am a Ph.D. candidate (ABD) in the Exceptional Education Program at the University of Central Florida (UCF). I am writing to request your permission to utilize and fully reference 'The Eyes Test' (children's version) and 'Reading the Mind in Films Test' in my dissertation, which examines abilities of individuals, particularly those with autism spectrum disorders, to perceive the emotions of others.

Although your website indicated, "Permission is not required to use any of our tests. We just ask that you use the test responsibly and reference our work where appropriate", it is UCF's policy that written permission be obtained from the owner/designer of any test used or referenced in a dissertation.

Thank you in advance for your consideration and prompt reply;

APPENDIX B. DATABRAY-CAFE SET PERMISSION

Databrary Access Agreement

The undersigned Institution wishes to allow its Authorized Investigators identified in Annex II ("Authorized Investigators") to access Databrary.

Databrary is a web-based data library housed at New York University designed for sharing developmental and behavioral data, including video files and associated metadata. Authorized Investigators have both contributor and user privileges to all shared data in the library. However, many uses of Databrary do not involve contributing data or conducting research on shared data. IRB approval is not required for access to Databrary; however, IRB approval is required to contribute personally identifiable data to be shared through Databrary or to conduct research on data obtained through Databrary.

By signing this Access Agreement, effective as of the date entered below, the Institution, on behalf of itself and its Authorized Investigators, hereby agrees to its terms, including those found in the attached Annex I, and hereby acknowledges receipt of and agrees to be bound by the Databrary Access Guide, including the Statement of Rights and Responsibilities for Databrary, for Institutions, and for Investigators, including those provisions regarding the contribution and use of data by Authorized Investigators and the Institution. The Databrary Access Guide may be amended from time to time. In addition, the Institution hereby agrees that the Institution and its Authorized Investigators will use Databrary and data obtained through it exclusively for the purpose of scientific research or education under an academic, research, government, health, or commercial entity (but in the last case, solely for non-commercial purposes).

By signing this Access Agreement, the Institution verifies that (a) it maintains an ethics or Institutional review board that reviews and approves research involving human subjects, (b) the Authorized Investigator(s) are eligible to conduct independent research at this Institution and the Institution accepts responsibility for its Authorized Investigators' actions related to the use of Databrary, (c) it grants the Authorized Investigators the authority to choose and manage affiliates who meet Databrary's qualifications and who agree to follow Databrary's ethical principles, and (d) the person executing this Access Agreement on behalf of the Institution has the authority to do so.

The Institution agrees that Databrary, New York University, The Pennsylvania State University, and the relevant funding agencies bear no responsibility for the use of Databrary or the information contained within it. The Institution indemnifies and renders harmless Databrary, New York University, and The Pennsylvania State University from all claims, losses, liability, and other damages that arise from Institution's or Authorized Investigator's violations of this Access Agreement, provided however, this indemnification shall only be to the extent and within the limitations of Section 768.28 Florida Statutes, subject to the provisions of that statute whereby Institution shall not be held liable, whether in tort, equity or contract, for any claim or judgment by any one person that exceeds \$200,000, or any claims or judgments, which, when totaled with all other claims or judgments arising out of the same incident or occurrence, exceeds the sum of \$300,000.

It is understood and agreed that this document shall constitute a separate agreement between Databrary and the Institution on behalf of each of its Authorized Investigators, as amended from time to time by the Institution and Databrary, to include additional Authorized Investigators as listed in Annex II.

As an Investigator, I acknowledge that I have read and understand the terms of this agreement.

Name and title of Authorized Investigator: Rebecca Ann Hines

Signature of Authorized Investigator: Rebecca Ann Hines

Date: January 16, 2017

As the Authorized Organizational Representative (AOR), my signature below indicates that I have authority to bind my Institution under this agreement.

Institution: THE UNIVERSITY OF CENTRAL FLORIDA BOARD OF TRUSTEES

Name & Title of AOR: STEVEN C. KOOGLE, ASSISTANT DIRECTOR

Signature of AOR: DLCKL

Date: 4/6/17

APPENDIX C. HOW ARE YOU FEELING PERMISSION

PERMISSION TO USE COPYRIGHTED WORKS IN DISSERTATION

Creative Teaching Press
6262 Katella Avenue
Cypress, CA 90630-5204
customerservice@creativeteaching.com

June 6, 2017

Dear Creative Teaching Press:

I am a Ph. D. Candidate in Exceptional Education at the University of Central Florida (UCF). I am writing you to request permission to reference the 'How Are You Feeling Today' from Creative Teaching Press in my dissertation, which examines abilities of individuals, particularly with autism spectrum disorders, to perceive the emotions of others. The Creative Teaching Press website indicated that you are the copyrighted owner of the emoji emotions card. It is UCF's policy that written permission be obtained from the owner/designer of any referenced material in a dissertation.

Please indicate your approval of this request by signing the attached document and returning it to me as soon as possible. Your signing of this letter will also confirm that you own the copyright to the above-described material.

Thank you very much for your consideration. I look forward to hearing from you.

Very truly yours,

Christine K. Duff
Ph.D. Candidate
University of Central Florida
Christine.Duff@ucf.edu
321-356-6964

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

By: Bunny Benson *Bunny Benson*

Title: Executive Assistant to the CEO

Date: 6/8/17

For:
How Are You Feeling Today? Emoji Chart
SKU: 5385

APPENDIX D. BOARDMAKER, TRADEMARK OF TOBII DYNAVOX PERMISSION

From: Pam DeLuca <Pam.DeLuca@tobiidynavox.com>
Sent: Monday, July 10, 2017 8:34:10 AM
To: Christine Duff
Subject: RE: New case email notification. Case number 00465639

No Problem Christine,

Please use up to 250 PCS with our permission. Please ensure that an updated copyright statement is included:

The Picture Communication Symbols ©1981–2016 by Tobii Dynavox. All Rights Reserved Worldwide. Used with permission.

Boardmaker® is a trademark of Tobii Dynavox.

Good luck on your dissertation!

Thank you!

Pam DeLuca

Customer Service/Inside Sales Representative

Tobii Dynavox

2100 Wharton Street, 4th Floor

Pittsburgh, PA 15203

Phone: 1-800-588-4548 x2

Fax: 1-866-585-6260

E-mail: pam.deluca@tobiidynavox.com

Web: www.tobiidynavox.com

APPENDIX E. DO2LEARN EMOTION CARDS PERMISSION

Re: Attn: Sandra; RE: Permission to Use Emotion Cards

Do2Learn Support <do2learn@do2learn.com>

Thu 3/30/2017 9:58 AM

To: Christine Duff <Christine.Duff@ucf.edu>;

Hi Christine,

You are welcome to print out the Do2learn picture cards and use them for your study, as long as you aren't going to be making any money or posting the images on another site.

Let me know if you have any questions, or if you need further written clarification.

Thanks,
Sandra
Do2Learn

On Wed, Mar 29, 2017 at 12:24 PM, Christine Duff <Christine.Duff@ucf.edu> wrote:

Hello Sandra,

I am emailing you as per our recent conversation to request permission to use the Learn2Do Emotion Cards Level One in a study I am doing to see if students can learn to recognize emotions. May I have permission to download and print the pictures from the following link?

<http://do2learn.com/activities/SocialSkills/EmotionAndScenarioCards/EmotionAndScenarioCards.pdf>

Please let me know if you have any questions. Thank you very much for your consideration.

Christine Duff

321-356-6964

Christine Duff, M.Ed., M.S.Ed.
Doctoral Candidate
Toni Jennings Fellow
LEAD Scholar
University of Central Florida
College of Education and Human Performance

APPENDIX F. LANGUAGE BUILDER PERMISSION

PERMISSION TO USE COPYRIGHTED WORKS IN DISSERTATION

Stages Learning Materials
PO Box 1770
Pacific Palisades, CA 90272
info@stageslearning.com

June 6, 2017

Dear Stages of Learning:

I am a Ph. D. Candidate in Exceptional Education at the University of Central Florida (UCF). I am writing you to request permission to reference the Language Builder Emotion Cards from Stages of Learning in my dissertation, which examines abilities of individuals, particularly with autism spectrum disorders, to perceive the emotions of others.

It is UCF's policy that written permission be obtained from the owner/designer of any referenced material in a dissertation.

Please indicate your approval of this request by signing the attached document and returning it to me as soon as possible. Your signing of this letter will also confirm that you own the copyright to the above-described material.

Thank you very much for your consideration. I look forward to hearing from you.

Very truly yours,

Christine K. Duff
Ph.D. Candidate
University of Central Florida
Christine.Duff@ucf.edu
321-356-6964

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

By: *Angela Nelson*

Title: President

Date: 06/08/17

APPENDIX G EMOTION CARDS PERMISSION

PERMISSION TO USE COPYRIGHTED WORKS IN DISSERTATION

Stages Learning Materials
PO Box 1770
Pacific Palisades, CA 90272
info@stageslearning.com

June 6, 2017

Dear Stages of Learning:

I am a Ph. D. Candidate in Exceptional Education at the University of Central Florida (UCF). I am writing you to request permission to reference the Language Builder Emotion Cards from Stages of Learning in my dissertation, which examines abilities of individuals, particularly with autism spectrum disorders, to perceive the emotions of others.

It is UCF's policy that written permission be obtained from the owner/designer of any referenced material in a dissertation.

Please indicate your approval of this request by signing the attached document and returning it to me as soon as possible. Your signing of this letter will also confirm that you own the copyright to the above-described material.

Thank you very much for your consideration. I look forward to hearing from you.

Very truly yours,

Christine K. Duff
Ph.D. Candidate
University of Central Florida
Christine.Duff@ucf.edu
321-356-6964

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

By: *Angela Nelson*

Title: President

Date: 06/08/17

APPENDIX H. SPAFF CODING PERMISSION

From: Jim Coan <jac3zt@eservices.virginia.edu>
Sent: Saturday, May 6, 2017 6:28 PM
To: Christine Duff
Subject: Re: SPAFF Coding Figure Permission

Hi Christine!

Feel free to use it!

And thank you for your patience!

Jim

From: Christine Duff
Sent: Friday, April 28, 2017 9:42 AM
To: jcoan@virginia.edu; jac3zt@virginia.edu
Subject: SPAFF Coding Figure Permission

Hello Dr. Coan,

I am a PhD candidate in the Exceptional Education track at the University of Central Florida. My dissertation pertains to assessing accuracy of first grade students in projecting and identifying emotions using a two-way mirror intervention.

I am hoping to reference Figure 16.2, p. 271, along with specifics of the Action Units (AUs), from your article Coan, J. A., & Gottman, J. M. (2007). The specific affect coding system (SPAFF). *Handbook of emotion elicitation and assessment*, 267-285, in my dissertation. I have attached the letter of permission to reference the Figure and the AUs. that I am hoping you will sign.

If you have questions or concerns, in addition to email, I can be reached via cell 321-356-6964.

Thank you for your consideration. I look forward to hearing from you.

Christine Duff

Christine Duff, M.Ed., M.S.Ed.
Doctoral Candidate
Toni Jennings Fellow
LEAD Scholar
University of Central Florida
College of Education and Human Performance
Orlando, FL 32816-1250

APPENDIX I. PARENT CONSENT



An Investigation of Mirror-Based and Flashcard-Based Interventions for First Grade Students in Inclusive Classrooms Participating in a Social Skills Program

Informed Consent

Principal Investigator: Christine Duff, M.Ed., M.S.Ed.
Research Assistant: Celestial Wills-Jackson, M.S.Ed.
Faculty Advisor: Rebecca A. Hines, Ph.D.
Investigational Site(s): UCP of Central Florida
Seminole Lake Mary Campus
756 N. Sun Drive Lake Mary, FL 32746

How to Return this Consent Form: You are provided with two copies of this consent form. If you give consent for your child to participate in the research, please sign one copy and return it to your child's teacher and keep the other copy for your records

Permission to Take Part in a Human Research Study

Introduction: Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being asked to allow your child to take part in a research study which will include about 30 students at UCP of Central Florida, Seminole/Lake Mary Campus, 756 N. Sun Dr., Lake Mary FL. Your child is being invited to take part in this research study, because he or she is a student in the first grade at UCP of Central Florida Seminole/Lake Mary Campus.

The primary person doing this research is UCF student Christine Duff, and UCF student Celestial Wills-Jackson is serving as research study assistant. Because Christine and Celestial are doctoral students, Dr. Rebecca A. Hines, a UCF faculty advisor in the Department of Child, Family, and Community Sciences, will guide them.

What you should know about a research study:

- Someone will explain this research study to you.
- A research study is something you volunteer for.
- Whether or not you take part is up to you.
- You should allow your child to take part in this study only because you want to.
- You can choose not to take part in the research study.
- You can agree to take part now and later change your mind.
- Whatever you decide it will not be held against you or your child.
- Feel free to ask all the questions you want before you decide.

Purpose of the research study: An important component of the Sanford Harmony social skills program is empathy and critical skills thinking. The primary purpose of this research study is to investigate whether a mirror intervention or a flashcard intervention has any effect toward helping young children learn empathy.

What your child will be asked to do in the study: The total length of study will be six weeks, with the first week obtaining pre intervention ratings for all students, and the sixth week obtaining post intervention ratings. The middle four weeks of the study is when the intervention will occur. The Sanford Harmony social skills program will begin the week of the intervention, and will continue throughout the school year.

If you do not wish to have your child participate in the group assigned, they will not be able to participate in this study. Students will receive the mirror intervention on Mondays and Wednesdays for four weeks. The research assistant (RA) will escort student pairs to and from the classroom.

The RA will assist students in choosing/circling their top three choices from the ten emotion words from the Emotion Word Assessment (EWA) for both the mirror and flashcard intervention. The principle investigator (PI) will privately tell the student projecting the mirror image the emotion word which word to project; that will read from ordered words previously chosen at random prior to the start of the study.

The mirror intervention students also will be photographed during the session. The photographs (of expressed emotions) will be used to assess the accuracy of the emotion projected. Students whose parents have not given permission to have their child photographed will not be included in the study.

UCF IRB Version Date: 01/2010

Permission to Take Part in a Human Research Study

The photographs will be numbered, based upon the expressed emotion (for example, if angry was the first word on session one; Session 1, angry was the first word so the number one will be written on back of the photograph).

Specific Procedures for the Mirror Intervention:

Upon entering the cafeteria, each pair of students will be told Please take your seat on each side of the panel display. One student will express the emotions and the other student will choose the emotion they think the person is expressing. You will switch sides after the emotions are expressed. Are you ready to begin?" Prompting by the PI will be consistent with pointing to the word and privately saying the word, and asking the individual projecting the emotion to "Look in the mirror at your reflection, what do you look like when you are feeling ex. happy". Please hold that expression until I can take a picture. When I have taken the picture, we will move to the next word.

Simultaneously as the PI is instructing the student in projecting the emotion, the RA will be sitting beside the student ready to receive and identify the emotion they see the individual project. The RA will say, "Choose your top three choices for the emotion that you think the person is feeling, if you do not see your word choice, you may write your own emotion word". Students will be provided a pencil by the RA, and if the student is not able to write their choices of words, the RA will write the word emotion that the student says. "For each word, the PI will ask the maximum number of prompts by the PI for each projection of emotion, and by the RA for each identification of emotion will be three.

What Parents will be Asked to Do: Parents will be asked to complete a rank order checklist called the Child Behavior Checklist (CBCL) on two occasions. The CBCL will be completed by parents at their home and parents will return the completed form to their child's teacher during the first and also the sixth week of the study (the middle four weeks are the mirror and flashcard intervention weeks).

Your child's teacher will provide demographic data about your child that will include your child's gender, age, ethnicity, disability, reading level and speech difficulty. If you do not want your child's demographic information shared, your child cannot participate in the study.

Additional Study Information: Your child will interact with Christine (PI) and Celeste (RA) throughout the interventions and will be supervised. Your child does not have to express or identify any emotion word or complete every task. You or your child will not lose any benefits if your child skips questions or tasks.

Location: The Sanford Harmony social skills program will be implemented in your child's classroom by your child's teacher. The mirror and flashcard interventions will occur in the school cafeteria.

Time required: We expect the time for each intervention session to be about 20 minutes for a total 40 mins x 4 weeks = 160 minutes or two hours and forty minutes.

The CBCL that parents will be asked to complete will take approximately 10 minutes to complete. As parents are asked to complete the CBCL two times, the overall study total amount of time expected for parents to complete the checklists is 20 minutes total.

UCF IRB Version Date: 01/2010

Permission to Take Part in a Human Research Study

Audio taping, video taping or camera:

All students in the study will be photographed using a iPhone 6S. If you do not want your child's voice to be recorded, or your child to be photographed, your child will not be able to be in the study.

The photographs and recordings will be used to assess the emotion and selected emotion photograph expressions or recordings may be used during written, or public presentation pertaining to the study. None of the photographs will be uploaded to "the cloud" and after photographs have been evaluated initially, and then at the end of the study, all photographs will be deleted.

Risks: There are no expected risks for taking part in this study.

Benefits: We cannot promise any benefits to you, your child, or others from your child taking part in this research. However, possible benefits include your child developing or increasing social skills.

Compensation or payment:

There is no compensation, payment, or extra credit for your child's part in this study. If your child chooses not to participate, you or your child may notify his or her teacher or the researcher, and there will be no penalty.

Confidentiality: We will limit your personal data collected in this study. Efforts will be made to limit your child's personal information to people who have a need to review this information. We cannot promise complete secrecy. Organizations that may inspect and copy your information include the IRB and other representatives of UCF.

Demographic information about your child such as reading level, disability, gender, culture/ethnicity, and speech difficulties will be coded in a way that will not identify your child. Your child will be issued a study identification number that will be cross-referenced with the rank order checklists and your child's scores. The PI is the only person that will have this information and your child will not be identified in any way. Along with the photographs, the cross referencing link pertaining to child's assigned identification number will be destroyed upon completion of the study.

Confidential research: This study is confidential. That means information such as your child's name will not be disclosed.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt your child talk to Christine Duff, Ph.D. student, College of Education and Human Performance, (cell: 321-356-6964; email Christine.Duff@ucf.edu) or Dr. Rebecca Hines, Faculty Supervisor, Department of Child, Family and Community Counseling at Rebecca.Hines@ucf.edu.

IRB contact about you and your child's rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For

UCF IRB Version Date: 01/2010

Permission to Take Part in a Human Research Study

information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

- The research team is not answering your questions, concerns, or complaints.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You want to get information or provide input about this research.

Withdrawing from the study:

You may decide not to have your child continue in the research study at any time without it being held against you or your child. If you decide to have your child leave the research, contact the investigator Christine Duff so that the investigator can remove your child from the study. The person in charge of the research study can remove your child from the research study without your approval. Possible reasons for removal include activity that causes harm to your child or other children.

Your signature below indicates your permission for the child named below to take part in this research.

DO NOT SIGN THIS FORM AFTER THE IRB EXPIRATION DATE BELOW

Name of participant

Signature of parent or guardian

Printed name of parent or guardian

Date

- Parent
- Guardian (See note below)

APPENDIX J. TEACHER CONSENT



An Investigation of Mirror-Based and Flashcard-Based Interventions for First Grade Students in Inclusive Classrooms Participating in a Social Skills Program

Teacher Informed Consent

Principal Investigator: Christine Duff, M.Ed., M.S.Ed.
Research Assistant: Celestial Wills-Jackson, M.S.Ed.
Faculty Advisor: Rebecca A. Hines, Ph.D.
Investigational Site(s): UCP of Central Florida
Seminole Lake Mary Campus
756 N. Sun Drive Lake Mary, FL 32746

Introduction: Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study which will include first grade students at UCP Seminole/Lake Mary campus. You have been asked to take part in this research study because you a first grade teacher at UCP Seminole/Lake Mary campus.

The primary person doing this research is UCF student Christine Duff, and UCF student Celestial Wills-Jackson is serving as research study assistant. Because Christine and Celestial are doctoral students, Dr. Rebecca A. Hines, a UCF faculty advisor in the Department of Child, Family, and Community Sciences, will guide them.

Purpose of the research study: An important component of the Sanford Harmony social skills program is empathy and critical skills thinking. The primary purpose of this research study is to investigate whether a mirror intervention has any effect toward helping young children learn empathy.

What you will be asked to do in the study: You will be asked to complete a rank order checklist called the Teacher Report Form (TRF) on two occasions, You will be asked to complete the TRF during the first week at the beginning of the study, and the sixth week at the end of the study.

In addition, you will be asked to distribute, collect and securely store until returned to the PI, the following: parent consent forms and the Child Behavior Checklist (CBCL) that parents will also complete during the first week and the sixth week of the study.

Lastly, you will be asked to provide student demographic information pertaining to the student's gender, ethnicity, disability, reading level and speech difficulty. You must not provide this information unless parents have provided consent (signed and returned the parent consent form).

Location: The middle four weeks of the study will include a mirror intervention on Monday and Wednesdays in the school cafeteria with the mirror session lasting about 20 mins each session. The RA will escort students to and from your classroom, two students at a time. You can complete the TRF in your classroom.

Time required: We expect that it will take you 10 minutes to complete the TRF each time, for a total of 20 minutes overall time.

Risks: There are no risks to you.

Benefits: There are no expected direct study benefits to you.

Compensation or payment: There is no compensation or other payment to you for taking part in this study.

Confidentiality: We will limit your TRF data collected in this study to people who have a need to review this information and you will not be identified. We cannot promise complete secrecy.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt your child talk to Christine Duff, Ph.D. student, College of Education and Human Performance, (cell: 321-356-6964; email Christine.Duff@ucf.edu) or Dr. Rebecca Hines, Faculty Supervisor, Department of Child, Family and Community Counseling at Rebecca.Hines@ucf.edu.

IRB contact in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX K. MIRROR FIDELITY CHECKLIST

Mirror Fidelity Check List

Instructions: If item was followed, write a 1. If item was not followed, write a 0. Each researcher will initial for each of the items assigned.

DATE	ITEM	1- YES 0 - NO	INITIAL
PROCEDURE (R, RA)	1. Mirror display panel set up, center of table. Chairs arranged, pencils on table		
	2. One sharpened pencil and EWA response card placed on non-reflective side of display		
	3. Students previously paired/rotation were escorted to cafeteria two at a time by RA		
	4. The R asked each student individually, to identify all words on the EWA 8X5 card		
	5. The student evidenced recognition of all eight words		
	6. If the student did not recognize a word, the R prompted the student by privately restating		
	7. Prompting was in level, monotone voice		
	8. Students were advised by R they would take turns expressing and writing each emotion word		
	9. The R read the directions on the EWA card to the students		
	10. The RA prompted the student to write their name of the index card.		
	11. The R explained the student must hold the expression in the mirror, until the R has taken photo		
	12. The R read the words in the correct order to the student on the reflected side of display panel		
	13. The RA assisted the student on the non-reflected side of mirror to complete 1 st , 2 nd , 3 rd choices		
	14. The RA assisted the student to write their new choice of word, if the student thought there was an additional emotion word that was not listed on the EWA word bank.		
	15. The RA ensured all EWA cards were completed		
	16. When seven emotions were expressed and EWA completed, the R advised students to change places and the same procedures were followed for expression, photos, and EWA completion		
	17. Upon completion of the students both having turn to express seven emotions and complete the EWA response card, the students were escorted back to classrooms and next pair escorted to cafeteria		
18. TOTAL		Out of 17	17

APPENDIX L. IRB PERMISSION



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Human Research

From: UCF Institutional Review Board #1
FWA00000351, IRB00001138

To: Christine Duff

Date: February 14, 2017

Dear Researcher:

On 02/14/2017 the IRB approved the following human participant research until 02/13/2018 inclusive:

Type of Review: UCF Initial Review Submission Form
Expedited Review

Project Title: An Investigation of Flashcard and Mirror-Based Interventions on Emotion Identification Scores for First Grade Students in Inclusive Classrooms Participating in a Social Skills Program

Investigator: Christine Duff

IRB Number: SBE-16-12802

Funding Agency:

Grant Title:

Research ID: N/A

The scientific merit of the research was considered during the IRB review. The Continuing Review Application must be submitted 30 days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at <https://iris.research.ucf.edu>.

If continuing review approval is not granted before the expiration date of 02/13/2018, approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

All data, including signed consent forms if applicable, must be retained and secured per protocol for a minimum of five years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained and secured per protocol. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Page 1 of 2



Signature applied by Gillian Amy Mary Marlen on 02/14/2017 12:39:34 PM EST
IRB Coordinator

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