Evaluating Inter-Method Reliability of Attachment Classifications and Limitations to Concordance in Middle-Childhood

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Senior Honor's Thesis

A thesis presented to the faculty of The University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the Bachelor of Science degree with Honors in Psychology

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Abstract

The current study examines the inter-method reliability of attachment classification paradigms in middle-childhood, and potential constraints disorganization and child-sex may have on the concordance of these measures. Two popular methods, the Manchester Child Attachment Story Task (MCAST) and Projective Family Drawings, assess the internal working models of children in order to evaluate attachment. Previous research has shown the MCAST to have robust internal reliability and content validity. This study examines dependency across methodologies in order to determine the reliability and validity of the family drawings. This study used a rural, low-income, African-American sample of 176 children who had completed both the MCAST and a family drawing collected from the Family Life Project to investigate the concordance of the two measures. Chi-square analysis found significant concordance for measurements of security and avoidance. Furthermore, high disorganization in the family drawing limited concordance of avoidant classifications. These findings are discussed in the context of their utility in clinical and research settings.

Acknowledgments

I would like to thank my mentor, Dr. Roger Mills-Koonce, for his amiable guidance and patience, and making the task of writing a thesis manageable/enjoyable. Graduate student Nicholas J. Wagner also helped me a lot with the research/writing process, and I thoroughly enjoyed the work and research I did for him. Acknowledgment is also due to Dr. Jean-Louis Gariepy for serving on my Honors Committee, and for teaching an engaging class that furthered my knowledge on the subject of this thesis.

My fellow students and former colleagues: Becky Kennedy, Melinda Murphy, Joon Hyeuk Woo, Devin Tempton, Mary Houston, Kelli Germany, Dana Horlick, Maria Rodriguez, Darryl Alexander, and Quinn Richardson. I would like to thank all of you for never throttling me during the long arguments over the coding of the family drawings or CU videos.

I am grateful to my parents, James Houser and Susan Adam, for bringing me into this world, putting food in my belly, and clothes on my back. And my Grandmother, Dr. Katherine King, for her encouragement and support over the years.

Evaluating Inter-Method Reliability of Attachment Classifications and Limitations to Concordance in Middle-Childhood

Broadly speaking, attachment theory is the study of parent/child interaction and how these initial ties between mother and child influence later relationships (Cassidy, 1999). The term *attachment* refers to the affectional bond the child develops with its mother. John Bowlby, the founder of attachment theory, conceptualized attachment as *proximity seeking* behaviors used by the child in order to maintain physical closeness to their mother, or *primary caregiver* (PC), in order to feel safe or "secure". These behaviors are representative of an established cognitive-behavioral structure known as an *attachment style* (Crittenden, 1990; Bretherton, 1992; Kaplan & Main, 1986). Attachment styles (or patterns) are strategies that support the child in the face of anxiety inducing interrelational situations (Cassidy, 1999). Complex cognitive-behavioral structures such as attachment can be difficult to quantify. Although persistent throughout a person's lifespan, Bowlby recognized that the attachment system was easier to assess in the formative years, before coping mechanisms and other systems begin to exert moderating influences. While Bowlby laid much of the theoretical foundation of attachment theory, it was not until a student of attachment theory, Mary Ainsworth, developed a method of assessment known as the Strange Situation Paradigm (SSP), that real empirical analysis of attachment was possible (Bretherton, 1992).

The majority of what we have learned about attachment comes from the behaviors children express during the SSP. Although attachment manifests behaviorally in young life, as the child ages these behaviors are integrated into a more cognitively complex system. As such, later measures of attachment assess children's attachment styles at a cognitive level. There are two common measurements of attachment in middle-childhood. One is the Manchester Child Attachment Story Task (MCAST) (Green, Stanley, & Peters, 2000). The MCAST is a robust

measurement of attachment, with strong inter-rater reliability and content validity, but takes a long time to administer and assess (Green, Stanley, & Peters, 2000). Another measure that is gaining popularity is the *Projective Family Drawings Task* (Fury, Carlson, & Sroufe, 1997). Family drawings are more affordable and quick to administer than the MCAST, but the content validity of its measurements have not been as thoroughly assessed as the MCAST. The purpose of the current study is to examine the inter-method reliability and concordance of these measurements.

Attachment Patterns

Studies have traditionally categorized children into one of four major classification groups: secure (B), insecure-avoidant (A), insecure-ambivalent (C), or insecure-disorganized (D) (Kaplan & Main, 1986). Securely attached children use the attachment figure as a 'secure base.' Secure attachment results from parenting in which the mother responds with sensitivity to the child's needs and distress (Cassidy, 1999). Securely attached children can explore new environments without apprehension because they know that they can use their caregiver as a safe haven when confronted with distressing situations. Insecure children are not capable of using their attachment figure in this way, and must resort to other strategies to ease distress. Insecure-avoidant children tend to inhibit outward displays of attachment, and internalize distress (Crittenden, 1990). Conversely, insecure-ambivalent children amplify attachment behaviors, and are not easily soothed (Crittenden, 1990). It is important to emphasize that the behaviors expressed by insecurely attached children are not maladaptive for their situation; instead, insecure children are using the best strategies they have available for inconsistent or unresponsive mothers (Crittenden, 1990).

Because attachment is easiest to measure in infancy and toddlerhood, it is often discussed within the SSP's empirical framework. The Strange situation paradigm consists of a twenty-minute experiment designed to activate the attachment system in an incremental way by having the child experience a series of separation and reunion episodes with the mother in an unfamiliar setting. Researchers studying children in infancy and toddlerhood often use the SSP in order to elicit attachment behaviors by creating emotionally arousing circumstances involving child and parent (Ainsworth, 1978; Kaplan & Main, 1986; Green, Stanley, Smith, & Goldwyn, 2000). How the children react in each episode reflects the quality of their attachment to the caregivers (Holmes, 1993).

The classic Ainsworth ABC rating is given based on the extent of the child's exploration of the novel environment, proximity seeking behavior, and the ability to use the parent as a source of comfort when distressed (Ainsworth, 1978; Green et al., 2000; Kaplan & Main, 1986). In the SSP, a securely attached child will actively explore their environment, show distress when left by their mother, and be comforted when their parent returns (Holmes, 1993). Insecure-avoidant children display inhibited exploration, show few overt signs of distress when separated, and normally suppress attachment behaviors upon reunion with their PC. Insecure-ambivalent children also show subdued exploration, along with a high degree of distress upon separation, and low soothability when the parent attempts to comfort them (Ainsworth, 1979; Holmes, 1993; Kaplan & Main, 1986).

Despite its capability to distinguish reliably among the ABC attachment categories, for over a decade the Strange Situation paradigm has difficulty classifying a particular subset of children (Ainsworth, 1979; Main & Solomon, 1990). These children did not fit clearly into any one category, and in fact did not consistently share any kind of coherent attachment strategy at all

(Main & Solomon, 1990). Instead, what these children shared were "bouts or sequences of behavior which seemed to lack readily observable goal, intention, or explanation" (Main & Solomon, 1990, p. 122). This revelation eventually led to a new classification of attachment known as disorganized/disoriented (D). Disorganized children lack of predominant behavioral strategy when confronted by distressing stimuli Behavioral atypicalities in disorganized attachment include sequential or simultaneous displays of contradictory behavior patterns, incomplete or undirected movements and expressions, sterotypies (physical tics similar to those found in Tourette Syndrome), anomalous postures, freezing, and indices of apprehension regarding the parent (Main & Solomon, 1990).

Disorganized attachment is the attachment style most strongly associated with negative developmental outcomes (Bohlin, Eninger, Brocki, & Thorell, 2012; Diamond, 2004; Simard, Moss, & Pascuzzo, 2011; Thompson, 2008). Disorganization has been associated with later behavioral, affective, and emotional problems such as ADHD, conduct problems, and callous and unemotional traits (Bohlin et al., 2012; Green, Stanley, & Peters, 2007). Previous studies have found approximately 15% of children in low-risk households display disorganized behavior; however, these rates increase dramatically when in adverse home environments, with over 80% of children suffering from direct abuse or extreme neglect by their parents developing disorganized traits (Bohlin et al., 2012).

Attachment in Middle Childhood and Internal Working Models

During infancy and toddlerhood, the behaviors elicited in the SSP are representative of the underlying attachment pattern the child has formed with the PC. Later in life, as the effects of socialization begin to take hold and coping mechanisms increase in complexity, observed

behaviors in the laboratory mask attachment patterns. As such, most studies conducted during middle childhood and beyond measure attachment at the representational level (Diamond, 2004).

The formation of attachment patterns result in a cognitive and affective structures known as internal working models (IWM) (Blount-Matthews & Hertenstein, 2005; Crittenden, 1990; Fraley, 2002). Early dyadic interactions between themselves and their caregiver influence the representational models of organized children, and reflect the early attachment pattern assessed in the strange situation (Fraley, 2002; Ainsworth, 1978). An internal working model is an organized pattern of cognitive-behavioral processes that is relatively stable over a person's lifetime (Fraley, 2002). IWMs manifest early in the child's life, but become more empirically important once children mature and more overt attachment behaviors become suppressed (Diamond, 2004).

Internal working models are divided into two separate levels of organization: a representational level, which is characterized by the mental representations of the self, others, and relationships, and a behavioral level, which is characterized by the actions that result from these patterns of thought (Blount-Matthews & Hertenstein, 2005). These constructs influence inter-relational behavior, resulting in a representational system individuals will rely upon when confronted with distressing or unfamiliar situations throughout their lives (Crittenden, 1990). The MCAST and the Family Drawing paradigms are designed to tap into IWMs as a way to measure attachment at the representational level.

Methods of Assessment in Middle Childhood

The current study focuses on the two common methodologies that assess the IWMs of older children. The first is Green, Stanley, and Peters's Manchester Child Attachment Story Task (MCAST) (2007). The second, which has recently gained popularity, is the *Projective Family*

Drawing Task (Goldner & Scharf, 2012; Fury, Carlson, & Sroufe, 1997; Oluremi, 2010; Pianta, Longmaid, & Ferguson, 1999).

MCAST. The MCAST readily elicits attachment behavior by focusing on dyad-specific stories about parent/child interaction that trigger emotional arousal (Green, Stanley, & Peters, 2007). The task relies on open-ended story questions in order to classify the attachment style of children. Children are told stories where they are put in a distressing situation (e.g. having a nightmare), and asked to finish the story themselves. How they complete the story is representative of their IWM (Green, Stanley, & Peters, 2007). Secure children are more likely to have coherent stories that are quickly resolved and usually involve the parent helping them (Green, Stanley, & Peters, 2007; Del Giudice, 2008). Avoidant children are more likely to result to non-interpersonal means of resolving distress, and normally exclude parents from the story; conversely, ambivalent children often resort to unsuccessful interpersonal interactions, where the caregivers are incapable of resolving the child's distress (Del Giudice, 2008). Disorganized stories often lack coherent narrative structure, and normally involve thematic overtones of violence, aggression, and fear (Green et al., 2007).

Many consider the MCAST a kind of "gold standard" in terms of assessing representational models. A theoretical framework supports the MCAST's rationale for interpretation/classification, and its inter-rater reliability is very robust, showing 94% agreement for secure vs. insecure classifications and 86% for disorganized vs. non-disorganized (Green, Stanley, & Peters, 2007). The predictive outcomes of those it classifies as disorganized attests the MCAST's content validity. Children classified as disorganized by the MCAST are often socially maladjusted and develop later behavioral, affective, and emotional problems such as

ADHD, conduct problems, and callous and unemotional traits (Bohlin, Eninger, Brocki, & Thorell, 2012; Green, Stanley, & Peters, 2007; Hesse & Main, 2000).

Family Drawings. Despite its advantages, the MCAST is neither expedient nor efficient. It takes several hours for trained clinicians to code a single child using the MCAST methodology (Green, Stanley, & Peters, 2007). As such, another methodology has recently gained popularity, called the Projective Family Drawing Task (Goldner & Scharf, 2012; Fury, Carlson, & Sroufe, 1997; Oluremi, 2010; Pianta, Longmaid, & Ferguson, 1999).

During the Projective Family Drawing Task, children are given 8 markers, a blank sheet of paper, and are instructed to draw their family. These drawings are coded for cognitive and affective indicators of representational models (Fury et al., 1997). Secure children normally include background detail, with significantly distinguished figures that display positive affect, positive facial affect, and relaxed bodies. The drawings of avoidant children normally lack color, and either omit or do not distinguish family members (Goldner & Scharf, 2012). Ambivalent drawings often distort figures, displaying them as unusually large or small with exaggerated body parts or facial features (Fury et al., 1997; Kaplan & Main, 1986). Family drawings have shown to be capable of indicating disorganized attachment in children (Fury et al., 1997; Madigan, Goldberg, Moran, & Pederson, 2004). Traits specific to the disorganized child's representation model include false starts, scratched out or scrunched figures, and violent/unusual signs, symbols or scenes (Fury et al., 1997).

Prior research shows that Projective Family Drawings have limited reliability when assessing attachment classifications, with 82.5% coder accuracy (Pianta, Longmaid, & Ferguson, 1999). The Family Drawings have been shown to predict internalizing aggression, which is associated with some disorganized outcomes found by the MCAST (Bohlin et al., 2012; Goldner

& Scharf, 2012). Although these findings are useful, there has not been a rigorous assessment of the content validity of the family drawings. Because prior research has thoroughly replicated the predictive outcomes of the MCAST, the current study will evaluate the content validity of the family drawings by assessing its concordance with the MCAST.

Constraints on Concordance in the Family Drawing Task

The MCAST and family drawings have never been directly compared. The goal of the current study is to examine classifications of security, avoidance, ambivalence, and disorganization given by both methodologies to show the reliability and validity of the Projective Family Drawings. Concordance between the MCAST and the family drawings may be constrained by two properties of the drawings: disorganization and child sex.

Disorganization. As Madigan and colleagues (2004) showed in their study, naïve observers describe drawings by disorganized children with far more negative labels then positive ones. The result of Madigan and colleagues research is indicative of the ease of assessing the data for disorganized traits. What has not yet been demonstrated is whether these drawings can be used to effectively predict underlying organized models in disorganized children. Children's drawings become increasingly chaotic in cases of extreme disorganization, manifesting in erratic colors and strange symbols (Fury et al., 1997). This chaos in the drawings might make it harder to code underlying attachments. The MCAST has been shown to accurately and concurrently measure organized attachment styles along with disorganization in children (Green et al., 2007). The current study aims to examine the concordance of attachment ratings across these two methods of assessment in cases of low vs. high degrees of disorganization as rated by the family drawings.

Child-sex. There are two ways that child-sex may effect concordance. One is that

Boys and girls have different rates of attachment security. Second, girls tend to have more artistic ability than boys do.

In infancy and toddlerhood, rates of attachment classifications do not differ much between boys and girls (Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998). However, once children enter middle-childhood prevailing rates of insecurity begin to vary between the sexes (Del Giudice, 2008; Granot & Mayseless, 2001; Kerns, Abraham, & Schlegelmilch, 2007). Males are typically more avoidant than ambivalent (27% vs. 2% respectively), and female more ambivalent (25%) than avoidant (4%) (Del Giudice, 2008). Males also have significantly higher rates of disorganized classifications and more severe cases of disorganization when rated on a continuous scale (Del Guidice, 2008; Kerns, Abraham, & Schlegelmilch, 2007).

More emotionally competent children (i.e. better capable of recognizing emotional states in others and healthy self-regulatory acts) have consistently lower rates of avoidance, ambivalence, and disorganization (Colle & Del Guidice, 2011). In middle-childhood, girls tend to be more emotionally competent than their male counterparts (Colle & Del Giudice, 2011). Numerous studies have shown that girls in middle-childhood normally have higher levels of expressiveness, detail, and color in their drawings than boys do (Behrens & Kaplan, 2011; Goldner & Scharf, 2012; He & Wong, 2011; Oluremi, 2010). This higher quality of drawing skill could be the result of girls being more emotionally competent than boys are, and/or that the family drawings themselves bias artistic expression as secure. In either case, the current study expects the clarity of the girls' family drawings will affect the concordance of family drawings.

Current Study

The current study aims to measure the concordance in the 4-way attachment classifications (A, B, C, D) between the family drawing task and the Manchester Child

Attachment Story Task, and investigate the extent to which the observed concordances vary as function of child-sex or the amount of disorganization displayed in the family drawing task. First, it is hypothesized that classifications of attachment categories will be consistent across methods. Second, it is hypothesized that the strength of these concordances will be moderated by the level of child attachment disorganization, such that weaker prediction of security, avoidance, and ambivalence is expected among children with higher ratings of attachment disorganization in the family drawings. In addition to these hypotheses, the current study also predicts that child sex will have a moderating influence on attachment dimensions. It is hypothesized that the clarity of girls' family drawings will lend itself to higher levels of concordance between their drawings and MCAST attachment scores.

Method

Participants

The current study used a subsample of the Family Life Project (FLP). The FLP is a longitudinal study focusing on families living in poverty in non-urban population centers throughout Central Pennsylvania and Eastern North Carolina (Vernon-Feagans, Garrett-Peters, Willoughby, & Mills-Koonce, 2012). Three counties were selected from each state in order to collect a representative sample of Appalachia (PA) and the Black South (NC). The current study uses data collected from North Carolinian children assessed by both the MCAST and family drawings. Out of the 1,292 children collected in the initial sample, 222 African-American children completed the MCAST in kindergarten. Of these children, an additional 193 made a family drawing at approximately the same age. The final analysis excluded children classified as A/C without disorganization, leaving 176 children who met all criteria for examination. Of these children, 43% were male.

Procedure, Materials, and Methods

MCAST.

Procedure. During the kindergarten home visit, research assistants administered questionnaires and the MCAST. During this task, children were given dolls that represent their PC and themselves and were inserted into four distress vignettes (e.g. waking up from a nightmare, getting hurt, etc.) where they can play out dyadic interactions between themselves and the PC. In each vignette, the parent is nearby but not in immediate proximity, giving the child an opportunity to engage in attachment behaviors. The goal of each vignette was to arouse the child to the point where they obviously emotionally involved in the upsetting scene they are depicting. The interviewer then asks the child a series of questions to clarify and parse apart the story, and assess the various mental states the child attributes to each of the dolls at different periods in the story. Afterwards, the child is allowed a period of free-play in order to "wind down". This interview takes approximately 20 to 30 minutes to administer, and is later coded by research assistants that have been trained to high inter-rater reliability.

Measures.

Attachment behaviors. Narrative story stems were selected specifically to activate the proximity seeking behavior associated with attachment patterns. Experimenters keep track of role reversal between TC and PC, self-care, caregiver behavior, and the degree of conflict in the stories. Throughout the distress vignettes process, children are continuously rated on different ABC attachment spectrums. Each vignette is assigned a predominant attachment classification. Afterwards, children are categorically assigned as either secure, avoidant, or ambivalent by assessing attachment trends across vignettes.

Coherence and disorganization. Codings for disorganization were adapted from disorganized attachment behaviors derived from Main & Solomon's Strange Situation. Disorganization is rated on a continuous scale (1-9) and categorically assigned as disorganized when a threshold rating of 5 is reached. Elements of bizarreness and violence are factored in the overall disorganized score.

Family drawings

Materials and Procedure. Administration of the family drawing task occurred approximately a year after the MCAST, when the child was in the first grade. Materials used during the assessment included pieces of paper, a pencil, and 8 basic color felt-tip markers. Initially, the children were given a "warm-up" task, in which they were instructed to draw a "person" with the pencil they are provided. The intention of this preliminary task is to relax the child before the assessment begins in earnest. Once the child has completed the warm-up, the RA gives them a piece of 8" x 10" paper and the markers, and the child is then asked to draw a picture of their family. Outside of this initial request, RAs give no further instruction. Once the drawing is completed, RAs interview the child in order to identify who is in the drawing. RAs were given a script to adhere to in order to decrease variability in the interaction between themselves and the children.

Measures.

Family organization. This measured the spatial relationship and identity of the figures the child drew. These characteristics were key to subsequently coding attachment themes. The coding sheet allowed for a maximum coding of 12 figures, with a priority of identifying the target child (TC), PC, and secondary caregiver (SC) (if present). Groups were measured as

evenly spaced figures with figures at each end equidistant from the midpoint. Coding kept track of the number of groups, and which group the TC, PC, and SC were in.

Attachment themes. Attachment in the family drawing is measured by the presence (1) or absence (0) of traits found in the drawing that correspond to different attachment styles. Each attachment strategy is assessed via 8 distinct characteristics that are either absent or present in the drawing. For a full list of these characteristics, see the Appendix. Organized forms of attachment are characterized by the position of the TC in relation to the PC, facial affect and body posture, the amount of differentiation between figures, and degree of detail/color in the picture as a whole. The drawings of insecure children may also omit figures or exaggerate body parts (i.e. heads in more avoidant drawings or limbs, torsos, and facial features in more ambivalent drawings). Disorganization manifests in drawings as bizarre, irrational, or violent imagery with scrunched, unfinished, or scratched out figures.

Results

Data Analysis Plan

Data analyses are presented in two parts. First, frequency analyses of the attachment classifications based on the MCAST and the family drawing task are presented, including stratifications by child-sex and poverty level (race and geographic location are constants since all of the MCAST data were collected on African American children in North Carolina). To address hypothesis 1 –that ABCD attachment classifications will be replicated across the MCAST and family drawings– chi-square analyses are conducted to test the independence of attachment classifications across methodologies, followed by multinomial regression to look at categorical predictions including appropriate control variables. Hypotheses 2 and 3 – that child disorganization level as measured in the family drawings as well as the sex of the child would

affect concordances– are assessed using chi-squared analysis stratified by these respective variables.

Frequencies of Attachment Categories

Frequencies of attachment categories across three income levels (100% below the poverty line, between 100% and 200% of the poverty line, and 200% above the poverty line) and child-sex for the MCAST are presented in Table 1. Only 21 children qualified for the latter group, and had no ambivalent or disorganized classifications. Of the valid cases, the majority of children classified as secure (~75%). Low rates of insecurity were found in the sample, with avoidance at 11% (n =20), ambivalence at 5.1% (n =9), and disorganization at 5.7% (n = 10). Male/female ratios were evenly split across attachment classifications, males only being under-represented in the resistant category (n = 2).

Distributions of SES and child sex for the 176 valid family drawings are presented in Table 2. Attachment classifications remained relatively consistent across income stratifications, with security and income-to-needs positively correlated. Approximately 39% were classified as secure (n = 69), 17% were classified as avoidant (n=30), 15.3% were classified as resistant/ambivalent (n = 50), and 28.4% were classified as disorganized (n = 50). Again, child sex was not significantly different across attachment categories, aside from males being mildly under-represented in the resistant category (n =9).

Concordances between the MCAST and Family Drawings

Analysis of 4-way classifications. To investigate the relationship between the two methods of attachment assessment, a 4x4 cross-tabulation table was created based on the 4-way MCAST categories and 4-way family drawing categories. Table 3 summarizes these data. To address hypothesis 1, these frequencies were analyzed with a Chi Square contingency test of

independence. Results show significant concordance (dependence) across attachment categories $\chi 2$ (9, N = 176) = 22.64, $p < .01$, suggesting that the attachment classifications across these two methodologies are not independent. The avoidant and secure categories were the most concordant across methodologies, of which each evidenced 40% concordance rates. Concordance of resistance and disorganization were low (n=1 case in each).

In addition to the chi-square analysis, a nominal regression was performed on the two methods of assessment and included controls such as child sex and family income. The reference category was a secure attachment classification as measured by the family drawings. Ratings of security on the MCAST were less likely to occur when the rating on the family drawing was avoidant b = 1.35, Wald $\chi^2(1) = 4.47$, $p < .05$.

Disorganization in family drawings as constraint on concordance. Hypothesis 2 predicted that higher levels of disorganization in the family drawing would have a detrimental effect on the concordances between itself and the MCAST. To address this hypothesis, ratings of disorganization found in the family drawings were used as a grouping variable in order to determine the effect of chaotic elements in the drawings on the concordance rates of the 3-way ABC classification (secure, avoidant, ambivalent) between the MCAST and family drawing methodologies. Children were sorted into the "high" group if their drawings had 3 or more disorganized traits. This cut-off was chosen for analytic reasons, in order to have significant sizes in both groups. Table 4 displays concordances between the two methods of assessment. Chi-square analysis were performed independently for the non-disorganized ABC categories and the disorganized ABC categories. Stronger concordance (dependency) was found among organized group [χ^2 (4, N = 123) = 13.1, $p < .01$] as compared to the disorganized group (which also exhibited concordance within the avoidance and the secure classifications) [χ^2 (4, N = 36) = 4.1,

$p > .05$]. All children classified as avoidant by both methods were in the non-disorganized group. Concordance of security did not significantly differ between the two groups (~50% in both). The low rate of resistance attachments precluded interpretation of the results for this category.

Child-sex as a constraint on concordance. In the final hypothesis, sex was assessed as a moderator on inter-method reliability. Cross-tabulations showed slightly higher (though not powerful) concordance rates of avoidance in males (6:1), but no significant differences between boys and girls.

Discussion

When studying constructs as complex as the internal working models of children, it is important that methodologies used to assess them are both valid and reliable. Prior research has shown that the internal reliability of the Manchester Child Attachment Story Task, and the predicative outcomes of the disorganized classifications so derived from the MCAST attest to its content validity (Green, Stanley, & Peters, 2007; Green et al., 2000). Conversely, the Projective Family Drawings have not been subject to as extensive a validation process, especially when compared to other measures of attachment representation (Behrens & Kaplan, 2011). However, there are many benefits to measuring attachment dimensions with the drawings, namely ease of application and assessment. The current study aimed to measure the concordances of attachment classifications between these two methods in order to determine the content validity of the family drawing task. Additionally, this study wanted to examine how disorganization and child sex may limit these concordances.

Concordance of Attachment Classifications

Addressing Hypothesis 1, we found significant dependence across methodologies for classifications of security and classifications of avoidance, but not for ambivalence or disorganization. The relatively high concordance of secure classifications is potentially the result of strong indicators in both methodologies. Secure attachment is the dominant phenotypic classification in every attachment assessment (Ainsworth, 1979; Fury et al., 1997; Green et al., 2000; Kaplan & Main, 1986). The indicators of security are well known and strong in both the MCAST and family drawings, which could be driving higher concordances. Colle and Del Guidice have also shown secure children to be more artistically expressive (2011), which may influence the clarity of their drawings and allow for easier classification.

The clarity of avoidant indicators may also be the reason that it is the only concordant insecure classification. Avoidant drawings have characteristics that require little coder interpretation (e.g. lack of color, negative or no affect of figures, etc.). The clarity of avoidant drawings results in more inter-rater agreement; and ultimately, higher concordance between the MCAST and family drawings. Ambivalent and disorganized indicators are more ambiguous. Indices of ambivalence in drawings include size distortions and proximity of figures. Indicators of disorganization involve elements such as ominous or violent themes. The markers of ambivalence and disorganization in this sense may be "weaker" due to differences in interpretation of these characteristics (i.e. lower inter-rater agreement), resulting in lower inter-method reliability.

Constraints on Concordance

Disorganization. This study hypothesized that the rates of concordance between the ABC classifications using the MCAST and those using the Family Drawings would differ as a function of the extent which those attachment strategies are organized or not. This hypothesis proved true only for avoidant attachment. Concordance of secure attachment classifications did not differ as a function of disorganization. The strength and clarity of secure children's drawings may explain why the concordance of secure classifications was not affected by high levels of disorganization. Conversely, analysis indicated that avoidant classifications were concordant across methods in only when disorganization was low. This means that avoidant indicators, while more powerful than other insecure markers, are not as clear as secure features. High levels of disorganization also have features that are antithetical to avoidant traits (i.e. excessive colors vs. lack of color). These contradictions, when combined with the chaotic nature of highly disorganized drawings, might mitigate the stronger indicators of avoidance in drawings.

Child-sex. Hypothesis 3 proposed that the concordance of the ABCD ratings would differ as a function of child sex. This hypothesis was not supported. This null finding suggests that although attachment rates may differ between boys and girls and methodologies, sex does not ultimately affect measurement accuracy. There may still be effects of emotional competence, but examination of more global variables may better address this question.

Limitations in the Current Study

Certain limitations restrict the implications of our findings and should be addressed in subsequent research. The results of this study are only generalizable to African American children living in rural areas, and only those families in lower income brackets. To validate the findings further, additional studies should be conducted on more diverse populations. The size of certain attachment demographics in the MCAST (n = 9 ambivalent; n = 10 disorganized) also reduced the power of statistical analyses. Future studies need to focus on larger populations to ensure more powerful sample sizes.

The study conducted the assessments at different times with little overlap. Most MCAST interviews were collected when the children were in Kindergarten, whereas the Family Drawings were collected when the children were in 1st grade. It is possible that attachment representations changed for some children during this time period. Future research should address this shortcoming and be sure to administer all measurements over a relatively short span of time.

Furthermore, prior research has indicated that continuous variables are better measurements of attachment than categorical variables (Fraley & Spieker, 2003). The current study used attachment classifications as measurements. As a result, a more direct relationship between certain variables (such as strength of attachment moderating concordance) could not be assessed. Future research should use continuous measurements to answer such questions.

Implications

The Manchester Child Attachment Story Task is costly to administer and takes several hours to code (Green et al., 2000). The Projective Family Drawings is a faster and more efficient

measurement of representational models. This study indicates that avoidant and secure classifications are relatively concordant between methodologies. The experimenters suggest implementing the Projective Family Drawings as a precursor to administration of the MCAST. Combined, rates of secure and avoidant attachment make a large percentage of the overall population (~85%) (Ainsworth, Blehar, Waters, & Wall, 1978; Holmes, 1993). Researchers and clinicians could effectively avoid application of the MCAST for secure and avoidant children, saving time and money. Additionally, future studies should attempt to control for the disorganized "noise" in avoidant drawings. If accomplished, the projective family drawings could be used for highly disorganized avoidant children. However, considering the lack of concordance for disorganized classifications in this study, disorganized attachment's relatively low prevalence rate (Main & Solomon, 1990), and the developmental outcomes associated with it (Pasalich, Dadds, Hawes, & Brennan, 2012), the experimenters suggest continuing to use the MCAST as the primary means of classifying disorganized children

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Table 1.

Frequencies of attachment classifications for the MCAST

		Insecure-Avoidant	Secure	Insecure-Ambivalent	Insecure-Disorganized	*Total*
Income : Needs < 100%	N	9	62	5	8	84
	%	5.1%	35.2%	2.8%	4.5%	47.7%
Income : Needs 100%<R>200 %	N	8	57	4	2	71
	%	4.5%	32.4%	2.3%	1.1%	40.3%
Income : Needs > 200%	N	3	18	0	0	21
	%	1.7%	10.2%	0.0%	0.0%	11.9%
Income : Needs *Total*	N	20	137	9	10	176
	%	11.4%	77.8%	5.1%	5.7%	100.0%
Female	N	7	74	7	6	94
	%	4.1%	43.8%	4.1%	3.6%	55.6%
Male	N	12	57	2	4	75
	%	7.1%	33.7%	1.2%	2.4%	44.4%
Child-sex *Total*	N	19	131	9	10	169
	%	11.2%	77.5%	5.3%	5.9%	100.0%

Table 2.
Frequencies of attachment classifications for the Family Drawing Task

		Insecure-Avoidant	Secure	Insecure-Ambivalent	Insecure-Disorganized	Total
Income : Needs	N	11	33	16	24	84
< 100%	%	6.3%	18.8%	9.1%	13.6%	47.7%
Income : Needs	N	17	26	8	20	71
100%<*x*>200%	%	9.7%	14.8%	4.5%	11.4	40.3%
Income : Needs above 200%	N	2	10	3	6	21
	%	1.1%	5.7%	1.7%	3.4%	11.9%
Total Income : Needs Ratio	N	30	69	27	50	176
	%	17.0%	39.2%	15.3%	28.4%	100%
Female	N	12	39	17	26	94
	%	7.1%	23.1%	10.1%	15.4%	55.6%
Male	N	17	30	9	19	75
	%	10.1%	17.8%	5.3%	11.2%	44.4%
Child-sex Total	N	29	69	26	45	169
	%					

Table 3.

Cordances of Attachment Classifications for the MCAST and Family Drawings

Attachment Classifications			Family Drawings				
			Avoidant	Secure	Ambivalent	Disorganized	Total
Manchester Child Attachment Story Task (MCAST)	Avoidant	Count of Agreement	8	7	0	5	20
		% of MCAST	40.0%	35.0%	0.0%	25.0%	100.0%
	Secure	Rate of Agreement	17	53	26	41	137
		% of MCAST	12.4%	38.7%	19.0%	29.9%	100.0%
	Ambivalent	Rate of Agreement	3	2	1	3	9
		% of MCAST	33.3%	22.2%	11.1%	33.3%	100.0%
	Disorganized	Rate of Agreement	2	7	0	1	10
		% of MCAST	20.0%	70.0%	0.0%	10.0%	100.0%
Total		Rate of Agreement	30	69	27	50	176
		% of MCAST	17.0%	39.2%	15.3%	28.4%	100.0%

Table 4.

Concordances for High and Low Degrees of Disorganization

Attachment Classifications		Family Drawings							
		Avoidant		Secure		Ambivalent		Total	
		D	Non-D	D	Non-D	D	Non-D	D	Non-D
Manchester Child Attachment Story Task (MCAST)	Avoidant	0	8	3	9	1	0	4	17
	Secure	10	18	16	56	5	26	31	100
	Ambivalent	0	3	0	3	0	0	1	6
	Total	11	10	19	68	6	26	36	123

Appendix

Coding Attachment Themes

For the following descriptions you will only code the presence or absence of the these characteristics in the family drawing.

#	Insecure-Avoidant	0 = No 1 = Yes
A1	Lack of individuation	
A2	Child & mother positioned far apart on page	
A3	Omission of mother (or child)	
A4	Arms downward, close to body	
A5	Arms absent	
A6	Exaggeration of heads	
A7	Lack of color	
A8	Disguised family members	

#	Insecure-Resistant	0 = No 1 = Yes
R1	Figures crowded or overlapping	
R2	Figures separated by barriers	
R3	Unusually small figures	
R4	Unusually large figures	
R5	Figures on corner of page	
R6	Exaggerations of soft body parts	
R7	Exaggerations of facial features	
R8	Exaggerations of hands/arms	

#	Secure	0 = No 1 = Yes
S1	Background detail	
S2	Figures grounded (not floating)	
S3	Complete figures	
S4	Natural proximity	
S5	Males and females differentiated by gender	
S6	Positive facial affect	
S7	Individual figures	
S8	Firm, open-armed embracing stance	

#	Disorganized/Disoriented	0 = No 1 = Yes
D1	False starts	
D2	Figures scratched out	
D3	Over-bright, excessive and indiscriminant colors	
D4	Unfinished objects or pictures	
D5	Scrunched figures	
D6	Unusual signs, symbols, or scenes	
D7	Ominous or foreboding,	
D8	Irrational or disorganized	