ABSTRACT

HAWKINS, AMY LYNN. Cluster Analysis of Internal Working Models of Physically Abused Children: Validation of Clusters on Adjustment and Self-concept. (Under the direction of Dr. Mary Haskett.)

One major goal of this study was to advance the research on abused children by examining whether individual differences exist in the internal working models of abused children. A second goal was to determine whether those individual differences were related to any differences in the adjustment of abused children. Specifically, this study was designed to examine whether subgroups exist among physically abused children and whether those subgroups exhibit differences in their socioemotional adjustment and self-concept.

Participants included 74 children from a larger longitudinal study designed to examine factors that contributed to physically abused children’s successful transition from preschool to early elementary school. Children ranged in age from 5 to 7 years old and were identified as having a substantiated history of physical abuse. Children’s internal working models were measured using the McArthur Story Stem Battery, which was coded for representations of self, parent, and attachment themes. The Teacher Report Form/Caregiver-Teacher Report form was used to measure socioemotional adjustment (specifically internalizing and externalizing problems) and the Pictorial Scale of Perceived Competence and Social Acceptance was used to measure aspects of children’s self-concept. It was hypothesized that at least two distinct clusters would emerge based on children’s internal working models and that the clusters would differ in their socioemotional adjustment (i.e., internalizing and externalizing behaviors) and self-concept (i.e., maternal acceptance, peer acceptance, cognitive competence, and physical competence).
As hypothesized there were two distinct clusters, one with more positive internal working models (the Positive IWM cluster) and one with more negative internal working models (the Negative IWM cluster). Additionally, as hypothesized the two clusters differed in their internalizing and externalizing behavior problems. Specifically, the children in Negative IWM cluster exhibited significantly higher levels of both types of behavior problems. The clusters did not differ significantly on aspects of self-concept, with the exception of maternal acceptance. Findings support the notion that individual differences exist among children who have experienced abuse, and that these differences are meaningful in terms of children’s adjustment.
Cluster Analysis of Internal Working Models of Physically Abused Children: Validation of Clusters on Adjustment and Self-concept

by
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BIOGRAPHY

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Cluster Analysis of Internal Working Models of Physically Abused Children: Validation of Clusters on Adjustment and Self-concept

Introduction

Despite substantial evidence of negative outcomes associated with the experience of physical abuse in childhood, relatively recent research indicates that there are individual differences in adjustment among children who have experienced abuse (e.g., Cicchetti & Rogosch, 1997). In fact, there are some children who have experienced abuse that show “resilient functioning” in spite of their history of abuse and/or neglect (Bolger & Patterson, 2003; Cicchetti, Rogosch, Lynch, & Holt, 1993). Of particular relevance for the present study, research shows substantial within-group variability among physically abused children in terms of their self-concept and their socioemotional adjustment, that is, the degree to which they exhibit internalizing problems (e.g., withdrawal, anxiety, fearfulness, depression) or externalizing problems (e.g., hyperactivity, aggression, defiance, destructive behavior). A growing area of research seeks to identify factors that are associated with these individual differences in outcomes for maltreated children. The goal of the current study was to add to that literature using a person-oriented approach to examining characteristics of abused children; specifically, this study was designed to explore whether physically abused children, sub-grouped (i.e., “clustered”) on the basis of their internal working models of relationships, differed in their socioemotional adjustment and self concept.

Internal working models are children’s mental representations of people and relationships that are created during early relationships and are used to help children understand their future relationships. According to Bowlby (1973), children’s internal
working models of their relationships likely mediate the well-established link between attachment quality and later social and emotional competence. Research has documented that children’s attachment style can be affected by the experience of physical abuse, and that children who have experienced abuse are more likely than non-abused children to develop insecure attachment styles. Because many abused children develop insecure attachments, the internal working models of many of these children tend to reflect harsh and unpredictable relationships (Toth, Cicchetti, Macfie, & Emde, 1997; Toth, Cicchetti, Macfie, Rogosch, & Maughan, 2000). However, each abused child experiences a unique early family environment, and his or her internal working model is based on that unique experience. Therefore, in addition to differences in internal working models between abused and nonabused children, there are likely to be within group differences in the working models of abused children. It is possible that the within group differences in internal working models are associated with the variations in socioemotional adjustment (i.e., internalizing and externalizing behavior problems) and self-concept (i.e., maternal acceptance, peer acceptance, cognitive competence, and physical competence) that have been documented among abused children.

Purpose of the Study

Research on maltreatment has focused largely on maltreated children as a homogeneous group and on the differences between maltreated and non-maltreated children rather than on the possibility of variability within the maltreated sample. Within this body of research, however, there is evidence that suggests there are numerous individual differences among maltreated children. Furthermore, studies such as Ward and Haskett (2008) have
found support for the presence of important individual differences among maltreated children. The present study advanced the investigation of within-group differences among abused children by using a person-oriented approach to examine individual differences in physically abused children’s internal working models of relationships and determined whether those individual differences account for variations in indicators of adjustment related to internalizing and externalizing behavior problems as well as aspects of self-concept (i.e., perceived maternal acceptance, peer acceptance, cognitive competence and physical competence).

Literature Review

The following sections contain a discussion of the person-oriented approach to data analysis and the benefits of using such an approach, followed by an introduction to attachment theory and how that research has been related to maltreatment. The specifics of internal working models will then be explored in relation to typically developing children as well as abused children. This exploration will lead into a discussion of the link between working models and socioemotional adjustment problems and poor self-concept. Finally, although there has been a movement towards using “person first” language, much of the research in the area of maltreatment continues to refer to children who have experienced abuse as abused or maltreated children. Therefore, it is acknowledged that using person first language would be appropriate, but in an effort to be consistent with research in this area the remainder of this document will not exclusively use person first language when referring to maltreated children.
Person-Oriented Approach

Two main types of data analytic methods are often used to examine the characteristics of a sample — variable-oriented approaches and person-oriented approaches. In the variable-oriented approach, the focus is on the variable, its intercorrelations, and how it relates to specific criteria (Magnusson, 1998). In this approach, the variable tends to be at the core of constructs and theories and then becomes the main aspect of the research. This approach focuses on the variable by comparing one individual’s score to the scores of others, and it is in this comparison that the score becomes meaningful. Generally this is done by statistically comparing means and by conducting correlations, regression analyses, and analyses of variance. Using these statistical methods in this way assumes that individuals differ quantitatively rather than qualitatively across a variable or set of variables, and that variables function and relate in the same way across all individuals. Therefore, this approach highlights the scores on a particular variable rather than the person to whom the score belongs, and it assumes that the relations among variables that exist across individuals are also valid within the individual (Magnusson). A typical research question based on a variable-oriented approach would be “What is the correlation between internal working models and adjustment of abused children”?

Although the variable-oriented approach has merit for many types of research questions, it is limited when attempting to assess aspects of development that differ among individuals. According to Bergman and Magnusson (1997), it is difficult to translate results that describe variables into characteristics that describe individuals due to the fact that the information provided is variable-oriented and not related to the individual approach. In the
variable-oriented approach, an individual’s score for a variable, such as depression, is only meaningful in relation to others’ scores on that same variable. Additionally, examining variables can provide useful information about particular risk factors; however, how those variables influence development may differ among individuals. With respect to the present study, variable-oriented studies have not always found the expected links between children’s internal working models and various indicators of adjustment. For example, despite strong theoretical connections between various aspects of internal working models and children’s social information processing abilities, Lynn (2008) did not find significant correlations between those constructs using the same larger sample of physically abused children as was used in this study. Based on this variable-oriented approach, it appeared that internal working models were not important in terms of their link to children’s social information processing. However, it could be the case that the patterns of components that exist within children’s internal working models are meaningful with respect to social information processing of children.

The goal of the person-oriented approach is to discover patterns of factors that characterize an individual’s development and functioning (Magnusson, 1998). This is possible within the person-oriented approach because it is assumed that factors work in conjunction to influence development; therefore, there should be patterns of factors that influence diversity in children’s development. This allows the person-oriented approach to be used to answer broad questions about individual development, such as assessing whether patterns exist within specific factors (i.e., are there unique patterns in the internal working models of physically abused children), as well as more specific questions, such as relating
patterns to a number of factors (i.e., are the patterns in internal working models related to variations in adjustment among physically abused children?). According to Bergman (1998), a pattern refers to a specific individual’s profile on certain variables, and a classification divides the individuals into groups in which the individuals within the group are similar on the variable(s) but the groups themselves are not similar.

Due to the nature of the person-oriented approach and the assumption that patterns of factors exist within the individual, cluster analysis is often used as a statistical method to answer questions in this approach. Cluster analysis essentially “groups” individuals in terms of existing patterns by creating similarity scores between subjects on particular factors or variables, and individuals that are most similar are grouped together. Identifying these groups or clusters enables researchers to examine a seemingly homogenous sample and discover which variations and divisions exist within the sample and then further examine each of the subgroups that are created. Cluster analysis has been used previously to identify subgroups within samples of children exposed to interparental conflict (Grych, Jouriles, Swank, McDonald, & Norwood, 2000), different types and severities of maltreatment (Higgins, 2004), and physical child abuse (Ward & Haskett, 2008). Ward and Haskett examined individual differences in the social adjustment of physically abused children and found support for three distinct groups among the maltreated sample; one group was socially well-adjusted, one was marginally well-adjusted, and one was characterized by low social adjustment. Although the approach taken by Ward and Haskett was similar to the current study in use of cluster analysis to identify subgroups of physically abused children, the present study examined whether there were individual differences in the internal working
models of physically abused children. The following section will provide a basis for the relevance of attachment theory and internal working models in terms of understanding adjustment of maltreated children.

Attachment and Internal Working Models

Attachment theory, which suggests that children form attachment relationships with their caregivers based on their early experiences, started with the work of John Bowlby in the 1950s and 60s. According to Bretherton (1992), the goal of Bowlby’s work was to understand what contributed to a child to growing up “mentally healthy.” Bowlby concluded that infants and young children needed to experience a warm, intimate, and continuous relationship with their mother in order to increase the chance of having mentally healthy development. Following Bowlby’s contribution to attachment theory, Mary Ainsworth’s work led to a greater understanding of the attachment relationship and designated it as very specific type of relationship consisting of an affectional bond to a specific individual that endures over time and distance (Ainsworth, Blehar, Waters, & Wall, 1978).

Children’s early experiences with their caregivers form the foundation for the development of their attachment style. Secure attachment styles promote a positive orientation toward their primary caregiver (most often the mother), themselves, and the world and have been shown to result in optimal outcomes for children (Belsky & Pasco-Fearon, 2002; Simpson, Collins, Tran, & Haydon, 2007). In contrast to secure attachment, insecure attachment styles have been linked to a number of negative outcomes relating to children’s psychological and social functioning (Cicchetti, 1990; Springer, Sheridan, Kuo, & Carnes,
2007). These findings suggest that there is diversity in children’s adjustment that can be explained, at least in part, by their attachment style.

Within an attachment framework, the primary mechanism by which early family relationships are linked to later outcomes is children’s own construction of “internal working models” of relationships. Internal working models of parent-child relationships consist of the knowledge and expectations that a person has about the relationship and the way it functions. Bowlby (1973) added that within an individual’s working model of relationships exist representations of the self and of the caregiver. It is generally agreed that these models consist of mental structures, rules, and postulates that result from experiences with attachment figures and that these experiences form a collective perceptual record of the affective and behavioral components of child-caregiver interactions (George & Solomon, 1989). Based on their models of self and caregivers, children develop expectations about the self and others; the self is viewed as either worthy or unworthy of care and protection and others are viewed as available or unavailable to provide care and protection (Bowlby). Over time, these internal working models create “knowledge structures” in order for the child to understand current and future relationships (Bowlby, 1982). It also has been suggested that children’s working models contain themes that reflect aspects of their attachment relationships. In addition to representations of self and parent, Toth, Cicchetti, Macfie, Rogosch, and Maughan (2000) found evidence for the presence of moral-affiliative and conflictual themes within children’s working models.

Because there is a link between attachment and internal working models, variations in attachment security are likely to be reflected by similar differences among the working
models and representations of relationships that are formed by children. Indeed, Moss, Bureau, Béliveau, Zdebik, and Lépine (2009) found differences in internal working models between securely and insecurely attached children. Securely attached children had fewer conflictual themes in their narrative stories than did disorganized/controlling children, recounted more discipline themes than avoidant children, and had higher rates of coherence than ambivalent children. Differences between securely attached children and children with insecure attachments are evident in various other aspects of children’s lives such as socioemotional adjustment and self concept. Specifically, children with secure attachments have been found to experience fewer internalizing symptoms than children with insecure attachment styles; insecurely attached children have been found to experience higher levels of both internalizing and externalizing symptoms (Kidwell, Young, Hinkle, Ratliff, Marcum & Martin, 2010; Vondra, Shaw, Swearingen, Cohen, & Owens, 2001). Additionally, children with secure attachment styles are less susceptible to negative information influencing their self-concept than are children with insecure attachment styles (Broemer & Blümle, 2003).

As noted above, the quality of children’s attachment during preschool has been related to their level of socioemotional adjustment in early childhood. Research generally suggests that children with secure attachments have better outcomes and fewer behavior problems than do children with various types of insecure attachments (Lyons-Ruth, Easterbrooks, & Cibelli, 1997; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). For example, children with insecure attachment styles at 6 years old were more likely to have clinical levels of internalizing and externalizing behavior problems two years later (Moss, Smolla, Cyr, Dubois-Comtois, Mazzarello, & Berthiaume, 2006). Similarly, children’s
internal working models have been related to many aspects of their adjustment, including internalizing and externalizing behavior problems and self-concept. Children with higher levels of positive and appropriate discipline representations and lower levels of negative representations exhibited fewer behavior problems (Oppenheim, Emde, & Warren, 1997). Furthermore, using the Narrative Story Stem Battery, Moss and colleagues (2009) found that narratives of 7 to 9 year olds significantly predicted behavior problems as rated by their teachers, such that children with a higher presence of conflictual themes had higher levels of externalizing problems and total behavior problems (Moss et al.). These results suggest that children’s working models are a reflection of their attachment experiences and that these models may have a regulating effect on children’s behavior (Zimmerman, 1999).

Despite the evidence that shows relations between internal working models and socioemotional adjustment, there are studies such as Solomonica-Levi, Yirmiya, Erel, Samet, and Oppenheim (2001) that do not find the same level of relation between these two variables. Specifically, only disciplining parental representations were related to behavior problems, whereas positive and negative parental representations were not linked to behavior problems (Solomonica-Levi et al., 2001). This suggests that there is variability across studies and individual differences may help explain this variability. That is, studies with disparate findings may contain subgroups of children whose models contain patterns different from the children in other studies. These patterns within the internal working models may be related to behavior and the presence or absence of these patterns may explain the individual differences in socioemotional adjustment among children.
With respect to the link between attachment and self-concept, attachment relationships provide children with a base from which they build their view of themselves and the world with which they interact. Attachment theorists have suggested that attachment security and the internal working models that follow have important implications for children’s developing self-concept (Bretherton & Munholland, 1999). In fact, Cassidy (1988) found that children’s attachment security was related to their self-concept in that children with more secure attachments had higher levels of perceived cognitive competence and perceived peer acceptance. Goodvin, Meyer, Thompson, and Hayes (2008) found children’s early attachment security to be a unique predictor of their later self-concept. Results showed that children with secure attachments at age 4 exhibited higher rates of positive self-concept at age 5. Additionally, children who were more securely attached demonstrated more consistency in their self-concept (Goodvin et al.). These findings suggest that attachment is an important variable in the development of a child’s self-concept.

Based on the theory that children’s internal working models develop from their attachment relationships, it would follow that their models would also influence the development of children’s self-concept. Verschueren, Marcoen, and Schoefs (1996) found that children’s representations of self were significantly related to aspects of self-concept. Specifically, children who had negative representations of themselves in their working models reported lower levels of perceived physical and cognitive competence. These results suggest that children’s representations of themselves within their working models are connected to their self-concept and how they perceive themselves in various aspects of life. However, representations of the self are not the only aspect of children’s working models;
self representations work in conjunction with representations of the parent and various attachment themes to form children’s internal working models of relationships. Therefore, it would follow that additional research should investigate the potential relation of all aspects of children’s working models and their self-concept, specifically with regard to their perceived maternal and peer acceptance as well as their perceived physical and cognitive competence.

Despite the evidence that various aspects of internal working models are related to socioemotional adjustment and self-concept, it is still unclear whether particular patterns among components of the working models relate to socioemotional adjustment and self-concept. It is apparent that early attachment and internal working models can contribute to children’s development. Additionally, it is clear that the variation within the attachment styles and internal working models of children have been linked to between-group differences in adjustment for maltreated and non-maltreated children, which will be discussed in the following section. However, a person-oriented approach would extend the research showing group differences by examining patterns within components of working models and assessing for the presence of distinct subgroups among physically abused children based on those patterns. As a result of the importance of attachment and internal working models and their influence on various indicators of adjustment, a large amount of research has examined how attachment may differ between maltreated and non-maltreated children. The following section will discuss current knowledge of the internal working models of abused children.
Attachment and internal working models of maltreated children. Most studies on attachment of maltreated children have included children who have experienced a variety of types of abuse and neglect; thus, knowledge of attachment and internal working models of physically abused children, specifically, is limited. Research suggests that more maltreated children than non-maltreated children exhibit insecure attachments (Baer & Martinez, 2006; Cicchetti & Barnett, 1991; Egeland & Sroufe, 1981). Particularly, it has been found that many maltreated children display the type of insecure attachment referred to as Disorganized, in that they show a lack of clear attachment behavior and often appear confused, avoidant, or apprehensive during interactions with their caregivers (Carlson, Cicchetti, Barnett, & Braunwald, 1989). The percentage of maltreated children with insecure attachment styles is much higher than the percentage of non-maltreated children with insecure attachments (Egeland & Sroufe). Lynch and Cicchetti (1991) suggested that these insecure attachments continued beyond early childhood and were still evident when maltreated children were in their school-age years. Thus, differences in the attachment styles of maltreated and non-maltreated children are not temporary.

According to Rogosch, Cicchetti, Shields, and Toth (1995), children who have been maltreated experience extreme distortions of the caregiving environment in which models initially develop. Children then use these altered environments and relationships to develop their initial internal working models of themselves and others. Therefore, it is likely that the working models of maltreated children differ from those of their non-maltreated peers. In fact, a number of studies have found differences between maltreated children and their non-maltreated peers in the expression of internal working models (i.e., representations of self,
caregiver and attachment themes) (Toth, Cicchetti, Macfie, & Emde, 1997; Toth, Cicchetti, Macfie, Maughan, & Vanmeenen, 2000; Waldinger, Toth & Gerber, 2001). Narrative measures such as the McArthur Story Stem Battery have frequently been used to assess children’s representations of both self and caregiver as well as themes in children’s working models. The McArthur Story Stem Battery is a story stem completion task in which children use dolls to act out the end of story stems read to them by experimenters. Several investigators have used the story stem battery to assess representations of maltreated children. The following studies represent some of the most methodologically sound studies designed to examine various aspects of the representations of maltreated children.

Toth and colleagues (1997) used a story stem completion task to examine internal working models; specifically, they examined caregiver and self representations of children who had been maltreated ($n = 80$) and matched non-maltreated ($n = 27$) children between 3 and 6 years old. All children were enrolled in the study with their mothers. The mothers of the maltreated participants had perpetrated at least one instance of reported abuse. The authors initially examined how different representations (i.e., positive and negative parent and self representations) correlated with each other. These correlations showed that positive maternal representations were significantly correlated with positive self representations and negative maternal representations were significantly correlated with negative self representations, providing further support for the theory that representations of self and caregiver are related. As the authors hypothesized, maltreated children had significantly more negative maternal and self representations than the non-maltreated children. The authors also found that physically abused children, in particular, had the highest number of negative
maternal and self representations compared to children who had experienced the other subtypes of maltreatment (i.e., neglect or sexual abuse). Toth and colleagues (1997) concluded that relationships that could be potentially positive (with peers and teachers, for example) may be adversely affected by the relationship expectations of maltreated children, and this could be especially true for physically abused children.

Toth, Cicchetti, Macfie, Maughan, and Vanmeenen (2000) furthered the research on internal working models by examining the one-year stability of representations for 56 maltreated children and 37 matched non-maltreated children. Once again, children were enrolled in the study with their mothers, and the mothers of maltreated participants had perpetrated substantiated abuse. The MacArthur Story Stem Battery was used to assess positive and negative representations of caregiver and self. As expected, maltreated children had significantly more negative representations of self and parent compared to the representations of their non-maltreated peers, which is analogous to the results of Toth and colleagues (1997). Building on previous research, findings from this study also showed that maltreated children had fewer positive parent representations than did non-maltreated children. Representations of parent remained stable over time for both abused and non-abused children. However, grandiose self representations (i.e., the child in the story stem is portrayed to have over-inflated abilities) rose marginally for maltreated children between Time 1 and Time 2.

Representations and the person-oriented approach. Past studies of working models of maltreated children have been important in terms of pointing to differences in representations between abused and non-abused children. The attachment relationships experienced by
abused children translate into differences in working models between abused and non-abused children. However, whether patterns of representations exist within the working models of abused children cannot be determined using variable-oriented approaches like those employed in prior research; to further explore and understand the internal working models of abused children one must examine individual differences using a person-oriented approach.

Abused children’s representations of their attachment relationships are likely to be subject to within-group differences in addition to the between-group differences that have already been examined. Internal working models are highly complex and are composed of a number of facets such as representations of the self and caregiver and numerous relationship themes (Thompson, 2008). Using a person-oriented approach to examine individual differences would not only allow for consideration of how aspects of children’s internal working models combine, but also whether those different combinations are related to children’s adjustment. The domains of adjustment considered in the current study are abused children’s socioemotional adjustment (internalizing and externalizing behavior problems) and their self-concept (perceived maternal acceptance, peer acceptance, physical competence, and cognitive competence).

Internal Working Models and Socioemotional Adjustment of Abused Children

Numerous studies have examined the relation between socioemotional adjustment and the experience of maltreatment and found that maltreated children exhibit higher levels of behavior problems than non-maltreated children. Socioemotional adjustment problems among children have often been dichotomized into either internalizing or externalizing behavior problems. Internalizing behavior problems can include withdrawal, anxiety,
fearfulness, and depression, whereas externalizing behavior problems can take the form of hyperactivity, aggression, defiance, and destructive behavior (Achenbach, 1991). Feldman, Salzinger, Rosario, and Alvarado (1995) found that physical abuse was directly related to parent and teacher reports of internalizing and externalizing behavior problems. Children who have been maltreated, specifically those who have been physically abused, often have been found to have higher levels of externalizing behavior problems (Bolger & Patterson, 2001a; Teisl & Cicchetti, 2008). Additionally, studies have found that maltreated children exhibit higher rates of internalizing behavior problems compared to rates for non-maltreated children (Bolger & Patterson, 2001b; Kim & Cicchetti, 2006; Toth & Cicchetti, 1996). Specifically, Keiley, Howe, Dodge, Bates and Pettit (2002) found that early abuse was related to higher rates of internalizing and externalizing behavior problems in kindergarten, as rated by the teacher. Due to the plethora of research supporting higher levels of internalizing or externalizing behavior problems among abused children, it is clear that maltreatment is related to the development of these problems.

As suggested above, the experience of maltreatment has been related to both internalizing and externalizing behavior problems; therefore it would follow that there is the potential for a connection between children’s internal working models and behavior problems among abused children. In fact, several studies conducted by Toth and colleagues show internal working models of maltreated children are related to their adjustment. Toth, Cicchetti, and Kim (2002) found that children’s perceptions of their mothers (a construct similar to representations of parents) mediated the link between maltreatment and internalizing and externalizing behavior problems. This finding would suggest that the
experience of maltreatment influences children’s perceptions of their mothers, which then affects their behavioral adjustment.

Toth, Cicchetti, Macfie, Rogosch, and Maughan (2000) examined whether themes expressed in working models were related to children’s behavior problems and if there were differences between maltreated and non-maltreated children in both internal working models and behavior problems. The authors examined this by using the MacArthur Story Stem Battery to assess moral-affiliative themes and conflictual themes present in narrative stories and the Child Behavior Checklist – Teacher Report Form (CBCL-TRF) to assess behavior problems. Toth and colleagues (2000) found significant positive correlations between conflictual themes and behavior problems and significant negative correlations between moral-affiliative themes and behavior problems. These results suggest that themes present in maltreated children’s representations are significantly related to the socioemotional adjustment exhibited by maltreated children. The results also suggest that maltreated children who have higher rates of positive themes may be less likely to exhibit the externalizing behaviors common among maltreated children. However, the investigators did not account for the parent and self representations that are present in children’s working models, or how the themes combine with the representations within children’s models. Nor did they examine within-group differences in themes among the maltreated children.

It is possible that differences in the internal working models and the formation of those models may help account for variability in socioemotional adjustment among maltreated children. Using a person-oriented approach would allow for further examination of patterns within models and whether those patterns account for diversity in socioemotional
adjustment among abused children. In addition to influencing behavior, working models have been shown to influence self-concept among maltreated and non-maltreated children. Self-concept and its relation to attachment and maltreatment are discussed next.

*Internal Working Models and Self-concept of Abused Children*

Self-concept develops gradually over time and contains various dimensions that create a portrait of the self (Harter, 1988). It has been suggested that children’s perceived levels of competence and acceptance are among the domains that make up self-concept. Harter and Pike (1984) proposed that, for children under the age of 8, self-concept encompasses children’s perceived competence in various domains of functioning (e.g., cognitive and physical competence) and their perceived social acceptance (i.e., maternal and peer acceptance). Additionally, Harter and Pike suggested that children are able to distinguish between domains of self-concept and are not likely to view themselves as equally adequate in all domains; therefore, for children under 8 years, it is more appropriate to view self-concept as a group of variables rather than one overall variable.

It has been suggested that the experience of abuse may contribute to viewing the self as unworthy, which may then impact a child’s self-concept (Harter, 1998). Research on self-concept of abused children is not as extensive as the literature on their socioemotional adjustment and only one published study was available on the association between internal working models of maltreated children and their self-concept. Some studies have shown that maltreated children have lower levels of perceived competence and social acceptance than their non-maltreated peers (Toth & Cicchetti, 1996; Vondra, Barnett, & Cicchetti, 1990), but findings are not consistent across all studies. For example, a study of 6-7 year olds revealed
that maltreated children showed significantly more positive self-concept in terms of social acceptance (Barnett, Vondra, & Shonk, 1996) and Kinard (2001) did not find group differences in perceived academic competence. It is possible, because self-concept develops gradually throughout childhood, that differences in study findings may be age related. Kinard (2001) included a sample of abused children between 6-12 years old, a developmental period during which self-concept is changing (Harter, 1988); therefore, it is possible that his lack of findings is related to the fluidity of self-concept and changes that happen between ages 6 and 12.

To date, research examining the connection between internal working models and self-concept among maltreated children has been quite limited. Toth and Cicchetti (1996) found that maltreated children’s relatedness to mother was significantly correlated with their perceived social acceptance. However, the direct link between children’s working models and their self concept has not been examined for a maltreated sample. The present study was designed to advance this area of research by examining whether there are subgroups of abused children with similar patterns in internal working models who differ from other subgroups (with different internal working models) in terms of aspects of their self-concept.

Statement of the Problem

The negative consequences of child abuse have been well-documented over the past several decades. Abused children have been shown to have more negative working models of relationships (Toth et al., 1997), higher rates of internalizing and externalizing behavior problems (Cicchetti & Toth, 1995; 2000), and lower levels of self-concept (Vondra, et al., 1990). Much of the research examining characteristics of abused children has been variable-
oriented in nature and has focused on how abused and non-abused children differ in numerous areas of functioning. Although previous research has been extremely important in providing knowledge of the effects of abuse, little research has provided insight into the wide individual differences that exist within this group of children. Previous research has been useful in the development of interventions to reduce long-term negative outcomes for abused children. However, effectiveness of those interventions varies across abused children (Moss, Dubois-Comtois, Cyr, Tarabulsy, St-Laurent, & Bernier, 2011; Toth, Maughan, Manly, Spagnola, & Cicchetti, 2002), with some abused children less likely to benefit from particular approaches. Understanding factors associated with the diversity in adjustment of abused children could assist in refining intervention approaches for these children.

Using a person-oriented approach to understanding characteristics of abused children should provide important information about heterogeneity among these children. According to Magnusson (1998), by examining a group of children with a common history of abuse, we will be able to provide more in-depth information about the functioning of the individuals. That is, the functioning of abused children may be considered similar when compared to that of non-abused children; however, conducting in-depth examinations of the functioning of physically abused children would provide information on how functioning may differ among children within this group. Therefore, by examining the internal working models of physically abused children using a person-oriented approach, we are likely to better understand the models of these children and any patterns that may exist in their models. Thus, the purpose of this study was to examine whether subgroups of physically abused
children with similar patterns of internal working models differ in their socioemotional adjustment and self-concept.

Research Questions and Hypotheses

Individual differences in the internal working models of physically abused children were examined through cluster analysis. Clustering on internal working models included children’s representations of self, representations of parent, moral-affiliative themes, and conflictual narrative themes. Due to the exploratory nature of cluster analysis, specific hypotheses about the number of clusters that would be identified and the nature of those clusters could not be made. However, it was expected that one or more clusters would be characterized by a generally favorable pattern of working models and at least one other would be characterized by a less favorable pattern. Further, it was expected that clusters would differ on measures of socioemotional adjustment and self-concept. Specifically it was hypothesized that:

1. Clusters would differ significantly on internalizing behavior.
2. Clusters would differ significantly on externalizing behavior.
3. Clusters would differ significantly on cognitive competence.
4. Clusters would differ significantly on physical competence.
5. Clusters would differ significantly on maternal acceptance.
6. Clusters would differ significantly on peer acceptance.
Method

Participants

Participants were a subset of participants from a larger longitudinal study designed to examine factors that contributed to physically abused children’s successful transition from preschool to early elementary school. Participants in the larger study were 96 child/parent dyads, where the parent enrolled in the study was the abuser. Criteria for inclusion in the larger study included (a) a substantiated report of physical abuse by the parent to the social service registry within the prior 12 months; (b) confirmation that the child/parent dyad was living in the same home; (c) an absence of sexual abuse of the child; (d) the family was predominantly English speaking; and (e) the child was in his or her last year of preschool, kindergarten, or first grade.

In the current study, children were included if they completed the measures of internal working models and self-concept and if their teacher completed the teacher report measure of children’s behavior. Nearly all (79%) of the children enrolled in the larger study were included in the current study. The sample for this study was 74 children who ranged in age from 5 to 7 years old ($M = 6.33; \, SD = .54$). A large majority of children in the study were male ($n = 49; 66\%$) and most (70%) children were African American. Finally, the children had a mean IQ score of 90.65 ($SD=12.52$). Despite the longitudinal nature of the larger study, only one time point for each child was used in the current study. Not all children were enrolled in a formal preschool at the preschool time point (thus, no teacher-report data were available); therefore, only the kindergarten or first grade time points were used in the present study. The time point with the most complete data was used. If both kindergarten and first
grade time points had equivalent data, the first grade time point was used. The kindergarten
time point was used for 22 of the children and the first grade time point was used for 52 of
the children.

Several children in the larger study had siblings that were also participants in the study. The present study included 10 sets of siblings; seven of the sets consisted of two siblings and the final three sets each consisted of three siblings. The current study included all children from the 10 sets of siblings because each child could have unique representations of their experiences, unique levels of socioemotional adjustment, and a unique self-concept. However, to examine the degree to which including multiple children from one family would impact the independence of observations, correlation analyses were conducted between sibling pairs on all study variables. Two sets of correlations were run due to the fact that three of the sibling sets had three siblings in the study. For these three sets, a different pair was included in each set of correlations. All correlation values for sibling pairs can be found in Table 1. The majority of correlations were not significant, providing statistical justification for including all siblings in the study. However, there were significant correlations in scores for Moral-Affiliative Themes between sibling pairs. Thus, the cluster analysis was run twice—once with all children included and once with only one sibling from each set included. Because results produced a very similar pattern of findings, a decision was made to retain the full sample.

Instrumentation

Measure of internal working models. Children’s internal working models of relationships were measured using a story-stem completion task based on the MacArthur
Story Stem Battery (Bretherton, Oppenheim, Buschbaum, & Emde, 1990) and developed by Bretherton and colleagues (Bretherton, Ridgeway, & Cassidy, 1990). The MacArthur Story Stem Battery contains a number of stories and investigators choose which stories to administer based on their research questions. This study included seven stories that used a combination of dolls (mother, father, grandmother, and two same-sex child dolls) matched to the gender and race of the child participant. Stories portrayed emotionally-laden family interactions designed to be relevant to the lives of young children; content areas included child accident, child injury, parental conflict, child fear, parent-child separation and reunion, and family interaction. Each story and administration directions are provided in Appendix A.

Stories were administered individually to each child by trained research assistants. The child was instructed to “Listen to the beginning of the story, and then finish it any way you would like to.” The research assistant then told the beginning of the story and acted it out, using the dolls. At the conclusion of the story stem, the child was asked to “Show me and tell me what happens now.” An initial story about a birthday party was presented as a practice story to introduce the task and allow children to gain familiarity with the procedures. Administration of all stories was audiotaped and videotaped for later coding.

In their review of research using the MacArthur Story Stem Battery, Holmberg, Robinson, Corbitt-Price, and Wiener (2007) stated that numerous studies yielded high levels of interobserver agreement, with high to moderate intraclass correlations ranging from .80 to .96. Additionally, internal consistency and stability scores have been reported in various studies for content theme composite scores with alpha ranging from .69 to .87 (Holmberg et al.). In terms of validity, Warren, Oppenheim, and Emde (1996) suggested that the narrative
measure and coding system are useful assessment tools and provide support for the coding of themes present in the stories. Additionally, previous research has continually shown that the differences in outcomes and adjustment can be related to the variables generated by this measure. Specifically, studies have shown that maltreated and non-maltreated children obtained significantly different scores on Child and Parent Representation composites, and that scores on the Conflictual composite mediated the relation between maltreatment status and externalizing disorders (Buchsbaum, Toth, Clyman, Cicchetti, & Emde, 1992; Toth, Cicchetti, Macfie, Rogosch & Maughan, 2000).

Measure of socioemotional adjustment. Socioemotional adjustment was measured in terms of Internalizing and Externalizing Problems on the Child Behavior Checklist, Teacher Report Form (TRF; Achenbach & Rescorla, 2001) and Caregiver–Teacher Report Form (C-TRF; Achenbach & Rescorla, 2000). The TRF is intended for teachers of children ages 6 to 18 years old and obtains ratings by teachers on 118 items regarding the child’s competencies and emotional and behavioral problems. The TRF was used for the majority of children in the present study; however, due to the fact that certain children were under the age of 6, the C-TRF was used for those children. The C-TRF is used for children between 1 ½ and 5 years of age and contains 100 items regarding children’s competencies and emotional and behavioral problems. The two forms are comparable, are part of the same overall assessment system, and are designed to measure similar behaviors over different ages (Achenbach & Rescorla, 2000). Additionally, there are a number of similar items used to measure behaviors across the two forms.
On both versions of the measure, teachers rated how true each item was of the child at that time or within the past 6 months using the following scale: 0 = not true; 1 = somewhat or sometimes true; 2 = very true or often true. Raw scores were converted to $T$ scores ($M = 50; SD = 10$) based on age group and gender for three composites, including Internalizing Problems, Externalizing Problems, and Total Problems. For purposes of this study, $T$ scores for Internalizing Problems and Externalizing Problems were used as the measures of socioemotional adjustment. Additionally, the $T$ scores for four subscales from the TRF and C-TRF were used for a follow-up profile analysis of cluster differences on subscales. The Anxious/Depressed, Somatic Complaints, Attention Problems, and Aggressive Behavior subscales were used, as they were the most comparable across the two forms of the TRF (Achenbach & Rescorla, 2000). These four subscales contained the greatest amount of similar items across the two forms, suggesting that they were assessing the same behaviors and that scores across the two forms would be comparable.

The TRF has shown high levels of internal consistency, with alpha = .90 for the Internalizing Problems score and alpha = .95 for the Externalizing Problems score (Achenbach & Rescorla, 2001). Additionally, the C-TRF has shown similarly high rates of internal consistency with alpha = .89 for the Internalizing Problems score and alpha = .96 for the Externalizing Problems score (Achenbach & Rescorla, 2000). Stability, as measured by test-retest reliability over 2 weeks, has been consistently high for the TRF, with $r = .86$ for Internalizing Problems and $r = .89$ for Externalizing Problems (Achenbach & Rescorla, 2001). Additionally, individual subscales have shown acceptable levels of stability with correlations ranging from .68 to .91 depending on the subscale (Achenbach & Rescorla,
Validity has been well established through over 40 years of research showing TRF and C-TRF scores distinguish between demographically similar referred and nonreferred children (Achenbach & Rescorla, 2000; Achenbach & Rescorla, 2001).

**Measure of self-concept.** Children’s self-concept was measured using the Pictorial Scale of Perceived Competence and Social Acceptance (Pictorial Scale; Harter & Pike, 1984). The Pictorial Scale is an individually-administered measure of perceived competence and social acceptance in young children. The Pictorial Scale included 24 items administered in a picture format. For each item, the child was read a brief statement about pairs of pictures of children engaged in various tasks while the examiner pointed to the corresponding picture (e.g., “this child is good at doing puzzles and this child is not very good”). The examiner then asked the child to point to the child in the picture that was most like him/her and then asked whether the picture was a lot like him/her = 4, somewhat like him/her = 3, a little like him/her = 2, or not at all like him/her = 1.

The measure yielded scores for four subscales each containing six items: Cognitive Competence, Physical Competence, Maternal Acceptance, and Peer Acceptance. Each item was scored 1 (less competent/less accepted) through 4 (more competent/more accepted). To determine the score for each subscale, scores for all items in that scale were added together and the total was then divided by the number of items in the subscale for a final score. For the present study, self-concept was measured using all four aspects (Cognitive Competence, Physical Competence, Maternal Acceptance, and Peer Acceptance) as individual variables.

Numerous studies have suggested that, based on the multi-dimensional structure and picture format, the Pictorial Scale is a suitable measure of self-concept for younger children.
Mantzicopoulos, French, and Maller (2004) found support for the multi-dimensional structure of the Pictorial Scale for middle class and low-income kindergarteners. Internal consistency for the four subscales has ranged from alpha = .75 to alpha = .89 (Harter & Pike, 1984). Additionally, Mantzicopoulos and colleagues (2004) found similar internal consistency scores as those reported by Harter and Pike. The following levels of internal consistency were found for the present study: Physical Competence alpha = .57; Cognitive Competence alpha = .70; Maternal Acceptance alpha = .76, Peer Acceptance alpha = .81. Additionally, according to Harter and Pike, the Pictorial Scale also demonstrated acceptable convergent, discriminant, and predictive validity.

**Procedures**

*Participant recruitment and general data collection procedures.* Participants for the larger study were identified through Child Protective Services as having substantiated cases of physical abuse. Parents of abused children in the appropriate age range were sent a letter informing them of the study and providing them with contact information for the research office. Parents that were interested in the study called the research office and were screened for participation by a doctoral-level psychologist. If the family met the research criteria described above, they were scheduled for a three-hour data collection session at a university-based clinic. Families were informed that the study included three data collection sessions that would span three years and that they would be scheduled to attend one three-hour session each year. Optimally, the initial session was scheduled when the child was in preschool, the second session occurred approximately one year later when the child was in kindergarten, and the third and final session was scheduled when the child was in first grade.
To encourage participation, parents received $70 for their participation and transportation to the data collection site and childcare were provided. To promote continued participation in all three time-points of the study, the payments were increased by $10 each year the family participated. Parents also received a book with contact information for local parenting and family support resources and their child was given educational materials and a small toy.

Confidentiality was maintained by assigning identification numbers to all participating families and cataloging data according to these numbers in locked filing cabinets. To take further precautions for confidentiality, a Certificate of Confidentiality was obtained from the federal Department of Health and Human Services, which protects families from research information being used in court proceedings. Procedures for the larger study were approved by the university Institutional Review Board. Informed consent was obtained from parents and assent was obtained from children at the beginning of each session. Teams of undergraduate research assistants, supervised by a graduate student, administered all measures with parents and children. To help ensure unbiased data collections, undergraduate research assistants were not aware of the families’ involvement with Child Protective Services or participants’ substantiated histories of abuse.

Families were scheduled for a three-hour data collection session at a university-based clinic. Informed consent was obtained from parents at the beginning of each session and assent was obtained from children. Teams of undergraduate research assistants, supervised by a graduate student, administered all measures with parents and children. Children and parents completed measures concurrently in separate, private interview rooms and participants were given the option to decline to participate in any aspect of the data collection.
process. All measures were completed in a standard administration order, and of the measures used in the present study, children completed the McArthur Story Stem Battery prior to completing the Pictorial Scale of Perceived Competence and Acceptance.

At the data collection session, parents also signed a consent form allowing their child’s teacher to be contacted so that teacher ratings could be obtained. Once consent from the parent was obtained, the teacher was contacted about participation in the study and all teachers were given the option of declining participation. If the teacher agreed to participate, a visit to the school was scheduled and the measures were given to the teacher to complete. Measures would then be collected from teachers once they had been completed and teachers received $15 for participating in the study.

_Protections for coding the MacArthur Story Stem Battery._ Creating usable data from the MacArthur Story Stem Battery was an involved process that had two main steps—coding each story along a number of dimensions and generating scores using the codes. A flow chart of score creation is provided in Appendix B. Each story was coded separately using the Rochester Narrative Coding II Manual (2001). This manual is the latest revision of the MacArthur narrative coding manual – Rochester Revision (Robinson, Mantz-Simmons, Macfie, & the MacArthur Narrative Working Group, 1996). Stories were coded by undergraduate research assistants who were unaware of the child’s history of maltreatment as well as any hypotheses that were to be tested. All coders completed a series of training sessions with the same graduate student trainer (the author) until 80% minimum inter-rater agreement was established. After inter-rater reliability was reached during training, coders
were assigned a series of tapes to code individually and approximately 30% of the narratives were coded by a second coder in order to assess inter-rater reliability.

Toth, Cicchetti, Macfie, Maughan, and colleagues (2000) reported the inter-rater agreement of the MacArthur narrative coding manual – Rochester Revision ranged from kappa = .71 to 1.0 for all categorical variables. Toth, Cicchetti, Macfie, Rogosch, and colleagues, (2000) also assessed inter-rater reliability of this coding system and reported it to range from kappa = .73 to .95 and the Moral-affiliative and Conflictual composite scores are negatively correlated ($r = -.28, p < .05$). Oppenheim, Emde, and Warren (1997) also found adequate inter-rater reliability of the coding system, kappa = .85. However, due to the fact that kappa could not be computed for certain variables in this study, percent agreement was calculated for all variables and ranged from 78% to 100% for all variables of interest. Principal component analyses in previous studies have shown adequate internal consistency ranging from alpha = .70 to .81 for the parent composite scores (Oppenheim et al.). Prior research provides evidence to support the validity of the coding system. For example, Toth and colleagues (1997) suggested that the ability of the codes of MacArthur narrative stories to reveal differences between maltreated and non-maltreated children on their differential care giving histories provides validation for the measure and its coding system.

**Representations.** Each of the six stories (excluding the practice story) was first coded for representations of self (child representations) and representations of caregivers (parent representations). Generating those codes required several steps. To determine self representations, all stories were coded for the presence of positive, negative, and false child representations. Positive child representations included pride, helping, and feeling good
about self in any domain (e.g., child doll helps clean up the spilled juice). Negative child representations included aggression, shame, self-blame, and feeling bad about oneself in any domain (e.g., child doll hits the mom doll). False child representations encompassed reports of inappropriate emotions or an overly compliant strategy (e.g., when asked how the child doll feels about the parent dolls arguing, participant says “good” or “fine”).

To determine parent representations, stories were coded for the presence of positive, negative, disciplining, controlling, and incongruent parent representations. Positive parent representations included protection, caretaking, affection, and helpfulness (e.g., mother, father, or grandmother doll puts a band-aid on the hurt finger). Negative parent representations involved harsh or punitive behaviors, rejection, and ineffectual actions (e.g., mother, father, or grandmother doll rejects a child doll’s bid for closeness, or moves rather than deal with the monster). Disciplining parent representations consisted of descriptions of the mother, father or grandmother dolls disciplining a child doll, which may have included physical punishment if it was not overly harsh (e.g., mother, father, or grandmother doll put the child doll in time out, or parent doll spanked the child doll). Controlling parent representations were parental doll attempts to control the child doll independent of discipline (e.g., parent doll tells the child doll to go to bed, not as a punishment). Incongruent parent representations were when a child told a story about one or both parent dolls dealing inconsistently with the child doll (e.g., Parent doll comforted the child doll and put a band-aid on the hurt knee, then yelled at the child doll for falling off the rock).

Themes. In addition to specific self and parent representations, all stories were coded for themes including: (a) affection (an appropriate display of hugs, kisses, and compliments);
(b) affiliation (a positive situation where two or more dolls were participating in an activity together); (c) compliance (when a child doll yielded to the rules or requests of an adult doll in the story); (d) empathy/helping (character/doll identified with or demonstrated an understanding of the thoughts or feelings of another); (e) reparation/guilt (character/doll made story stem wrongs/upsets right, made amends, or displayed feelings of guilt); (f) aggression (verbally aggressive comments or physically aggressive acts); (g) verbal conflicts (highly inflected angry verbal remarks such as name calling or yelling); and (h) escalation of conflict (incidence of a coherent escalation in the level of conflict beyond that initially expressed).

*Composite scores.* Codes for child representations, parent representations, and themes were used to generate scores using the method employed by Toth, Cicchetti, Macfie, Maughan, and colleagues (2000). Self representations were assessed using the child representations scale, which contained positive representations, negative representations, and false representations. The codes for positive, negative and false representations were summed across narratives in order to create summary scores. The Positive Child Representations composite was the sum of the positive representations scale with a range of 0-6, where a score of 6 corresponded to having a positive representation in each of the 6 stories. The Negative Child Representations composite was the sum of both the negative and false scales. Therefore, the Negative Child Representations composite score was divided by two, to create the average composite score, because it combined two scales (i.e., the negative and false scales). The composite score ranged from 0-6, and a 6 equated with having a negative and false representation in each story.
Parental representations were assessed using composite scores as outlined by Toth and colleagues (1997). The Positive Parent Representations composite, containing only positive representations, had a range of 0-6, where a 6 corresponded to a positive representation in each story. The Negative Parent Representations composite consisted of scores on negative, controlling and incongruent representations. Therefore, the Negative Parent Representations composite score was divided by 3, to create an average composite score, because it combined three scales (i.e., negative, controlling, and incongruent). Scores ranged from 0-6, and a score of 6 showed that there were negative, controlling, or incongruent representations in each story.

Finally, using the method employed by Toth, Cicchetti, Macfie, Rogosch, and Maughan (2000), the coded themes were used to create composite scores for Moral-Affiliative themes and Conflictual themes. The score for each individual theme was created by summing the presence of that theme across the six stories to create a summary score. Composite scores for Moral-Affiliative and Conflictual themes were then generated by averaging the sum of relevant content codes for each theme. The Moral-Affiliative composite consisted of scores for affection, affiliation, compliance, empathy, and reparation/guilt. The total score was the sum of the scores for all five relevant themes divided by 5, in order to create an average composite score. The Conflictual composite consisted of scores for aggression, verbal conflicts, and escalation of conflict. The total score was the sum of the three themes divided by 3, which created an average composite score. Please see the flow chart in Appendix B for further illustration and explanation of composites scores for all internal working model (IWM) variables.
Table 1

**Correlations Among Siblings on Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sibling Pair 1</th>
<th>Sibling Pair 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measures of Internal Working Models</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Child Representations</td>
<td>.43</td>
<td>.35</td>
</tr>
<tr>
<td>Negative Child Representations</td>
<td>.31</td>
<td>.06</td>
</tr>
<tr>
<td>Positive Parent Representations</td>
<td>.54</td>
<td>.49</td>
</tr>
<tr>
<td>Negative Parent Representations</td>
<td>-.04</td>
<td>-.12</td>
</tr>
<tr>
<td>Moral-Affiliative Themes</td>
<td>.77*</td>
<td>.81**</td>
</tr>
<tr>
<td>Conflictual Themes</td>
<td>-.27</td>
<td>-.63</td>
</tr>
<tr>
<td><strong>Measures of Socioemotional Adjustment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalizing Behavior</td>
<td>.42</td>
<td>.39</td>
</tr>
<tr>
<td>Externalizing Behavior</td>
<td>-.13</td>
<td>.15</td>
</tr>
<tr>
<td><strong>Measures of Self Concept</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Competence</td>
<td>.08</td>
<td>.55</td>
</tr>
<tr>
<td>Physical Competence</td>
<td>.42</td>
<td>.58</td>
</tr>
<tr>
<td>Maternal Acceptance</td>
<td>-.18</td>
<td>.53</td>
</tr>
<tr>
<td>Peer Acceptance</td>
<td>.05</td>
<td>.02</td>
</tr>
</tbody>
</table>

* $p < .05$
** $p < .01$
Results

Preliminary Analyses

To examine and describe the data, means, standard deviations, and ranges were calculated for all study variables and values can be found in Table 2. Skewness and kurtosis values were computed to examine the distribution of the study variables and all variables had acceptable levels of skew and kurtosis, which can be found in Table 3.

A series of analyses was conducted to identify possible covariates. Previous research has shown gender differences as well as ethnicity differences in the socioemotional adjustment and self-concepts of children (Chen, 2010; Hatcher, Maschi, Morgen, & Toldson, 2009; French & Mantzicopoulos, 2007; Maschi, Morgen, Bradley, & Hatcher, 2008). Therefore, two MANOVAs were run to determine if socioemotional adjustment or self-concept differed by gender or ethnicity (African American/ Non-African American). Results indicated that socioemotional adjustment variables did not differ by gender or ethnicity. Additionally, self-concept variables did not differ by gender or ethnicity, with the exception of Physical Competence which differed by gender. Specifically, males had significantly lower Physical Competence score ($M = 3.47; SD = .45$) than females ($M = 3.67; SD = .45$), $F(1, 66) = 6.20, p = .02$; therefore, gender was included as a covariate in the subsequent MANCOVA analysis for self-concept.

Clustering Strategy

Cluster analyses were conducted using six variables from Narrative Story Stems. Specifically, scores for Positive Child Representations, Negative Child Representations, Positive Parent Representations, Negative Parent Representations, Moral-Affiliative themes,
and Conflictual themes were included in the cluster analysis. The first decision was to
determine which method of cluster analysis would be used. Due to the exploratory nature of
the study, a hierarchical agglomerative, rather than a partitioning method, was most
appropriate (Aldenderfer & Blashfield, 1984). Aldenderfer and Blashfield also suggest that
the hierarchical agglomerative method is appropriate for use with smaller samples.
Additional support for conducting a cluster analysis with a sample size of 74 can be found in
previous studies that have conducted hierarchical agglomerative cluster analysis with similar
sample sizes and found meaningful results (Daignault & Hebert, 2009; Davies & Forman,
2002). The next step in the cluster analysis was to establish the criterion for determining
distance between cases. Squared Euclidian Distance was an appropriate measure of distance
for the present study because the variables entered into the cluster analysis were continuous
and on the same scale (Norusis, 2009). In the third step of cluster analysis, Ward’s minimum
variance method was chosen to determine which clusters were merged at successive steps;
however, average-linkage was used as a second measure to examine the similarity of the
cluster solution and increase confidence that clusters were sound. These two methods are the
most often used within social science research (Bergman & Magnuson, 1997) and Ward’s
method minimizes the within-group distances for each cluster. The final step in the cluster
analysis was to determine the optimal number of clusters to represent the data. Two indices
were used for this purpose – the change in the agglomeration coefficients and visual
inspection of the dendrogram. Large increases in the agglomeration coefficient indicated that
the optimal number of clusters had been reached. The dendrogram provided a visual
representation of how subjects were combined into clusters, and helped clarify the appropriate number of clusters.

Using Ward’s method, support was found for a two-cluster solution. The change in agglomeration coefficient generated by Ward’s method provided support for a two-cluster solution with a change between the coefficients of 117.88. The next highest change in the agglomeration coefficient was 42.96 for a three-cluster solution. Visual inspection of the dendrogram offered further support for the two-cluster solution (Appendix C). The dendrogram shows that throughout the successive steps, participants were combined into clusters of varying sizes, with certain clusters being substantially larger or smaller than others. At the step where two clusters are formed, the clusters become more visually meaningful and relatively equal in size. Finally, re-estimating the clusters using the average-linkage method yielded consistent results with those found using Ward’s method. The largest change in agglomeration coefficient was for a two cluster solution and the visual inspection of the dendrogram produced by the average-linkage method (Appendix D) showed clusters of similar size and make-up as those produced using Ward’s method. In summary, there was substantial support for a two cluster solution.

*Cluster Descriptions*

The two clusters were comprised of 46 and 28 members, and differed significantly on all aspects of working models with the exception of Negative Parent Representations. All means and standard deviations for clustering variables for each cluster as well as the tests for significant differences between clusters on each clustering variable can be found in Table 4. Based on these differences, Cluster 1 \( (n=46) \) labeled “Positive IWM” had significantly higher
scores on all of the positive aspects of their internal working models (i.e., Positive Child Representations, Positive Parent Representations, and Moral-Affiliative Themes) and lower scores on two of the negative aspects (i.e., Negative Child Representations and Conflictual Themes). Due to lower scores on the positive aspects of internal working models and higher scores on negative aspects, Cluster 2 \( n=28 \) was labeled “Negative IWM”.

The children in the two clusters were relatively similar on demographic variables. Due to the heavy verbal load in narrative story stems, correlations were run to assess the relation between children’s IQ scores and the six representation variables. Only the Conflictual Themes variable was significantly correlated with IQ \( r = .242, p = .05 \); due to this relation a \( t \)-test was conducted to determine if children in the clusters differed on IQ. The \( t \)-test revealed that children in the two clusters were not significantly different in terms of IQ, and therefore, IQ was not considered a covariate in further analyses. Additionally, there were no significant differences between the children in the two clusters on race. However, the clusters did differ significantly on gender, \( X^2 (1, 74) = 7.66, p = .006 \); the Positive IWM cluster included a significantly greater proportion of females than did the Negative IWM cluster. The Positive IWM cluster included 21 females \((46\% \text{ of the cluster})\) whereas the Negative IWM cluster included only 4 females \((14\% \text{ of the cluster})\). See Table 5 for all means and standard deviations of the demographic variables for each cluster and tests for significant differences between clusters.

**Validation of Clusters on Socioemotional Adjustment and Self-concept**

The data analytic strategy used to explore validation of clusters on socioemotional adjustment and self-concept included a series of analyses. First, because both socioemotional
adjustment variables (Internalizing Problems and Externalizing Problems) came from the TRF/C-TRF and all four self-concept variables (Maternal Acceptance, Peer Acceptance, Cognitive Competence, and Physical Competence) came from the Pictorial scale. Repeated Measures MANOVAs were run to examine (a) differences in the scores across variables from the same measure, and b) differences in the patterns of scores for the two clusters. In order to examine the assumption of homogeneity of variance among variables for the Repeated Measures MANOVAs, Box’s M tests were conducted. The Box-M test for the homogeneity of variance-covariance matrices produced non-significant results for both MANOVAs; socioemotional adjustment, $F(3, 93329.263) = 1.997, p > .05$; self-concept, $F(10,15209.302) = .981, p > .05$. This suggests that there were acceptable levels of homogeneity across variables for both the socioemotional adjustment and self-concept MANOVAs. Then, in order to address specific hypotheses related to whether clusters differed in their scores on each individual variable, a series of independent samples $t$-tests or one-way ANOVAs were conducted, depending on whether covariates were included in the analyses.

Socioemotional adjustment. A Repeated Measures MANOVA was run to determine whether the entire sample differed on internalizing and externalizing behavior problems and whether the children in the clusters differed in their pattern of scores. $T$ scores for Internalizing Problems and Externalizing Problems were entered as the dependent variables in the MANOVA with Cluster membership serving as the independent variable. Results revealed a significant main effect for TRF scores, $F(1, 68) = 9.833, p = .003$, partial $\eta^2 = .199$, with significantly higher Externalizing scores than Internalizing scores. However, there was
not a significant interaction between TRF scores and cluster membership, $F(1, 68) = 1.266$, $p = .265$, partial $\eta^2 = .018$, indicating that children in the two clusters did not differ in their pattern of scores. That is, Externalizing Problems scores were higher than Internalizing Problems scores for children in both clusters.

In order to specifically examine Hypotheses 1 and 2 and determine whether there were significant differences between children in the two clusters on mean scores for Internalizing Problems and Externalizing Problems, two separate Independent Samples $t$-tests were run. All means and standard deviations for the two clusters can be found in Table 6. Results indicated that clusters differed significantly in their mean scores for both Internalizing Problems, $t(68) = -2.099$, $p = .04$, $r^2 = .061$, and Externalizing Problems, $t(68) = -3.321$, $p = .001$, $r^2 = .140$. For both Internalizing Problems and Externalizing Problems children in the Negative IWM cluster had higher mean scores than children in the Positive IWM cluster.

**Self-concept.** A Repeated Measures MANCOVA was run to determine whether the sample had significantly different scores across self-concept variables and whether children in the two clusters exhibited significantly different patterns of self-concept scores. The scores for Maternal Acceptance, Peer Acceptance, Cognitive Competence, and Physical Competence were entered as the dependent variables and once again Cluster Membership was entered as the dependant variable. Also, because boys and girls differed significantly on Physical Competence, gender was entered as a covariate in this analysis. Results from the Repeated Measures MANCOVA revealed a significant main effect for self-concept, $F(1,69) = 6.854$, $p < .001$, partial $\eta^2 = .230$. However, there was not an interaction between self-
concept and cluster membership, $F(1, 69) = 1.763$, $p = .162$, partial $\eta^2 = .071$. Thus, there are differences in Maternal Acceptance, Peer Acceptance Cognitive Competence and Physical Competence scores for the entire sample, but children in the two clusters did not differ in their pattern of scores on the self-concept variables.

To specifically examine Hypotheses 3 through 6, one-way ANOVAs were used to explore the potential for cluster differences on each aspect of self-concept individually. Once again, all means and standard deviations for the two clusters can be found in Table 6. Results revealed that children in the two clusters did not differ significantly on three out of the four aspects: Cognitive Competence, $F(1, 71) = .108$, $p = .743$, partial $\eta^2 = .002$; Physical Competence, $F(1, 71) = .012$, $p = .914$, partial $\eta^2 = .000$; Peer Acceptance, $F(1, 71) = 1.855$, $p = .177$, partial $\eta^2 = .025$. Maternal Acceptance was the only aspect of Self-concept that was significantly different by cluster, $F(1, 71) = 4.223$, $p = .044$, partial $\eta^2 = .056$, with children in the Negative IWM cluster having higher scores for maternal acceptance than children in the Positive IWM cluster.

Follow-up Analysis

To further explore the significant cluster differences on Internalizing Problems and Externalizing Problems scores, a profile analysis was conducted to examine possible profile differences between children in the two clusters on the individual subscales of the TRF. The following four subscales were included in the profile analysis: Anxious/Depressed, Somatic Complaints, Attention Problems, and Aggressive Behavior. These four subscales were included because the scales and items were comparable across the TRF and C-TRF allowing
for all subjects who were in the cluster analysis to be included in the profile analysis. Finally, the grouping variable for the profile analysis was Cluster Membership.

To conduct the profile analysis, a repeated measures MANOVA was used to identify subscales on which the two clusters were similar and different and to compare their overall pattern of scores on the subtests of the TRF/C-TRF. Mauchly’s Test of Sphericity revealed a significant effect, suggesting that the assumption of sphericity was violated. In order to avoid an increase in the likelihood of Type I error, the lower-bound epsilon correction was used to correct for the violation of the sphericity assumption. After the correction, results indicated a significant main effect for TRF/C-TRF subscales, $F(1, 68) = 9.394$, $p = .003$, partial $\eta^2 = .121$, suggesting that when children in the clusters were examined together the overall mean scores differed across the various subscales of the TRF/C-TRF. Additionally, there was a significant interaction between TRF/C-TRF subscale scores and cluster membership, $F(1, 68) = 5.133$, $p = .027$, partial $\eta^2 = .070$, revealing that children in the Positive IWM cluster and children in the Negative IWM cluster had significantly different patterns across TRF/C-TRF subtest mean scores. The Negative IWM cluster had elevated mean scores on Attention Problems, and Aggressive Behavior and their scores decreased for Anxious/Depressed and Somatic complaints, whereas the Positive IWM cluster means scores were fairly consistent across all four areas. Please see Figure 1 in Appendix E for a graph of the profile analysis results. Additionally, partial eta squared revealed that 7% of the variance in performance across subtests could be accounted for by cluster membership.

Due to the fact that the Repeated Measures MANOVA did not indicate which subtest mean scores were significantly different, a series of $t$-tests was conducted to examine which
subtests differed significantly by cluster. All means, standard deviations, and tests of significant differences for TRF/C-TRF subtests can be found in Table 7. Results indicated that children in the two clusters differed significantly on Anxious/Depressed, Attention Problems, and Aggressive Behavior. For all three subtests with significant cluster differences, children in the Negative IWM cluster had higher mean scores than children in the Positive IWM cluster. However, children in the two clusters did not differ significantly on Somatic Complaints.
Table 2

*Mean Scores and Standard Deviations of Measures for Full Sample*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>Range</th>
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<tbody>
<tr>
<td>Measures of Internal Working Models</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Positive Child Representations</td>
<td>1.24</td>
<td>1.06</td>
<td>0.0-5.0</td>
</tr>
<tr>
<td>Negative Child Representations</td>
<td>0.47</td>
<td>0.60</td>
<td>0.0-2.0</td>
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<td>Positive Parent Representations</td>
<td>2.73</td>
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</tr>
<tr>
<td>Negative Parent Representations</td>
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<td>0.55</td>
<td>0.0-3.0</td>
</tr>
<tr>
<td>Moral-Affiliative Themes</td>
<td>1.21</td>
<td>0.69</td>
<td>0.0-3.8</td>
</tr>
<tr>
<td>Conflictual Themes</td>
<td>0.80</td>
<td>0.77</td>
<td>0.0-3.3</td>
</tr>
<tr>
<td>Measures of Socioemotional Adjustment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalizing Behavior</td>
<td>52.23</td>
<td>10.27</td>
<td>37-79</td>
</tr>
<tr>
<td>Externalizing Behavior</td>
<td>55.97</td>
<td>10.42</td>
<td>41-83</td>
</tr>
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<td>Measures of Self Concept</td>
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</tr>
<tr>
<td>Cognitive Competence</td>
<td>3.58</td>
<td>0.51</td>
<td>2.2-4.0</td>
</tr>
<tr>
<td>Physical Competence</td>
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<td>0.45</td>
<td>2.3-4.0</td>
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<tr>
<td>Maternal Acceptance</td>
<td>3.04</td>
<td>0.75</td>
<td>1.7-4.0</td>
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<td>Peer Acceptance</td>
<td>3.40</td>
<td>0.72</td>
<td>1.5-4.0</td>
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Table 3

*Skew and Kurtosis Values for Measures*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Skew</th>
<th>S.E.</th>
<th>Kurtosis</th>
<th>S.E.</th>
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</thead>
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<td>Measures of Internal Working Models</td>
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<td>.28</td>
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<td>.55</td>
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<tr>
<td>Positive Parent Representations</td>
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<td>Negative Parent Representations</td>
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<td>3.53</td>
<td>.55</td>
</tr>
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<td>Moral-Affiliative Themes</td>
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<td>1.66</td>
<td>.55</td>
</tr>
<tr>
<td>Conflictual Themes</td>
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<td>.28</td>
<td>1.25</td>
<td>.55</td>
</tr>
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<td>Measure of Socioemotional Adjustment</td>
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</tr>
<tr>
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<td>-0.39</td>
<td>.57</td>
</tr>
<tr>
<td>Externalizing Behavior</td>
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<td>.29</td>
<td>-0.30</td>
<td>.57</td>
</tr>
<tr>
<td>Measure of Self-Concept</td>
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<td>Cognitive Competence</td>
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<td>1.13</td>
<td>.55</td>
</tr>
<tr>
<td>Physical Competence</td>
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<td>-0.28</td>
<td>.55</td>
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<td>Maternal Acceptance</td>
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<td>-1.26</td>
<td>.55</td>
</tr>
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<td>Peer Acceptance</td>
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<td>0.23</td>
<td>.55</td>
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<td>Variable</td>
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<td>Negative IWM Cluster</td>
<td>F value</td>
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<td>----------------------</td>
<td>----------------------</td>
<td>---------</td>
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<tr>
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<td>(n=28)</td>
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</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
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</tr>
<tr>
<td>Measures of Internal Working Models</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Child Representations</td>
<td>1.67 (1.05)</td>
<td>0.54 (0.58)</td>
<td>27.48***</td>
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</tr>
<tr>
<td>Negative Child Representations</td>
<td>0.34 (0.49)</td>
<td>0.68 (0.71)</td>
<td>5.94*</td>
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</tr>
<tr>
<td>Positive Parent Representations</td>
<td>3.54 (0.98)</td>
<td>1.39 (0.74)</td>
<td>99.77***</td>
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<tr>
<td>Negative Parent Representations</td>
<td>0.60 (0.61)</td>
<td>0.71 (0.43)</td>
<td>0.74</td>
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<tr>
<td>Moral-Affiliative Themes</td>
<td>1.48 (0.67)</td>
<td>0.77 (0.46)</td>
<td>24.07***</td>
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<tr>
<td>Conflictual Themes</td>
<td>0.62 (0.58)</td>
<td>1.10 (0.95)</td>
<td>7.08**</td>
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</table>

* $p < .05$
** $p = .01$
*** $p < .001$
Table 5

Demographic Characteristics of Clusters

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<th>Positive IWM Cluster</th>
<th>Negative IWM Cluster</th>
<th>X^2 value</th>
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<tr>
<td></td>
<td>Number (%)</td>
<td>Number (%)</td>
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<tr>
<td>Child Race</td>
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</tr>
<tr>
<td>African American</td>
<td>31 (67%)</td>
<td>21 (75%)</td>
<td>0.48</td>
</tr>
<tr>
<td>Non African American</td>
<td>15 (33%)</td>
<td>7 (25%)</td>
<td></td>
</tr>
<tr>
<td>Child Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>25 (54%)</td>
<td>24 (86%)</td>
<td>7.66**</td>
</tr>
<tr>
<td>Female</td>
<td>21 (46%)</td>
<td>4 (14%)</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Positive IWM Cluster</th>
<th>Negative IWM Cluster</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Child Age</td>
<td>6.40 (0.55)</td>
<td>6.20 (0.56)</td>
</tr>
<tr>
<td>Child IQ</td>
<td>91.00 (13.44)</td>
<td>90.14 (11.14)</td>
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</table>

** p < .01
Table 6

Cluster Differences on Socioemotional Adjustment and Self-concept Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Positive IWM Cluster</th>
<th>Negative IWM Cluster</th>
<th>t value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
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</tr>
<tr>
<td>TRF/C-TRF</td>
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<tr>
<td>Internalizing Problem</td>
<td>49.3 (8.74)</td>
<td>54.5 (11.91)</td>
<td>-2.01*</td>
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<tr>
<td>Externalizing Problems</td>
<td>53.0 (8.31)</td>
<td>61.0 (11.80)</td>
<td>-3.32***</td>
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</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>F value</td>
</tr>
<tr>
<td>Self-concept</td>
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<tr>
<td>Maternal Acceptance</td>
<td>2.94 (0.74)</td>
<td>3.21 (0.75)</td>
<td>4.22*</td>
</tr>
<tr>
<td>Peer Acceptance</td>
<td>3.30 (0.78)</td>
<td>3.56 (0.58)</td>
<td>1.86</td>
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<tr>
<td>Physical Competence</td>
<td>3.56 (0.49)</td>
<td>3.51 (0.40)</td>
<td>0.01</td>
</tr>
<tr>
<td>Cognitive Competence</td>
<td>3.57 (0.54)</td>
<td>3.59 (0.44)</td>
<td>0.11</td>
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</table>

* p ≤ .05  
** p < .01  
*** p = .001
Table 7

Means, Standard Deviations, and Tests of Significance on TRF Subtests by Cluster

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Positive IWM Cluster</th>
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<tr>
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<td>(n=44)</td>
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<td>M (SD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TRF/C-TRF Subscales</td>
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<tr>
<td>Anxious/Depressed</td>
<td>54.80 (6.81)</td>
<td>53.36 (4.59)</td>
<td>57.23 (9.04)</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>53.86 (7.37)</td>
<td>53.73 (6.62)</td>
<td>54.08 (8.63)</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>56.99 (8.10)</td>
<td>54.89 (5.62)</td>
<td>60.54 (10.29)</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>57.57 (8.95)</td>
<td>54.64 (5.61)</td>
<td>62.54 (11.23)</td>
</tr>
</tbody>
</table>

* p < .05
** p = .01
Discussion

Within the literature on the maltreated population, studies generally have focused on comparing maltreated and non-maltreated children. These previous studies have shown that there are differences between maltreated children and their non-maltreated peers in their internal working models (Toth et al., 2000), socioemotional adjustment (Shonk & Cicchetti, 2001) and self-concept (Barnett, Vondra, & Shonk, 1996). Despite the importance of the findings from previous research, little information has been provided regarding the degree to which diversity in adjustment might exist within the maltreated population. Studies such as Ward and Haskett (2008) have begun to provide evidence of individual differences among maltreated children through the use of cluster analysis. This study was designed to expand the understanding of individual differences among abused children by exploring variation in the internal working models of abused children through the use of cluster analysis. It is important to consider variations in children’s internal working models as it has been suggested that these models influence the nature of future relationships (Toth et al., 1997). Research has suggested that abused children continue to experience relationship difficulties into adulthood (Mullen, Martin, Anderson, Romans & Herbison, 1996). Thus, exploring variations in the working models of abused children and the degree to which they are associated with adjustment may allow for greater understanding of relationship difficulties of abused children and how to intervene. In addition to exploring whether there were distinct subgroups (i.e., clusters) of children with unique internal working models, a second purpose was to determine the validity of these clusters by investigating whether children in the subgroups actually differed in their socioemotional adjustment and self-concept.
**Internal Working Model Clusters**

As hypothesized, there were distinct clusters of children within the abused sample that differed in their internal working models. Specifically, a two-cluster solution was supported, with one cluster (Positive IWM) exhibiting more positive aspects of internal working models and the other (Negative IWM) exhibiting more negative aspects. Approximately, 62% of the abused children in this study were in the Positive IWM cluster, which suggests that despite a history of abuse, some physically abused children are able to create relatively positive relationship models. A question that remains is what factors influence whether or not abused children develop positive working models. In this study, children in the clusters did not differ in terms of IQ scores, so intellectual functioning does not appear to be a major factor in whether an abused child develops a positive or negative model working model. Additionally, there were no significant differences between the clusters in terms of the race of the children, suggesting that abused children of different races are equally likely to develop either a positive or negative model of relationships. Clusters did differ in terms of gender; with a significantly lower proportion of girls in the Negative IWM cluster, which could indicate that abused girls may be at less risk than abused boys for developing negative working models. Certainly, there are many other variables that could impact the development of working models beyond these few demographic characteristics. Future research should be designed to examine which factors influence whether abused children develop positive or negative working models. Such factors could be individual child characteristics (e.g., temperament), interactions between child characteristics and features of
the parent-child relationship, or environmental influences such as quality of the parents’ relationship or history of family or community violence.

Children in the Positive IWM cluster had significantly more positive themes as well as more positive representations of children and parents present in their working models than did the children in the Negative IWM cluster. Abused children in the positive IWM cluster tended to represent relationships in a more positive manner, and they specifically represented themselves and their parents in a more positive fashion. Given the quality of their internal working models, abused children in this cluster likely had more positive interactions with their parents and other adults and expected those adults to be caring and affectionate. Additionally, children in the Positive IWM had significantly fewer negative representations of children and themes related to conflict in their working models than the children in the Negative IWM cluster. Due to the fact that children’s working models serve as a guide for future relationships (Bowlby, 1973, 1982), it is probable that abused children in the Positive IWM cluster were more likely to have positive expectations for future relationships than the abused children in the Negative IWM cluster. Because abused children in the Negative IWM cluster were more likely to have negative expectations for relationships, they might be at greater risk for having subsequent negative or dysfunctional relationships beyond the initial caregiver relationship. They may be more likely to expect that other adults in their lives will be harsh and negative and that the relationships will ultimately result in conflict. In order to determine the long-term implications of having positive or negative working models, future studies should examine long-term relationship functioning of the children in each cluster.
These results suggest that not only are the internal working models of children in the Positive IWM cluster more positive, they are also less negative than those of children in the Negative IWM cluster. Previous research has suggested that higher levels of positive themes combined with lower levels of negative themes within internal working models are related to better adjustment among children (Stadelmann, Perren, von Wyl, & von Klitzing, 2007). Results of the present study provide additional support for the past studies which show that children who have high levels of positive representations as well as low levels of negative representations appear to be well-adjusted. Additionally, research on resilience among maltreated children has suggested that positive and supportive family relationships have served as protective factors among children who have experienced abuse (Afifi & MacMillan, 2011). Because children’s internal working models are based on caregiver experiences, having positive working models may serve as a protective factor for abused children in terms of their future relationships and adjustment. As noted above, to determine the impact of positive working models (i.e., high positive and low negative representations of self and parents) on future relationships of abused children, investigations must be conducted to examine whether having positive working models at a young age relates to more meaningful, high-quality relationships later in life.

Even though all children in this study shared the similar experience of physical abuse by a parent, finding two distinct subgroups of abused children provides support for the notion that there are individual differences among these children in their internal working models. The presence of these two distinct clusters suggests there might be individual differences in abused children’s response to various intervention approaches. For example, children with
positive models of relationships might benefit more than children with negative models from programs that are based on forming interpersonal relationships. Interventions using peer mentoring and teacher “banking time”, for example, might be particularly effective. Children with positive working models may be more willing to accept these intervention efforts because they expect beneficial outcomes from relationships and view others as trustworthy and supportive, whereas children with negative models are likely to expect relationships with peers and teachers to result in conflict and tension and might, therefore, resist these types of interventions. Thus, there is the potential that variance in response to interventions may be related to these distinct patterns of internal working models among abused children.

Finally, the results of the cluster analysis provide support for including all relational aspects of children’s working models when investigating internal models. Previous research has examined all of the aspects included in this study individually; however, parent representations, self representations and relationship themes had not been examined together in a single study until this investigation. In order to initially examine whether aspects of abused children’s working models were related to the various indicators of adjustment a correlation matrix was to examine relations between each internal working model variable and every measure of adjustment and self-concept. When examining the correlations between aspects of the working models and each measure of socioemotional adjustment and self-concept, the results seemed spurious and the pattern of findings was difficult to interpret. For example, positive parent representations were related to internalizing behavior problems and externalizing behavior problems but nothing else; moral-affiliative themes were related to externalizing behavior problems but not internalizing behavior problems; conflictual themes
were related to cognitive competence but nothing else. However, when considering all aspects together in the cluster analysis, meaningful patterns of components were found in the internal working models of abused children. Therefore, it is likely to be more productive for investigators to consider all aspects of a child’s internal working model together, rather than examining links between any single component (e.g., child representations) and children’s adjustment.

Validation of Clusters on Socioemotional Adjustment

Due to the established link between socioemotional adjustment and internal working models (Bolger & Patterson, 2001a; Bolger & Patterson, 2001b; Toth et al., 2000; Teisl & Cicchetti, 2008), it was expected that the children in the two clusters would differ in how frequently they demonstrated both internalizing and externalizing behavior problems. This hypothesis was supported; specifically, children in the Positive IWM cluster had significantly less frequent internalizing and externalizing behavior behaviors than children in the Negative IWM cluster. In addition, results indicated that the sample as a whole exhibited significantly more externalizing behavior problems than internalizing behavior problems. This finding is not surprising, as previous research has suggested that maltreated children tend to be rated as exhibiting higher levels of externalizing behavior problems than internalizing behavior problems (Shonk & Cicchetti, 2001). In summary, results of the present study indicate that although both groups of abused children were more likely to exhibit externalizing behavior problems than internalizing behavior problems, children with negative internal working models were at greater risk for exhibiting these behaviors.
When examining scores in terms of the clinical significance of problematic behaviors, means for both clusters fell within the nonclinical range on internalizing behavior problems. However, for externalizing behavior problems the mean T-score for the Negative IWM cluster was in the Borderline range for clinical significance whereas the mean for the Positive IWM cluster remained within the normal range. Upon further examination of scores for individual children, it was found that a larger proportion of children in the Negative IWM cluster exhibited clinically significant levels of internalizing behavior problems (30%) and externalizing behavior problems (38%) than children in the Positive IWM cluster (4% internalizing, 11% externalizing). Chi square analyses revealed significant differences between clusters in the proportion of children with clinically significant behavior problems for both internalizing ($X^2 (1, 70) = 7.13, p = .008$) and externalizing behavior problems ($X^2 (1, 70) = 9.18, p = .002$). Taken together, these data suggest that abused children with positive working models exhibit some risk of clinically significant adjustment problems, but children with negative models may be at much greater risk.

Previous research has provided evidence that children who had a greater number of negative representations in their internal working models evidenced higher rates of internalizing and externalizing behavior problems (Toth et al., 2000). The present study found a similar pattern of results, in that children in the Negative IWM cluster had significantly higher levels of internalizing and externalizing behavior problems than did children in the cluster with a pattern of more positive working models. That is, even within this sample of children at risk for developing unfavorable internal working models of
relationships, relatively high rates of positive representations were associated with relatively positive adjustment.

Additionally, these results provide support for the notion that children’s internal working models, which are based on the caregiver relationship, influence other aspects of children’s lives. In this study socioemotional adjustment was rated by children’s teachers on the basis of their behavior in the school setting. Therefore, the differences found between clusters on their socioemotional adjustment provide support for theoretical links between working models of relationships and children’s adjustment within the school setting. Toth and colleagues (2000) began to provide support for this notion; however, they examined only the themes present in internal working models of maltreated children and showed that themes were related to behavior in the school setting. The present study builds on that previous research by considering themes as well as representations within abused children’s internal working models, then sub-grouping abused children based on their complete models, and finally, examining the degree to which those subgroups of abused children differed in their behavior in the school setting. Results from this study replicate and expand prior studies that document a link between positive, healthy working models and fewer behavior problems.

A post-hoc profile analysis was conducted to further examine differences between children in the two clusters in terms of specific aspects of internalizing and externalizing behavior problems. Results indicated that children in the two clusters exhibited distinct patterns of scores across TRF/C-TRF subscales such that children in the Positive IWM cluster exhibited significantly less attention problems, aggressive behavior, and anxiety than children in the Negative IWM cluster. These results provide further validation of cluster
differences and suggest that there are a number of potential behavioral areas in which abused children exhibit within group diversity in their functioning. Additionally, it further validates the separate clusters and affirms that children’s internal working models can influence specific behaviors within the school setting and that children with negative internal working models are at greater risk for demonstrating these behaviors than children with positive models. Therefore, due to the fact that aspects of adjustment have been related to internal working models, it is possible that abused children with negative internal working models may need interventions that focus on changing their working models in addition to any interventions that focus on changing their behaviors.

*Validation of Clusters on Self-concept*

It was expected that children in the Positive IWM cluster would differ significantly from children in the Negative IWM cluster on how accepted they felt by their mothers and peers and how physically and cognitively competent they felt. Contrary to the hypotheses clusters generally did not differ on these aspects of self-concept. However, results did indicate that the children in the Positive IWM cluster felt significantly less accepted by their mothers than did children in the Negative IWM cluster. This finding was contrary to what was expected and was initially surprising; however, it is possible that children in the Positive IWM cluster had more realistic perceptions of how accepted they were by their mothers and the scores for the children in the Negative IWM cluster represented inflated perceptions of maternal acceptance. Previous research has suggested that maltreated children tend to have inflated perceptions of their acceptance and competence (Vondra, Barnett & Cicchetti, 1990), so perhaps abused children with negative internal working models are more likely to hold
these inflated perceptions than abused children with positive working models. Additional research will be needed to address this explanation for the findings.

Children in the two clusters did not exhibit significantly different patterns of scores on the subscales for self-concept. Specifically, the lowest scores for children in both clusters were in how accepted they felt by their mothers and their highest scores were in how cognitively competent they felt, with perceptions of their peer acceptance and physical competence falling in between. Despite the similar pattern, the mean scores for the Positive IWM cluster all fell below the means for the Negative IWM cluster. Although these differences were not significant (with the exception of Maternal Acceptance), this further supports the theory that abused children with positive working models may have less inflated self-concepts than abused children with negative working models.

In addition to the fact that maltreated children have evidenced inflated self-concept, previous research has also suggested that younger children (i.e., children in preschool through second grade) tend to report inflated self-evaluative judgments (Mantzicopoulos, 2004; Mantzicopoulos, 2006; Stipek & Mac Iver, 1989, Vondra, Barnett & Cicchetti, 1990). Thus, another possible explanation for the non-significant self-concept findings is related to the age of the children in this study. Due to the fact that children in this study were in kindergarten and first grade and had experienced physical abuse, it is possible that the sample as a whole, regardless of cluster membership, had inflated self-concept scores. Indeed, despite the fact that there was some variability among children on their self-concept scores, the majority of scores tended to be on the positive end of the spectrum and ranged from 3.04 to 3.59 on a scale of 1 to 4. Additionally, children in the two clusters only differed
significantly on Maternal Acceptance which had the largest range of scores (1.66 to 4.0) and the lowest mean score for children in each cluster (Positive IWM cluster $M = 2.94$, Negative IWM cluster $M = 3.21$). This provides additional support for the possibility that inflated self-concept scores among this sample may explain the non-significant findings for these variables.

Harter (1999) suggested that victims of chronic abuse tend to report negative self evaluations in the various domains of self-concept. It is possible that children in the clusters were similar in self-concept because the severity and chronicity of physical abuse experienced by these children was not at the extreme end of the continuum. Information on the chronicity and severity of abuse for the present sample was not available; however, because all children were living with the abusive parent (i.e., the children had not been removed from the home), it is likely that the physical abuse was in the mild to moderate range. Perhaps within-group differences in abused children’s behavior problems surface with less chronic abuse but variations in self-concept only become evident in samples that include children who have experienced more severe and/or chronic abuse. It is possible that including children who had experienced more severe and chronic abuse would have resulted in findings consistent with the hypotheses. Future research will need to examine this issue to determine whether there is an effect for chronicity of abuse on variations in the self-concept of maltreated children.

Study Limitations and Future Directions

Although efforts were made to ensure that this study and the data collected were sound, the study was not without limitations. One limitation related to the characteristics of
the sample is that although children were required to have a substantiated history of abuse, a limited amount of information was available about the abuse experience. It is possible that children in this study also experienced additional forms of maltreatment (e.g., neglect). Further, although the substantiated case happened within one year of children entering the study, it is not known when the first instance of abuse occurred or whether abuse continued throughout the course of the study. Because chronicity and severity as well as type of maltreatment have been shown to be associated with outcomes (e.g., Fantuzzo, Perlman & Dobbins, 2011; Jaffee & Maikovich-Fong, 2011), it will be important for future research to consider characteristics of the abuse experience to determine how typology and timing of abuse relates to the adjustment of subgroups of maltreated children.

The sample for the present study was predominately African American and male, which mirrors the fact that a higher proportion of African American children experience physical abuse (Lu, Landsverk, Ellis-Macleod, Newton, Ganger & Johnson, 2004). The demographic characteristics of this sample might have enhanced external validity of the study, but the degree to which findings generalize to female victims of physical abuse and to European American and Hispanic abused children is unknown. Further research is needed to determine the degree to which findings can be replicated with a more ethnically diverse sample and a larger proportion of abused girls.

It is important to note that although meaningful differences were found in the working models of the abused children in the study, it cannot be determined whether one cluster was comprised of children with healthy internal working models because their working models were not compared to those of a sample of non-abused children. Therefore,
it will be important for future research to further explore how these clusters of abused children compare to non-abused children (matched on relevant variables) in terms of their working models to determine whether abused children who exhibit more positive working models actually hold healthy working models of relationships.

To ensure that the developmentally appropriate measure of socioemotional adjustment was used for each child, two different forms of the TRF were used—one for children under 6 and one for children who were 6 or 7. Although this was not a problem for the initial analyses, it did limit the subscales that were included in the follow up profile analysis. Despite the fact that the two are corresponding measures and scores are comparable (Achenbach & Rescorla, 2001), only four of the subscales on the TRF had equivalent scales on the C-TRF (Aggressive Behavior, Attention Problems, Anxious/Depressed and Somatic Complaints), thereby limiting the current study to examining cluster differences in profiles for only those four scales. Scales such as Withdrawn, Rule Breaking Behavior, Thought Problems, and Social Problems were not included in this profile analysis, but children in the two clusters may exhibit significant profile differences on these variables. Based on the patterns that were found in the present study, it is possible that abused children with negative internal working models may also exhibit more social problems, thought problems, withdrawn behaviors, and especially rule breaking behaviors than abused children with positive internal working models. Therefore, it will be important for future research to examine potential variations in patterns on the full TRF profile. Examining the full TRF profile may point to specific areas to address in intervention efforts.
It is acknowledged that due to its exploratory nature, the scope of the present study was somewhat restricted. Specifically, this study only examined whether abused children who differed in their internal working models exhibited differences on two aspects of functioning; socioemotional adjustment and self-concept. Therefore, researchers should seek to determine whether individual differences exist in additional areas of functioning such as emotion regulation and peer relationships. It is certainly possible that there is not only diversity between the abused children in the Positive IWM cluster and those children in the Negative IWM cluster for other variables, but there also may be interactions between those additional variables and the variables used in the present study. For example, it is possible that abused children’s emotion regulation serves as a moderator in the relation between cluster membership and internalizing and externalizing behavior problems. It will be vital for future research to continue to examine the relation between individual differences in the internal working models of maltreated children and additional childhood outcomes. It also is important to explore whether these individual differences are stable over time; that is, future research should use longitudinal research designs to examine whether children in the two clusters continue to demonstrate different patterns of socioemotional adjustment over time.

In summary, the current study was designed to investigate whether there were meaningful individual differences among abused children. Specifically, the present study provides support for the hypothesis that abused children exhibit individual differences in their internal working models. Results also support the notion that these distinctions in internal working models are meaningful, by providing evidence that the children in the two clusters differ in their socioemotional adjustment. Specifically, results of the present study
suggest that whether abused children have positive or negative working models of relationships might influence adjustment in other areas of their lives, such as functioning in the school setting. These findings provide important information for clinicians attempting to help abused children achieve optimal outcomes. Based on these results, it is possible that abused children with negative internal working models may require interventions to address their relationship schemas in addition to addressing their problematic behaviors and internalizing concerns. It is hoped that this study will encourage future investigations of the individual differences that exist within maltreated children.
References


APPENDICES
APPENDIX A

Narrative Story Stems: Administration

Introduction of Figures

Experimenter: “Look who we have here” (bring out family)

“Here’s our family. Look. This is grandma, this is daddy, this is mommy, and these are the girls, Bria and Megan (and these are the boys, Sean and Chris).” (show them to the child as you name them).

Experimenter: “Who do we have here?” (point to family figures as child names them)

“You know what? I’ve got an idea. Let’s pretend to make up some stories about them. How about if I start a story about our family and you finish it.”

Warm-Up Story: Birthday Party

Props: Table, chairs, birthday cake

Characters: All the characters

Set up: Place figures on the table according to the picture.

Experimenter: “Here’s their table and chairs, and what’s this?” (show cake to child and wait for child to name it)

As needed, state, “What kind of cake?” “Yes, it’s a birthday cake.”

“Listen carefully to the story. The Mommy has baked this beautiful birthday cake and she calls out…

Mother: …“Come on grandma, come on Dad, come on boys/girls, let’s have a birthday party."

Experimenter: “Show me and tell me what happens now” (invitingly). Let the child play with the figures or tell a story yourself if child does not.

Prompts: If the child wants to sing “Happy Birthday”, join him/her and sing along.
“Show me how they eat the cake”
What might the children say about this beautiful cake?”

80
General prompting: If child performs ambiguous actions with figures ask “What are they doing?” and if the child uses an ambiguous pronoun when talking about the figures, ask “who was doing it?” Experimenter can also repeat the child’s statement in question form, to verify what the child said (“The mommy wiped the juice? And then what?”)

Spilled Juice

Props: Table, chairs, cups, plates
Characters: Mom, Dad, both children

Experimenter: OK. I think I have an idea for a new story (put away the grandmother and cake, and set out the figures as below:

(shake the box with the plates and cups) “Can you help me set the table for dinner” (give box to child, wait till child has set the table, help if necessary).

“Now put the family around the dinner table so they’re ready to eat” (wait till child has placed the figures).

“Here is our family eating dinner and Sean/Bria gets up and reaches and spills his/her juice” (make figure knock cup off toy-table so cup is visible to child).

Mother: “Sean/Bria, you spilled your juice!!” (reproachful tone of voice) (stand the mother up, and face the child doll, and move her up and down while she is “talking”)

Experimenter: “Show me and tell me what happens now.”

Prompting:
Prompt (if child does not spontaneously mention): “What do they do about the spilled juice?”
Prompt if child only gives one response: “Anything else?”, “What else?” or “Then what?”. 
Hurt Knee

Props: Rock, green felt
Characters: Mom, Dad, both children

Experimenter: “OK, I have an idea for another story. You put our family there and get them ready for the next one while I put these things away.”

“OK, look what I’ve got” (set out piece of green felt and rock).

“This is the park. Do you sometimes go to the park with your Mom and Dad?”

“Here is our family and they’re out walking in the park (stand all the dolls up and move them to the felt as you talk), and at this park there is this high, high rock.”

Child: “Look mommy and daddy. Watch me climb this high, high rock.” (make child figure climb rock, then fall off).

“Boo-hoo, I’ve hurt my knee” (crying voice).

Experimenter: “Show me and tell me what happens now.”

Prompt if child does not spontaneously mention: “What do they do about the hurt knee?”

Experimenter: “All done? Shall we try another? Let’s put these away.” Leave one child and the parents out on the table.

Monster in the Bedroom

Props: Bed, dresser
Characters: Mom, Dad, one child

Experimenter: “Can you get the family ready for the next one?” (set out the props as shown)

Experimenter: “Look what happens now. Listen carefully.”
Mother: (to small child figure) “It’s bedtime. Go up to your room and go to bed.”

Father: “Go up to bed now.”

Child: “OK, Mommy and Daddy, I’m going.”

Experimenter: As child walks to the room, state, “Bria/Sean goes upstairs to her/his room, and she/he goes…”

Child: “Mommy! Daddy! There’s a monster in my room! There’s a monster in my room!” (alarmed tone of voice)

Experimenter: “Show me and tell me what happens now.”

Prompt if child does not mention spontaneously: “What do they do about the monster in the room?” If necessary, use other prompts.

Experimenter: “OK, let’s get ready for the next one.”

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Lost Keys

Props: None
Characters: Mom, Dad, one child
Setting: Mom and Dad are facing each other in glare positions.

Experimenter: Make child walk into the room, and explain, “Bria/Sean comes in the room and sees Mom and Dad looking at each other like this. Look at my face (show angry expression).

Mother: (angrily) “You lost my keys!”

Dad: “I did not!”

Mom: “Yes you did, you always lose my keys!”

Dad: “I did not lose them this time.”

Experimenter: “Show me and tell me what happens now.”
Prompt: If child does not enact end or resolution of conflict. “What’s going to happen about Mom and Dad’s argument?”

Experimenter: “OK, let’s get ready for the next story”

Departure

Props: Car, green felt
Characters: Mom, Dad, Grandma, both children

Experimenter: Set out family and green felt and car as shown, with car in front of the child. Bring grandmother out of the box. “Let’s use the grandmother this time”

“Heive we have their front lawn, and here we have their car. This is the family car”

“You know what it looks like to me, (the child’s name). It looks like the mommy and the daddy are going on a trip.”

Mother: “O.k. boys (girls). Your dad and I are going on a trip. We are leaving on our trip now. See you tomorrow. Grandma will stay with you.”

Experimenter: “Show me and tell me what happens now.”

Let the child put the figures in the car and make the car drive off. Only intervene if the child refuses or seems unable to make the car drive away. In either case, make the car disappear from the table top).

If the child wants to retrieve the car, state, “No, they’re not coming back yet”.

If the child puts everyone in the car, state, “No, only the mother and father are going”.

Experimenter: “And away they go…”

Prompt: “What do the children do now, while the parents are away?” or use other prompts as needed.
Reunion

Props: Car, green felt

Characters: Mom, Dad, Grandma, both children

Experimenter: “OK, you know what? It’s the next day and the grandma looks out of the window (make grandma look toward car) and she goes…”

Grandmother: “…Look boys (girls), here comes your Mommy and Daddy. They’re home from their trip.” Bring out the car from under the table. Do not move it toward the child.

Experimenter: “Show me and tell me what happens now”. (Let child drive car toward “home”).

Prompt if child does not spontaneously take the figures out of the car: “What do they do, now that the mom and dad are home?” Also use other prompts where appropriate.

Experimenter: Closing, using your own words.
APPENDIX B

Flow Chart for Narrative Story Stems Coding

Representations of Child

1. Positive
   Representations of Child

2. Negative
   Representations of Child
   - Negative Representations
   - False Representations

Representations of Parent

3. Positive
   Representations of Parent

4. Negative
   Representations of Parent
   - Negative Representations
   - Controlling Representations
   - Incongruent Representations
Attachment Themes

5. Moral/Affiliative Themes

- Affection
- Affiliation
- Compliance
- Empathy
- Separation/guilt

6. Conflictual Themes

- Aggression
- Verbal Conflict
- Escalation of Conflict
APPENDIX C

Dendrogram Using Ward Method

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Rescaled Distance Cluster Combine
APPENDIX D

Dendrogram using Average Linkage

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Rescaled Distance Cluster Combine
Figure 1. Plot of profile analysis for cluster differences on aspects of Internalizing and Externalizing behavior problems (TRF/C-TRF subtest mean scores).