Signs of disorganization in middle childhood attachment narratives

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Introduction

A challenge for the field of parent-child attachment has been the development of theoretical conceptualizations and measurement tools that provide for age appropriate assessment of attachment. Our understanding of children's attachment representations after infancy greatly increased with the conceptualization of secure base scripts, that is, children's internalized understanding and expectations of organizing behaviors and emotions in relation to caregivers (Bretherton & Munholland, 2008; Waters & Waters, 2006). Secure base scripts provide concrete understanding on how early sensorimotor experiences transfer into abstract images, i.e., children's internal working models of themselves and others (Waters & Waters, 2006; Waters & Roisman, 2019). This theoretical development in turn lead to new interview methods designed to assess children's attachment representations, such as story-telling procedures.

Measurement approaches to middle childhood attachment representations have typically involved age-specific adaptation of older and younger age methods. For example, the Story Stem technique—which was pioneered as a measure of attachment representations in preschoolers (Bretherton et al, 1990)-- was later modified to be age appropriate for children in later middle childhood (Granot & Mayseless, 2001; Kerns et al., 2011), and coding systems were based on conceptualizations of signs of disorganization identified at younger ages. Thompson and Raikes (2003), however, have argued that the field may overlook age-specific transformations in attachment patterns when similar manifestation of these patterns is assumed across ages. Indeed, a key insight in the field is that disorganized attachments undergo developmental transformations, with specific forms of role reversal emerging by the early school years (Main & Cassidy, 1988) that are described also in middle childhood (Brumariu et al, 2018; Moss, 2005). It is vital to understand the specific narrative and behavioral signs that disorganized children display in middle childhood, and to consider

whether these reflect disorganized types identified at younger ages. This study aims to describe the specific signs that school age children with disorganized attachment display in their attachment story narratives, and how these signs may cluster into profiles or subtypes of disorganized attachment. We also examine whether these signs and/or profiles are associated with children's background factors, continuous insecure attachment pattern ratings (avoidance, ambivalence, disorganization), and mental health symptoms.

Disorganized attachment behavior from early to middle childhood

Attachment is an evolutionary motivational system that functions to restore the child's feelings of safety under distress (Bowlby, 1969). In middle childhood, the main goal of the attachment system gradually shifts from physical proximity to emotional accessibility of the caregiver at times of stress, and attachment relationships become more jointly negotiated and co-regulated (Kerns & Brumariu, 2016). Based on the quality of early experiences with primary caregivers, infants and children typically form specific, organized attachment patterns in relating to their caregivers (Ainsworth, 1990). Securely attached children have consistently received sensitive care and openly approach their caregivers for comfort when distressed, and by middle childhood they communicate their needs openly and collaborate with parents in emotion regulation and problem-solving (Kerns, 2013; Kerns et al., 2011). Insecure-avoidant children have caregivers who consistently reject their bids for comfort, and they subsequently learn to suppress their distress, often appearing overly self-reliant and emotionally distant to caregivers in middle childhood (Bosmans & Kerns, 2015; Kerns & Brumariu, 2016). Insecure-ambivalent children experience unpredictable caregiving that results in strong negative emotions and contact seeking as strategies to retain access to caregivers. In middle childhood they are easily dysregulated and prone to conflict and expressing strong negative affect (Brumariu, 2015; Brumariu et al., 2018; Hans et al., 2000).

Main and Solomon (1986) found that some infants did not fit the organized attachment patterns, instead displaying anomalous and contradictory attachment behaviors such as simultaneous avoidance and approach towards the parent, freezing upon parental reunion, and frightened or odd facial expressions or behaviors when the caregiver was present (Main & Solomon, 1990). These behaviors are conceptualized as resulting from the infant's fright without solution when the attachment figure is simultaneously a source of fear and the only possible source of comfort (Main & Hesse, 1990; Main & Solomon, 1990). At the core of disorganized attachment are parental anomalous behaviors-- such as frightening/frightened, hostile-intrusive and extremely withdrawing behaviors, role-reversal, disorientation and affective communication errors-- that leave the child under high fearful arousal without co-regulatory help (Lyons-Ruth & Spielman, 2004; Lyons-Ruth et al., 1999). This leads to ongoing activation of the child's defense/self-protective systems (fight, flight, and freeze) as the arousal cannot be downregulated by approaching the parent for co-regulation (Liotti, 2017).

Subsequent work has addressed whether there might be important subgroups of disorganized children. One proposal is that disorganized infants can be divided into two subtypes – those who continue approaching the caregiver despite displaying disorganized behavior, and those who use avoidance and/or resistant behavior in addition to disorganization, thus failing to approach the caregiver (Lyons-Ruth, 2002). This may be related to caregiver behavior: The disorganized children continuing approach to the mother had *helpless* mothers who were highly withdrawing, fearful, and easily overwhelmed under distress, but could provide more positive interaction in low-stress situations, while disorganized children displaying avoidant/resistant behavior had *hostile* mothers who showed high role-confusion, negative-intrusive behavior, and developed coercive power struggles with their children (Lyons-Ruth, 2002). Another distinction proposed among disorganized

infants is between those who show high fear and those who do not (Lyons-Ruth & Jacobvitz, 2016; Padron et al., 2014). A study by Padron et al. (2014) suggested that only the high-fear group had distressing parenting, while the low fear group showed more innate difficulties such as poor emotion regulation as newborns. In a review of studies of infant disorganization, Solomon and colleagues (2021) suggest that signs of disorganization fall into four clusters: fear or apprehensive behaviors; disorientation or dissociation; conflict or contradictory behaviors; and stereotypies (although the latter two were viewed as weaker signs of disorganization).

By six years, new forms of disorganization emerge, as increasing cognitive competencies enable about two thirds of disorganized children to respond to inadequate parental care by developing highly controlling strategies towards parents (Lyons-Ruth & Spielman, 2004; Main & Cassidy, 1988; Moss et al., 2004). The *controlling-punitive* strategy comprises commanding, humiliating and cruel child behavior, and the parents experience their children as increasingly difficult, are emotionally unavailable, and fail to structure interaction with their children (Lecompte & Moss, 2014; Moss et al., 2004). The *controlling-caregiving* strategy involves children setting their own needs secondary and instead attending to parental needs, or protecting or entertaining the parent (Bureau et al., 2009; Lyons-Ruth & Jacobvitz, 2016; Moss et al., 2004). Parents tend to view their controlling-caregiving children as especially adaptive, and the relationship is paradoxically characterized by both disinvestment and closeness, with low parental sensitivity and children meeting the parent's needs (Lecompte & Moss, 2014; Moss et al., 2004). In middle childhood the hostile-punitive strategy was positively correlated with attachment ambivalence, whereas both hostile-punitive and caregiving child behavior were negatively correlated with attachment avoidance (Brumariu et al., 2018). A third group of disorganized children still show the classic disoriented behaviors present in disorganized infants such as confused and dissociative

behaviors, freezing, or other anomalous behaviors (Brumariu et al., 2018; Bureau et al., 2009). Parental emotional unavailability, rather than abuse, has been linked with dissociation in the context of attachment disorganization (Dutra et al., 2009). Further, children high on disoriented disorganization had mothers with unpredictable, hostile, and guilt-inducing behavior (Brumariu et al., 2018)

Although child disorganized attachment is related to both internalizing and externalizing psychopathology (Fearon et al., 2010; Groh et al., 2012; Madigan et al., 2016), less is known about possible differences between different subtypes of disorganization. Some studies indicate that controlling-punitive children especially show externalizing symptoms in middle childhood and adolescence (Moss et al., 2004, Lecompte & Moss, 2014), whereas controlling-caregiving children tend to show internalizing symptoms (Dubois-Comtois et al., 2013; Moss et al., 2004). By contrast, Brumariu et al. (2018) found that disorganized-disoriented as well as controlling-punitive children reported high depression, and their parents reported higher child behavioral problems.

Signs of disorganization in middle childhood attachment narratives

The previous efforts to identify subtypes of disorganized attachment have been based on observations of child-parent interactions. Given the importance of attachment representations at older ages, we sought to identify what signs of disorganization are found in the attachment Story Stem narratives of children in middle childhood. Attachment Story Stem narratives represent one of the most crucial ways of measuring child attachment in preschool and school age (Kerns & Seibert, 2021). Children are presented with attachment-activating doll play stories, and after a standard prompt they are asked to tell what happens next in the story.

Concerning signs of disorganization in school age narratives, Stacks (2007) found that 6-year olds with attachment disorganization showed dysregulated story content, including

mother absence, frightening quality of the story and violent and hostile acts, as well as dysregulated behaviors including fear and agitation and controlling behavior towards the administrator. Moss and colleagues (2009) reported that disorganized-controlling children showed more conflict themes in their narratives than avoidantly or securely attached children. Solomon and colleagues (1995) further showed that disorganized-controlling children especially displayed violence and hostility in their Story Stem narratives. Disorganized 6-year old children may also show disorientation, silence, and difficulty telling stories (Kaplan, 1987).

Bureau and Moss (2010) noted that the controlling strategies are more fragile than organized secure and insecure strategies and surface in chaotic, violent, unresolved, or overly constricted narratives. Even for children using controlling attachment strategies, representations still include unresolved fear (Bureau & Moss, 2010; Solomon & George, 1999), and these strategies are at risk for collapse under high distress (Liotti, 2017). Further, some disorganized children show dissociation (Duschinsky & Solomon, 2017), conceptualized as an ancient strategy of tonic immobility (‘playing dead’) under extreme danger without escape where the usual functions of defense system (fight, flight or vigilant freeze) are switched off to minimize damage by suppression of fear and movement (Solomon et al., 2021). A narrower conceptualization of dissociation has described it essentially as behavioral fugue states where children tend to space out with blank eyes and be unresponsive to environment (Duschinsky, 2020). Inappropriate emotional expression may also be related with disorganized attachment, in that strong emotions appear out of the blue or in inappropriate context as they are disconnected from their original source by dissociative processes (Duschinsky, 2020). In summary, a broad range of signs pertaining to child or adult depictions of parent-child interactions, as well as narrative style, have been identified as possible signs of disorganized attachment in Story Stem narratives.

Present Study: Identifying Signs of Disorganization and their Profiles in Story Stem Narratives of Children in Middle Childhood

Our first aim was to extend the understanding of how disorganized attachment is manifested in middle childhood by analyzing the presence and co-occurrence of signs of disorganization found in the Story Stem narratives of 8 – 12- year old children previously classified as disorganized. We focused on specific signs of disorganization so we could, with cluster analysis, investigate how different signs describe disorganized profiles or subtypes. This approach provides potential for identifying specific age-salient disorganization patterns in middle childhood, rather than a priori looking for subtypes of disorganized attachment identified in younger children. We generated a list of signs of disorganization identified in the literature, and then, using data collected as part of two studies conducted in different countries with samples of different risk, we coded the signs of disorganization that were observed in children's stories. After examining the role of background factors, we then used cluster analysis to derive disorganized attachment profiles, i.e., subtypes.

Our second aim was to further understand differences in the disorganized subtypes we derived through cluster analysis by comparing them on the specific signs, overall ratings of insecure (avoidant, ambivalent and disorganized) attachment, and mental health symptoms. This allowed us to determine which signs were typical for certain disorganized subtypes and whether some subtypes showed co-occurrence with specific insecure attachment pattern ratings or were associated with psychopathology.

Materials and methods

Participants. The participants were drawn from two prior studies, a U.S. community sample and a high-risk Finnish sample. We included in this report all children who had been

classified as disorganized in the original studies based on a Story Stem measure of attachment (described below).

U.S. sample

The original study included 114 children who were recruited by distributing flyers to local schools as well as by contacting families who had participated in previous research with our lab. The sample was from the U.S. Midwest region, and data collection took place between 2016-2017 (Obeldobel, 2019).

The U.S. disorganized subsample for this project included 21 children (13 male) who ranged from 9-12 years old (M = 10.52; SD = 1.03). Regarding race/ethnicity, 76.2% of parents reported their children were White/Caucasian and 23.8% reported mixed race or other. Parent reports indicated that 71.4% of families had parents who were neither divorced nor separated. For mothers, 19% reported having a high school diploma, 9.5% reported an associate degree or some college, 42.9% reported having a four-year degree, and 28.7% reported having 1-4 years of post-graduate education. Finally, 33.3% of parents reported that their families qualified for free/reduced lunch and 4.8% reported that they qualified for food stamps.

Finnish sample

The Finnish sample was drawn from a longitudinal study following up on the development of children whose mother received prenatal outpatient treatment for drug use disorder (n=51), and a control sample of children with non-using mothers with medical pregnancy risks, but no specific psychosocial risk (n=50) (for more details on the sample, see Belt et al., 2012; Flykt et al., 2021). The drug-use group was recruited from two Finnish outpatient clinics offering integrated substance use and parenting interventions, and the control group from a

hospital outpatient clinic. All mothers stopped or reduced their drug use during pregnancy, and there were no health differences between the children in drug use and control groups either in infancy or at school age. Forty children (15 drug-use group, 25 controls) completed the Story Stem assessment at the school age follow-up in 2016.

The Finnish disorganized subsample included 12 children (9 male) who were 8-12 years old (M = 10.58; SD = 1.44). All were Finnish-speaking White/Caucasians. Nine were from families with prenatal drug use history, and seven of them had mothers reporting ongoing substance use problems. Three children in the drug-use group were in foster care. Two of the drug-using mothers had not completed high school, but all other mothers had attained some education after high school. None of the families reported severe economic distress. All mothers except one control mother reported current mental health problems. All but one child had parents who were separated or divorced.

Procedures

The studies were approved by local ethic committees and have been conducted along the ethical guidelines of Declaration of Helsinki. In the U.S., children attended a lab visit with their parents, whereas in Finland parents could choose whether to participate at a lab or in their own home. At both sites, the study began by obtaining written parental consent and child assent. All children completed the same Story Stem procedure which was administered by a graduate student. Parents reported family demographic information and completed a questionnaire measure of child mental health symptoms. In the U.S. sample, parents and children received $25 each for their participation, and in the Finnish sample participants received small gifts.

Measures (Administered in Both Samples)

Assessment of Children's Representations of Attachment

We were interested in identifying signs of attachment disorganization displayed by children originally coded as primarily disorganized. To assess children's attachment representations, children had completed a videotaped Story Stem task. They were given a story prompt with an attachment theme and were asked to complete the story using dolls and props. We used four story prompts, each involving the child and their mother. The first two story prompts were developed by Kerns and colleagues (2011) to capture salient challenges for children in middle childhood. In the first, the child is struggling with a homework assignment while it is getting late and s/he is unsure of being able to finish it before bedtime. The mother is in an adjacent room. In the second story, the child is returning home after having a big fight with a friend at the friend's home. The friend tells the child to leave and the child returns to his or her own home and slams the door upon returning. The mother is seated in the room and (neutrally) asks the child "Is that you, (child's name)?". We also used two additional stories including a separation prompt and a reunion prompt (Granot & Mayseless, 2001). In the separation story, the child's mother, the child, and a babysitter are standing together in the child's home. The mother informs the child that she will be leaving on a 3-day trip that she has been planning for a long time and the babysitter will stay with the child. The mother gets into her car and drives away. In the final story, the mother returns home from her trip and the child is prompted to tell the story of their reunion. In each of the stories the child is asked to show and tell what would happen next using the dolls and props.

The Story Stem procedure was originally coded for attachment security, avoidance, ambivalence, and disorganization, based on criteria adapted from Granot and Mayseless (2001), with no distinctions for subtypes of disorganized children. Ratings of each pattern

were based on four criteria: coordination of actions, expression and regulation of emotions within the dyad, coherence of the narrative, and constructive resolutions to the problems (see Kerns et al., 2011). We delineate here the criteria for scoring a narrative on disorganization. For coordination of actions, a story would be rated high on disorganization if there is a lack of coordination between the child and parent; the parent may be unavailable, unusually harsh, and/or not much help to the child. Regarding expression and regulation of emotions, a story would be rated high on disorganization if the child showed inconsistent displays of emotions or emotions out of sync with events. A story's narrative discourse would be scored highly on disorganization if the narrative is incoherent, difficult to follow, contains unusual elements, or ends abruptly. The child may also appear "spacy" or show odd behaviors. Finally, for constructive resolution to problems, a story would rate highly on disorganization if problems were not solved or the solution is not constructive. There may be frightening themes in the story and the parent may be portrayed as not understanding the child's needs or perspective. Each of the patterns were rated on a 1 – 5 rating scale (5: a prototypical pattern; 1: no sign of pattern).

In the US sample, all tapes were coded by two raters, the last author and a graduate student that she trained in the method. Coders were blind to background information. Inter-rater reliabilities (intra-class correlations) for the larger (original) sample were .74 for security, .79 for avoidance, .71 for ambivalence, and .78 for disorganization. Differences of over one scale point were discussed between both coders to negotiate a final score, and smaller differences were averaged for the final score. In the Finnish larger (original) sample, two graduate students trained by the last author, and blind to all background information, rated the stories, 18 being double coded for reliability. Inter-rater reliabilities (intra-class correlations) were .81 for security, .79 for avoidance, .80 for ambivalence and .80 for disorganization. A third trained coder (first author) looked through all cases where coders

disagreed by more than one point or where at least one of them rated any disorganization. Differences were negotiated between all three coders, and if not completely resolved, the last author was consulted and her coding used.

For the current study, we recoded interviews for all participants for whom disorganization was the highest-rated attachment pattern. For these 33 children, attachment disorganization scores ranged from 3 to 5 (M = 4.029, SD = 0.580). We (authors 1, 2, and 4) began by generating a list of possible signs of disorganization based on our understanding of the literature, which was subsequently refined after we had reviewed 13 participants. After this initial piloting, we identified a list of 21 signs to code from these tapes.

Then, all three coders independently coded all tapes for the presence of each of the 21 signs. That is, a coder watched the entire Story Stem interview, and coded (yes or no) whether each sign was shown (at least once) during the interview. After all tapes were coded, we omitted five categories: three with low inter-rater reliability and difficulties to clarify during scoring, including use of organized strategies (the child used elements of multiple organized strategies within or between stories) and the child and caregiver demonstrating emotional disconnect in the absence of caregiver rejection. Further, two other variables were omitted due to lack of variability, making them poor candidates for cluster analysis: almost all cases were scored for a lack of a secure base script (94%), and almost none were scored as very passive or submissive (7%). Finally, we aggregated two categories for role reversal that are indicators of adult type coping (child takes care of parental needs, shows adult coping) as coders found this distinction difficult to make for some cases and both involved clear role reversal by child in which child took responsibility for the situation in an adult-like manner. The remaining 15 categories had alphas based on 3 raters ranging from .60 to .91, except for difficulty telling stories (α = .47), which we kept for conceptual reasons. Thus, we retained

15 categories for analysis with alphas ranging from .47 to .91; 12 categories had alphas of .70 or higher (median alpha = .77). Table 1 includes a description of each of the signs.

Children's mental health symptoms

We assessed children's mental health symptoms with parent report of Total Difficulties on the Strengths and Difficulties Questionnaire- Parent Version (SDQ; Goodman, 1997). Preliminary analyses revealed that internalizing and externalizing scores were highly correlated, r (31) = .64, so we analyzed a single Total Difficulties score. The 20-item Total Difficulties score is generated by summing the Emotional Problems and Peer Problems (internalizing difficulties) and Conduct Problems and Hyperactivity (externalizing difficulties) subscales of the SDQ. Parents rate whether each item is "not true," "somewhat true," or "certainly true" for the child. The SDQ is a widely used measure with well-established validity and reliability (Goodman, 1997; Goodman, 2001; Kersten et al., 2015). Cronbach's alpha for the total difficulties score in this sample was .81.

Maternal substance abuse

About half of the Finnish sample mothers had a prenatal substance use disorder diagnosis, while in the US community sample there was none. Accordingly, we coded the Finnish drug use mothers as a drug using group (yes=1) and the Finnish control group and US sample as a non-substance using (no=0) group.

Analysis Plan

We began by calculating descriptive information (means and standard deviations) for the 15 signs of disorganization to see their relative frequency. Specifically, we calculated the proportion of cases where the sign was observed. Then, we tested, using t-tests, whether the

rates of the signs of disorganization varied by child sex, mother's prenatal substance abuse history (present/absent), or sample country (US/Finnish).

Next, we used cluster analysis to derive groups based on the scores for the 15 signs of disorganization. We used agglomerative hierarchical cluster analysis, which is recommended for smaller sample sizes (norusis.com/pdf/SPC_v13.pdf). We used the average linkage method to define the distance between clusters at each stage as this method is more robust and less sensitive to outliers (Yim & Ramdeen, 2015). We used the square Euclidian distance metric as our index of distance between the cases. We then examined a range of solutions as described below to determine which groups to investigate further, taking into consideration cluster group size and interpretability.

Finally, we examined further the 4- group cluster solution. We conducted group comparisons, using t-tests and ANOVAs, to determine how the identified groups differed on signs of disorganization, insecure attachment patterns ratings (i.e., continuous scores on attachment avoidance, ambivalence, and disorganization), and mental health symptoms.

Results

Proportion of Cases Exhibiting Specific Signs of Disorganization

Our first study aim was to understand the presence and co-occurrence of different signs of disorganization. Our final list included 15 signs of disorganization, based on previous literature, that could be reliably identified by coders. As shown in Table 1, there was substantial range in how often different signs of disorganization were coded. Three signs were scored in at least two thirds of the sample: parent acknowledging problem but not offering help, children's difficulty telling stories, and lack of problem resolution. Four signs were shown by about half of the children: frightening story themes, collapse of coping, illogical/magical events and inappropriate emotions. About a third displayed parent ignoring

problem, parent-child power struggles, parent being punitive or helpless, child caregiving or coercive role-reversal, and dissociation. A less common sign, the child trying to control the interviewer, was displayed by only 13% of children. As most signs of disorganization were shown by only a minority of children in the sample, we concluded it is useful to derive subgroups of children who might show distinctly different patterns of disorganization.

We then examined whether the use of signs of disorganization varied by child sex, parental drug use history, or sample country. None of these analyses were significant, and we therefore based the subsequent cluster analyses on the entire sample of 33 children.

Derivation of Clusters

To examine the profiles or subgroups of disorganization, and given the descriptive aims of our study, we used cluster analysis to examine a range of solutions without a priori assumptions. We initially generated solutions based on deriving 2 – 8 clusters, and then examined membership within these groups. We considered how the clusters separated across steps (e.g., when previously large clusters divided), as well as whether many clusters had very small membership (fewer than 4 cases).

Table 2 displays the number of cases per cluster with the different solutions. At the 2-cluster solution, there is one very large cluster distinguished mainly by difficulty telling stories, and one small cluster that scored higher on signs of disorganization such as frightening themes, harsh or helpless parenting, and collapse of coping (the smaller cluster from the 2-cluster solution is Cluster 4 in the 4 group solution described below). At the subsequent 3-cluster stage (clusters with 6, 12, and 15 members), the large cluster from stage 2 split into two; the 12 member cluster is identical to cluster 1 in the 4-cluster solution, and the 15 member cluster showed less harsh parent-child interactions, less fright, and less extremes of emotion. The 15- member cluster then divided at the four- group stage. By the 5-

group solution, new groups had 3 or fewer members and were not investigated further. Since the 4-cluster solution was theoretically the most meaningful, we only report its results.

Comparisons of Clusters on Signs of Disorganization, Attachment Patterns and Mental Health Symptoms

Our second aim was to understand how the clusters were associated with different signs of disorganization, continuous attachment patterns, and children's mental health symptoms. After testing how the four clusters differed on the 15 signs of disorganization, we then reviewed the pattern of differences to derive labels for the clusters. The four subgroups differed on 12 of the specific signs of disorganization (Table 3). Cluster 4 differed from others especially in higher power struggles, punitive and harsh as well as helpless parenting and children's inappropriate emotions. As compared to Clusters 2 and 3, children in Cluster 4 also showed more child coercive behavior, more frightening story themes, and illogical/magical events. Further, they showed higher caregiving role-reversal than Cluster 1. We thus labeled the Cluster 4 as *highly chaotic/frightening disorganization.* Cluster 1 similarly showed higher child coercive behavior, frightening story themes and illogical/magical events as compared to Clusters 2 and 3 and was on an intermediate level in power struggles and punitive/harsh parenting. We thus labeled the group as *moderate disorganization, with chaotic story themes* clusters. Cluster 3 was distinguished by stories in which the caregiver ignored the problem and the child showed signs of dissociation; we labeled this cluster *dissociation and an ignoring parent.* Cluster 2 was mostly distinguished in that children had parents who acknowledged the problem but did not help, and there were low levels of parental coercion and frightening or illogical story themes. The children in Cluster 2 also displayed more caregiving role-reversal than Cluster 1 children, although they did not differ from Cluster 4 children. We labeled Cluster 2 *caregiving role-reversal with low*

disorganization. Table 4 provides examples of the Fight with the Friend story from one girl and one boy who were assigned to each cluster. Note that the clusters were based on signs of disorganization scored across all stories for a participant, and children did not necessarily show all of the signs they were scored on in each story. Nevertheless, the story scripts in Table 4 provide examples of the elements of the stories told by children. Note that in all cases these stories are missing key elements of a secure script which would include child reporting problem to parent and expressing appropriate emotion, parent acknowledging and collaborating with child on a solution, and the problem getting solved in a realistic way.

The four subgroups differed on the insecure attachment patterns. For avoidance, F (3,29) = 2.88, p =.053, the *highly chaotic/frightening disorganization* (Cluster 4) group was lower on avoidance than the *caregiving role-reversal with low disorganization* (Cluster 2) and *dissociation and an ignoring parent* (Cluster 3) groups, respectively (means 1.08, 1.93, 1.94). For ambivalence, F (3, 29) = 3.17, p = .039, the *dissociation and an ignoring parent* group (Cluster 3) was lower than the *moderate disorganization, with chaotic story themes* (Cluster 1) and *highly chaotic/frightening disorganization* (Cluster 4) groups, respective means 1.06, 1.70, 2.38. For disorganization, F (3, 29) = 6.78, p = .001, *moderate disorganization, with chaotic story themes* (Cluster 1; mean = 4.27) and *highly chaotic/frightening disorganization* (Cluster 4; mean = 4.50) groups were higher than the *caregiving role-reversal with low disorganization* group (Cluster 2; mean = 3.57), and the *highly chaotic/frightening disorganization* (Cluster 4) was also higher than *dissociation and an ignoring parent* (Cluster 3; mean = 3.81).

The subgroups also differed in mental health symptoms, F (3, 29) = 3.26, p = .036. Follow up LSD comparisons revealed that children in the *dissociation and an ignoring Parent* (Cluster 3; mean = 2.25) had higher scores than children in the *moderate disorganization, with chaotic story themes* group (Cluster 1; mean = 1.70) or the *caregiving*

role-reversal with low disorganization group (Cluster 2; mean = 1.60). The *highly chaotic/frightening disorganization* group (Cluster 4; mean = 1.93) was not significantly different from any other groups.

Discussion

Our study aimed to extend the understanding of how disorganized attachment is manifested in middle childhood. We first analyzed which signs of disorganization are most prominently found in the Story Stem narratives of school age Finnish and U.S. children (8 – 12 years old) with a disorganized attachment classification. The frequency of different signs varied greatly. Only five of the 15 signs were shown by a majority of children, suggesting that children display disorganization in multiple distinct ways. We further identified specific disorganized subtypes (clusters) based on the combinations of these disorganization signs and found the four-cluster solution to be the most theoretically meaningful with adequate cluster sizes. The identified subtypes differed both by the quality of interactions with caregivers as well as the child's narrative style. Two of the subtypes included coercive parent-child exchanges and frightening and illogical stories, whereas two others were notably characterized by lack of fright, and low overt disorganization in the context of dissociation or caregiving role-reversal. Regarding our second aim, we found that the subtypes were distinguished based on children's continuous attachment scores, groups with chaotic-frightening elements showing high disorganization and ambivalence, whereas the dissociated and role-reversing children showed higher avoidance. Further, children in the dissociation subtype showed higher mental health symptoms than other groups.

Signs of Disorganization in Middle Childhood Story Stem Narratives

A wide variety of signs of disorganization have been described in theoretical discussions of

disorganization and incorporated into observational and narrative measures of attachment (Kaplan, 1987; Main & Solomon, 1990; Solomon et al, 2021). We initially coded children's Story Stem interviews for 21 possible signs of disorganization identified based on literature and watching 13 pilot videos. Following our final coding, we narrowed our list to 15 signs that had sufficient variability and were reliably recognized by all three coders. All but one of the 15 signs were shown by at least 25% of the children, and therefore we suggest it is worthwhile to include all these signs as coding criteria for measures of attachment disorganization in middle childhood. The occurrence of the signs did not vary by child sex, sample country, or mother's substance abuse history.

Some signs were very common in the story narratives of disorganized children: Two thirds displayed parents acknowledging the problem without offering help, difficulties telling stories, and lack of problem resolution. Similarly, over half had frightening story themes and displayed collapse of coping. It is possible that these represent more general-level signs of disorganization, and most did not differentiate between the clusters (with the exception of frightening elements). Role reversal behaviors have been identified as markers of disorganized attachment (Main & Cassidy, 1988; Moss et al., 2004), and were noted for a substantial minority of children in our sample (29 – 40% of children).

The Narrative-based Disorganization Subgroups

Investigators have proposed different ways to distinguish disorganized subtypes (Lyons-Ruth, 2002; Moss et al., 2004; Padron et al, 2014; Solomon et al., 2021). In our study, the four-cluster solution provided the greatest differentiation of middle childhood disorganized attachment groups while still retaining adequate group size. Two groups seemed to show more distinct and classic signs of disorganization: The *highly chaotic/frightening disorganization* group especially displayed harsh, chaotic, and frightening interactions with

parents, as well as highly helpless parenting and child's caregiving role-reversal. The *moderate disorganization, with chaotic story themes* group was similarly high on classic disorganization signs such as frightening and illogical themes but lacked the highly punitive parenting typical for the *highly chaotic/frightening disorganization* group. Interestingly, only these two subtypes included children portraying overtly chaotic, harsh, and frightening interactions and narrative elements, whereas children in the other two groups, *dissociation and an ignoring parent* and *caregiving role-reversal with low disorganization*, had parents who were mainly distinguished by their lack of provision of appropriate emotional care. Chaotic-frightening narratives have been described to result from 'mental segregation in the context of threat to integration' which leads to representational-level chaotic fantasies in middle childhood that intrude in inappropriate contexts (Reisz et al., 2018). Previous research has described that fear and chaos are typical for disorganized children (Bureau & Moss, 2010; Solomon & George, 1999), but similarly to what has recently been proposed in infancy (Duschinsky & Solomon, 2017, Padron et al., 2014; Solomon et al., 2021), it appears that in middle childhood only some disorganized children show high fright, whereas others may display dissociation or other conflicting attachment behaviors.

Previous research (e.g., Moss et al., 2004; Bureau et al., 2009) has recognized three subtypes of disorganized children starting from preschool-age: Controlling-punitive, controlling-caregiving, and chaotic/continuing disorganized children. The *highly chaotic/frightening disorganization* group was especially characterized by punitive parenting, power struggles and child being coercive, which could bear resemblance to controlling-punitive child attachment, as the child's punitive behavior is often accompanied by similar, reciprocal parental behavior. Interestingly, the *highly chaotic/frightening disorganization* group was also relatively high on child role-reversing caregiving and its counterpart, helpless parenting. Punitive and caregiving strategies have been described as separate, age-salient

strategies for school age children (Moss et al., 2004), but they can also co-occur, especially since some children experience hostile and helpless parental behaviors in alterations (Lyons-Ruth et al., 2005; Sleed et al., 2021).

Interestingly, we could also differentiate a *caregiving role-reversal with low disorganization* group. Controlling-caregiving children have been described as less disorganized, more likely to have security as their secondary strategy, and more capable to approach their caregivers in low-stress circumstances (Lyons-Ruth, 2002). They are also more positively viewed by their parents (Lecompte & Moss, 2014; Moss et al., 2004) which could lead to less negative feedback and problem behaviors. Yet, they are still at risk for false self and not having their needs met by caregiving adults (Lecompte & Moss, 2014; Moss et al., 2004) as well as for internalizing mental health disorders (Dubois-Comtois et al., 2013, Moss et al., 2004). It is, however, notable that in our study this group showed equally, not higher amount of caregiving behavior, than the *highly chaotic/frightening disorganization* group. Vulliez-Coady and colleagues (2013) have described that parental helplessness may be typical for parents of both punitively and non-punitively disorganized children, but that there are two different types of helpless role-confusion: emotionally needy (i.e., seeking support from the child) and helpless and abdicating, with only the latter associated with punitive child behavior. Interestingly, in our study, the *caregiving role-reversal with low disorganization* group typically had parents who acknowledged their needs, but did not respond to them, potentially indicating a less severe parenting dysfunction than having parents who are completely helpless or displaying harsh or ignoring/uninvolved parenting.

The type of secondary organized insecure attachment strategy may also be meaningful in understanding different types of disorganization in middle childhood. Both the *highly chaotic/frightening disorganization* group and the *moderate disorganization, with chaotic story themes* group were found to show not only higher disorganization, but also higher

ambivalence scores, which seems to indicate that there was a high frequency of negative emotions such as anger and fear. Similarly, a previous study (Brumariu et al., 2018) has shown children's disorganized, hostile-punitive strategy to be associated with attachment ambivalence. Reisz and colleagues (2018) describe that, according to Bowlby, anger is similarly prevalent in ambivalent and disorganized attachment, which could explain why the groups with more chaotic and frightening disorganization are also high in ambivalence. However, the function of anger may differ in that in organized ambivalence, it is meaningfully directed towards the parent to gain attention, whereas in disorganized attachment anger becomes shapeless, punitive, or out of context. Our results thus suggest that high expressed anger as well as fear are typical for only certain subgroups of disorganized children.

Interestingly, the *dissociation and an ignoring parent* group only differed from other groups for two signs of disorganization: higher child dissociation and higher tendency for parents to ignore problems rather than acknowledging them but offering no help. It is possible that these parents are even more withdrawing than other parents, perhaps also suggested by simultaneous high levels of attachment avoidance shown by their children. Dissociation has been described as a protective mechanism from overwhelmingly painful emotions, and high withdrawal can be especially harmful for maternal co-regulation, eliciting disorganization in the infant (Goldberg et al., 2003). Duschinsky (2020) also describes from Bowlby's unpublished work that Bowlby viewed both disorientation and avoidance as manifestations of repressed attachment behavior. Dissociation may help divert attention away from emotion-eliciting cues that form a risk to trigger attachment behavior (Ducshinsky, 2020) under circumstances of highly frightful events where complete repression of these cues is not possible (Duschinsky & Solomon, 2017). Dissociation is thus described as an

emergency response, the extreme point on the continuum of segregated attachment processes (Reisz et al., 2018).

Disorganized children, as a group, are at risk for developing both internalizing and externalizing mental health symptoms (Groh et al, 2014; Madigan et al, 2016). Our findings contribute by showing that the *dissociation and an ignoring parent* group showed more parent-reported mental health symptoms than the *moderate disorganization, with chaotic story themes* group or the *caregiving role-reversal with low disorganization* group. Solomon and colleagues (2021) state that the highest mental health risk stems from dissociation in the context of attachment disorganization, as this results from experiences of overwhelming, immobilizing fear that prevents the use of more sophisticated defenses of fight, flight or (vigilant) freeze. Surprisingly, although disorganization characterized by fear is generally considered a high developmental risk (Solomon et al., 2021), children in the *highly chaotic/frightening disorganization* group were not rated higher than others on mental health symptoms. Interestingly, children in the dissociation group also depicted parents who ignored their problems, suggesting that neglect of emotional needs may be even more harmful for child mental health than harsh but engaged parenting (Dutra et al., 2009). Thus, this study suggests that disorganized children showing dissociation need to be recognized as a specific high-risk group in terms of their mental health, although it will be important to replicate this finding in larger samples.

Strengths, limitations, and future directions

There is a need for more studies that begin with basic observation and analysis as an alternative to presuming that variation in disorganization found at younger ages applies to older ages as well. Our study was exploratory in nature and represented the first effort of delineating forms of disorganization in later middle childhood based on an analysis of

specific signs of disorganization rather than a priori assumptions about the types of disorganization that might occur. The strengths included using a binational sample which also included high risk children. The main limitation of the study was its small sample size, and therefore the results should be considered as preliminary. It is possible or even likely that more or different types of clusters would emerge in a larger sample, so the results should be replicated. It is possible that the obtained results would also differ in a more homogenously high- or low-risk sample as the relative frequency of clusters might vary with risk, e.g., dissociation group might be identified more often in abuse samples. Our study also indicates that there may be interesting counterparts between child and parental interaction behaviors, such as an ignoring parent and dissociating child, but these should be confirmed by observational studies of parent-child interaction behavior.

Children's attachment narratives are powerful organizers of affective meanings (Oppenheim, 2006) and reflect their inner worlds of dialogic relationships with caregivers and other close relationship partners (Holmberg et al., 2007). Attachment Story Stems are also highly feasible and fruitful methods to measure school age children's attachment and inner worlds. Due to the high significance of child disorganized attachment as a predictor of psychopathology, and as an indicator of traumatic or dysfunctional parent-child relationships, it is vital that clinicians be able to recognize disorganized attachment in various ages. Recognizing the unique and age-specific signs of disorganization may help direct children and their families to suitable interventions.

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Table 1. Signs, Means, Standard Deviations and Inter-rater-reliabilities between three coders for 15 Signs of Disorganization

Sign	Mean	SD	Alpha
Lack of problem resolution	.68	.42	.85
Collapse of coping	.51	.39	.70
Parent acknowledge but no help	.81	.32	.71
Parent ignore problem	.35	.41	.80
Power struggles between parent and child	.27	.41	.91
Parent punitive/harsh	.33	.42	.85
Parent helpless	.37	.38	.71
Role reversal: child coercive	.29	.38	.77
Role reversal: child caregiving or adult coping	.40	.37	.62
Difficulty telling stories	.77	.29	.47
Frightening story themes	.53	.46	.87
Events illogical/magical	.48	.40	.73
Emotions not appropriate	.45	.37	.60
Signs of dissociation	.30	.39	.77
Child tries to control interviewer	.13	.29	.79

Table 2. Emergence of Clusters (average linkage method, squared Euclidean distance measure)

Number of Clusters	Size of Clusters
2	6, 27
3	6, 12, 15
4	6, 12, 11, 4
5	6, 3, 9, 11, 4
6	4, 2, 3, 9, 11, 4
7	4, 2, 3, 9, 10, 1, 2
8	4, 2, 3, 9, 10, 2, 1, 1

Table 3. Four Cluster Solution: Mean Differences on Signs of Disorganization (1-Way ANOVA comparisons)

Sign	Cluster1 N = 12	Cluster2 N = 11	Cluster3 N = 4	Cluster4 N = 6	F (3,29) (p value)	Posthoc LSD
Lack of problem resolution	.81	.55	.75	.61	.806 (.501)	
Collapse of coping	.50	.21	.58	1.00	9.516 (.001)	4 < 1,2,3 1, 3>2
Parent acknowledge but no help	.78	.88	.42	1.00	3.565 (.026)	1,2,4 > 3
Parent ignore problem	.44	.09	.92	.28	6.612 (.002)	3 > 1,2,4 1 > 2
Power struggles between parent and child	.31	.00	.00	.83	16.24 (.001)	4 > 1,2,3 1 > 2
Parent punitive/harsh	.42	.00	.25	.89	10.061 (.001)	4 > 1,2,3 1 > 2
Parent helpless	.19	.36	.17	.83	8.44 (.001)	4 > 1,2,3
Role reversal: child coercive	.42	.06	.00	.67	7.134 (.001)	1,4> 2,3
Difficulty telling	.83	.76	.92	.56	1.684	

stories					(.192)	
Frightening story themes	.89	.15	.00	.83	24.700 (.001)	1,4 > 2,3
Events illogical/magical	.67	.24	.33	.67	3.394 (.031)	4,1 > 2
Emotions not appropriate	.47	.33	.17	.83	4.308 (.012)	4 > 1,2,3
Signs of dissociation	.19	.15	.92	.39	6.706 (.001)	3 > 1,2,4
Child tries to control interviewer	.11	.09	.08	.28	.624 (.606)	
Role reversal: child caregiving or adult coping	.19	.48	.33	.72	3.747 (.022)	2, 4 > 1

Table 4: Example Responses to the Fight with a Friend Story Prompts by Children in Different Clusters

Story: Fight with a Friend set-up: mother sitting on a couch with her back to the front door. Child coming home. Interviewer Story Prompt: You were over at a friend's house playing. You and your friend got into a big fight, and your friend tells you to leave. You are just getting home now (move the doll). You go inside the house and slam the door (show with doll). Your mom says (in a neutral tone of voice), "Is that you, X?" Show me what happens next.

Cluster 1: Moderate disorganization, with chaotic story themes

Example A (Girl)

- Child says it is her, goes to table (away from mom). Mom comes over, asks what is wrong, child says nothing.
- Mom asks again, child says ok, that she had a small fight with her friend, was asked to leave.
- Mom says oh no, asks if she wants to invite over another friend, child says yes. *(lack of problem resolution; lack of secure base script)*
- Another friend agrees to come over, child is happy. Says "that's it." *(emotions not appropriate (overly bright affect); difficulty telling stories (abrupt story ending)*
- Interviewer asks if anything else happens, child gets invited to sleepover at second friend's house and allowed to go.

Example 2 (Boy)

- Mom asks why he slammed door hard, says because he can. Mom asks again, says because friend mad at him, mom says ok. *(parent acknowledges problem but does not help; power struggle; lack of problem resolution)*
- Mom and child go to watch TV, when mom tells him to turn it off he gets mad and kicks the couch. *(collapse of coping; emotions not appropriate (extreme for situation)*
- Asks to go outside and play sports, mom says yes but only badminton. They play together, child acts up, mom says she will go play with dad since child acted up. *(parent punitive)*
- Mom says go in house and do anything except watch TV, child says so of course I watch TV, turns it off when mom comes in, mom gets mad. *(power struggle)*
- I get sent upstairs. *(parent punitive)*

Cluster 2: Caregiving role reversal with low disorganization

Example A (Girl)

- Mom asks what is wrong, child says got in big fight with friend, mom asks her to come over and gives her a big hug.
- Child says she doesn't know what to do, mom says to take deep breath, then invites her to watch TV. Gives her dinner and leaves to do household chores. *(parent acknowledges problem but does not help; lack of secure base script)*
- Child goes to mom, says she doesn't know what to do, asks if she can make up with friend, mom says she doesn't know, maybe she can apologize. *(parent seems somewhat helpless, child has to cope on her own)*

- Child and mother watch TV, then child says "the end". *(difficulty telling stories (abrupt story ending)*
- Interviewer prompts, what happens next. Child says next day she and friend both apologize and are best friends again. "Done."

Example B (Boy)

- Child says he had fight with a friend, mom asks what it was about. Child said he invited him to his house and friend hit him. *(odd/unusual element; parent acknowledges problem but does not help (does not address child emotional needs)*
- Mother asks why (no answer from child), then she immediately leaves to go sit on couch. *(parent ignores problem; lack of secure base script)*
- Child says "That's it", interviewer asks if anything else happens, child says no. *(lack of problem resolution; difficulty telling stories (abrupt story ending)*

Cluster 3: Dissociation and an ignoring parent

Example A (Girl)

- Mom asks how was child's day, child says "good enough" and goes to her room.
- Later child goes to mom, says she got in an argument and is sad, then says "bye" and returns to her room. *(parent ignores problem)*
- Child says that is what would happen, interviewer asks what would happen next. Child says go about day as normal. *(lack of problem resolution)*
- Says when she would see the friend again it would be awkward. When asked if anything else would happen, child says she would hang out with a friend in a group at school.

Example B (Boy)

- Child tells mom he got in fight with a friend. No reaction from mom. *(parent ignores problem; lack of problem resolution)*
  Child sits down and watches TV with mom. Give her a hug. Knocks over a prop and comments on it.
- Shows child doll hugging mom and telling her "I love you". Then says they would get annoyed and so he would go to bed. *(emotions not appropriate)*
- Interviewer asks what happens next, child says mom would come and check on him after he went to bed.
- Rest of story off script as he talks about what household tasks his mom would do while he slept and what he would do the next morning. (*lack of secure base script*)

Cluster 4: Highly chaotic/frightening

Example A (Girl)

- Child shown to approach mom who asks her where she has been.
- Child says got in a fight, doesn't want to talk about it, calls mom an idiot. *(role reversal with child punitive; emotions not appropriate (extreme emotions); lack of secure base script)*
- Child goes to room, mother follows and suggests friend wants to make up, child says friend does not.
- Mother leaves and calls friend's mom to discuss.
- Friend's mom says friend does not want to make up. *(lack of problem resolution, although later there is a resolution)*
- Child comes in and sternly reprimands mom, saying she did not give her permission to call. *(role reversal with child punitive; power struggle)*
- Mom says they are supposed to go meet the friend and friend's mom, child does not want to go. Mom says she will, and tells child to give mom a hug. *(power struggle; emotions not appropriate to situation)*
- Child and friend meet up, friend apologizes, child does not accept apology. *(collapse of coping)*
- Then child abruptly decides they will make up and they play together. *(illogical magical solution to problem)*
- Start to play, initially fun but then have argument over what to play. *(collapse of coping)*
- Child goes home, tells mom they had another fight, mom says they should make up again
- Meet up with friend, they make up, say it is for the best, child says she missed the friend and felt bad she started the fight
- They go play at the beach

Example B (Boy)

- Child slams door, goes to room and sulks. *(emotions not appropriate (extreme emotion)*
- Mom goes to child and angrily asks why he slammed door, child says had fight with friend, then child says mom calms down and understands. *(parent punitive)*
- Mom asks what they fought about, child answers, mom says not worth fighting about. Says he should have come up with a solution. Mom leaves his room. *(parent acknowledges but does not offer help, lack of problem resolution)*
- Child goes to see what mom is doing, when he approaches she jumps-- child says mom startles. *(frightening/odd behavior)*
- Child says mom's words helped. Mom says ok, then offers him dinner.
- Child goes outside, "jumps for joy", somersaults. *(emotions not appropriate; events unrealistic)*
- Child says going so well he jumps around, falls down and breaks his leg. *(frightening theme; illogical; odd elements)*
- Says mom is frightening, he is shaking, and ambulance comes to take him away. Mother stays there, says: "what is happening?" *(collapse of coping; mother helpless; lack of secure base script)*

- Child comes home, child and mom say hello to each other. Child says he doesn't know what to say next for the story. *(difficulty telling story; lack of secure base script)*
- Mom asks how it was in hospital. Child says Ok, leaves to go play outside, depicts doll flying through the air. *(parent acknowledges problem but does not help; illogical/magical events)*