
**Title - Prior Participation in the Strange Situation and Overstress Jointly Facilitate Disorganized Behaviours: Implications for Theory, Research, and Practice**

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Abstract

We seek to understand why a relatively high percentage (39%; vs the meta-analytic average, 15-18%) of disorganized/disoriented (D) classifications has accrued in the low-risk Uppsala Longitudinal Study (ULS) study, using experienced D coders. Prior research indicates that D behaviours do not always indicate attachment disorganization stemming from a history of frightening caregiving. We examined the role of two other presumed factors: participation in a previous strange situation and overstress. Our findings indicate that both factors were highly prevalent in the ULS sample and that they jointly predicted higher rates of D. First, participation in a previous strange situation was associated with significantly higher distress displays during the second visit than occurred among previously untested children, suggesting that prior participation in the strange situation had a sensitizing effect on child distress during the second visit. Second, unless separations were cut short in lieu of high distress during the second visit, re-tested children were disproportionately likely (ca 60%) to be classified D. We argue that these findings have important implications for theory, research, and practice. In particular, we conclude that practitioners must refrain from misattributing the appearance of any D behaviors observed to a history of maltreatment.

Keywords: Attachment; Disorganized/disoriented; strange situation; measurement; equifinality
Although a majority of maltreated children are often judged disorganized/disoriented (D) in the strange situation (e.g., Carlson, Cicchetti, Barnett, & Braunwald, 1989; Main & Solomon, 1986, 1990; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999) there is no reason to presume that the converse holds; that children who display D behaviours have necessarily been maltreated. Many have, indeed, apparently experienced subtly frightening parental behaviour – such as the parental retreat on infant approach, anomalous sounds (Abrams, Rifkin, & Hesse, 2006; see also Lyons-Ruth & Jacobvitz, 2008). Nonetheless, children’s displays of disorganized/disoriented (D) behaviours may well be mistakenly attributed to maltreatment when many other causes are possible (cf. Wilkins, 2012).

In this paper, we highlight why it is important - in practice and principle - to become aware of the very real existence of multiple causes of children’s D behaviours. In the low-risk Uppsala Longitudinal Study (ULS), an unexpectedly high proportion (39%) of D classifications were assigned to children’s behaviour in the strange situation. Using data from that study, we examined the prevalence and predictive ability of two candidate causes of D: Prior participation in the strange situation and overstress.

**The Standard Pathway to Disorganized Attachment**

First identified by Main (1973) as “unclassifiable” strange situation behaviour, and later identified as disordered/disoriented behaviour (Main & Weston 1981; see Duschinsky, 2015), disorganized/disoriented (hereafter, disorganized, “D”) behaviour was most fully described and systematized for those working with the strange situation procedure by Main and Solomon (1986, 1990). This form of infant behaviour is thought to represent a break-down in normative (secure [B], insecure-avoidant [A], insecure-resistant [C]) attachment-related patterning in the face of attachment-associated stress (Main & Solomon, 1986, 1990; hereafter, Main & Solomon, 1990). As seen in strange situations conducted with infants and toddlers and their parents, D is identified in behavioural expressions displayed in
the presence of the caregiver, such as simultaneous or sequential displays of contradictory behaviours, undirected or misdirected movements, stereotypies, freezing and stilling, and direct indices of fear of the caregiver (Main & Solomon, 1990).

As described by Hesse and Main (2006), an important reason why such a breakdown may occur within the child’s relationship with caregivers is because of the behavioural paradox in which children find themselves when their caregivers are simultaneously the source of alarm (e.g., due to being abusive/maltreating, or simply frightened, frightening, or dissociative) and the only possible solution to alarm (i.e., because the offspring is pre-programmed to turn to his/her stronger and wiser attachment figure to deal with cues to danger). Thus, the more alarmed the child is, he/she should be led to turn to his/her attachment figure/the solution to alarm, but the closer the child gets to the attachment figure/the source of alarm, the more motivated he/she should be to flee from the attachment figure. Hence, a positive (behavioural) feedback loop is created, with inescapable fear – fear without solution – as a likely psychological outcome (e.g., Hesse & Main, 1999, 2006).

Supporting the validity of D and its assessment in the strange situation, empirical research has indicated two related key predictors of D, forming what may be called the “standard pathway” to D. The first is the parent’s Unresolved or Cannot Classify status on the Adult Attachment Interview (Main, Goldwyn, & Hesse, 2003), while the second (associated empirically with the first) is abusive, frightening, dissociative, and other anomalous caregiving behaviors (e.g., Cyr, Euser, Bakermans-Kranenburg, & van IJzendoorn, 2010; Hesse & Main, 2006). Findings such as these are now well-corroborated. Thus, in this paper, we do not deny that D may be caused by subtly to overtly frightening parental behaviours, nor that D may be validly assessed in the strange situation.

Why it is Important to Consider other Causes of Disorganized Behaviours
Already in their seminal paper on D, Main and Solomon (1990, p. 123) alerted readers to the possibility that D cannot always be attributed to parental maltreatment or other frightening forms of parental behaviours. In other words, D behaviours may also have other causes. They noted, for example (as have Pipp-Siegel, Siegel, & Dean, 1999) that neurological disturbance could cause some children to display behaviours (e.g., stilling and freezing of movement, stereotypical behaviours) in the strange situation that are equivalent to those displayed by children with D attachment stemming from maltreatment, parental frightening behaviours and the like (see also Hesse and Main, 2006). Consequently, in the coding of children with neurological problems, the children’s behaviours during the preseparation episodes should set the baseline for the coding of D behaviours during the reunion, disentangling neurological impairments from attachment behaviours.

Recently, in the context of a monograph on custody evaluations, Main, Hesse, & Hesse (2011, p. 441) expressed their concern regarding the risk that – in the context of such evaluations - practitioners might equate D behaviours in children with maltreatment from parents. As well, they noted other misconceptions concerning attachment in general and D in particular.

Nevertheless, researchers have largely proceeded in exploring tenets of the standard pathway (i.e., unresolved loss/abuse, maltreatment, anomalous caregiving) to D. On the one hand, this is praiseworthy as replication is key in science, though by no means always achieved (cf. Open Science Collaboration, 2015). On the other hand, to the extent that this collective focus has prevented researchers from exploring other possible causes, it may have led to general unawareness of other causes. Particularly from skimming the popular books now available on D in many countries, we believe that there is indeed general unawareness of other causes.

We are also aware of scholars (e.g., Wilkins, 2012, p. 26; Shemmings, 2011;
Shemmings & Shemmings, 2011) who have sanctioned for social workers to identify D in naturalistic settings, as an indicator of maltreatment. For example, in a paper entitled "Disorganised attachment indicates maltreatment", Wilkins (2012, pp.17-18) notes, "The overlap between maltreatment and DA [disorganized attachment] is so significant that … DA is the most reliable indicator of child maltreatment currently available”. Further, if D is identified, then investigation of "other” indicators of maltreatment is encouraged (Wilkins, 2012, p. 17 and 21). On the basis of well-established cognitive confirmation biases (e.g., Nickerson, 1998), we hasten to add that if such additional investigations are initiated, and especially on disadvantaged populations (cf. Alexius & Hollander, 2014; Granqvist et al., 2014), there is ample opportunity for investigators to identify additional faulty indices of maltreatment, with the possible net result that the child is taken out of the parent’s custody on invalid grounds. In other words, faulty logic at the outset may lead, on a slippery slope, to outright malpractice and discrimination. For these reasons, it is practically important to pay attention to the possibility of other causes of D behaviours.

Another necessity for the field is to identify methodological constraints on the validity of D classifications. For example, if some common practice in attachment research would inadvertently lead to inflated (or deflated) estimates of D, then precaution against such practice is warranted to maximize the validity of future assessments.

Consideration of other causes of D is also an important undertaking as a principal matter, given that many, or even most psychological phenomena may have multiple causes, or be brought to fruition via multiple pathways. Indeed, multiple causes may well be present regardless of how much attention a particular cause/pathway has rendered in the scientific literature up to any given point in time, and thus regardless of how inclined people have become to fall prone to the single cause fallacy (cf. Kelley, 1973). The idea of multiple causes also conforms to the principle of equifinality that partly defines the field of developmental
psychopathology (e.g., Cichetti & Rogosch, 1996); the same end state can be reached by different means.

Behaviours thought to indicate D attachment are no different. To the contrary, D behaviours may be a good case in point because they are represented by a list of different classes of behaviours that have only thing in common theoretically; they are not organized/oriented (Main & Solomon’s [1990] ”exclusion principle”, p. 152). In a real sense, they represent negative rather than positive attributes (i.e., disorganization). Thus, to obtain a more complete understanding of D behaviours, it is advisable to explore multiple causes/pathways.

**Disorganized Behaviours in Relation to Prior Participation in the Strange Situation and Overstress**

The available literature provides a rich source of observations from which clues to alternative methodological (i.e., contextual and procedural) causes of D may be derived. Two such causes are relevant to this study: re-administration of the strange situation and overstress. First, Ainsworth and colleagues’ (1978) data on readministration of the strange situation only two weeks after the first administration provides suggestive evidence that prior participation in the strange situation (1) sensitizes children (i.e., makes them more distress-prone during the second visit) and (2) could be one cause of at least ”D-like” behaviours. Session I had yielded the expectable distribution of organized attachment behaviours and classifications. However, in session II, the infants tended to be highly distressed and (as Main had observed at the time as a graduate student) many infants displayed what was then regarded difficult-to-classify (cf. D) behaviours (Main & Solomon, 1990, p. 126).

Second, regarding overstress, Takahashi (1986) - working when the D system was not yet available - initially observed a surprisingly high proportion of resistant behaviours (32% C classifications among Japanese infants). Like Ainsworth et al’s (1978) session II
infants, these Japanese infants tended to be highly distressed, probably due to a lack of almost any prior separation experiences from their mothers (e.g., van IJzendoorn & Sagi-Schwartz, 2008). Despite high levels of distress, Ainsworth et al.’s (1978) directions for conducting the procedure left unclear how much (or little) time spent in distress should lead to termination of a separation episode. Consequently, many of these Japanese infants did not get their separation episodes sufficiently shortened. When these tapes were later re-examined, Grossmann and Grossmann (1989) concluded that many overstressed infants showed behaviours resembling those of the then emerging D category, thus suggesting that overstress could be an additional cause of D-like behaviours.

Naturally, both the Ainsworth et al (1978) and Takahashi (1986) studies left unclear whether re-administration and overstress, respectively, sufficed to produce real D behaviours at levels sufficient for a primary D classification assignment. In addition, no study has to the best of our knowledge tested if re-administration and overstress exert unique, mediational, or interactive effects on D.

The Present Study

The aim of this paper was to clarify whether prior participation in the strange situation and/or overstress contributed to the high percentage (39%) of D classifications assigned in the low-risk ULS. In our first step, we examined the prevalence of these factors in the sample. Second, we tested whether prior participation in the strange situation sensitized children such that they displayed higher distress in the second assessment than did previously untested children (cf. Ainsworth et al., 1978). Finally, we tested whether prior participation in the strange situation and/or overstress predicted higher rates of D classifications. In so doing, we examined unique, mediational, and interactive effects.

Method

Participants
The data set comprised 85 children (43 girls, 42 boys) from the Uppsala Longitudinal Study (ULS) who had been coded both (1) within the four-way attachment classification system and (2) for overstress during the strange situation with their mothers (see further below). The sample was derived through random selection from a municipality birth register. Nevertheless, it is best described as a middle class sample, with comparatively high parental education. At the time of enrollment in the mid 1980’s, 56% of the fathers and 60% of the mothers had a college education or a university degree. Maternal age was $M = 30$ years, 4 months, $SD = 4$ years, 6 months (see Bohlin, Hagekull, & Rydell, 2000, for further information on the sample). The strange situation procedures were conducted in 1986.¹

**Measures**

**Disorganized attachment.** At age 15 months, the infants were observed in the 20 minute, semi-structured, laboratory-based strange situation procedure (Ainsworth et al., 1978) together with their mothers. Utilizing video-tapes, the three original ”major” categories system (i.e., avoidant [A], ambivalent [C], and secure [B] attachment) of strange situation response were first assigned by the last author. The strange situation tapes were later-re-examined and coded using the four-category system (i.e., including also Disorganized/disoriented [D] attachment) by the first and second authors, who cross-validated most of their codings against the fourth author. The data reported in this article is based on the four-category coding. Notably, the second and fourth authors are highly experienced, internationally recognized attachment coders, the fourth author being the inventor of the D coding system.

Although all cases were coded independently by the first and second authors, they sat in the same room and - in order to increase the validity of the data – discussed and resolved disagreements after they had decided on their individual classifications. The coders had very few disagreements, but we do not report reliability on the cases coded in such close
proximity, as the joint setting could have inflated interjudge agreement. Note, however, that 14 additional cases were coded when the coders were in different countries. The interjudge agreement for these 14 cases across all four categories was 86%, $K = .80$; the corresponding agreement for D versus non-D was 93%, $K = .85$. The attachment distribution is provided under the first heading of the Results section.

**Participation in a Prior Strange Situation.** Participation in a prior strange situation with father was included as a potential facilitator of D. The strange situation visits were scheduled in a counter-balanced order (i.e., father visit 1 vs mother visit 1), but some fathers did not participate. Repeated administration was thus a semi-random sample from the larger sample. Thirty children (or 35%) had participated on a previous occasion with their fathers. The prior visit ranged from 4 - 43 days prior to the strange situation with mother that is studied in the present article.

**Overstress and Preseparation Distress.** *Overstress* was included as a potential facilitator of D. We used two sets of variables. The first was an objective measure of *overextended separation*, operationalized as more than 1 minute of crying (Ainsworth et al’s [1978] C1 and/or C2) during the separation episodes (i.e., episode 4 or episodes 6-7) of the strange situation visit with their mothers. We used 1 minute rather than 20-30 seconds (cf. Grossmann & Grossmann, 1989; Main & Solomon, 1990) of hard/continuous crying as the cut-off for overextended separation. This was to allow mothers some time to get into the strange situation room following the experimenter’s signal to do so. A conservative definition of ”overextended” was also appropriate considering that we sought to study a facilitator of break-downs in expected behavioural organization. The second set was an independent observer’s subjective or *intuitive classification of overstress*, defined for the observer as ”a separation goes on too long in spite of the child displaying marked (i.e., more than mild to moderate) distress during a separation episode”.


Overextended separations and intuitive overstress were determined by coders who were blind to the children’s strange situation classifications and had limited knowledge about the attachment coding system. The coders were students in the final year of a 5-year clinical psychology training to become licensed psychologists. Their interjudge agreement across 20 cases was high, range of $K_s = .70 - 1.0$. Disagreements were resolved through discussion. To keep the number of statistical analyses within reasonable limits, overextended 1st separation, overextended 2nd separation, and intuitive classification of overstress of the child (i.e., in either separation) were aggregated into an average measure of total overstress ($\alpha = .75$), which was used in subsequent analyses.

Finally, we included a measure of Preseparation distress specifically to determine whether participation in a prior strange situation sensitized children for the re-administration. We used Ainsworth et al.’s (1978) 15-second interval ratings of crying in the strange situation preseparation episodes (i.e., episodes 2-3), which were averaged to form a mean score, intraclass $r$ for average measures = .50. This was to test whether a potentially sensitizing effect could be observed already when the child got re-acquainted with the room, prior to being separated from the mother. The crying ratings, provided by the aforementioned students, displayed high interjudge agreement across 20 cases (intraclass $r$ for average measures = .99).

Results

Observed Attachment Distribution Vis-a-Vis the Meta-analytic Distribution

The initial three-way (i.e., secure [B], avoidant [C] and resistant [C]) distribution was similar to the distribution expected from international meta-analyses of normal populations (see Bohlin et al., 2000; van IJzendoorn et al., 1999). After having re-coded the sample for disorganization, the 3-way distribution in the sample was, A 11%, B 61%, C 7%, and 21% were considered unclassifiable (“Cannot Classify”, CC). Corresponding
percentages specifically for those who visited the strange situation for the first (and second) time were, A 10 (11) %, B 57 (67) %, C 6 (8) %, and CC 27 (14) %.

The 4-way distribution in the sample was, A 5%, B 45%, C 3%, D 39%, and CC 8%. Corresponding percentages specifically for those who visited the strange situation for the first (and second) time were, A 4 (6) %, B 45 (44) %, C 4 (3) %, D 37 (42) %, and CC 10 (6) %.

Thus, when recoding the ULS sample for D, we found that 39% of infants had been categorized as D, compared to 15-18% in meta-analytic normal samples (Groh et al., 2012, 2014; van IJzendoorn et al., 1999). The eight percent unclassifiable cases were excluded from subsequent analyses. This was because we strived to obtain a pure measure of D to facilitate comparisons with other studies of D, which have rarely included unclassifiable cases. Nonetheless, we ran supplemental analyses using a D/unclassifiable vs organized contrast, which reproduced the main findings reported.

Using the four-way distribution, meta-analytic findings on normal samples have indicated 15-18% D (as noted) and 15% A (Groh et al, 2012, 2014; van IJzendoorn et al., 1999). These distributions deviated significantly from the observed distribution of the present sample (Fisher exact = .000 - .003). Thus, there was a higher percentage of D and a lower percentage of A observed in this sample than expected. In fact, the percentage of D in the present sample was more similar to samples with low SES (34%), child neurological abnormalities (35%), and maternal alcohol and drug abuse (43%) than with normal population samples (15-18%; Groh et al., 2012, 2014; van IJzendoorn et al., 1999).

Tests of Research Questions

To examine whether prior participation in the strange situation and overstress were prevalent in the sample and/or predicted the probability of D classifications, we performed three sets of analyses. First, we descriptively examined the prevalence of prior
participation in the strange situation and over stress. Participation in a prior strange situation was indeed prevalent; as noted, 35% of the sample had participated in the strange situation in the same laboratory on a previous occasion with their fathers. Timing of the previous participation was not related to D classification ($\eta = -.04, n.s.$). Similarly, over stress was prevalent in the sample, both according to the “objective” criterion of > one minute of hard/continuous crying (29% in the 1st separation, 34% in the 2nd separation) and the intuitive classification of over stress (34%) in either separation.

Second, to analyze whether prior participation in the strange situation might sensitize children, making them more distress-prone during the second participation (cf. Ainsworth et al., 1978), we analyzed bivariate relations between prior participation in the strange situation on the one hand and pre separation distress and total over stress in the second assessment on the other hand. These analyses are presented in Table 1.

As shown in Table 1, children who re-visited the strange situation displayed higher pre separation distress and were also more likely to be judged overstressed during the second assessment. Thus, the first strange situation appears to have had a sensitizing effect on the children’s distress during the second session.

Finally, there were no bivariate relations between prior participation in the strange situation and over stress on the one hand and D classifications on the other (see Table 1). Consequently, the conditions for testing a mediational model with readministration of the strange situation as predictor, D as outcome, and total over stress as mediator were not met (e.g., Baron & Kenny, 1986).

To analyze the possibility of interaction effects between prior participation in the strange situation and over stress, we ran a hierarchical logistic regression analysis. Notably, this possibility was suggested by the sensitizing effect of prior participation in the
strange situation on children’s distress. The analysis included as predictors prior participation in the strange situation along with the measure of total overstim. These variables were used as centered predictors in block 1. To address the possibility of interaction effects between predictors, the second block included their two-way interaction term. The outcome variable was D vs non-D.

As indicated by the absence of bivariate relations (see Table 1), results for block 1 were not significant, \( \chi^2 (1) = .17, n.s., -2 \text{ Log likelihood} = 104.368 \). However, results were significant for block 2, which contained the interaction term, \( \chi^2(1) = 6.58, p < .01, -2 \text{ Log likelihood ratio} = 97.80 \). The regression is presented in Table 2 and the interaction term is graphically displayed in Figure 1.

As shown in the figure, the combination of prior participation in the strange situation and high overstim was associated with a particularly high probability of D. In fact, a majority (58%) of these children were assigned a D classification, whereas a minority of children were assigned a D classification when none or merely one of the two factors was present. Across these latter conditions, the average percentage D was 36%.

**Discussion**

We have reported a surprisingly high percentage of Disorganized/disoriented (D) attachment classifications - assigned by experienced coders based on strange situation observations - among children in the otherwise low-risk, middle class Uppsala Longitudinal Study. Faced with this finding, we decided to examine whether two candidate facilitators of D could have contributed to the high percentage of D classifications. First, both presumed facilitators - prior participation in the strange situation and overstim - were highly prevalent in the sample. Second, prior participation in the strange situation had a sensitizing effect for the re-administration of the procedure, making children more distressed during the second
assessment than were previously untested children. Finally, the combination of prior participation in the strange situation and overstress during the second assessment predicted a higher probability of D classification assignments. In fact, a majority of these children (ca 60%) had a primary D classification. This percentage is at least comparable with the international average for maltreatment samples (48%; van IJzendoorn et al., 1999).

The findings reported here have several implications for theory, research, and practice. Regarding theory, our findings suggest that a temporary state of high distress - when it is coupled with no apparent solution to the distress (i.e., based on memory traces from the previous strange situation session) - may suffice to produce inflated D behaviours. We speculate that jointly prior participation in the strange situation and overstress may temporarily place otherwise "organized" children in a similar paradoxical junction as that facing children with D attachment stemming from frightening parental behaviours. However, this paradoxical injunction is likely to be context-specific (i.e., applicable to the strange situation alone). Thus, we suggest that it may take more than one stressful encounter with the strange situation to momentarily break the organized child’s expectations of the efficacy of his/her own behaviours and of the caregiver’s responsiveness in the strange situation.

To illustrate, when the secure child’s attachment system is highly active, the attachment figure is normally represented as responsive, and the child is inclined to approach. However, the child’s proximity seeking is to no avail in this particular, painfully familiar context of re-occurring, stressful separations; thus the child withdraws or engages in other behaviours antithetical to a full approach. Similarly, when the avoidant child’s attachment system is active, the attachment figure is represented as rejecting, and smooth defensive avoidance is the child’s expected response. Yet, the magnitude of stress invoked by the stressful re-encounter with the strange situation may be sufficient to break the pattern of defensive avoidance, yielding an increased necessity of approach and the appearance of

Regarding research, our findings imply that researchers must pay increased attention to the methodological constraints on the validity of D classifications. Although it is not uncommon to have two or more strange situations within attachment-based longitudinal projects (separated, however, by 6 months in both the Minnesota longitudinal study [Sroufe, Egeland, Carlson, & Collins, 2009] and Berkeley [Main, Kaplan, & Cassidy, 1985]), as compared to 4-43 days in the present study) caution is clearly warranted, as our findings indicate that traces from a first session sensitize children to the second, making them more distress-prone in that succeeding session. Unless separations on the second assessment are kept short, the child’s behavioural organization may be compromised.

Notably, our findings extend those of Ainsworth and colleagues (1978), which had indicated that two weeks was a too short inter-assessment interval, yielding high distress and “difficult to classify” attachment behaviours on the second assessment. Our findings show that children may be exceptionally distressed during a second strange situation whether it is conducted a few days or a month and a half following the initial assessment. In other words, although special attention to the length of the separations in relation to child distress is clearly warranted during the second assessment, there may be no fool proof temporal rule for a safe inter-assessment interval lasting less than six months (e.g., see Sroufe & Waters, 1977, for remarkable ABC stability given a six-month separation between strange situations).³

Finally, regarding practical implications, we are deeply concerned about the potential misuse of attachment theory via attempted determinations of D in particular, especially with respect to forced custody assessments. We know of a number of cases in which children have been taken out of their socially disadvantaged parents’ care based in no
small part on social agencies’ allusions to attachment-related problems, including allusions to D, which have occasionally reflected very simple misunderstandings of attachment theory and related research (see Alexius & Hollander, 2014; cf. Main et al., 2011, with reference to several specific misunderstandings). From a recent review of forced custody investigations, researchers concluded that “In the majority of cases there is an account of attachment theory, and the children’s emotional needs were interpreted as lack of attachment. [Yet] The methods by which the alleged dysfunctional attachment within the families [were] … explored are not presented in any of the investigations.” (Alexius & Hollander, 2014, p. 299, brackets added).

An important conclusion from the present study is therefore that the combination of prior participation in the strange situation and overstress is sufficient to produce similar rates of child D behaviours as does parental maltreatment. In other words, undergoing maltreatment or other forms of frightening caregiving are by no means necessary conditions for (or sole causes of) the appearance of child D behaviours (cf. Shemmings & Shemmings, 2011; Wilkins, 2012). Notably, there may also be additional D-facilitators besides maltreatment, subtly frightening behaviours, and the methodological factors studied here, such as extensive non-parental care (Hazen et al., 2014), frequent over-night separations from the primary caregiver (Solomon & George, 1999), and gene-environment interactions (e.g., Lujik et al., 2011; Spangler, 2013).

It should go without saying that professionals must do a rigorous job in substantiating their forced custody orders, ideally with direct evidence of child maltreatment, and at least with a solid assessment of the home environment as providing a palpable risk of detriment to the child’s health and development. In either case, alleged signs of D will clearly not do as a proxy, whether they have been observed in the strange situation or in other settings such as the child’s home. For the sake of both children and their parents, social authorities might instead, by default, exhaust the support possibilities (e.g., parent education programs,
economic subsidies) that social services could potentially offer. In addition, they should pay equal attention to the harm done by (repeated) separations of children from their caregivers (e.g., Bowlby, 1973, 1980) as to the potential gains that may be offered by placing the child in foster care (cf. Alexius & Hollander, 2014).

It could be argued that the relatively high proportion of D classifications observed in this study among children who were not overstressed and/or who visited the strange situation for the first time (on average about a third [36%] of these children were judged D) demonstrates a high prevalence of ”standard pathway D” in the sample as a whole. We agree that the proportion of D assignments was surprisingly high also under the ”non-facilitated” conditions, and yet not notably higher than in some other low-risk studies that have used experienced strange situation coders (e.g., Abrams et al., 2006, 31%; Ainsworth & Eichberg, 1991, 33%; Hazen et al., 2014, 34%; Schuengel et al., 1999, 31%; Solomon & George, 1999, 39%). Whether the relatively high D proportion among children under the non-facilitated conditions reflects a high prevalence of the standard pathway to D attachment can only be determined on the basis of observations pertaining to the standard pathway (e.g., parental Adult Attachment Interview status, frightening caregiving behaviours, maltreatment). Regrettably, such data is not available within this study.

The most important limitation of this study is that we did not design the study a priori as an experiment with random assignments to conditions to test whether pertinent manipulations cause children to display D behaviours. Instead, faced with a surprisingly high proportion of D classifications, we attempted to trace its cause post-hoc, by putting two key factors (with sufficient variation in the study) to the test. Concerned with research ethics, we do not recommend that researchers design future experiments to replicate our findings. Instead, we encourage researchers to try to replicate these findings using available data from established projects. However, our major carry-home message with this paper is a warning
pertaining to methodological constraints on the validity of D classifications in the strange situation. This warning may serve an important function for future research and applications whether or not the exact findings presented here are replicated.

In closing, we reiterate that a temporary state of high distress when it is coupled with no apparent solution to the distress may be one cause of the appearance of D behaviours. Keeping methodological constraints on the validity of D classifications in mind calls for a change of hearts among attachment researchers; the appearance of D in the strange situation is clearly sufficiently ”reactive” that deviations from optimal procedures can cause serious problems. Rather than viewing the strange situation and associated coding systems as ”robust”, researchers should be astonished about the possibility that when the procedure is conducted under optimal conditions, they may actually tap something as complex and predictive (e.g., Fearon et al., 2010; Groh et al., 2014; van IJzendoorn et al., 1999) as the organization (or lack thereof) of children’s attachment behaviours with a reasonable degree of validity. After all, the procedure is based on observations of what a child does in a mere flash of 20 minutes, and when placed in a strange situation.

Notes

1 This omission was understandable as published recommendations on the shortening of separations were not available at the time (see Main & Solomon, 1990; Grossmann & Grossmann, 1989).

2 The latter percentage (18%) is from the most recent large-scale meta-analyses that have included disorganized attachment classifications (Groh et al., 2012, 2014). We are grateful to Ashley Groh for providing us with these meta-analytic data-sets.

3 This conclusion converges with that derived from other studies indicating a well-developed capacity among infant toddlers to maintain long-term memories, which may in fact last up to
several months (e.g., Klein & Meltzoff, 1999; Rovee-Collier, 1999; Rovee-Collier & Barr, 2001).
References


Table 1.

Bivariate relations\textsuperscript{a} among Prior Participation in the Strange Situation (SSP), Preseparation Distress, Total Overstress, and Disorganized (D) vs non-D classifications

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<thead>
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<th></th>
<th>Presep distress</th>
<th>Overstress</th>
<th>D vs non-D</th>
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<tbody>
<tr>
<td>Prior SSP</td>
<td>.38**</td>
<td>.34**</td>
<td>.03</td>
</tr>
<tr>
<td>Presep distress</td>
<td>.24*</td>
<td></td>
<td>.17</td>
</tr>
<tr>
<td>Overstress</td>
<td>.17</td>
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\textsuperscript{a} The relation between prior SSP and D vs non-D is reported as the phi coefficient, remaining relations are reported as eta coefficients. // Note. N = 77 for analyses of D (i.e., excluding 8 unclassifiable cases) and 85 in the remaining analyses.

\textsuperscript{**}p < .01
Table 2.

Logistic Regression Results for Prior Participation in the Strange Situation (SSP) and Total Overstress Predicting Disorganized (scored 1) vs Organized (scored 0) Attachment

<table>
<thead>
<tr>
<th>Block 1:</th>
<th>Nagel-kerke $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
</tr>
<tr>
<td></td>
<td>Disorganized attachment</td>
</tr>
<tr>
<td>Prior SSP</td>
<td>.00</td>
</tr>
<tr>
<td>Overstress</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Block 2:</th>
<th>Nagel-kerke $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
</tr>
<tr>
<td></td>
<td>Disorganized attachment</td>
</tr>
<tr>
<td>Prior SSP</td>
<td>.11*</td>
</tr>
<tr>
<td>Overstress</td>
<td>-.75</td>
</tr>
<tr>
<td>Prior SSP X Overstress</td>
<td>1.48*</td>
</tr>
</tbody>
</table>

*Note. N = 77

*p < .05; two-tailed.*
Figure 1. Interaction between Total Overstress (Low vs High) and Participation in Prior strange situation (1st SSP vs 2nd SSP) on Percentage of Disorganized Attachment. Results from Logistic Regression, $\chi^2 (1) = 6.58$, $p < .01$, -2 Log likelihood = 97.80, Nagelkerke $R^2 = .11$. 