



Research article

The role of negative parental attributions in the associations between daily stressors, maltreatment history, and harsh and abusive discipline



Marieke Beckerman, Sheila R. van Berkel, Judi Mesman, Lenneke R.A. Alink*

Centre for Child and Family Studies, Leiden University, The Netherlands

ARTICLE INFO

Article history:

Received 10 June 2016
 Received in revised form
 25 November 2016
 Accepted 30 December 2016

Keywords:

Parental attributions
 Harsh discipline
 Child abuse
 Parenting stress
 Information processing

ABSTRACT

Negative parental attributions are related to parent and family stressors and are thought to be important predictors of subsequent disciplinary actions and, potentially, abusive parenting. We examined if negative parental attributions mediate the relation between daily stressors (i.e., low SES, parenting stress, partner-related stress) parents' own history of child maltreatment, and harsh and abusive parenting. Mothers ($n = 53$) completed a computerized attribution task and reported on daily stressors, their own history of child maltreatment and their discipline strategies. Mothers' negative parental attributions mediated the association between parenting stress (but not the other stressors) and harsh and abusive discipline. These findings implicate that interventions to decrease (the risk of) child abuse should not only focus on reducing abuse-related stressors, but also target negative parental attributions.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

The research literature identifies many different types of risk factors for harsh and abusive parenting (Stith et al., 2009). Different types of daily stressors, such as socioeconomic strain, marital discord, and parenting problems have been studied as risk factors for harsh and abusive parenting, and are found to negatively influence parents' ability to use positive and effective discipline strategies (Coln, Jordan, & Mercer, 2013; Liu & Wang, 2015; Puff & Renk, 2014). In addition, parents' own history of child maltreatment is found to be a crucial risk factor for the parent to maltreat their own children (e.g., Dixon, Browne, & Hamilton-Giachritsis, 2005; Pears & Capaldi, 2001). A possible underlying mechanism that explains why current stress and past experiences of maltreatment relate to harsh and abusive parenting is parental attributions (i.e., parental interpretations and evaluations of child behavior; Milner, 1993, 2003). According to the Social Information Processing (SIP) model negative parental attributions are important predictors of subsequent disciplinary actions and potentially, harsh or abusive parenting (Milner, 1993, 2003). The model theorizes that parents who attribute responsibility and hostile intent to the child and evaluate the behavior as more serious and wrong, are at risk for child abuse. Further, high stress levels and the experience of childhood maltreatment are thought to predict negative parental attributions (Milner, 1993, 2003). This implies a mediation model from current stressors and past maltreatment via negative attributions to harsh and abusive parenting that has not yet been empirically examined as such. Therefore, the aim of the present study is to explore negative

* Corresponding author.

E-mail address: alinkra@fsw.leidenuniv.nl (L.R.A. Alink).

parental attributions as mediators that may explain why current stress and childhood maltreatment relate to the use of harsh and abusive discipline.

Stress can be caused by a broad range of factors. At the family level an important source of stress is low socioeconomic status (SES). The Family Stress Model (FSM; Conger & Conger, 2002; Conger & Donnellan, 2007) posits that parents with a low SES experience elevated levels of stress because of the economic hardship (e.g., low income, high debts, work instability) they encounter. As a consequence, parents will be more irritable, harsh, and inconsistent in their disciplinary practices. Several empirical studies support this relation between a low SES and the use of harsh discipline and abusive parenting. For example, low educational level and unemployment predict harsh discipline (Dodge, Pettit, & Bates, 1994), and physically abusive parents were found to be significantly more often parents with a low education, a low income, a lower occupational level, and being more often unemployed than non-abusive parents (Cappelleri, Eckenrode, & Powers, 1993; Euser et al., 2013; Sedlak et al., 2010; Whipple & Webster-Stratton, 1991). Moreover, poverty levels are associated with higher rates of child maltreatment (Eckenrode, Smith, McCarthy, & Dineen, 2014; Sedlak et al., 2010).

An additional family-related stress factor that is linked to more harsh discipline and abusive parenting, is stress caused by interparental conflict and marital dissatisfaction (i.e., partner-related stress). Empirical evidence extensively demonstrates the relation between partner-related stress and abusive parenting. For example, abusing parents and those at risk for abusive parenting have been found to be more dissatisfied with their relationships (Chan, 1994; Salisbury, Henning, & Holdford, 2009), report less support from their partners (Whipple & Webster-Stratton, 1991), and hold less positive opinions of their partners (Smith, Hanson, & Noble, 1974), compared to other parents. In addition, marital conflict and low marital quality are related to the use of more coercive and harsh discipline (Chang, Lansford, Schwartz, & Farver, 2004; Coln et al., 2013; Kaczynski, Lindahl, Malik, & Laurenceau, 2006).

Another source of stress at the family level that might be particularly relevant in predicting harsh and abusive parenting is the stress a parent experiences in relation to parenting tasks and challenging child behaviors (i.e., parenting stress). Parenting stress results from a disturbance in balance between parents' perceptions of demands of parenting and their perceptions of their resources meeting those demands (Deater-Deckard, 2004). In general, the difficulty that arises from the responsibility of raising children, leads to higher levels of stress (Crnic & Greenberg, 1990). Nevertheless, feelings of competence in parenting and the experience of level of demandingness can differ greatly among parents. We would like to emphasize that this is not to be confused with negative parental attributions. For example, parents can experience their children as highly demanding (i.e., stressful), without attributing this behavior as negative (e.g., "It is normal for young children to be demanding"). According to the Parenting Stress Model (Abidin, 1990), parents who experience high levels of challenging child behavior, dysfunctional parent-child interactions and low levels of available resources (i.e., parenting stress), are also parents who engage in more negative, authoritarian parenting. Research demonstrates that parenting stress is indeed a risk factor for the use of harsh and abusive discipline. For example, parenting stress is related to the use of more corporal punishment and psychological aggression (Anthony et al., 2005; Liu & Wang, 2015; Rodgers, 1998), and more authoritarian, power-assertive discipline strategies (Deater-Deckard & Scarr, 1996). Additionally, it has been found that abusive mothers experience significantly more parenting stress than non-abusive mothers (Chan, 1994).

In addition to risk factors at the family level, a parent's own history of child maltreatment is seen as a crucial risk factor for the parent to become maltreating to their own children (Berlin, Appleyard, & Dodge, 2011). This is supported by many studies that confirm the intergenerational transmission of child maltreatment, and studies that found a relation between childhood maltreatment and the use of harsh and abusive discipline (Coohey & Braun, 1997; Dixon et al., 2005; Newberger et al., 1986; Pears & Capaldi, 2001; Whipple & Webster-Stratton, 1991).

Some research has been done on mediating mechanisms that might explain the relation between stress and harsh and abusive discipline practices and the intergenerational transmission of child maltreatment. For instance, the relation between economic stress and harsh parenting was found to be mediated by parental depression (McLoyd, Jayaratne, Ceballo, & Borquez, 1994; Parke et al., 2004), and the intergenerational continuity of abuse has been found to be partially mediated by early childbearing and cohabiting with a violent person (Dixon et al., 2005). However, most research demonstrates the direct associations of stress and prior childhood maltreatment with the use of harsh and abusive parenting without testing mediational pathways. Based on the SIP-model, we examine parental attributions as possible mediators that may explain why stress and childhood maltreatment relate to harsh and abusive parenting.

Parental attributions are defined as parental interpretations and evaluations of child behavior (Milner, 1993, 2003). The SIP-model theorizes that when parental attributions are biased, the quality of parenting behavior can be compromised and might even take the form of abusive parenting. Parents who have biased attributions are hypothesized to attribute more responsibility and more hostile intent to the child (e.g., "he spilled the milk because he wants to get back at me"), and evaluate child behavior as more serious, wrong, and blameworthy compared to other parents. In addition, these parents are expected to be less able to think of alternative explanations for the child's behavior (e.g., "he spilled the milk, because he is too young to hold the cup straight") and are believed to ascribe negative child behavior to internal, stable, and global child characteristics. The more the parent attributes the child behavior as negative, the higher the chance that the parental disciplinary response will be harsh, and may subsequently result in abuse (Milner, 1993, 2003).

Furthermore, the SIP-model describes that the current experience of stress and the experience of childhood maltreatment are risk factors for the parental attribution to become biased. Stress is thought to be responsible for the parent's automatic and rigid rather than controlled and flexible information processing (Milner, 1993, 2003). Empirical evidence shows that people who are (chronically) stressed show cognitive impairments, such as problems in learning and memory (Kuhlmann, Piel, &

Wolf, 2005; Lupien, Maheu, Tu, Fiocco, & Schramek, 2007), and are indeed more likely to process information automatically and habitually instead of in a controlled and flexible manner (Hermans, Henckens, Joëls, & Fernández, 2014; Vogel et al., 2015). During automatic processing, parents are less likely to take situational information into account. As a consequence, parents are less able to understand the child's behavior within the actual context and will attribute more responsibility to the child, and evaluate the child's behavior as more wrong (Milner, 1993, 2003). The experience of childhood maltreatment is thought to be a cause of having biased pre-existing cognitions (e.g., general beliefs about children and child rearing), given that moral standards and beliefs regarding children and parenting are thought to mainly develop in the family of origin (Milner, 1993, 2003; Van Ijzendoorn, 1992). Particularly when parents evaluate ambiguous child behavior, challenging but age-appropriate child behavior, and minor transgressions, it has been proposed that parents are more likely to be influenced by their pre-existing cognitions (Milner, 1993, 2003).

In sum, important risk factors that are related to harsh and abusive parenting are the current experience of stress and past experiences of childhood maltreatment. Mediating pathways that explain this relation are rarely studied. We explore parental attributions as a potential mediating mechanism, and hypothesize that:

- Current stressors and past childhood maltreatment are related to more harsh and abusive discipline in parents.
- Negative parental attributions are related to more harsh and abusive discipline.
- Negative parental attributions mediate the relations between current stressors, past childhood maltreatment and harsh and abusive discipline.

2. Method

2.1. Sample

We were interested in studying variance in stressors and harsh and abusive discipline within the general population, and thus used a non-risk sample. Convenience sampling was used. Participants were recruited in different ways in order to include families with various socio-economic backgrounds. Mothers were recruited through health care services and door-to-door flyer distribution. Information about the study was provided by brochures, an internet page, and verbally by recruiters. Mothers could self-enroll by filling out a short questionnaire on the internet about family characteristics and were contacted by telephone within a few days. Because cultural background could influence the way parents evaluate child behavior (i.e., parental attributions), we chose to only include parents with one specific cultural background (i.e., Dutch). Mothers were eligible for participation if they had a child in the age range of 2–6 years old, were living in the Netherlands, had the Dutch nationality and self-identified as having a Dutch cultural background. Exclusion criteria were mother's psychopathology, severe intellectual or physical handicaps of the mother or the child, and not speaking the Dutch language. Mothers reported this on the enrollment questionnaire. Anonymity was guaranteed.

The recruitment resulted in a total number of 56 mothers and their biological children. Due to missing data on one of the measurements, three mother-child dyads were excluded from analysis. These dyads did not significantly differ from the final sample ($n = 53$) on family income, maternal age and education, child age, and gender of the child (all $ps > 0.05$). For the final group maternal educational level had the following distribution: 4% low, 30% average, 65% high, meaning that most mothers completed an education after high-school. Monthly net family income was on average € 2805 ($SD = 1013$, range 1000–4250), which is slightly above the average income of the Dutch population. Most of the mothers were married and/or living with the biological father of their child (83%), a few were single parents (13%), and the remaining mothers lived with a new partner who helped raising the child (4%). The mothers were between 22.0 and 48.6 years old ($M = 34.0$, $SD = 6.7$). The participating children were between 2.0 and 6.0 years old ($M = 3.7$, $SD = 1.1$), 51% were boys.

2.2. Procedure

Data were collected during a home visit and a laboratory visit. The aim was to complete the laboratory visit within a week after the home visit. During the home visit mother-child dyads were filmed and mothers were asked to fill out several questionnaires. Mothers were then invited to visit the lab at the university where they completed computer tasks and filled out more questionnaires. Mother and child received a small gift after the home visit and at the end of the study they received a gift coupon of €75 and a DVD with the recordings of the home visit. Informed consent was obtained from all mothers. Procedures and measures were approved by the Ethical Committee of the Institute of Education and Child studies of Leiden University.

2.3. Measures

2.3.1. Socioeconomic status. Mothers were asked to report their highest completed education and their monthly net family income, $r(51) = 0.27$, $p < 0.05$. To calculate their socioeconomic status (SES) both scores were standardized before computed into a sum score for total SES. Lower scores indicated lower SES.

2.3.2. Partner-related stress. Mothers completed the marital scale of the Maudsley Marital Questionnaire (MMQ; Crowe, 1978). The scale consists of 10 items about the mother's relationship with her partner. Examples of questions are: 'How much tension, coolness, quarrelling, nagging and violence is there in the marriage?' and 'Can you let you partner know your true feelings?'. Answers were given on an 8-point Likert scale (0 *very positive* to 8 *very negative*). Six mothers did not have a partner, these mothers did not significantly differ from the final sample ($n = 53$) on the study variables (all $ps > 0.21$). Analyses with the MMQ were done on a sample of 47 mothers. The Cronbach's alpha of the marital scale in this sample was 0.85.

2.3.3. Parenting stress. Parenting stress was measured with the Parenting Daily Hassles Scale (PDH; Crnic & Greenberg, 1990). Mothers rated 20 statements about potential hassles related to challenging child behavior and parenting tasks that occurred in their family in the previous week, such as 'My child resists or struggles with me over bed-time' and 'I have difficulties in getting my child ready for outings and leaving on time'. A 5-point Likert scale was used to measure parent's assessment of the intensity of the hassles, ranging from 0 *no burden* to 4 *great burden*. The Cronbach's alpha of the PDH scale in this sample was 0.71.

2.3.4. Childhood maltreatment. To measure different types of maltreatment the mother may have experienced during her childhood the Childhood Trauma Questionnaire (CTQ; Thombs, Bernstein, Lobbestael, & Arntz, 2009) was used. The questionnaire consists of 24 items assessing the experience of emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Mothers rated statements such as 'People in my family called me things like stupid, lazy, or ugly' and 'People in my family hit me so hard that it left me with bruises or marks' on a 5-point Likert scale (0 *never true* to 5 *very often true*). For analysis the total mean score was used. Internal consistency of the total scale was $\alpha = 0.92$.

2.3.5. Negative maternal attributions. To test negative maternal attributions of ambiguous child behavior a computerized task was developed, called the Parental Attributions of Child behavior Task (PACT). The task consisted of presentations of ten ambiguous drawings of child behavior that could be explained as either being naughty or clumsy, and five drawings of neutral child behavior. Mothers were specifically asked to imagine their own children while evaluating the behavior in the drawings. Each time, two ambiguous illustrations were followed by a neutral one. Examples of ambiguous situations are: a child tripping over a laptop wire while chasing a ball, causing the laptop to fall off the table; a child picking flowers from a garden and giving them to someone; a child spilling food while eating with fork and knife. Examples of neutral situations are: a child reading a book; a child riding a bike; a child playing in the sandbox. Although the outcome of the behavior in the ambiguous pictures was negative (e.g., broken laptop, stains on clothing), it was disputable if the behavior that caused the outcome should also be evaluated as negative (i.e., wrong, blameworthy). The aim of the task was to measure the evaluation of the behavior; the attribution. The children in the drawings were gender neutral and were drawn without any facial expressions, to prevent interference of these features with the interpretation of the behavior in the picture. After showing the illustration of the child behavior for 4000 ms, mothers were asked to quickly answer eight attribution questions within 3500 ms each; four negative questions (e.g., 'Do you think this is naughty?') and four positive questions (e.g., 'Do you think this is cute?'). Each question could be answered with YES or NO. We were interested in the mothers' immediate responses. By letting parents choose between a simple YES/NO, instead of using a scale measure, we could ask the parent to answer quickly (within 3500 ms), thereby aiming at a realistic simulation of mothers' thinking process. The answers to the four negative attribution questions were used to assess the parent's level of negative attributions of the behavior. We mainly tried to tap into the evaluative (wrongness, blameworthiness) part of the negative attribution. When a negative attribution question was answered with YES, this was counted as a negative attribution (i.e., score 1). Negative maternal attributions could range from 0 to a maximum score of 40. Cronbach's alpha for negative attributions was 0.89.

2.3.6. Maternal harsh and abusive discipline. We combined two self-report measures to assess maternal harsh and abusive discipline. The first measure we used was the Parenting Scale (PS; Arnold, O'Leary, Wolff & Acker, 1993). The PS provides a measure for dysfunctional discipline strategies (discipline mistakes), divided into three subscales: overreactivity, laxness, and verbosity. We used the overreactivity scale, which reflects overreactive disciplinary actions such as displays of anger, meanness, and irritability (Arnold et al., 1993). Mothers indicated which of two statements (A and B) described their discipline tendency best on a 5-point Likert scale (ranging from 1 *A completely applies* to 5 *B completely applies*). An example of two statements is: 'A. When my child misbehaves I usually do not get into an argument' – 'B. I usually get into a long argument with my child'. Another example is: 'A. When my child misbehaves I spank, slap, grab, or hit my child...Never or rarely' – 'B. Most of the time'. The higher the score, the more overreactive discipline the parent uses.

The second measure that was used for assessing maternal harsh and abusive discipline was the Conflict Tactics Scale Parent Child (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). The CTSPC is a questionnaire with 32 items that obtains reports of maltreatment from parents. The questionnaire has six subscales. We were interested in the subscales minor physical assault, severe physical assault, and psychological aggression. Because of the absence of severe physical assault in our sample, only the subscales minor physical assault and psychological aggression were used. Mothers rated statements on a 5-point Likert scale ranging from 1 *never* to 5 (*almost*) *always*. Example items are 'I slapped my child on the hand, arm, or leg', 'I shook my child', 'I pinched my child' (physical assault), and 'I shouted, yelled, or screamed at my child', 'I swore or cursed at my child', and 'I said I would send my child away or kicked him/her out of the house' (psychological aggression). Higher scores indicated more minor physical assault and psychological aggression.

Table 1
Summary of Correlations, Means, Standard Deviations and Range for Background and Study Variables (n=53).

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | M (SD) | Range |
|----------------------------------|--------|--------|--------|--------|-------|--------|------|-------|-------|--------------|-------------|
| Background variables | | | | | | | | | | | |
| 1. Age mother | | | | | | | | | | 34.02 (6.66) | 22.00–48.60 |
| 2. Age child | 0.16 | | | | | | | | | 3.75 (1.06) | 2.02–6.03 |
| 3. Gender child | 0.18 | –0.01 | | | | | | | | 1.49 (0.51) | 1.00–2.00 |
| 4. Number of children | 0.48** | –0.12 | 0.04 | | | | | | | 1.85 (0.93) | 1.00–4.00 |
| Study variables | | | | | | | | | | | |
| 5. SES | 0.28* | –0.14 | –0.28* | 0.40** | | | | | | 0.02 (1.58) | –3.67–2.67 |
| 6. Parenting stress | 0.18 | –0.04 | 0.08 | 0.23 | 0.05 | | | | | 0.71 (0.32) | 0.10–1.55 |
| 7. Partner-related stress | 0.06 | 0.39** | 0.16 | 0.02 | –0.13 | 0.13 | | | | 1.16 (0.83) | 0.20–4.00 |
| 8. Childhood maltreatment | 0.21 | –0.06 | 0.19 | 0.21 | –0.07 | 0.01 | 0.15 | | | 1.40 (0.47) | 1.00–2.88 |
| 9. Negative attributions | 0.27* | 0.02 | –0.16 | 0.31* | 0.14 | 0.47** | 0.12 | –0.11 | | 16.25 (7.43) | 1.00–37.00 |
| 10. Harsh and abusive discipline | 0.06 | 0.33* | –0.20 | 0.07 | 0.16 | 0.19 | 0.21 | –0.06 | 0.34* | 0.00 (0.81) | –1.23–2.32 |

* $p < 0.05$.

** $p < 0.01$.

Subscales of the different measures were significantly correlated: overreactivity and minor physical assault $r(51) = 0.39$, $p < 0.01$, overreactivity and psychological aggression $r(51) = 0.48$, $p < 0.01$, and minor physical assault and psychological aggression $r(51) = 0.57$, $p < 0.01$. We therefore combined the PS overreactivity subscale with the CTSPC minor physical assault and psychological aggression subscales into one harsh and abusive discipline scale. A total mean score was computed after standardizing the scores, with higher scores meaning more use of harsh and abusive discipline. Internal consistency of this combined scale was $\alpha = 0.74$.

2.4. Data analysis

SPSS 23.0 was used to conduct data-analysis. There were no outliers on any of the study variables, as evidenced by the absence of standardized individual scores lower than

–3.29 or higher than 3.29 (Tabachnick & Fidell, 2012). All study variables were normally distributed. The Preacher and Hayes (2004) method was applied using the online available PROCESS macro for SPSS (Hayes, 2013) to test mediation.

3. Results

3.1. Preliminary-Analysis

We tested whether the ambiguous pictures in the PACTelicited different responses from the mothers than the neutral pictures to confirm the main premise of this instrument. Indeed, mothers had higher scores on the negative attribution questions in reaction to the ambiguous pictures, compared to the neutral pictures, $t(52) = -15.76$, $p < 0.001$, $d = -2.74$.

Correlations and descriptive statistics for study variables and relevant background variables are displayed in Table 1. Mothers who expressed more negative attributions in the computer task reported more parenting stress and harsh and abusive discipline. No significant associations were found between any of the other study variables, so no mediation was tested for these variables. Regarding the background variables (i.e., age mother, age child, gender child, number of children), none of them were related to both negative attributions and harsh and abusive discipline, so they were not added as covariates in subsequent mediation analysis.

3.2. Mediation model

Since negative attributions were only significantly associated with the risk factor parenting stress and harsh and abusive discipline, the mediation model was solely tested for parenting stress (see Fig. 1). One thousand bootstrap resamples were used and 95% bias corrected (BC) confidence intervals were computed. The indirect path from parenting stress, through maternal negative attributions, to harsh and abusive discipline was significant, $B = 0.36$, $S.E. = 0.19$, 95% BC $CI = 0.08, 0.79$. The direct effect of parenting stress on harsh and abusive discipline was not significant, $B = 0.12$, $S.E. = 0.37$, $p = 0.75$. So, the relation between parenting stress and maternal harsh and abusive discipline was fully mediated by maternal negative attributions.

4. Discussion

We have shown that negative parental attributions mediate the association between current experience of parenting stress and harsh, potentially abusive, discipline. We found no such relations for the other current stressor variables (i.e., low SES and partner-related stress) or for past childhood maltreatment.

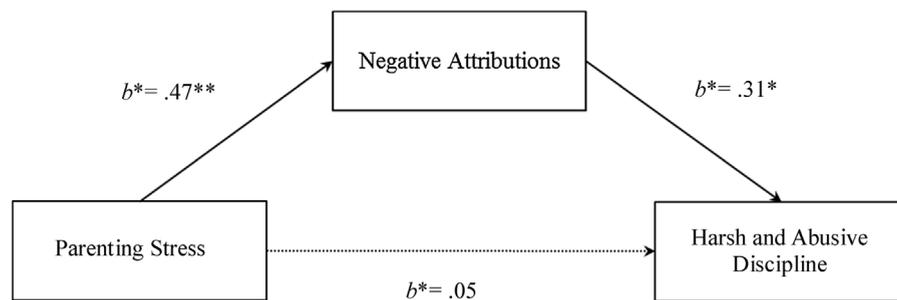


Fig. 1. Mediation model of parenting stress on harsh and abusive discipline by negative maternal attributions. * $p < 0.05$. ** $p < 0.01$.

Our mediating model is in line with the SIP-model, which theorizes that high stress levels predict negative parental attributions, which in turn predict subsequent disciplinary actions and potentially, harsh or abusive parenting (Milner, 1993, 2003). We found that mothers' current experience of parenting stress had an indirect effect on their use of more harsh and abusive discipline via their negative attributions. According to the SIP-model, the type of processing (i.e., automatic or controlled) that is used by the parent while evaluating child behavior is influenced by stress (Milner, 1993, 2003). Applying this model to our findings, the experience of parenting stress may have caused mothers to operate more on automatic pilot. As a consequence, mothers may have had difficulties taking situational factors into account while evaluating the ambiguous child pictures and may have been less able to understand the child's behavior within the actual context. This would explain their evaluations of the child's behavior as more wrong (i.e., negative attribution) and in turn, these negative attributions were related to the mothers' increased level of harsh and abusive discipline.

Only one of the predictors was found to be associated with negative parental attributions. We found an association between parenting stress and negative parental attributions and not between the other current stressor variables (i.e., low SES and partner-related stress) or for past childhood maltreatment and negative parental attributions. An explanation for this lack of findings might be that the type of stress that negatively influences parental attributions is quite specific. According to the SIP-model, it is hypothesized that when automatic processing is caused by child-related stress, it is likely that other emotions and cognitions related to the child will also be triggered, which are expected to be negative for parents at risk for child abuse (e.g., anger and hostility; Milner, 1993, 2003). Thus, automatic processing in combination with negative child-related emotions and cognitions caused by parenting stress are likely to negatively affect parental attributions. The drawings of ambiguous child behaviors may have elicited more negative cognitions in parents who experienced more parenting stress, because the behavior on the picture reminded them of negative parenting experiences, making them more susceptible to automatic processing.

Because our data are correlational it should be noted that it is also possible that parents with more negative attributions experience more parenting stress. The SIP model differentiates between parental attributions which are theory-driven (i.e., more general pre-existing attributions; e.g., "when children disobey they are purposefully testing the parent"), and parental attributions that are context-driven (i.e., processing attributions; e.g., "my child spilled the milk because he wants to get back at me"). The SIP-model theorizes that pre-existing attributions can influence how parents experience and cope with (parenting) stress (like an "internal working model", Bowlby, 1982), while processing attributions are rather influenced by stress (i.e., automatic processing; Milner, 1993, 2003). Because we studied context-driven attributions, we propose that parenting stress negatively affected parental attributions, rather than the other way around. Of course, this needs to be tested in future experimental research.

This study has some limitations. First, we used self-report questionnaires to measure harsh and abusive discipline. We are aware of the limitations of using self-report measures, such as social desirability bias, and highly recommend the use of observational measures where possible in replicating our study. A second limitation is our small sample size, which makes it more difficult to identify relations between variables. However, we did find quite a large effect size for negative parental attributions in relation to parenting stress and harsh and abusive parenting. A third limitation is that, although we tried to include mothers with different socioeconomic backgrounds for a representative sample, our final sample consisted of mothers with a relatively high SES background. As a consequence, we should cautiously generalize our findings. Furthermore, we only selected Dutch mothers to participate in our study, so generalization claims should mainly focus on mothers with this, or a comparable, cultural background. Last, our study focused on mothers and did not include fathers. Some literature suggests that mother and father attributions for child behavior are not only different (Chen, Seipp, & Johnston, 2008; Lansford et al., 2011), but also predict child and parenting outcomes differently (Werner, 2012; Williamson & Johnston, 2015). We encourage future research to study the paternal attributions in addition to the maternal attributions in relation to harsh and abusive discipline.

In conclusion, we found that negative parental attributions function as a mediator in the relation between parenting stress and harsh, potentially abusive, discipline. This highlights the importance for future research to study processing attributions as underlying mechanisms that can explain the relation between risk factors and harsh and abusive parenting. Experimental and longitudinal study designs should elaborate our cross-sectional results to further confirm the suggested pathways as

proposed by the SIP-model. Moreover, we used a general- population sample in which harsh and abusive discipline rarely occur. We cannot automatically generalize these results to a high-risk population. Replication with a high-risk sample would shed more light on the applicability of our findings to other populations. When studying risk factors for parental attributions special attention should be paid to stressors that are directly related to the child or to parenting, since those seem to have the largest influence on the evaluation of ambiguous child behavior, and indirectly on harsh and abusive parenting. Our results implicate that interventions to decrease (the risk of) child abuse should not only focus on reducing abuse-related stressors, but also target negative parental attributions.

References

- Abidin, R. R. (1990). *The parenting stress index* (Rev. ed.). Odessa, FL: Psychological Assessment Resources.
- Anthony, L. G., Anthony, B. J., Glanville, D. N., Naiman, D. Q., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behaviour and preschoolers' social competence and behaviour problems in the classroom. *Infant and Child Development*, *14*, 133–154. <http://dx.doi.org/10.1002/icd.385>
- Arnold, D. S., O'Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The parenting scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment*, *5*, 137–144. <http://dx.doi.org/10.1037/1040-3590.5.2.137>
- Berlin, L. J., Appleyard, K., & Dodge, K. A. (2011). Intergenerational continuity in child maltreatment: Mediating mechanisms and implications for prevention. *Child Development*, *82*, 162–176. <http://dx.doi.org/10.1111/j.1467-8624.2010.01547.x>
- Bowlby, J. (1982). *Attachment and loss* (2nd ed.). *Attachment* (vol. 1) New York: Basic Books.
- Cappelleri, J. C., Eckenrode, J., & Powers, J. L. (1993). The epidemiology of child abuse: Findings from the 2nd national incidence and prevalence study of child abuse and neglect. *American Journal of Public Health*, *83*, 1622–1624. <http://dx.doi.org/10.2105/ajph.83.11.1622>
- Chan, Y. C. (1994). Parenting stress and social support of mothers who physically abuse their children in Hong Kong. *Child Abuse & Neglect*, *18*, 261–269. [http://dx.doi.org/10.1016/0145-2134\(94\)90110-4](http://dx.doi.org/10.1016/0145-2134(94)90110-4)
- Chang, L., Lansford, J., Schwartz, D., & Farver, J. (2004). Marital quality, maternal depressed affect, harsh parenting, and child externalising in Hong Kong Chinese families. *International Journal of Behavioral Development*, *28*, 311–318. <http://dx.doi.org/10.1080/01650250344000523>
- Chen, M., Seipp, C. M., & Johnston, C. (2008). Mothers' and fathers' attributions and beliefs in families of girls and boys with attention-deficit/hyperactivity disorder. *Child Psychiatry & Human Development*, *39*, 85–99. <http://dx.doi.org/10.1007/s10578-007-0073-6>
- Coln, K. L., Jordan, S. S., & Mercer, S. H. (2013). A unified model exploring parenting practices as mediators of marital conflict and children's adjustment. *Child Psychiatry & Human Development*, *44*, 419–429. <http://dx.doi.org/10.1007/s10578-012-0336-8>
- Conger, R. D., & Conger, K. J. (2002). Resilience in Midwestern families: Selected findings from the first decade of a prospective, longitudinal study. *Journal of Marriage and Family*, *64*, 361–373. <http://dx.doi.org/10.1111/j.1741-3737.2002.00361.x>
- Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*, *58*, 175–199. <http://dx.doi.org/10.1146/annurev.psych.58.110405.085551>
- Coohey, C., & Braun, N. (1997). Toward an integrated framework for understanding child physical abuse. *Child Abuse & Neglect*, *21*, 1081–1094. [http://dx.doi.org/10.1016/s0145-2134\(97\)00067-7](http://dx.doi.org/10.1016/s0145-2134(97)00067-7)
- Crnici, K. A., & Greenberg, M. T. (1990). Minor parenting stresses with young children. *Child Development*, *61*, 1628–1637. <http://dx.doi.org/10.1111/j.1467-8624.1990.tb02889.x>
- Crowe, M. J. (1978). Conjoint marital therapy: A controlled outcome study. *Psychological Medicine*, *8*, 623–636. <http://dx.doi.org/10.1017/S0033291700018833>
- Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: are there gender differences? *Journal of Family Psychology*, *10*, 45–59. <http://dx.doi.org/10.1037/0893-3200.10.1.45>
- Deater-Deckard, K. (2004). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice*, *5*, 314–332. <http://dx.doi.org/10.1111/j.1468-2850.1998.tb00152.x>
- Dixon, L., Browne, K., & Hamilton-Giachritsis, C. (2005). Risk factors of parents abused as children: A mediational analysis of the intergenerational continuity of child maltreatment (Part 1). *Journal of Child Psychology and Psychiatry*, *46*, 47–57. <http://dx.doi.org/10.1111/j.1469-7610.2004.00339.x>
- Dodge, K. A., Pettit, G. S., & Bates, J. E. (1994). Socialization mediators of the relation between socioeconomic-status and child conduct problems. *Child Development*, *65*, 649–665. <http://dx.doi.org/10.1111/j.1467-8624.1994.tb00774.x>
- Eckenrode, J., Smith, E. G., McCarthy, M. E., & Dineen, M. (2014). Income inequality and child maltreatment in the United States. *Pediatrics*, *133*, 454–461. <http://dx.doi.org/10.1542/peds.2013-1707>
- Euser, S., Alink, L. R. A., Pannebakker, F., Vogels, T., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013). The prevalence of child maltreatment in the Netherlands across a 5-year period. *Child Abuse & Neglect*, *37*, 841–851. <http://dx.doi.org/10.1016/j.chiabu.2013.07.004>
- Hayes, A. F. (2013). *Macro package for SPSS*. Retrieved from: <http://processmacro.org/download.html>
- Hermans, E. J., Henckens, M., Joëls, M., & Fernández, G. (2014). Dynamic adaptation of large-scale brain networks in response to acute stressors. *Trends in Neurosciences*, *37*, 304–314. <http://dx.doi.org/10.1016/j.tins.2014.03.006>
- Kaczynski, K. J., Lindahl, K. M., Malik, N. M., & Laurenceau, J. P. (2006). Marital conflict, maternal and paternal parenting, and child adjustment: A test of mediation and moderation. *Journal of Family Psychology*, *20*, 199–208. <http://dx.doi.org/10.1037/0893-3200.20.2.199>
- Kuhlmann, S., Piel, M., & Wolf, O. T. (2005). Impaired memory retrieval after psychosocial stress in healthy young men. *Journal of Neuroscience*, *25*, 2977–2982. <http://dx.doi.org/10.1523/jneurosci.5139-04.2005>
- Lansford, J. E., Bornstein, M. H., Dodge, K. A., Skinner, A. T., Putnick, D. L., & Deater-Deckard, K. (2011). Attributions and attitudes of mothers and fathers in the United States. *Parenting-Science and Practice*, *11*, 199–213. <http://dx.doi.org/10.1080/15295192.2011.585567>
- Liu, L., & Wang, M. (2015). Parenting stress and harsh discipline in China: The moderating roles of marital satisfaction and parent gender. *Child Abuse & Neglect*, *43*, 73–82. <http://dx.doi.org/10.1016/j.chiabu.2015.01.014>
- Lupien, S. J., Maheu, F., Tu, M., Fiocco, A., & Schramek, T. E. (2007). The effects of stress and stress hormones on human cognition: Implications for the field of brain and cognition. *Brain and Cognition*, *65*, 209–237. <http://dx.doi.org/10.1016/j.bandc.2007.02.007>
- McLoyd, V. C., Jayaratne, T. E., Ceballos, R., & Borquez, J. (1994). Unemployment and work interruption among African American single mothers: Effects on parenting and adolescent socioemotional functioning. *Child Development*, *65*, 562–589. <http://dx.doi.org/10.1111/j.1467-8624.1994.tb00769.x>
- Milner, J. S. (1993). Social information processing and physical child abuse. *Clinical Psychology Review*, *13*, 275–294. [http://dx.doi.org/10.1016/0272-7358\(93\)90024-g](http://dx.doi.org/10.1016/0272-7358(93)90024-g)
- Milner, J. S. (2003). Social information processing in high-risk and physically abusive parents. *Child Abuse & Neglect*, *27*, 7–20. [http://dx.doi.org/10.1016/s0145-2134\(02\)00506-9](http://dx.doi.org/10.1016/s0145-2134(02)00506-9)
- Newberger, E. H., Hampton, R. L., Marx, T. J., & White, K. M. (1986). Child abuse and pediatric social illness: an epidemiologic analysis and ecological reformulation. *American Journal of Orthopsychiatry*, *56*, 589–601. <http://dx.doi.org/10.1111/j.1939-0025.1986.tb03492.x>
- Parke, R. D., Coltrane, S., Duffy, S., Buriel, R., Dennis, J., Powers, J., & Widaman, K. F. (2004). Economic stress, parenting, and child adjustment in Mexican American and European American families. *Child Development*, *75*, 1632–1656. <http://dx.doi.org/10.1111/j.1467-8624.2004.00807.x>
- Pears, K. C., & Capaldi, D. M. (2001). Intergenerational transmission of abuse: A two-generational prospective study of an at-risk sample. *Child Abuse & Neglect*, *25*, 1439–1461. [http://dx.doi.org/10.1016/s0145-2134\(01\)00286-1](http://dx.doi.org/10.1016/s0145-2134(01)00286-1)

- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717–731. <http://dx.doi.org/10.3758/BF03206553>
- Puff, J., & Renk, K. (2014). Relationships among parents' economic stress, parenting, and young children's behavior problems. *Child Psychiatry & Human Development*, 45, 712–727. <http://dx.doi.org/10.1007/s10578-014-0440-z>
- Rodgers, A. Y. (1998). Multiple sources of stress and parenting behavior. *Children and Youth Services Review*, 20, 525–546. [http://dx.doi.org/10.1016/s0190-7409\(98\)00022-x](http://dx.doi.org/10.1016/s0190-7409(98)00022-x)
- Salisbury, E. J., Henning, K., & Holdford, R. (2009). Fathering by partner-abusive men attitudes on children's exposure to interparental conflict and risk factors for child abuse. *Child Maltreatment*, 14, 232–242. <http://dx.doi.org/10.1177/1077559509338407>
- Sedlak, A. J., Mettenburg, J., Basena, M., Petta, I., McPherson, K., Green, A., & Li, S. (2010). *Fourth national incidence study of child abuse and neglect (NIS?4): report to congress*. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families. Available at: <http://www.acf.hhs.gov/programs/opre/resource/fourth-national-incidence-study-of-child-abuse-and-neglect-nis-4-report-to>
- Smith, S. M., Hanson, R., & Noble, S. (1974). Social aspects of battered baby syndrome. *British Journal of Psychiatry*, 125, 568–582. <http://dx.doi.org/10.1192/bjp.125.6.568>
- Stith, S. M., Liu, T., Davies, L. C., Boykin, E. L., Alder, M. C., Harris, J. M., & Dees, J. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior*, 14, 13–29. <http://dx.doi.org/10.1016/j.avb.2006.03.006>
- Straus, M. A., Hamby, S. L., Finkelhor, D., Moore, D. W., & Runyan, D. (1998). Identification of child maltreatment with the parent-child Conflict Tactics Scales: development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*, 22, 249–270. [http://dx.doi.org/10.1016/s0145-2134\(97\)00174-9](http://dx.doi.org/10.1016/s0145-2134(97)00174-9)
- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). New York: Harper Collins.
- Thombs, B. D., Bernstein, D. P., Lobbstaal, J., & Arntz, A. (2009). A validation study of the Dutch Childhood Trauma Questionnaire-short form: Factor structure, reliability, and known-groups validity. *Child Abuse & Neglect*, 33, 518–523. <http://dx.doi.org/10.1016/j.chiabu.2009.03.001>
- Van IJzendoorn, M. H. (1992). Intergenerational transmission of parenting: A review of studies in nonclinical populations. *Developmental Review*, 12, 76–99. [http://dx.doi.org/10.1016/0273-2297\(92\)90004-1](http://dx.doi.org/10.1016/0273-2297(92)90004-1)
- Vogel, S., Klumpers, F., Krugers, H. J., Fang, Z., Oplaat, K. T., Oitzl, M. S., & Fernandez, G. (2015). Blocking the mineralocorticoid receptor in humans prevents the stress-induced enhancement of centromedial amygdala connectivity with the dorsal striatum. *Neuropsychopharmacology*, 40, 947–956. <http://dx.doi.org/10.1038/npp.2014.271>
- Werner, N. E. (2012). Do hostile attribution biases in children and parents predict relationally aggressive behavior? *Journal of Genetic Psychology*, 173, 221–245. <http://dx.doi.org/10.1080/00221325.2011.600357>
- Whipple, E. E., & Webster-Stratton, C. (1991). The role of parental stress in physically abusive families. *Child Abuse & Neglect*, 15, 279–291. [http://dx.doi.org/10.1016/0145-2134\(91\)90072-1](http://dx.doi.org/10.1016/0145-2134(91)90072-1)
- Williamson, D., & Johnston, C. (2015). Maternal and paternal attributions in the prediction of boys' behavior problems across time. *Journal of Clinical Child and Adolescent Psychology*, 44, 668–675. <http://dx.doi.org/10.1080/15374416.2013.862803>