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Harsh discipline in toddlerhood : A longitudinal study on maternal physiological and behavioral predictors

Joosen, K.J.

Citation

Joosen, K. J. (2012, November 22). *Harsh discipline in toddlerhood : A longitudinal study on maternal physiological and behavioral predictors*. Retrieved from <https://hdl.handle.net/1887/20154>

Version: Not Applicable (or Unknown)

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Note: To cite this publication please use the final published version (if applicable).

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Author: Joosen, Katharina Jacomina

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Issue Date: 2012-11-22

1 Introduction

Harsh discipline is a parenting strategy that is used worldwide, especially in challenging child-rearing situations (Gershoff et al., 2010). Some studies report that more than 90% of the normal population of parents use harsh discipline with their children (for reviews see e.g., Gershoff, 2002; Paolucci & Violato, 2004). These high percentages are in sharp contrast to the fact that harsh physical discipline practices have been banned by law in several countries (including The Netherlands) due to the empirically proven negative consequences of such discipline strategies on children's development (Gershoff et al., 2010; Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004). Children of parents who use harsh discipline have higher levels of externalizing behavior problems in childhood (e.g., Bender et al., 2007; Fine, Trentacosta, Izard, Mostow, & Campbell, 2004; O'Leary, Slep & Reid, 1999; Prinzie, Onghena, & Hellinckx, 2006), are more likely to become delinquent (Hoeve et al., 2009) and generally have lower levels of mental health (Gershoff, 2002) compared to children of non-harsh parents. Nonetheless, a controversy remains as to whether these negative consequences are related to the use of all forms of harsh or physical discipline including spanking, which has sometimes been labeled as 'discipline with reasonable force' (Baumrind, Larzelere, & Cowan, 2002). Adding to this debate, a recent study among a large ethnically diverse sample included spanking and found that across all subgroups the use of spanking as the sole measure of harsh discipline in kindergarten *was* predictive of more externalizing problem behavior in 3rd grade (Gershoff, Sexton, Lansford, Davis-Kean, & Sameroff, 2012).

Defining harsh discipline

Contrary to the study of Gershoff et al. (2012), most empirical work on harsh discipline uses definitions including multiple disciplining (or punishing) behaviors. Because measures of harsh discipline generally encompass a multitude of different behaviors it is plausible that part of the explanation of the divergence in findings for effects of harsh discipline lies in the different and only partly overlapping definitions used across studies. The various harsh discipline strategies can be seen on a continuum ranging from subtle forms such as grabbing hard, to forms of corporal punishment in the middle of the continuum (such as hitting with a belt or paddle), to more extreme forms of physical punishment (such as beating or kicking causing injuries which could result in hospitalization) at the other end of this harsh discipline continuum. Thus, comparing results on child outcomes of harsh discipline is problematic when some studies include only part of the continuum (e.g., spanking) in their definitions, while other studies include the whole, or a different, range of harsh discipline behaviors.

Besides this continuum based solely on physical aspects of harsh discipline, the broader concept of overreactive discipline which includes parenting behaviors such as yelling, threatening, commanding, and name-calling has been used in several studies (e.g. Bugental & Happaney, 2004; Chang, Schwartz, Dodge, & McBride-Chang, 2003; Fine et al., 2004; Leung & Slep, 2006; Straus & Stewart, 1999). Such overreactive parenting behaviors are central to Patterson's coercion theory. Within this theoretical framework, parents respond with escalating coercive discipline strategies such as physical and verbal harshness when faced with challenging child behavior (Patterson, 1982). There is substantial evidence that this pattern of physically and verbally harsh discipline is related to negative child outcomes through processes such as modeling and lack of positive reinforcement (e.g., Patterson, Capaldi, & Bank, 1991; Shaw, Bell, & Gilliom, 2000). Following coercion theory and the idea of escalating discipline in multiple modalities, both physical (e.g., spanking, grabbing, pushing, and pulling) and verbal (e.g., yelling, name calling, and aggressive/irritated tone of voice) discipline strategies are included as aspects of harsh discipline in the current thesis.

Uncovering harsh discipline strategies during home observations is extremely difficult due to the social *undesirability* of this parenting behavior. When parents participate in a standardized discipline task in their own home environment, it seems reasonable to presume that they will at least try to show their best behavior in front of the camera. The fact that this minimizes the chance to observe severe forms of harsh discipline also implies that observations of subtler harsh discipline behaviors (such as grabbing) could potentially signal the use of more blatant harsher strategies without a camera person present. This would mean that even subtle forms of harsh discipline may be predictive of child development. This was confirmed, for example, by a study in which such subtle harsh discipline behaviors were observed in a laboratory setting and found predictive of a growth in child conduct problems at home and at school (Snyder, Cramer, Afrank, & Patterson, 2005). Therefore we included more subtle forms of physical and verbal harsh discipline in our operationalization of harsh parenting. Since harsh parenting has been shown to have a negative impact on children's development (e.g., Gershoff, 2002) it is especially important to examine maternal predictors of harsh discipline. If we can identify parents at risk for harsh discipline based on their parenting skills or characteristics in infancy, this could enhance early preventive intervention efforts.

Predicting harsh discipline: Maternal sensitivity to infant signals.

The construct of maternal sensitivity is rooted in the framework of attachment theory and was first studied in detail by Mary Ainsworth during her well-known Uganda study (1967). Based on this extensive, naturalistic, observational study of Ugandan mothers with their infants, she defined the construct of sensitivity as a mother's ability to perceive child signals, to interpret these signals correctly, and to respond to them promptly and appropriately (Ainsworth, Bell, & Stayton, 1974). Over the following decades maternal sensitivity has been the topic of an abundance of empirical work, which has shown the importance of this construct in predicting positive child outcomes such as secure attachment (Bakermans-

Kranenburg, Van IJzendoorn, & Juffer, 2003; De Wolff & Van IJzendoorn, 1997), self-regulation (Eisenberg et al., 2001), social functioning (e.g., Kochanska, 2002; Van Zeijl et al., 2006), and cognitive competence (e.g., Bernier, Carlson, & Wipple, 2010; Tamis-LeMonda, Bornstein, & Baumwell, 2001).

Even though maternal sensitivity has often been studied in relation to child outcomes, less empirical attention has been paid to the link between maternal sensitivity towards infants and future parenting strategies such as harsh discipline. This lack of studies linking early sensitivity to later harsh discipline can probably be explained by the fact that these constructs stem from very different research traditions, namely attachment and social learning theories respectively. However, the literature on the two parenting constructs shows substantial overlap in the way they are described and explained. Milner (1993, 2003) presented a four-stage model of social information processing, which describes high- risk and abusive parents as (1) more biased in the perception of, as well as less attentive to, their child's behavior, (2) more likely to interpret negative child behaviors as motivated by hostile intent, and to have child-centered attributions (i.e., to view this behavior as due to internal, stable, and global child factors), (3) less likely to use situational cues when evaluating their children's behavior, and (4) less likely to have well-developed skills or abilities to implement and modify child-directed responses and parenting strategies. These four stages clearly resemble the main elements of Ainsworth's maternal sensitivity construct (i.e., awareness and interpretation of signals and appropriate responding), but are formulated in terms of the absence of these skills. Thus, there is reason to believe that a lack of sensitivity in infancy may predict harsh discipline strategies in toddlerhood.

Over the years the large amount of empirical work centered around the construct of maternal sensitivity has led to a great variety in operationalizations. Part of this variety is accounted for by the setting in which maternal sensitivity is observed. In principal any dyadic interaction can be used to observe maternal sensitivity. Ainsworth's exploratory work in both Uganda (Ainsworth, 1967) and Baltimore (Ainsworth, Blehar, Waters, & Wall, 1978) was based on elaborate naturalistic observations of mother-infant dyads during a variety of daily routines (i.e., bathing, feeding, etc.). Even though this strategy provides an extensively detailed picture of maternal behaviors across different situations it is also very time consuming. Therefore, shorter naturalistic observations of single daily routines such as bathing or feeding have been employed in many studies over the years (e.g., Albers, Riksen-Walraven, Sweep, & De Weerth, 2008).

At other times the choice of setting to observe maternal sensitivity depends on the type of maternal responsiveness one wishes to observe. For example, maternal sensitivity to distress has been shown to be a stronger predictor of infant attachment security than maternal sensitivity to non-distress (McElwain & Booth-LaForce, 2006). An observation paradigm that includes both non-distressing and potentially distressing interactions is the Still-Face Paradigm (SFP; Tronick, Als, Adamson, Wise, & Brazelton, 1978). This standardized face-to-face dyadic interaction consists of three episodes: (1) a baseline with normal interaction, (2) the 'still-face' episode in which the adult becomes unresponsive whilst maintaining a neutral facial expression, and (3) a reunion in which normal

interaction is resumed. Especially the so-called 'carry-over effect' evident from a continuation of increased negative affect from the still-face into the reunion episode makes the reunion episode suitable for observing maternal sensitivity to distress.

Predicting harsh discipline: The role of the autonomic nervous system (ANS).

From a biological perspective, individual differences in parental physiological reactivity to (negative) infant stimuli have been related to differences in the quality of parenting. For example, greater heart rate (HR) reactivity to infant crying has been shown to distinguish parents at risk for abuse from controls (for a review see McCanne & Hagstrom, 1996). Furthermore, there has been empirical support for a direct relation between greater maternal HR reactivity and more use of overreactive discipline strategies (Lorber & O'Leary, 2005). However, greater HR reactivity in response to infant crying has also been found in mothers with a prompt response to infant crying (Del Vecchio, Walter, & O'Leary, 2009); an aspect of maternal sensitivity. The fact that greater HR reactivity seems to be related to both harsh and sensitive parenting may be due to the fact that activation of both the sympathetic and the parasympathetic branch of the autonomic nervous system (ANS) can lead to increases in HR (see Berntson, Cacioppo, Quigley, & Fabro, 1994). These dual mechanisms influencing HR create a problem for the interpretation of HR reactivity.

To examine the underlying mechanisms of physiological reactivity, Porges' polyvagal theory (1995, 2001, 2007, 2011) describes three subsystems of the ANS, namely the social communication circuit (involving the myelinated vagus and the PNS), the mobilization circuit (involving the SNS and fight-flight behaviors), and the most primitive circuit of immobilization (involving the unmyelinated vagus and e.g., feigning death or freezing behaviors). These three subsystems developed in three phylogenetic stages and are, therefore, hierarchically activated when responding to external stressors. The activation of a specific subsystem also depends on the perception of the environment as either safe or threatening. In a safe environment the PNS circuit for social communications is activated to promote survival by facilitating social interactions and social bonds.

This newest circuit of social communication depends on the functioning of the ventral vagal complex (VVC), which originates in the nucleus ambiguus. The VVC functions as an active vagal brake by controlling cardiac output via the sino-atrial node (Porges, 2001, 2007). The degree of cardiac control by the vagal brake can be quantified by measurement of the amplitude of respiratory sinus arrhythmia (RSA; Porges, 1995). Efficient disinhibition of the vagal brake (i.e., RSA withdrawal) seems to be associated with increased behavioral and emotional control, which enables rapid mobilization as well as calm and self-soothing behavioral states in response to environmental demands (Porges, 1996). In other words, an efficiently functioning vagal brake points to physiological flexibility when reacting to environmental demands. Individuals with stronger RSA withdrawal are supposedly better able to respond adequately to external stressors (Porges, Doussard-Roosevelt, & Maiti, 1994). Since parental sensitivity refers to an adequate and prompt response to infant signals (Ainsworth et al.,

1974), sensitivity in response to infant distress may be related to functioning of the vagal brake, with more sensitive parents showing stronger RSA withdrawal.

However, when the environment is perceived as dangerous or threatening the autonomic system switches to the more primitive circuits and activates the SNS to regulate defensive strategies through a fight-or-flight response. Since harsh parents, given their negative and child-blaming attributions, seem to operate from a threat rather than a safety perspective, they may be expected to show physiological overreactivity of especially the mobilization circuit (SNS) in response to infant crying. Thus, the negative behavioral overreactivity to infant signals seen in parents at risk for abuse (Milner, 2003) may signal a chronically overactivated SNS resulting from a *poorly* functioning vagal brake (Porges, 2001). Therefore, the difference between parents who do use harsh discipline and those who do not would be the combination of an overreactive SNS with an unresponsive PNS.

Study design

The current thesis is based on two waves of a longitudinal study that was conducted in a sample of 103 families with a newborn second child. In the first wave participants were approached through midwifery practices in the western region of the Netherlands. Of the 72 practices that were asked to assist the approach of participants, 53 participated in handing out pamphlets and letters on the study to pregnant women expecting a second child. Due to a self-selection of higher educated families during the first wave, a second method was implemented to include a larger group of lower educated mothers. During the second wave, the Regional Coordination Programs of the Dutch National Institute (NIPHE) assisted in approaching families from the lower socioeconomic strata *after* the birth of their second child. Postal codes were selected of areas in which more than 30% of inhabitants had a low income (less than 14,200 Euro per year; as defined by the Dutch Central Bureau of Statistics). Families with a newborn infant living in these areas received a letter from the NIPHE with information about the study by mail.

Families were included when: 1) the first child scored either low or high on externalizing behavior (cutoffs based on Van Zeijl et al., 2006), 2) the first child was younger than six years old, 3) the newborn second child was neither premature nor handicapped, 4) both children and parents lived together in one household and 5) both parents were Caucasian and of Dutch ethnicity. The first wave resulted in a total of 57 families fitting all criteria, of which a total of 50 families agreed to participate in the home visits (25 'high externalizing' families; 25 'low externalizing' families). An additional 76 families were selected with this second method, of which 53 participated in the study (27 'low externalizing' families and 26 'high externalizing families').

All families were visited at home a total of 7 times during the first two years after birth of the second child. These home visits were scheduled at regular intervals when the youngest child was 3, 6, 9, 12, 18 and 24 months old. Home visits up to 9 months included various dyadic settings to observe maternal sensitivity, which were videotaped and coded later. Furthermore, among the wave 2 sample

a cry paradigm was administered at 3 and 6 months, during which physiological data was collected. Home visits from 12 months onwards included videotaped observations of discipline strategies as well as of maternal sensitivity. Attrition rates were low during the 2 years of data collection. Of the 50 families included during the first wave, 36 (72%) families continued to participate in the study up to and including the final home visit at 24 months. Attrition was even lower in the second wave sample of participants from lower socioeconomic strata. Of the 53 families included at the start, 47 (88.7%) also participated in the last home visit.

Aims and outline of the current thesis

In the current thesis we investigate both maternal sensitivity and physiological reactivity to infant crying as potential early indicators of later harsh discipline. The chapters are organized in the following manner. In Chapter 2 the relation between maternal sensitivity and physiological reactivity to repeated infant crying is described. Specifically, we describe the differences in physiological reactivity to a standardized set of repeated infant crying bouts between highly sensitive mothers and less sensitive mothers using repeated measures analyses. Chapter 3 focuses on the predictive role of early maternal sensitivity on harsh discipline in toddlerhood, for which we use a mediational model. Furthermore, we investigate maternal sensitive behavior across various settings and examine whether maternal sensitivity to infants is a stable construct over time. Chapter 4 addresses the question whether observed harsh discipline at 12 months can be predicted by sympathetic (SNS) overreactivity to repeated infant crying. In this chapter harsh mothers are compared to non-harsh mothers on their physiological reactivity to repeated infant crying. Chapter 5 presents a general discussion in which the main findings of the current thesis are summarized and discussed. Limitations of the current thesis are addressed and some suggestions for further research are formulated. In addition this chapter includes a discussion of both theoretical and practical implications of the results.