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Unravelling the effect of household chaos on parenting

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General introduction

Most people experience some degree of household chaos from time to time: losing your keys, running late for an appointment, or your children running around while you attempt to tidy the room. Household chaos is defined as a lack of family and week routines, and high levels of clutter, noise, and crowding (Evans & Wachs, 2010; Matheny, Wachs, Ludwig, & Phillips, 1995). Household chaos is related to lower quality parenting: parents in chaotic homes are less sensitive and responsive to their children's signals and use more harsh discipline (Coldwell, Pike, & Dunn, 2006; Deater-Deckard, Wang, Chen, & Bell, 2012; Dumas et al., 2005). If household chaos is causally related to lower quality parenting, this means that reducing household chaos could be a way to improve parenting. Therefore, it is important to know whether more household chaos actually leads to lower quality parenting, or whether household chaos and lower quality parenting only occur simultaneously but are both caused by a third factor. Also, the question arises whether all parents are equally affected by household chaos, or whether it only affects parenting in certain parents, for instance those who are more sensitive to stimuli or have lower self-regulation. These are questions that this dissertation aims to answer through two experimental studies in which levels of household chaos are manipulated.

The evolution of household chaos

The use of the term household chaos followed upon years of research in which separate aspects of household chaos had been studied in relation to child development and parenting. Prior to Bronfenbrenner's ecological model (Bronfenbrenner & Crouter, 1983), these studies were mostly interested in the social aspect of the micro-environment in which a child grew up (i.e., social interactions). As this model also pointed to the importance of the physical micro-environment, this aspect too received increased focus. Initially, this research centered around materials or resources for specific uses to aid children in development (such as the presence of children's books in the home) while later it focused on "potentially stressful, nonspecific background factors" (Matheny et al., 1995, p. 430), including noise, crowding, and traffic patterns in the home. Terminology such as environmental confusion or environmental chaos was introduced and lack of routines and structures was added to the definition (Matheny et al., 1995; Wachs & Corapci, 2003), eventually resulting in the current definition of household chaos.

Throughout the evolution of the concept of household chaos, studies have consistently shown that more household chaos is related to less optimal child development and parenting (for an overview, see Matheny et al., 1995 and Wachs & Corapci, 2003). This was found mostly in families with low socio-economic status (SES; e.g., Deater-Deckard, et al., 2012; Mills-Koonce et al., 2016; Vernon-Feagens, Garrett-Peters, Willoughby, Mills-Koonce, & The Family Life Project Key Investigators, 2012; Martin, Razza, & Brooks-Gunn, 2011). However, studies have shown that relations between household chaos, parenting and child development

are also present in middle-class communities (e.g., Coldwell et al., 2006; Gottfried & Gottfried, 1984; Hygge, Evans, & Bullinger, 2002; Johnson, Martin, Brooks-Gunn, & Petrill, 2008), making household chaos an important subject across all levels of society.

Household chaos and child development

Household chaos has been related to child development, including wellbeing, and cognitive, social-emotional, and behavioral development. In more chaotic households, children had lower IQ scores (Deater-Deckard et al., 2009). Also, toddlers growing up in a more chaotic household showed a delay in expressive and receptive vocabulary 3 years later (Vernon-Feagans et al., 2012; Martin et al., 2011). Furthermore, children from more chaotic households showed lower scores on delayed gratification, more conduct problems and callous-unemotional behavior, and more aggression and attention problems (Coldwell et al., 2006; Deater-Deckard et al., 2009; Martin et al., 2011; Mills-Koonce et al., 2016). In adolescents, more household chaos predicted more substance abuse and worse physical wellbeing two years later (Tucker, Sharp, Van Gundy, & Rebellon, 2018).

These developmental outcomes may partly be explained by increased stress (e.g., Brown et al., 2019; Nelson, O'Brien, Blankson, Calkins, & Keane, 2009; Selander et al., 2009) or through a coping mechanism which filters out unwanted as well as developmentally important stimulation (Evans, Kliewer, & Martin, 1991). These outcomes could also be explained by parenting, with more household chaos leading to lower quality parenting, which in turn may lead to less optimal developmental outcomes. Studies have found support for mediation of the effect of household chaos on child outcomes through parenting. In a large longitudinal study, more household chaos was related to less favorable child outcomes such as conduct problems, callous-unemotional behavior, and to slower expressive language development, which was explained by more harsh parenting and less parental sensitivity (Mills-Koonce et al., 2016; Vernon-Feagans et al., 2012; Vernon-Feagans, Willoughby, Garret-Peters, & The Family Life Project Key Investigators, 2016).

Household chaos and parenting

Many studies have shown that household chaos is related to parenting. In the last two decades, higher levels of household chaos have been related to more maternal harsh parenting and overreactivity (e.g., Deater-Deckard et al., 2012; Dumas et al., 2005; Lawrence et al., 2019; Park & Johnston, 2020), and to less parental sensitivity, warmth and joy (Coldwell et al., 2006; Zvara, Lathren, Mills-Koonce & The Family Life Project Key Contributors, 2020; Coe, Parade, Seifer, Frank & Tyrka, 2019). Several mechanisms are proposed to underly this relation. One explanation may simply be that parents are less able to hear their child's bids through high noise levels (Matheny et al., 1995). Another is that parental stress or

negative emotions may mediate this relation. Studies have shown that chaotic environments may be more stressful (e.g., Brown et al., 2019, Nelson et al., 2009; Selander et al., 2009), and more stress is associated with more harsh parenting (e.g., Beckerman, Berkel, Mesman & Alink, 2017). Also, more chaotic environments could affect parenting by making parents more fatigued (Matheny et al., 1995). Therefore, more chaotic households could result in more harsh parenting through increased stress or negative emotions. Moreover, more chaotic environments may interfere with cognitive capacities needed to inhibit behavior such as harsh parenting (Crandall, Deater-Deckard, & Riley, 2015). Chaotic environments may thus lead to increased harsh parenting through reduced self-regulation. Also, parental self-efficacy has been consistently related to parenting (e.g., Albanese, Russo & Geller, 2019; Jones & Prinz, 2005). As parental self-efficacy is lower in more chaotic households (Corapci & Wachs, 2002), household chaos could also affect parenting through reduced parental self-efficacy. Lastly, it is possible that child behavior plays a role in how household chaos affects parenting, as previously suggested by Dumas et al. (2005). Next to that household chaos is related to more child conduct problems through increased parenting problems (Coldwell et al., 2006), it is possible that household chaos leads to more parenting problems through increased child conduct problems.

The question of causality

Although ample research has shown that more household chaos is related to lower parenting quality, it is not known whether this is a causal relation. If household chaos does lead to lower quality parenting, interventions to reduce household chaos could lead to improved parenting and potentially to less child maltreatment. Household chaos could thus form an effective element of prevention and intervention programs aimed at improving parenting and preventing or reducing child maltreatment. Since lower quality parenting and, its extreme form, child maltreatment are known to have many negative outcomes in children on short and long term (e.g., Bradley & Corwyn, 2007; Jackson, Choi & Preston, 2019; Norman, Byambaa, Rumna, Butchart, Scott, & Vos, 2012), knowing how to improve parenting is essential in order to prevent these negative outcomes. As previous studies on household chaos and parenting were mostly correlational, as stated above, it is possible that more household chaos leads to lower quality parenting, or that lower quality parenting leads to more household chaos, or that household chaos and lower quality parenting are both the outcome of a third variable. As decades of research have pointed to the importance of household chaos in relation to parenting, it is necessary to determine whether household chaos has a causal effect on parenting.

Effect on all parents?

It would also be necessary to know if household chaos affects all parents, or only specific parents, so that prevention and intervention efforts can be successfully targeted to increase efficiency of these efforts. One parental characteristic that is of interest, is sensory-processing sensitivity (SPS). This is the extent to which a person readily notices stimuli and is aroused by stimuli (Aron & Aron, 1997; Evans & Rothbart, 2008). Aron and Aron (1997) were the first to use the term sensory-processing sensitivity (SPS) and operationalized it as a lower threshold for stimuli and being easily overaroused. They found that SPS was a construct that was separate from emotionality and social introversion, albeit with partial overlap. This was an important step in the literature, as previously SPS was often seen as part of continuum of introversion and extraversion. Aron and Aron (1997) stated that SPS was a unidimensional construct, while later studies stated that SPS was a multidimensional construct. For instance, Smolewska, McCabe, and Woody, (2006) stated it was a three-dimensional construct, consisting of aesthetic sensitivity, low sensory threshold, and ease of excitation. Evans and Rothbart (2008) found that SPS consisted of two dimensions, reflecting sensory sensitivity (reflecting a lower threshold for stimuli) and sensory discomfort (reflecting being easily overaroused), which stands more closely to the definition of Aron and Aron (1997). Parents with higher SPS are thought to be more affected by household chaos than parents with lower SPS. As people with higher SPS are more aware of and more aroused by stimuli, parents with higher SPS may be more aware and more aroused by the same level of household chaos than parents with lower SPS. Thus, household chaos may affect their parenting more strongly than that of parents with lower SPS. Wachs (2013) studied SPS in relation to household chaos and found that high observed household chaos was only reported as high household chaos by mothers with higher SPS, whereas mothers with lower SPS did not rate their household as more chaotic. This supports the reasoning that parents with higher SPS may be more aware of and affected by household chaos than parents with lower SPS. Although findings by Wachs (2013) indicate that SPS may be important when studying household chaos in mothers, no other studies to date exist on household chaos and SPS. In other fields, higher SPS has been related to a stronger response to stress (e.g., Aron, Aron, & Davies, 2005; Evers, Rasche, & Schabracq, 2008). As chaotic environments may be more stressful (Brown et al., 2019; Nelson et al., 2009; Selander et al., 2009), these studies also lend support for the idea that a potential effect of household chaos may be stronger in parents with higher SPS. The current study aims to fill the gap in scientific knowledge on whether an effect of household chaos on parenting is stronger in parents with higher SPS.

In addition to SPS, self-regulation is also of interest as a moderator of the effect of household chaos on parenting. Self-regulation refers to attentional and inhibitory control (Bridgett, Oddi, Laake, Murdock & Bachmann, 2013). Core

cognitive functions that fall under self-regulation are attention shifting, working memory, and inhibition. Parents with lower self-regulation may have more trouble with refraining from harsh discipline and with implementing positive parenting strategies in light of a more chaotic environment, which may be highly distracting. More chaotic environments may require stronger self-regulation from parents and therefore affect parenting in parents with lower self-regulation more than in parents with higher self-regulation. This was confirmed by a recent correlational study, in which the relation between higher self-reported household chaos and more harsh parenting was diminished in mothers with higher self-regulation (Park & Johnston, 2020). Furthermore, it seems that stressful environments require more self-regulation in order to prevent a negative outcome. Self-regulation moderated aggressive behavior in response to stress in low-income adult community members, with more aggressive responses in low self-regulation adults (Sprague, Verona, Kalkhoff & Kilmer, 2011). As more chaotic households can be argued to be more stressful (e.g., Nelson et al., 2009; Selander et al., 2009), this study also lends support for the reasoning that effects of household chaos on parenting may be stronger for parents with low self-regulation.

Lastly, impulsivity is explored in relation to household chaos. Impulsivity is a temperamental construct that reflects response initiation and urgency in approach behavior (Eisenberg et al., 2007). Impulsivity has previously not been studied in the context of the association between household chaos and parenting. Parents with more impulsivity may find it more difficult to conduct positive instead of negative parenting practices in straining environments, such as chaotic homes, as these environments may make it more difficult to inhibit inappropriate behavior. Studies found that mothers with more impulsivity showed more harsh discipline, especially in straining situations (Rhoades, Grive, & Del Vecchio, 2017; Park, Hudec, & Johnston, 2017). A chaotic household could be considered a straining environment. Thus, the negative effect of household chaos on parenting quality may be stronger for more impulsive parents, as inhibiting harsh parenting in a chaotic environment is especially difficult for them.

Current study

This dissertation focuses on two research questions. The first is whether household chaos has a causal effect on parenting. The second is whether the effect of household chaos on parenting is stronger for parents with certain characteristics, such as high SPS, low self-regulation, and more impulsivity (see Figure 1). Two studies were conducted to answer these questions. Both studies used an experimental design in which household chaos was manipulated to test causality.

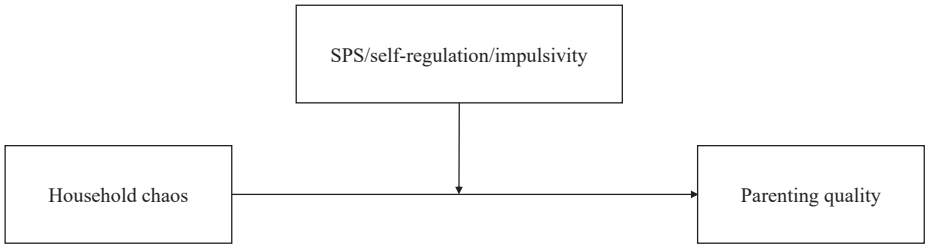

Figure 1. Model of the effect of household chaos on parenting quality, moderated by parental characteristics.

The first study was a lab study in which a living room setting was created in a lab room at Leiden University that was furnished as a living room. Two conditions were created within the living room: a neutral condition and a chaotic condition (see Supplemental material Chapter 2, Figure A1 and A2). In the chaotic condition, part of the room was closed off with a curtain, music and commercials were playing continuously, bold colors and prints were used, and clutter was added to the room in the form of papers, magazines, and baby clothes. The neutral condition was calm and orderly, while still being inviting. Non-parent, female young adults attended two lab visits two months apart to take care of an infant simulator for 45 min in both conditions (order counterbalanced). The infant simulator was programmed to cry at the same moments during both lab visits and participants were non-parents, which eliminated possible child effects on parenting and previous parenting experiences. Self-report and objective measures were used to measure SPS, self-regulation, and impulsivity. This study was executed in a highly controlled setting, which allowed for a very precise measure of the effect of the chaos manipulation on parenting.

The second study tested the potential causal effect of household chaos on parenting in a more ecologically valid situation, namely in families. The goal of the study was to test whether a change in household chaos resulted in a change in parenting. To this end, we aimed to decrease household chaos in the experimental group through a direct intervention, while not manipulating household chaos in the control group, and to subsequently test whether parenting improved in the experimental group compared to the control group. Participants were primary caregivers from Dutch families with a child between the age of 1.5-2 years old (twins or multiples were excluded). Based on a screening questionnaire (the Confusion, Hubbub And Order Scale, Matheny et al., 1995), families with elevated levels of household chaos were invited to participate in this study. The study was a randomized, controlled trial, in which one group of families was randomized to the intervention condition, and the other group was randomized to the control condition. During the pre- and posttest household chaos and parenting were measured using self-report as well as objective measures, such as observations

of the primary caregiver and the participating child. Self-report questionnaires and computer task were administered to measure SPS and self-regulation.

Outline of this dissertation

In Chapter 2, we test whether the chaos manipulation in the lab setting leads to lower caregiver sensitivity and whether this effect is stronger in participants with higher SPS. In Chapter 3, we extend these results by also studying harsh caregiving as a caregiving outcome, and we test whether the effect of the chaos manipulation on parenting is stronger for participants with lower self-regulation and more impulsivity. In Chapter 4, we test whether our intervention to decrease household chaos, the Structuring the Home to Induce a Nurturing Environment (SHINE) intervention, leads to improved parenting, measuring both sensitivity and harsh discipline. In Chapter 5, we test whether reducing household chaos leads to a stronger improvement in parenting for parents with higher SPS or lower self-regulation. In Chapter 6, the findings are integrated with the existing literature, and the strengths and limitations of the used methodology are considered. Implications for practice and future research on household chaos and parenting are discussed.

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