Unravelling the effect of household chaos on parenting

Andeweg, S.M.

General discussion

The aim of the current dissertation was to test whether household chaos has a causal effect on parenting and whether this effect was stronger for parents with higher sensory-processing sensitivity (SPS), lower self-regulation, or more impulsivity. Using two experimental studies, we found evidence for a causal effect of household chaos on parenting (Chapters 2 and 4). Moderation by SPS or self-regulation was inconsistent, and we found no moderation for impulsivity (Chapters 3 and 5). These findings should be integrated with findings from previous studies and need to be considered within the currently used study designs to formulate directions for future research and practical implications.

Household chaos and parenting

The first question of this dissertation was whether more household chaos leads to lower quality parenting. In our lab study, increased chaos led to lower caregiver sensitivity, whereas no effect on harsh caregiving was found (Chapters 2 and 3). In our intervention study, the intervention – aimed at reducing chaos – resulted in less harsh discipline, but no effect on sensitivity was found (Chapter 4). A closer look at the methodologies used to measure sensitivity and harsh parenting is necessary to understand these seemingly inconsistent results. In the lab study, an infant simulator was set to not respond to caregiving behavior and therefore simulate an inconsolable infant. This is known to be stressful to parents (Zeifman & St James-Roberts, 2017). Harsh caregiving and caregiver sensitivity were measured from the same video-observations. In the intervention study, we measured harsh discipline in a don't touch task and sensitivity in a free play task. The free play task consisted of 5 min of playing with the child. In the don't touch task, the parent needs to make sure that the child refrains from playing with an attractive toy for 2 min. Thus, the task to measure harsh discipline was more difficult than the task to measure sensitivity. The finding that caregiver sensitivity was affected by household chaos in the lab study along with the finding that harsh discipline was affected in the intervention study, indicates that household chaos may specifically affect parenting in difficult parenting situations, such as soothing an inconsolable infant or disciplining a child. However, in the lab study, we measured harsh caregiving in response to a crying infant simulator and did not find an effect of household chaos. This task may not have been suitable to elicit harsh caregiving. Parents who show harsh caregiving in response to an inconsolable infant mostly develop these behaviors after three months (Reijneveld, Van der Wal, Brugman, Hira Sing, & Verloove-Vanhorick, 2004), which does not compare to caring for an inconsolable infant simulator for two observations of 45 min. Thus, our method may not have been sufficient to elicit harsh caregiving. An alternative option is to use virtual reality: within an experimental design, a virtual living room with two conditions can be created, one chaotic and one neutral condition, and participants can be asked to perform the don't touch task with a simulated 2-year old. The nunchucks used with

virtual reality can simulate physical responses. Verbal and nonverbal harshness and laxness can still be coded in this paradigm.

Effect sizes

Overall, we conclude that parenting is affected by household chaos in already demanding parenting situations, and that both positive and negative parenting practices are negatively affected. This is in line with the findings from earlier correlational studies, such as finding more harsh parenting and less sensitive parenting in more chaotic households (e.g., Coldwell, Pike, & Dunn, 2006; Deater-Deckard, Wang, Chen, & Bell, 2012; Dumas et al., 2005). However, the effect sizes we found are smaller than previously found in correlational studies (e.g., Coldwell et al., 2006; Dumas et al., 2005). This may be due to several factors.

First, we used experimental designs. In social sciences, effect sizes in correlational studies are often stronger compared to those in experimental studies (Cheung & Slavin, 2016; Lipsey et al., 2012). This is mainly because many factors are related in social sciences, and whereas these factors may affect outcome measures in correlational studies, these are controlled for in experimental studies, resulting in smaller effect sizes. Regarding household chaos and parenting, our experimental study shows that household chaos only has a small direct effect on parenting (Chapter 2). In correlational studies household chaos may be related to stress or to parental self-efficacy, which are both also related to parenting (Nelson, O'Brien, Blankson, Calkins, & Keane, 2009; Selander et al., 2009; Corapci & Wachs, 2002; Beckerman, Berkel, Mesman & Alink, 2017; Albanese, Russo & Geller, 2019; Jones & Prinz, 2005). In experimental designs these relations are controlled for, whereas in correlational studies stress and parental self-efficacy would be able to be the third variable that influences both household chaos and parenting, and thereby lead to a larger effect size.

Second, it is possible that child effects play a role in how household chaos affects parenting, as previously suggested by Dumas et al. (2005). As child behavior is related to household chaos and parenting (e.g. Coldwell et al., 2006), a decrease in household chaos may lead to less difficult child behavior, which may in turn make parenting easier. This could explain why we found a small effect size in our lab study. In our lab study, the infant simulator followed the same crying schema in both lab visits, thereby deliberately excluding child effects. A larger effect size may be found if child effects are included: the chaotic environment would then affect sensitivity directly and indirectly through child behavior, as household chaos may lead to more child problem behavior, which in turn affects parenting. The effect we found in our RCT may be (partially) due to less difficult child behavior as a result of the chaos intervention (Chapter 4). To study this indirect effect, it would be necessary to compare the causal effect of household chaos on parenting with a

child and with an infant simulator. In our RCT we studied parents with their child and with the infant simulator at pre and posttest, providing the data to investigate the role of child effects. These data were not used in the current dissertation.

In all, household chaos does affect parenting, but the causal effect is small. Thus, the evidence of strong correlations between household chaos and parenting cannot be interpreted as proof of a strong causal effect of household chaos on parenting. Other factors may be important, such as stress and parental self-efficacy, and their direct contribution to parenting in combination with household chaos should be studied. For instance, high stress levels or low parental self-efficacy may cause more parenting problems (Beckerman et al., 2017; Albanese et al., 2019; Jones & Prinz, 2005), but may also lead to more household chaos (Nelson et al., 2009; Selander et al., 2009; Corapci & Wachs, 2002), which in turn adds on to the parenting problems.

Underlying mechanisms

Why does household chaos only affect parenting in demanding parenting situations, and not in non-demanding parenting situations? And how exactly does household chaos affect parenting? To better understand how household chaos may affect parenting, and which other factors may be important in this model, it is necessary to study the underlying mechanisms through which household chaos affects parenting. These mechanisms could be increased stress, fatigue and negative emotions, lower self-regulation, or lower parental self-efficacy, as these are related to both more household chaos and lower quality parenting (Brown, Anderson, Garnett, & Hill, 2019; Nelson et al., 2009; Selander et al., 2009; Crandall, Deater-Deckard, & Riley, 2015; Corapci & Wachs, 2002). Non-demanding parenting situations, such as playing with a child, may not cause stress, fatigue, negative emotions, impede on self-regulation, or lead to lower parental self-efficacy. Demanding parenting situations on the other hand, such as situations in which it is difficult to make a child cooperate or in which a child is unsoothable, may have this effect. If household chaos indeed operates through these mechanisms, then a chaotic environment may exacerbate the already heightened levels of stress, fatigue, negative emotions or lowered levels of self-regulation and parental self-efficacy. Thus, household chaos would add on to these factors and thereby lead to more harsh and less sensitive parenting in demanding parenting situations. In non-demanding parenting situations, household chaos may also lead to more stress, lower self-regulation and lower self-efficacy, but not to such an extent that parenting is impacted. This reasoning is in line with studies that found that child maltreatment occurs most in families where there is a cumulation of risk factors and the number of risk factors exceeds a certain threshold (Patwardhan, Duppong Hurley, Thompson, Mason & Ringle, 2017; Doidge, Higgins, Delfabbro, & Segal, 2017). Knowing how household chaos affects parenting could inform

prevention or intervention programs aiming to reduce parenting problems. For instance, interventions could reduce household chaos as well as improve stress coping mechanisms, or pay extra attention to boosting parental self-efficacy, to in turn reduce parenting problems.

Sensory-processing sensitivity

Another important question is whether household chaos affects parenting the same in all parents. We expected that household chaos would affect parenting more strongly in parents with higher sensory-processing sensitivity (SPS). First, as previous literature was inconclusive whether sensory-processing sensitivity (SPS) is a unidimensional, two dimensional, or three dimensional construct (Aron & Aron, 1997; Evans & Rothbart, 2008; Smolewska, McCabe, & Woody, 2006), we looked at dimensionality of SPS in our lab study (Chapter 2). We used a combination of self-report and observational measures to quantify SPS and found two components, which were similar to the components defined by Evans and Rothbart (2008): sensory sensitivity (how readily stimuli are perceived and if a person is generally affected by stimuli) and sensory discomfort (if a person is negatively aroused or overwhelmed by stimuli). This supports the notion that SPS is a two dimensional construct.

We expected that parents with more sensory-processing sensitivity (SPS) would show a stronger effect of household chaos on parenting. We hypothesized that due to a lower threshold for perceiving stimuli and stronger arousal to stimuli these parents would be more affected by the increased number and/or intensity of stimuli in chaotic households, thereby affecting their parenting practices more than in parents with low SPS. Our lab study showed partial support for this reasoning (Chapter 2). We found that participants with specifically more sensory sensitivity (i.e., a lower threshold for perceiving stimuli) showed a faster decrease in caregiver sensitivity in the chaotic compared to the neutral condition than participants with lower sensory sensitivity (i.e., a higher threshold for perceiving stimuli). We did not find this for SPS in general or specifically for sensory discomfort (i.e., increased arousal to stimuli). First, this means that when studying SPS it is important to distinguish between these components of SPS, as previously defined by Evans and Rothbart (2008). Second, this means that it is the heightened awareness rather than arousal by stimuli that makes people more susceptible to the effect of household chaos on parenting. Noticing the increased number and/or intensity of stimuli in highly chaotic environments may interfere with noticing and responding promptly and appropriately to infant stimuli. In our intervention study, we were not able to replicate these findings. Due to a smaller battery of measures for SPS in the intervention study than in the lab study, we could not distinguish between sensory sensitivity and sensory discomfort, which could explain why we did not find significant moderation (Chapter 5). Second, it is possible that SPS is not relevant to

parents within their own home environment, as that these parents have adapted cognitive reactivity strategies to cope with the amount of household chaos in their homes (Wyller, Wyller, Crane, & Gjelsvik, 2017), or have partners who are not high in SPS and help them to regulate their heightened reactivity to stimuli (Greven et al., 2019). These coping mechanisms may not have been activated in the lab study, in which no partner was present and parents could not control the level of household chaos, thereby making parents with higher SPS more susceptible to the effect of household chaos. Another explanation is that our intervention study may not have created large enough differences between pre and posttest levels of household chaos for SPS to become relevant. Based on the measures of chaos we used, we could not confirm that our intervention was successful in decreasing household chaos, while the difference in levels of chaos between the neutral and chaos condition in the lab study was large. Therefore, the effect of household chaos on parenting may only be stronger for parents with higher SPS in case of extreme differences in household chaos, such as occur around major life events like the addition of a new family member or moving to a new home, but not in case of differences in daily hassles. This would mean that household chaos generally affects parenting regardless of SPS. Our results could also indicate that parents with higher SPS are only affected by household chaos when it passes a certain threshold, equal to the level of household chaos in our lab study's chaotic condition. To test this assumption, it would be necessary to study whether the effect of household chaos on parenting in demanding situations is stronger for parents with higher SPS in a sample of highly chaotic families.

Self-regulation

Our hypothesis was that household chaos affects parenting more strongly in parents with lower self-regulation. Their lower attention shifting and inhibition skills and less adept working memory could mean that coping with the higher amount of stimulation from a chaotic environment is more difficult for these parents than for parents with high self-regulation, resulting in a stronger effect of household chaos on parenting. In the lab study, we did not find moderation by self-regulation, assessed with a self-report questionnaire and a computer task for inhibition (Chapter 3). In the intervention study, we found that a decrease in self-reported household chaos correlated with lower post-test harsh discipline in participants with higher self-regulation, whereas more harsh parenting was related to a decrease in self-reported household chaos in parents with lower self-regulation (Chapter 5). This was opposite to our expectation. Overall, our studies show mixed results on whether self-regulation moderates the effect of household chaos on parenting. An explanation for not finding this in the lab study is that self-regulation may be more relevant for harsh caregiving than for caregiver sensitivity, as refraining from harsh caregiving requires inhibition skills (Crandall et al., 2015). As discussed previously, our observations to measure harsh caregiving may not have

been successful in eliciting harsh caregiving, which also makes it difficult to find moderation by self-regulation. In our intervention study, lower harsh parenting in relation to a decrease in self-reported household chaos in parents with high self-regulation was expected, as less household chaos means less stimuli interfering with regulating parenting behavior. Parents low in self-regulation, on the other hand, showed more harsh discipline in relation to a decrease in chaos. This may be explained by the cognitive processes needed to establish the decrease in household chaos: the self-regulation capacity of parents with lower self-regulation may be insufficient to simultaneously maintain lower levels of household chaos and refrain from harsh discipline.

It is important to keep in mind that these results from analyses with change scores are correlational, meaning we cannot infer causality. As we used observational and computer task data for the parenting and self-regulation measures, it is not likely that our findings are due to subjective measurement types. Also, we again only found an effect on harsh discipline and not on sensitivity, indicating that self-regulation may indeed be more relevant for parenting in demanding situations than in non-demanding situations, and that good attention shifting and inhibition skills and working memory are needed to cope with a chaotic environment and a demanding parenting situation simultaneously. Another point to keep in mind is that our analyses only showed an interaction with self-reported household chaos, and not with other measures of household chaos. Therefore, the evidence for moderation by self-regulation in the intervention study was limited. Due to the limited evidence in the intervention study combined with not finding moderation by self-regulation in our lab study, our view is that it is too early to conclude that self-regulation moderates the effect of household chaos on parenting. Future studies should test whether experimentally reduced levels of household chaos indeed affect harsh parenting differently in parents with low vs high self-regulation abilities. Recruiting families with higher levels of household chaos may be helpful, as these families have more room for improvement.

Impulsivity

In our lab study, we exploratively studied whether more household chaos leads to lower parenting quality in parents who are more impulsive, reasoning that a chaotic environment combined with their higher urgency and faster approach behavior may make it difficult to refrain from harsh parenting and instead perform positive parenting strategies. We did not find that the effect of household chaos on caregiver sensitivity or harsh caregiving depended on impulsivity (Chapter 3). For harsh caregiving, this could be due to the task not being successful in eliciting harsh caregiving. For caregiver sensitivity, this means that more impulsive participants were not more affected by household chaos than less impulsive participants. The reasoning that more impulsive participants may have more trouble regulating

their behavior in chaotic environments may still be true, but our results do not show that this leads to less caregiver sensitivity per se. It is possible that these participants switched more between different types of caregiving behavior (i.e., rocking, feeding, changing the diaper), or between the tasks in phase 2 and 3 and caregiving behavior, but this does not necessarily mean that these behaviors are harsher or less sensitive. Finally, it may be necessary to test the combination of heightened impulsivity and neuroticism, as more neurotic people are more easily aroused (e.g., Brown & Rosellini, 2008; Helmers et al., 1997), and parenting quality in demanding situations has been found to be especially lower for more neurotic and extraverted fathers. In conclusion, we did not find evidence that impulsivity exacerbates the effect of household chaos on parenting, but as this was the first study to research this question, more research is needed, and research should also look into impulsivity and neuroticism.

Strengths and limitations

The designs of the two studies have multiple strengths and limitations. The lab study was done in a highly controlled setting, in which an infant simulator was programmed to cry at certain times, and with female young adults who did not have children as participants. This design was chosen specifically to partial out potential confounders in the relation between household chaos and parenting, such as previous parenting knowledge and experience. Also, the use of the infant simulator enabled us to partial out the potential role of child behavior in how household chaos affects parenting (e.g., Dumas et al., 2005). The use of the lab allowed us to manipulate household chaos (except for the aspect of family routines) and keep all other factors stable. Thus, the strength of this design was that we were able to very accurately assess the effect of household chaos on parenting. This inherently means that generalizability of the results from this study to families is limited: in families, parents are able to control the amount of household chaos (to some extent), parents have experience with their own child, and the child reacts to the home environment and parenting. The goal of the second study, the intervention study, was therefore to replicate the findings from the lab study in real families. The use of the RCT design allowed us to answer the question of causality and the use of self-report as well as objective measures of household chaos ensured comparability with previous studies, in which mostly one type of measurement was used. As we studied household chaos and parenting in the home environment, the findings from the intervention study are more generalizable to families than the findings from the lab study. However, generalizability is still limited as our sample consisted of intact families and was characterized by relatively high educational attainment, high income, and Dutch ethnicity. Regarding ethnicity, studies on household chaos, child development and parenting show roughly the same patterns in Western and non-Western samples, such as India, Israel, and South-Africa (see Wachs & Corapci, 2003), but standards of what is chaotic differ

across cultures. A systematic review can shed light on how important cultural differences are for the effect of household chaos on parenting. Also, cross-cultural research on this topic within countries may help understand parenting problems and child development problems.

In the intervention study we used a combination of objective and self-report measures for household chaos. As Wachs (2013) showed that self-reported levels of household chaos do not necessarily converge with observed levels of household chaos, the use of both types of measures of household chaos in our study is a strength. We do recommend some alterations to these measures for future research. For instance, our measure of family routines consisted of variability in the time the parent and child ate breakfast and dinner and the time the child was put to bed. Other aspects of family routines, such as whether the bedtime routine was performed in the same way each night, were not asked, and should be included in future measures of family routines. Also, there were some technical problems with the diary app, which resulted in quite some missing data. Furthermore, the goals in our intervention were not all measurable with our measures of household chaos. For instance, a goal to decrease clutter was to clean up all children's toys before bedtime, but observations of clutter were made during the day before the child's bedtime. Thus, future research with an intervention to reduce household chaos should make sure that measurements and goals of the intervention match more closely. Also, as crowding is not easily manipulated, we did not include this in our intervention and instead controlled for the number of children. Lastly, asking parents to fill out a screening questionnaire may have resulted in non-response from more chaotic families, as they may have a higher chance of losing the invitation to the screening questionnaire, or of simply forgetting it in the chaos of everyday life. Thus, this may not be the most effective way to recruit chaotic families or this requires more than one reminder to fill out the screening questionnaire.

Future research

While our study answers some research questions, it raises many more. To test whether some of our interpretations are correct, it is necessary that future experimental studies testing the effect of household chaos on parenting a) use self-report as well as objective measures of household chaos, b) measure positive and negative parenting practices in demanding and non-demanding parenting situations, and c) test for moderation by SPS and self-regulation in highly chaotic families. Regarding impulsivity, future studies should combine this with neuroticism to test moderation of the effect of household chaos on parenting. Furthermore, the mechanisms through which household chaos affects parenting, including stress, fatigue and negative emotions, self-regulation, and parental self-efficacy should be examined.

Another line of research is that on the role of child behavior. Besides knowing that parenting mediates the relation between household chaos and child development (Mills-Koonce et al., 2016; Vernon-Feagans, Garrett-Peters, Willoughby, Mills-Koonce, & The Family Life Project Key Investigators, 2012), it is necessary to test whether child behavior mediates the effect of household chaos on parenting. To this end, we studied parent-child interactions and parent-infant simulator observations in our intervention study (data not used in this dissertation). Furthermore, the effect of household chaos on parenting should also be studied in older children. Our study focussed on pre-school children, who generally spend much time at home. The effect of household chaos may be different for older children, who may be at home less but who also have an increasing role in the level of household chaos: for instance, the older children become, the more independent they are in grabbing toys from a basket, and the more parents can expect the child to help clean up. As previous correlational studies found relations between parenting and household chaos with school-aged children (e.g., Coldwell et al., 2006; Dumas et al., 2005), it can be expected that household chaos also affects parenting with older children.

Before we can formulate implications for practice, more research is necessary. Therefore, two important questions must be answered. The first question is whether our results are generalizable to families with low SES. In low SES families, other factors, such as financial stress or unemployment, are at play than in high SES families. Our samples consisted mostly of highly educated students or relatively high SES families. It is important to test whether and how strongly household chaos affects parenting in demanding situations in families with low SES. Second, it is important to study whether household chaos also affects parenting in families with a high risk of child maltreatment. If so, then this could be an opportunity for social workers to improve parenting. Helping families implement family routines or managing clutter and noise levels may be an effective way to reduce household chaos and thereby improve parenting and reduce child maltreatment. Knowledge on mechanisms underlying this effect should be used in this intervention. Also, future research should study whether aiding families in keeping household chaos at a low could be a preventive measure for parenting problems: if reducing household chaos leads to less harsh discipline, then making sure household chaos stays low may prevent harsh discipline. To better target these prevention and intervention efforts, information on whether SPS, self-regulation and impulsivity are moderators of the effect of household chaos on parenting could be used.

Implications

Our study sheds light on whether household chaos causally affects parenting and finds that it has a small effect in difficult parenting situations. The intervention study showed that harsh discipline decreased in the intervention group (Chapter

4). Still, we believe it is too early to implement this intervention in practice with families with clinical parenting problems. To this end, more research is needed in which the intervention is tested in families with extreme parenting problems. Also, understanding the mechanisms through which household chaos affects parenting would help to better shape the intervention. For instance, if household chaos affects parenting through stress, then implementing the chaos intervention next to a stress coping intervention, or adding a module on coping with stress to the intervention, is advisable. Also, our intervention may need modification for successful implementation in practice: is it feasible to add an intervention with 5 home visits to an already burdened family or should it be shortened? What goals from our standard list should be included, or should there not be a standard list to choose from? Studies with our intervention executed in a high-risk population should provide insight into which changes may be necessary before implementing the intervention in practice. Until these studies are executed, social workers should be advised to pay attention to the level of household chaos in families with young children, knowing that this may impact parenting.

Conclusion

In conclusion, household chaos affects both positive and negative parenting practices. This effect is only significant in demanding parenting situations, such as situations in which disciplinary actions towards the child are required or in which the child is inconsolable. The causal effect was small while correlational studies found larger effects, meaning that other factors may be important predictors of both household chaos and parenting. Therefore, more experimental studies in which the underlying mechanisms are investigated are important.

Support for moderation by SPS and self-regulation is inconsistent. Regarding SPS, this may exacerbate the effect of household chaos on parenting in case of extreme differences between or high levels of household chaos. Regarding self-regulation, parents with high self-regulation may benefit from reducing household chaos, while parents with low self-regulation may not have enough self-regulation capacities to simultaneously lower their level of household chaos and refrain from harsh discipline. The effect of household chaos on parenting was not dependent on impulsivity. Future studies should include self-report as well as objective measures of household chaos, and measures of positive and negative parenting practices in demanding and non-demanding situations. Also, it is necessary to test whether our findings can be replicated in older children, high risk families, and families with low SES and other ethnicities. Our results form a promising vantagepoint for further research, which could eventually lead to prevention and intervention programs to improve parenting by reducing household chaos.

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