

**From one Generation to the Next:**  
**The Mediating Role of Emotional and Behavioral Characteristics in**  
**Mothers with a History of Maltreatment, Depression and Borderline**  
**Personality Disorder in Child Mental Health**

DISSERTATION  
zur Erlangung des akademischen Grades  
doctor rerum naturalium (Dr. rer. nat.)  
im Fach Psychologie

eingereicht an der

Lebenswissenschaftlichen Fakultät  
der Humboldt-Universität zu Berlin

von  
Dipl.-Psych. Katja Dittrich

Präsidentin der Humboldt–Universität zu Berlin  
Prof. Dr.–Ing. Dr. Sabine Kunst

Dekan der Lebenswissenschaftlichen Fakultät  
Prof. Dr. Bernhard Grimm

Vorsitzende:  
Prof. Dr. Isabel Dziobek-Ferber

Gutachter:  
Prof. Dr. Reinhard Beyer  
Prof. Dr. Felix BERPohl  
Prof. a. D. Dr. Thomas Fydrich

Weiteres Mitglied:  
Dr. Andrea Ertle

Betreuung:  
Prof. Dr. Felix BERPohl und Dr. Katja Bödeker

Tag der Verteidigung: 19. Februar 2020

## Summary

Maternal experiences of early life maltreatment (ELM) pose a risk for child well-being. Similar intergenerational effects have been found for offspring of mothers with major depressive disorder (MDD) and borderline personality disorder (BPD), which are common sequelae of maltreatment experiences in childhood. An important aspect in this line of research is identifying mediating pathways that might help to explain these intergenerational effects. One possible way of transmission could be maternal deficits regarding certain emotional and behavioral characteristics. For example, parents with ELM as well as MDD and BPD show deficits in emotion regulation and empathy, less sensitivity in interaction with their child, higher parenting stress, and have a higher risk of abusive parenting. All of these parental deficits have also been associated with mental health problems in children and could thus function as potential pathways. However, the major problem with previous research efforts focusing on the intergenerational effects of maternal ELM, MDD, and BPD is that these three risk factors often co-occur, and similar mediating pathways have been proposed for all three risk factors. However, an integrated model considering all three factors and their respective pathways has not been proposed to date.

Thus, the overall aim of the present set of studies was to disentangle the specific contributions of ELM, MDD, and BPD to child mental health and identify specific mediating pathways of intergenerational transmission. The first specific aim was to test the hypothesis that ELM and MDD not only bear a risk for child psychopathology – which has previously been shown – but they also influence child quality of life (QoL), which is another important aspect of mental health (Paper I). The second aim was to identify specific mediating pathways that might explain these intergenerational effects of ELM, MDD, and BPD on child mental health regarding child QoL (Paper I, MDD and ELM only) and psychopathology (Papers II and III). Previous research has assessed the effects of ELM, MDD, and BPD in separate investigations or considered maternal psychopathology (i.e. MDD and BPD) as a potential mediator for the effect of ELM. In contrast to these investigations, the present studies have incorporated two or all three of these maternal risk factors as predictors in one study (Paper I including only ELM and MDD, Papers II and III including all three factors) and considered several potential mediators. This dissertation thereby focuses on maternal emotional and behavioral characteristics such as parenting behavior, emotional competences and abuse potential in mothers with ELM, MDD, and BPD as mediators for the effects on child mental health.

In *Paper I*, we found that maternal MDD – but not the severity of ELM – had a negative effect on child QoL. Parenting stress and maternal sensitivity mediated this effect. More precisely, maternal MDD predicted higher parenting stress and lower maternal sensitivity, which in turn predicted lower child QoL. *Paper II* showed that all three risk factors in mothers (i.e. ELM, MDD, and BPD) predicted higher maternal abuse potential. However, indirect effects via higher emotion regulation difficulties leading to higher abuse potential only emerged in mothers with MDD and BPD. Higher abuse potential also predicted higher child psychopathology, whereas maternal emotion regulation difficulties had no direct effect on child psychopathology. *Paper III* showed that personal distress, an uncomfortable reaction to the suffering of others, functioned as a mediator for the effect of maternal MDD and BPD on child psychopathology – i.e. maternal MDD and BPD predicted higher personal distress, which in turn predicted higher child psychopathology. Maternal BPD also predicted lower perspective-taking, which did not function as a mediator for the effect on child psychopathology. No effects emerged for maternal ELM.

In summary, our findings show that maternal MDD not only poses a risk for child psychopathology but also for child QoL. Elevated abuse potential in mothers with MDD, BPD, and higher ELM and the link between abuse potential and child psychopathology demonstrate the need for interventions and prevention efforts among these populations to reduce the risk even though actual abuse might not have occurred or been detected yet. For mothers with MDD and BPD, these interventions may specifically focus on emotional competences like emotion regulation, which mediated the effect of both MDD and BPD on abuse potential. Difficulties in empathic responding, sensitive caregiving, and stress coping may also be addressed as we identified personal distress as a mediator for the effect of maternal MDD and BPD on child psychopathology, and sensitivity and parenting stress as mediators for the negative effect on child QoL in the present studies. Further research should aim to identify more precise mediating processes that explain elevated abuse potential in mothers with ELM.

## **Zusammenfassung**

Mütterliche frühe Misshandlungserfahrungen stellen einen Risikofaktor für das kindliche Wohlergehen dar. Ähnliche intergenerationale Effekte wurden gefunden bei Kindern von Müttern mit Depression und Borderline-Persönlichkeitsstörung, welche beide häufige Folgeerkrankungen von frühkindlicher Misshandlungserfahrung sind. Ein wichtiger Aspekt der Erforschung intergenerationaler Effekte ist die Identifikation von mediierenden Pfaden, um diese Effekte besser zu verstehen. Ein möglicher Pfad der intergenerationalen Übertragung könnten bestimmte mütterliche emotionale und behaviorale Charakteristika sein. Zum Beispiel zeigen Mütter mit Misshandlungserfahrung, aber auch mit Depression und Borderline-Persönlichkeitsstörung Defizite in den Bereichen Emotionsregulation und Empathie, geringere Sensitivität in der Interaktion mit ihrem Kind sowie erhöhten elterlichen Stress und zeigen ein erhöhtes Risiko, selbst ihre Kinder zu misshandeln. Da all diese genannten Defizite zudem mit kindlichen psychischen Gesundheitsproblem assoziiert wurden, könnten sie potentielle Übertragungspfade darstellen. Bisherige Studien zu diesem Thema weisen jedoch das Problem auf, dass die drei mütterlichen Risikofaktoren, Misshandlungserfahrung, Depression und Borderline-Persönlichkeitsstörung häufig gemeinsam auftreten und dass für alle drei Faktoren ähnliche Übertragungspfade diskutiert, jedoch nicht in ein Modell integriert wurden.

Das übergeordnete Ziel der vorliegenden Studien war daher, die spezifischen Effekte von mütterlicher Misshandlungserfahrung, Depression und Borderline-Persönlichkeitsstörung auf kindliche psychische Gesundheit zu identifizieren und je spezifische mediierende Pfade zu testen. Das erste spezifische Ziel war zu ermitteln, ob mütterliche Misshandlungserfahrung und Depression nicht nur einen Effekt auf kindliche Psychopathologie haben, was bereits gezeigt werden konnte, sondern auch auf kindliche Lebensqualität, die einen weiteren wichtigen Aspekt von psychischer Gesundheit darstellt (Paper I). Das zweite Ziel war, spezifische Übertragungspfade zu identifizieren, die diese intergenerationalen Effekte von mütterlicher Misshandlungserfahrung, Depression und Borderline-Persönlichkeitsstörung auf kindliche psychische Gesundheit hinsichtlich der Lebensqualität (Paper I, nur Depression und Misshandlungserfahrung) und Psychopathologie (Paper II und III) erklären können. Anstatt mütterliche Misshandlungserfahrung, Depression und Borderline-Persönlichkeitsstörung separat zu betrachten oder mütterliche Psychopathologie als potenziellen Mediator für den Effekt der Misshandlungserfahrung auf kindliche Variablen zu untersuchen, wie dies in vorangegangenen Studien gehandhabt wurde, haben wir alle drei mütterlichen Risikofaktoren als gleichwertige Prädiktoren in einer Studie untersucht und gleichzeitig verschiedene Mediatoren

berücksichtigt. Der Fokus dieser Dissertation lag dabei auf mütterlichen emotionalen und behavioralen Charakteristika wie Erziehungsverhalten, emotionalen Kompetenzen und Misshandlungspotenzial als potenziellen Mediatoren.

In *Paper I* haben wir gefunden, dass mütterliche Depression, aber nicht Misshandlungserfahrung, einen negativen Effekt auf kindliche Lebensqualität hat. Mütterlicher Erziehungsstress und Feinfühligkeit in der Mutter-Kind Interaktion mediieren diesen Zusammenhang. Mütterliche Depression sagte dabei erhöhten Erziehungsstress und verminderte Feinfühligkeit vorher, was wiederum verminderte kindliche Lebensqualität prädizierte. *Paper II* zeigt, dass alle drei Risikofaktoren (d.h. Misshandlungserfahrung, Depression und Borderline-Persönlichkeitsstörung) erhöhtes mütterliches Misshandlungspotenzial vorhersagen. Aber nur bei Müttern mit Depression und Borderline-Persönlichkeitsstörung wurde dieser Effekt mediiert durch Schwierigkeiten in der Emotionsregulation. Mütterliches Misshandlungspotenzial hatte wiederum einen Effekt auf die kindliche Psychopathologie. Es gab keinen direkten Effekt von mütterlicher Emotionsregulation auf kindliche Psychopathologie. *Paper III* konnte zeigen, dass mütterlicher empathischer Distress, eine unangenehme eigene Reaktion auf das beobachtete Leiden anderer, als Mediator fungiert für den Effekt von mütterlicher Depression und Borderline-Persönlichkeitsstörung auf kindliche Psychopathologie. Dabei sagten beide mütterliche Erkrankungen jeweils erhöhten empathischen Distress vorher, welcher wiederum erhöhte kindliche Psychopathologie prädizierte. Mütter mit Borderline-Persönlichkeitsstörung zeigten zudem geringere Tendenz zur Perspektivübernahme, was jedoch kein Mediator war für den Effekt auf die kindliche Psychopathologie. Diese Effekte auf Empathie zeigten sich nicht für mütterliche Misshandlungserfahrung.

Zusammengefasst konnten wir zeigen, dass mütterliche Depression nicht nur einen Effekt auf die Psychopathologie der Kinder hat, sondern auch auf deren Lebensqualität. Sowohl schwerere Misshandlungserfahrung, als auch Depression und Borderline-Persönlichkeitsstörung erhöhen das mütterliche Misshandlungspotenzial. Wir konnten weiterhin zeigen, dass erhöhtes mütterliches Misshandlungspotenzial einen Effekt auf kindliche Psychopathologie hat. Diese Befunde legen einen Bedarf an gezielter Intervention und Prävention in diesen Populationen nahe, um das Risiko von negativen Effekten auf die kindliche psychische Gesundheit zu verringern, auch wenn tatsächliche Misshandlung womöglich nicht stattgefunden hat oder festgestellt wurde. Bei Müttern mit Depression und Borderline-Persönlichkeitsstörung könnte ein Ansatzpunkt für diese Interventionen besonders die Stärkung

von emotionalen Kompetenzen wie Emotionsregulation darstellen, welche als Mediator für den Effekt von Depression und Borderline Persönlichkeitsstörung auf Misshandlungspotenzial gefunden wurde. Auch Schwierigkeiten im empathischen Reagieren, feinfühliges Erziehungsverhalten und der Umgang mit Stress könnten adressiert werden, da wir empathischen Distress als Mediator für den Effekt von Depression und Borderline Persönlichkeitsstörung auf kindliche Psychopathologie identifiziert haben und Feinfühligkeit und Erziehungsstress als Mediatoren für den Effekt von Depression auf kindliche Lebensqualität. Welche Mediatoren spezifisch den Effekt von mütterlicher Misshandlungserfahrung auf Misshandlungspotenzial erklären wird durch zukünftige Forschung weiter zu klären sein.

## List of Papers contributing to this Dissertation

### Paper I

Dittrich K, Fuchs A, Bempohl F, Meyer J, Fuehrer D, Reichl C, Reck C, Kluczniok D, Kaess M, Hindi Attar C, Moehler E, Bierbaum AL, Zietlow AL, Jaite C, Winter SM, Herpertz SC, Brunner R, Boedeker K, Resch F. (2018) Effects of maternal history of depression and early life maltreatment on children's health-related quality of life. *Journal of Affective Disorders*, 225, 280-288. doi: 10.1016/j.jad.2017.08.053.

### Paper II

Dittrich K, Boedeker K, Kluczniok D, Jaite C, Hindi Attar C, Fuehrer D, Herpertz SC, Brunner R, Winter SM, Heinz A, Roepke S, Heim C, Bempohl F. (2018) Child abuse potential in mothers with early life maltreatment, borderline personality disorder and depression. *British Journal of Psychiatry*, 213 (1), 412-418. doi: 10.1192/bjp.2018.74.

### Paper III

Dittrich, K., Bempohl, F., Kluczniok, D., Hindi Attar, C., Jaite, C., Fuchs, A., Neukel, C., Herpertz, S.C., Brunner, R., Winter, S.M., Roepke, S., Kaess, M., Heim, C., Boedeker, K. (2019). Alterations of empathy in mothers with early life maltreatment, depression and borderline personality disorder and their effects on child psychopathology. *Psychological Medicine*. Advance online publication. doi: 10.1017/S0033291719001107.

## **List of Abbreviations**

BPD	Borderline personality disorder
ELM	Early life maltreatment
HRQoL	Health-related quality of life
IRI	Interpersonal Reactivity Index
MDD	Major depressive disorder
QoL	Quality of life
rMDD	Remitted major depressive disorder
UBICA	Understanding and Breaking the Intergenerational Cycle of Abuse
WHO	World Health Organization



## Table of Content

<b>Summary</b> .....	<b>2</b>
<b>Zusammenfassung</b> .....	<b>4</b>
<b>List of Papers contributing to this Dissertation</b> .....	<b>7</b>
<b>List of Abbreviations</b> .....	<b>8</b>
<b>Table of Content</b> .....	<b>9</b>
<b>1. Introduction</b> .....	<b>11</b>
<b>2. Parents with a History of Maltreatment, Depression or Borderline Personality Disorder</b> .....	<b>13</b>
2.1 <i>Parents with a History of Maltreatment</i> .....	13
2.2 <i>Parents with Mental Disorders</i> .....	14
2.3 <i>Co-occurrence of a Maternal History of Maltreatment, Depression and Borderline Personality Disorder</i> .....	16
<b>3. Mediating Pathways of Transmission</b> .....	<b>18</b>
3.1 <i>Parenting Behavior</i> .....	19
3.1.1 <i>Maternal Sensitivity</i> .....	20
3.1.2 <i>Maternal Parenting Stress</i> .....	21
3.2 <i>Individual Emotional Competences of the Mother</i> .....	21
3.2.1 <i>Maternal Emotion Regulation</i> .....	22
3.2.2 <i>Maternal Empathy</i> .....	23
3.3 <i>Maternal Abuse Potential</i> .....	24
<b>4. Aims of this Dissertation and Overview of Papers</b> .....	<b>26</b>
4.1 <i>Paper I: “Effects of maternal history of depression and early life maltreatment on children's health-related quality of life”</i> .....	29
4.2 <i>Paper II: “Child abuse potential in mothers with early life maltreatment, borderline personality disorder and depression”</i> .....	31

4.3	<i>Paper III: “Alterations of empathy in mothers with early life maltreatment, depression and borderline personality disorder and their effects on child psychopathology”</i>	33
<b>5.</b>	<b>General Discussion</b>	<b>36</b>
5.1	<i>Effects of ELM, MDD, and BPD on Child Mental Health</i>	37
5.2	<i>Mediating Pathways from ELM, MDD, and BPD to Child Mental Health</i>	37
5.2.1	Sensitivity and Parenting Stress as Mediators for the Effect on Child QoL	37
5.2.2	Emotion Regulation, Empathy, and Abuse Potential as Mediators for the Effect on Child Psychopathology	38
5.3	<i>Summary of Findings on Intergenerational Pathways and Impulses for Future Research</i>	41
5.4	<i>Clinical Implications</i>	42
5.5	<i>Strengths and Limitations of this Dissertation</i>	44
5.6	<i>Conclusion</i>	45
<b>6.</b>	<b>References</b>	<b>47</b>
<b>7.</b>	<b>Appendix</b>	<b>62</b>
7.1	<i>Original Manuscripts</i>	62
7.1.1	Paper I	62
7.1.2	Paper II	91
7.1.3	Paper III	113
7.2	<i>Contributions to Conferences (related to this Dissertation)</i>	142
7.2.1	Oral Presentations	142
7.2.2	Poster Presentations	143
	<b>Acknowledgments</b>	<b>145</b>
	<b>Eidesstattliche Erklärung</b>	<b>147</b>

## 1. Introduction

The importance of the primary caregivers for the development of a child has been widely acknowledged. Everyday interactions with one's primary caregivers – like the mother – may affect a child's psychological capacities, neurological development and social adjustment (Richter, 2004). Ideally, a child's development is fueled by a warm, responsive, and protective relationship and the supportive presence of the mother, which allows the child to explore his/her environment and strive for autonomy (Mahler, 1975; Ainsworth, 1969). Unfortunately, certain conditions may impair a mother's capacity to provide such a nourishing environment for child development or might even pose a risk for child mental health. More precisely, a large body of research provides evidence that a parental history of early life maltreatment (ELM) and parental psychopathology increase the risk of mental health problems in the offspring (Bosquet Enlow, Englund, & Egeland, 2018; Santana et al., 2015; Wiegand-Grefe, Geers, Plaß, Peterman, & Riedesser, 2009). Concerning maternal psychopathology, a focus has been placed on the harmful effects of maternal major depression (MDD) and borderline personality disorder (BPD) on child mental health (Goodman et al., 2011; Macfie, 2009).

From an evolutionary perspective, it seems reasonable that acquired skills and characteristics are transmitted from one generation to another, whereby children are affected by the experiences of their parents (Kellermann, 2013). An important aim among research into such an intergenerational transmission is to identify the underlying mechanisms (Rutter, 1998). This research might help to understand which exact processes are involved in the intergenerational transmission of maternal ELM and psychopathology that may have an influence on the psychological development of such children. As research in this area is growing, a number of mediating pathways have been identified: as already indicated above, maternal behavior in day-to-day interactions and the exposure of the child to the mother's maladaptive cognitions, affect, and behavior may play a crucial role in the increased risk of psychopathology in children of mothers with ELM, MDD and BPD. However, one major problem with these research efforts is that these maternal conditions that pose a risk for child mental health – namely maternal ELM, MDD, and BPD – often co-occur (Heim, Newport, Mletzko, Miller, & Nemeroff, 2008; Zanarini, 2000; Zanarini et al., 1998). Moreover, while similar mediating pathways have been proposed for all three risk factors, they have not been integrated in one combining model. Furthermore, the majority of research has focused on child psychopathology as outcomes, not considering child quality of life (QoL) as an important aspect of child mental health.

In the following chapters of this dissertation, an embedded review will be providing of previous research into the effects of maternal ELM, MDD, and BPD on child mental health. A combined model of transmission will be introduced, focusing on different potential mediators like individual emotional competences (empathy and emotion regulation), parenting behavior, and abusive behavior in mothers with ELM, MDD, and BPD for the effects on child mental health. This leads to the following aims of this dissertation: 1) to identify whether maternal ELM and MDD not only bear a risk for child psychopathology – which has previously been shown (Bödeker et al., 2018; Goodman et al., 2011) – but might also influence child QoL; and 2) to identify specific mediating pathways leading from maternal ELM, MDD, and BPD to child mental health (QoL and psychopathology). Subsequently, the findings of the three papers included in this dissertation will be summarized. Finally, this work will conclude with a general discussion and clinical implications.

## **2. Parents with a History of Maltreatment, Depression or Borderline Personality Disorder**

### **2.1 Parents with a History of Maltreatment**

Child maltreatment is a widespread global problem. In a review of a series of meta-analyses on child abuse and neglect, Stoltenburgh et al. (2015) reported estimated global rates of 12.7 % for sexual abuse (7.6 % among boys, 18.0 % among girls), 22.6 % for physical abuse, 36.3 % for emotional abuse, 16.3 % for physical neglect and 18.4 % for emotional neglect. Recent German investigations report rates of 12.0 % for emotional abuse, 5.8 % for physical abuse, 6.3 % for sexual abuse (6.7 % female, 5.9 % male), 27.0 % for emotional neglect and 19.2 % for physical neglect (Witt, Brown, Plener, Brähler, & Fegert, 2017). Experiencing ELM may cause behavioral and emotional difficulties in childhood and adolescence (Appleyard, Egeland, Dulmen, & Sroufe, 2005) and may have a life-long impact on mental health (review by Jaffee, 2017). Certain mental disorders such as MDD and BPD are meanwhile considered common sequelae of ELM (Heim & Nemeroff, 2001; Putnam, 2003; Springer, Sheridan, Kuo, & Carnes, 2003; Zancarini, 2000).

In the 1960s and 1970s, the idea of intergenerational effects of trauma was introduced in the psychiatric literature, initially in a different context than maltreatment (Trossman, 1968; for review, see Yehuda & Lehrner, 2018). These phenomena first came to attention through clinical practice, when an over-proportional number of families of holocaust survivors sought psychiatric support for their children described as showing depressive features, suicide attempts, anxiety, difficulties at school and excessive quarreling (Sigal & Rakoff, 1971; Trossman, 1968), apparently sometimes displaying even more severe psychiatric symptomatology than their parents (Rakoff, 1966). These observations started a wave of research on psychiatric outcomes in children of trauma survivors, supported by similar case reports and findings in offspring of Vietnam veterans in the 1980s and 1990s (e.g. Rosenheck & Nathan, 1985).

The majority of research on the intergenerational effects of ELM long focused on the transmission of violence, showing that parents with ELM show a greater risk of becoming abusive parents themselves (Widom, 1989). Only recently has the spotlight been extended to the psychological effects on the children of victims of ELM. Researchers have started to investigate the negative effects of parental experiences of ELM on mental health in the next generation. There is now a growing body of research showing that the offspring of those who experienced ELM have a higher risk of developing a mental disorder themselves (Miranda, de la Osa, Granero, & Ezpeleta, 2013a; Pasalich, Cyr, Zheng, McMahon, & Spieker, 2016; Plant,

Jones, Pariante, & Pawlby, 2017; Plant, Pawlby, Pariante, & Jones, 2017). These children show deficits in their social-emotional development and are at an elevated risk of emotional and behavioral problems that are considered precursors of oppositional defiant and affective disorders (Bosquet Enlow et al., 2018; Briggs et al., 2014; Collishaw, Dunn, O'Connor, Golding, & Avon Longitudinal Study of Parents and Children Study Team, 2007; Dubowitz et al., 2001; Min, Singer, Minnes, Kim, & Short, 2013; Miranda et al., 2013a; Myhre, Dyb, Wentzel-Larsen, Grøgaard, & Thoresen, 2014; Plant, Barker, Waters, Pawlby, & Pariante, 2013; Rijlaarsdam et al., 2014; Roberts, O'Connor, Dunn, & Golding, 2004; Schwerdtfeger, Larzelere, Werner, Peters, & Oliver, 2013; Thompson, 2007). A recent review by Plant et al. (2017) provides an overview of these findings. The authors considered twelve studies addressing this issue and conclude that there is strong evidence of an effect of maternal ELM on child psychopathology.

While there is increasing evidence of the effect of maternal ELM on child psychopathology, another similarly important aspect of mental health has not been considered to date. The World Health Organization (WHO) defines health as “not merely the absence of disease”, but rather “a state of complete physical, mental and social wellbeing” (World Health Organization, 1946). Health-related QoL (HRQoL) – an often-neglected component of health – is a multi-dimensional construct that comprises several aspects of a person's well-being and function, including physical, mental, behavioral, emotional, and social components as perceived by the person him-/herself and related individuals (Bullinger, 2011; Ravens-Sieberer et al., 2001, 2014). Considering the impact of maternal ELM on child risk of psychopathology, it seems conceivable that maternal ELM might also have a negative effect on child QoL. However, since studies on this matter are still lacking, this issue was addressed in the first paper of this dissertation.

## **2.2 Parents with Mental Disorders**

Studies from western countries suggest that between 15 and 23 % of children live with a parent with mental illness (Leijdesdorff, Doesum, Popma, & Klaassen, 2017). Due to a lack of data, it cannot easily be estimated exactly how many parents in Germany suffer from a mental disorder (Plass & Wiegand-Grefe, 2012), although in German psychiatric in-patient samples, the proportion of parents with mental illness varies between 17 and 45 % (Wiegand-Grefe, Halverscheid, & Plass, 2011). Half to two-thirds of them live together with their children or at least have regular contact with them (Wiegand-Grefe et al., 2009). It has been estimated that in Germany three to four million children have at least one parent with a mental disorder and 175,000 children each year have one parent who is in psychiatric in-patient treatment (Berger, 2004; Mattejat, 2009).

Already in the 1920s, the first observations were published reporting that children of mentally-ill parents seemed to show an increased risk of developing own mental health problems (Janet, 1925). To date, the number of studies addressing this topic has significantly grown. Wiegand-Grefe et al. (2009) found a three to five times increased risk of psychiatric problems in children of parents with mental disorders in general, while Santana et al. (2015) reported a three to five times higher risk of suicidal ideation in adolescents of parents with mental disorders and a two to four times higher risk of suicide attempts. Most studies addressing this issue have focused on specific parental disorders and their effects on the offspring. In the following, I will elaborate on studies on parental MDD and BPD as common sequelae of ELM.

Goodman and Rouse (2011) conducted a meta-analysis including 193 studies and found that maternal MDD predicted higher levels of externalizing, internalizing, and general psychopathology, as well as more negative affect and behavior and lower levels of positive affect and behavior in the offspring. Children of depressed parents often also suffer from difficulties in emotion regulation, depressed mood, attention deficits, non-compliance, aggression, difficulties in peer relations, and insecure attachment (review by Gelfand & Teti, 1990). A number of studies also show that children of mothers with BPD are more likely to show a range of maladaptive outcomes such as emotion dysregulation, internalizing and externalizing behavior problems, low self-esteem, emotion regulation problems, BPD symptoms, higher rates of attention deficit hyperactivity disorders, impulse control disorders and mental disorders in general, symptoms of affective disorders, and insecure attachment (Barnow, Spitzer, Grabe, Kessler, & Freyberger, 2006; Crandell, Patrick, & Hobson, 2003; Eyden, Winsper, Wolke, Broome, & MacCallum, 2016; Feldman et al., 1995; MacFie & Swan, 2009; Petfield, Startup, Droscher, & Cartwright-Hatton, 2015; Weiss et al., 1996).

As already emphasized above, in order to gain a more comprehensive picture of child mental health, it would be desirable to not only investigate psychopathology but also child QoL in these families. However, studies investigating the impact of maternal mental health problems on child QoL are scarce. Some studies report negative effects of maternal psychopathology in general without distinguishing specific disorders or types of symptoms (Giannakopoulos et al., 2009; Jeske, Bullinger, Plaß, Petermann, & Wiegand-Grefe, 2009; Wiegand-Grefe, Werkmeister, Bullinger, Plass, & Petermann, 2012). One study by Wiegand-Grefe has shown more specifically that the severity of acute depressive symptoms negatively affects child QoL (Wiegand-Grefe, Jeske, Bullinger, Plaß, & Petermann, 2010). The effect of a full diagnosis of MDD in mothers has not previously been elucidated and has thus been addressed in the first paper of this dissertation (likewise, the effect of BPD on child QoL has not specifically been addressed to date, although it was also not subject of this dissertation).

### **2.3 Co-occurrence of a Maternal History of Maltreatment, Depression and Borderline Personality Disorder**

The comorbidity of MDD and BPD is a common phenomenon. Zanarini et al. (1998) reported that 83 % of patients with BPD show a comorbid lifetime diagnosis of MDD, which was significantly higher than in patients with other personality disorders. Comorbid MDD was more common in female patients with BPD (85 %) than in their male counterparts (76 %). Summarizing the results of different studies, Corruble et al. (1996) found rates of comorbid BPD between 10 and 40% in MDD out-patients and 10 and 30% in in-patients.

Patients with MDD or BPD also often report maltreatment experiences in their childhood. In a study of 358 BPD patients by Zanarini et al. (1997), over 90% reported having been abused or neglected in childhood. These rates of abuse were significantly higher than in a sample of patients with other personality disorders. Epidemiologic studies also indicate that early exposure to adverse experiences such as maltreatment increases the risk of developing MDD (Heim & Nemeroff, 2001). Studies in samples of MDD patients report rates of 68 % to 76 % of patients having experienced at least one form of maltreatment (Bernet & Stein, 1999; Dannehl, Rief, & Euteneuer, 2017; Negele, Kaufhold, Kallenbach, & Leuzinger-Bohleber, 2015).

The co-occurrence of ELM, MDD, and BPD becomes highly relevant when investigating the intergenerational effects of these risk factors in parents, given that all of them have been associated with an elevated risk of offspring psychopathology. It remains unclear whether these effects on child mental health can be attributable to each of these three risk factors or perhaps effects of maternal ELM would no longer be found when considering common sequelae like MDD or BPD. A few studies have engaged first attempts to address this issue: in the study by Miranda et al. (2011), maternal maltreatment history no longer predicted child externalizing symptoms when controlling for a number of parental mental disorders (across all DSM-IV diagnoses). Other studies still found significant effects when controlling for different aspects of parent symptomatology such as maternal psychological distress when investigating the effects of sexual abuse (Roberts et al., 2004) or depressive symptoms when investigating the effects of physical abuse (Thompson, 2007) on child psychopathology. Another line of research has investigated the mediating role of maternal psychological distress for the effects of maternal ELM on child psychopathology, finding significant effects (Collishaw et al., 2007; Min et al., 2013; Miranda, de la Osa, Granero, & Ezpeleta, 2013b; Myhre et al., 2014;



Rijlaarsdam et al., 2014; Roberts et al., 2004). Although these studies have made important contributions, they did not specifically attempt to disentangle the specific effects of ELM and the common sequelae of ELM, MDD and BPD on child mental health.

Thus, the present set of studies sought to address the specific contribution of ELM, MDD, and BPD to child mental health. As a first aim, it was evaluated whether ELM and MDD not only bear a risk for child psychopathology – which has previously been shown – but might also influence child QoL (Paper I). The second aim was to identify specific mediating pathways that might explain these intergenerational effects of ELM, MDD, and BPD and child mental health in terms of child QoL (Paper I, MDD and ELM only) and psychopathology (Papers II and III). Instead of considering ELM, MDD, and BPD separately or maternal psychopathology as a mediator for the effects of ELM – as previous research has done – we included these three maternal risk factors as equivalent predictors in one study (Paper I only ELM and MDD) and considered several potential mediators.

In order to further illuminate the second aim of this dissertation, the following chapter seeks to integrate previous findings on mediating pathways of the transmission of maternal ELM, MDD, and BPD into one combined transmission model. The focus will thereby be placed on distinct emotional and behavioral characteristics of the mother that may increase the child's vulnerability to mental health problems.

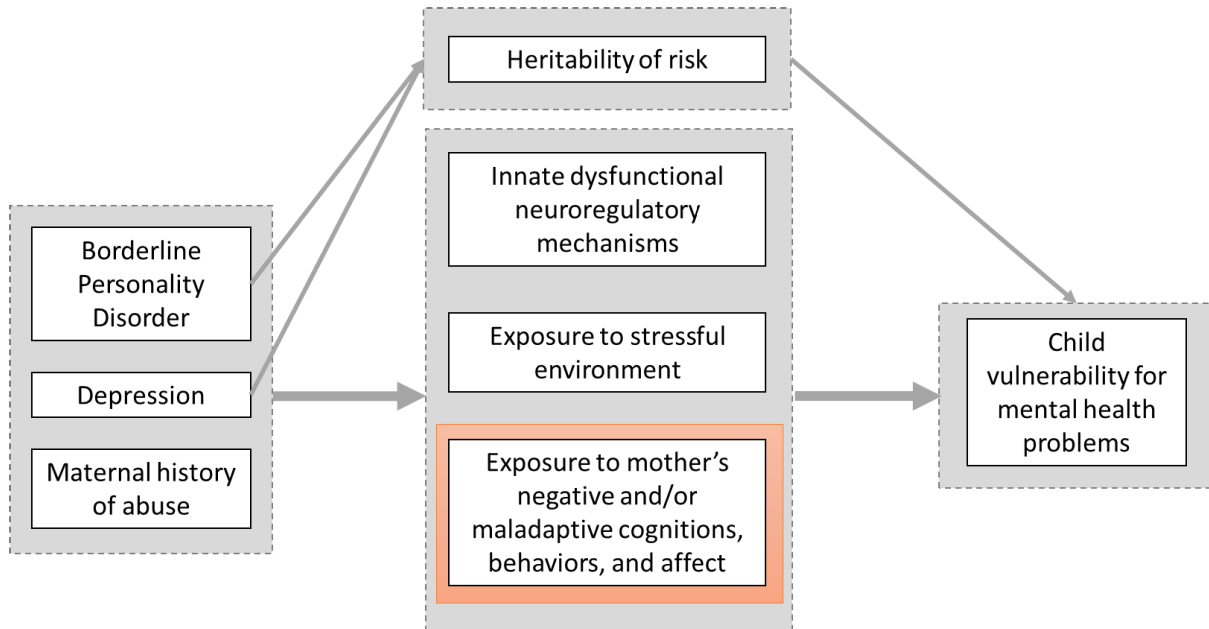
### 3. Mediating Pathways of Transmission

While overarching models of transmission for parental ELM and BPD are lacking (Bosquet Enlow et al., 2018), Goodman and Gotlib (1999) have proposed a comprehensive model for the transmission of maternal MDD on the functioning and development of children. Based on a literature review, they describe four mechanisms through which the vulnerability and risk of mental health problems in children may be increased: 1) genetic factors (heritability), 2) innate dysfunctional neuroregulatory mechanisms (due to maternal depression during pregnancy), 3) exposure to a stressful environment, and 4) exposure to the mother's maladaptive cognitions, behaviors, and emotions.

This model proposes general principles of transmission and may therefore be also applied to BPD and ELM (Figure 1), which will be briefly described as follows. Several mechanisms proposed in this combined model have already been addressed, whereby partly overlapping but also diverging findings emerged. First, a genetic component would not be likely to play a role in the transmission of ELM, but it has been found to play a role in the transmission of BPD (Skodol et al., 2002). Second, innate dysfunctional neuroregulatory mechanisms might also play a role for the children of mothers with BPD due to an abnormal neuroendocrine functioning during pregnancy (Lieb et al., 2004). Previous research has also shown that these mechanisms may play a role in the transmission of risk in mothers with ELM. To date, researchers have identified alterations in the biological stress regulation system (as the HPA-axis) in the offspring of traumatized parents (in the absence of own trauma exposure), such as lower cortisol levels and higher glucocorticoid receptor responsiveness (Lehrner et al, 2014; Yehuda, Teicher, Seckl 2007), higher sympathetic nervous system activation (Jovanovic Smith et al., 2011) and neurostructural alterations already observable at birth (Moog 2018). The investigation and partial identification of epigenetic pathways – meaning alterations in gene transcription or DNA function that may underlie these biological risk factors – represents a very recent advantage in the field (Yehuda & Lehrner, 2018). Third, similar to individuals who suffer from MDD, patients with BPD are more likely confronted with living in a more instable environment (Buck-Horstkotte, Renneberg, & Rosenbach, 2015). This instability may place their children at increased risk of developing psychopathology (Feldman et al., 1995). There is also evidence that lower social support, greater psychosocial adversity and a range of negative life events mediate the associations between maternal ELM and child mental health (Bosquet Enlow et al., 2018; Collishaw et al., 2007; Min et al., 2013; Miranda et al., 2013b).

The fourth proposed mechanism includes a number of related components and it represents the exposure to behavioral, cognitive or emotional characteristics of the mother, which have been summarized by Goodman and Gotlib (1999). This dissertation aims to provide

a more detailed insight into these types of mechanisms. The following sub-chapters will summarize literature specifically on certain individual emotional capacities of the parent (like empathy and emotion regulation), parenting behavior, and parental abuse potential, all of which have been proposed as mediators for the transmission of ELM, MDD, and BPD on child mental health.



*Figure 1:* Combined transmission model based on the depression transmission model by Goodman and Gotlib (1999) and expanded by effects of maternal borderline personality disorder and a history of maltreatment.

### 3.1 Parenting Behavior

Parenting characterized by the emotional availability of the mother and an emotional connection between the mother and child promotes secure child attachment and emotional development (Ziv IV, Aviezer, Gini, Sagi, & Karie, 2000). Observational studies suggest that an emotional unavailability of the mother triggers much greater distress in infants than her physical absence (Field et al., 2007; Field, Vega-Lahr, Scafidi, & Goldstein, 1986). Under certain conditions, this emotional supportive presence of the mother might be limited, mother-child interactions might be less attuned and the mother might no longer function as a “secure base” for the child (Ainsworth, Blehar, Waters, & Wall, 1978; Mahler, Pine, & Bergman, 1975). This might occur – for example – when maternal sensitivity is low or parenting stress levels are high. The present chapter will therefore summarize findings on sensitivity and parenting stress in mothers with ELM and MDD and their effects on child mental health. These two aspects of

parenting were considered as potential mediators for the effect on child QoL (Paper I). Studies have also reported effects of maternal BPD on child psychopathology via parenting style (Reinelt et al., 2013). However, as Paper I only addressed mothers with ELM and MDD, a detailed overview is only provided for these conditions.

### **3.1.1 Maternal Sensitivity**

Sensitivity describes the accurate perception, interpretation of and adequate response to the child's signals and communications and includes an authentic warm and positive appearance (Biringen, 2000). Several studies have already addressed the role of sensitivity in certain parental conditions. Mothers who experienced ELM and mothers with mental disorders like MDD are at a higher risk of showing lower sensitivity in interaction with their child (Campbell, Matestic, von Stauffenberg, Mohan, & Kirchner, 2007; Kluczniok et al., 2016; Zalewski, Cyranowski, Cheng, & Swartz, 2013). MDD has not only been associated with more negative parenting behavior when in acute state but even after the remission of depressive symptoms (reviews by Gelfand & Teti, 1990; Lovejoy, Graczyk, O'Hare, & Neuman, 2000).

Consequently, sensitivity could also function as a mediating pathway to child mental health. Previous research has already shown that mothers' and fathers' parenting behavior such as a lack of nurturance, monitoring and higher rejection mediate the effect of their acute depressive symptoms on child internalizing and externalizing problems (Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007). Moreover, less sensitive parenting mediates the effects of parental ELM on child psychopathology, whereby significant results have been found for harsh discipline, aggression and hostility towards the child (Collishaw et al., 2007; Rijlaarsdam et al., 2014; Thompson, 2007).

When including both ELM and MDD in one study to investigate the specificity of sensitivity as a mediating pathway for ELM and MDD, our group has shown that maternal sensitivity mediates the association of maternal MDD but not ELM on child emotional and behavioral problems (Bödeker et al., 2018). Thus, sensitivity seems to be more important for child psychopathology in mothers with MDD – as a common sequela of ELM – than for maternal ELM itself. As there is also some evidence indicating an association between low maternal sensitivity and low child QoL (Campbell, 1995), in the present dissertations it was interesting to also investigate the mediating role of maternal sensitivity for the effect of MDD and potentially ELM on child QoL (Paper I).

### **3.1.2 Maternal Parenting Stress**

Parenthood presents many new demands that carry the risk of parenting stress from childbirth onwards (Deater-Deckard, 1998). Parenting stress can be defined as a negative psychological reaction to the demands of parenthood when the parent perceives his/her resources (including psychological ones) as insufficient to meet the demands of being a parent (Deater-Deckard, 1998; Deater-Deckard & Scarr, 1996). It seems conceivable that such an aversive parental reaction may affect children. Accordingly, prior research has already established a link between elevated parenting stress and impaired child functioning in the areas of externalizing and internalizing behavior and social competence (Crnic, Gaze, & Hoffman, 2005; Eyberg, Boggs, & Rodriguez, 1993). Parenting stress and child behavioral problems may also have a bi-directional association, given that the behavior of the child might function as a stressor for the mother. Importantly, the available evidence suggests that regardless of the source of high parenting stress – which might also be the child him-/herself – it poses a risk for the mental health of children (Crnic et al., 2005; Morgan, Robinson, & Aldridge, 2002).

As highlighted above, child QoL is an important measure of child mental health, extending assessments of psychopathology to a more comprehensive picture of children's well-being in their everyday lives. To date, only limited efforts have been made to address the effects of parenting stress on child QoL: Kidwell et al. (2015) found that high parenting stress predicted low child general QoL. As QoL is a multi-dimensional construct including various aspects of life (Ravens-Sieberer et al., 2001), it would be interesting to ascertain what aspects are particularly affected by parental stress.

It is also known that early life stress – like experiencing ELM – may lead to higher levels of parenting stress later in life (Pereira et al., 2012). Similarly, evidence already exists that parenting stress is elevated in mothers with postnatal depression (Milgrom, 1996; Riva Crugnola et al., 2016) and parent depression in general (Salloum, Stover, Swaidan, & Storch, 2015). Consequently, parenting stress could also function as a mediator between MDD or ELM and child QoL, which has not been investigated to date. Thus, in Paper I we addressed the parenting stress next to maternal sensitivity as a potential mediator between maternal ELM and MDD and child QoL.

### **3.2 Individual Emotional Competences of the Mother**

A mother needs certain emotional competences to act as an adequate social partner for the child, meet the child's social and emotional needs and support the child's emotional development (Goodman & Gotlib, 1999). For example, in order to provide dyadic emotion co-regulation for her dysregulated infant, a mother would need adequate individual emotion

regulation strategies. This co-regulation is a prerequisite for the child's acquisition of his/her own emotion regulation strategies. Moreover, through social learning or modeling, children later acquire emotion regulation strategies that resemble those exhibited by their mothers (Goodman & Gotlib, 1999). In order to react to the child's emotional and physical needs and provide a nurturing environment, it would also be crucial to adopt his/her perspective and understand the child's cognitions and emotions. Therefore, this chapter addresses emotion regulation and empathy in mothers with ELM, MDD, and BPD as potential mediating pathways for intergenerational effects on their children (Papers II and III).

### **3.2.1 Maternal Emotion Regulation**

Emotion regulation is a critical competence for the initiation, motivation and organization of adaptive behavior and the prevention of stressful levels of highly negative affective states and maladaptive behavior (Cicchetti, Ackerman, & Izard, 1995). One of the most prominent features of BPD is emotion regulation problems (Glenn & Klonsky, 2009). MDD is primarily associated with other characteristics, although emotion regulation deficits also play a significant role in this type of disorder (Joormann & Stanton, 2016). Exposure to ELM has also been associated with an increased risk of emotion regulation problems in adulthood, probably due to the interruption of normative psychological development during childhood (Smith, Cross, Winkler, Jovanovic, & Bradley, 2014), which might also act as a risk factor for psychopathology in adulthood (Jennissen, Holl, Mai, Wolff, & Barnow, 2016; Kim & Cicchetti, 2010).

Emotion regulation problems may adversely affect parenting behavior and children's psychosocial development (Herr, Hammen, & Brennan, 2008). For example, parental emotion regulation deficits have been found to predict a more hostile and rejecting parenting style (Kohlhoff et al., 2016; Lorber, 2012; Saritaş, Grusec, & Gençöz, 2013) as well as a higher risk of child abuse (Crouch et al., 2018; Hiraoka et al., 2016; Smith et al., 2014). Interestingly, independent studies have found that emotion regulation difficulties thereby mediate the effects of ELM and BPD on abuse risk (Hiraoka et al., 2016; Smith et al., 2014).

Maternal emotion regulation deficits have also been found to predict child emotional and behavior problems mediated by child emotion regulation (Crespo, Trentacosta, Aikins, & Wargo-Aikins, 2017). Similarly, the association between maternal BPD symptoms and indicators of emotion regulation difficulties in infants has been found to be mediated by maternal emotion regulation difficulties (Gratz et al., 2014), which might in turn be a risk factor

for psychopathology and behavior problems in childhood (Cicchetti et al., 1995; Eisenberg et al., 2001; Suveg, Hoffman, Zeman, & Thomassin, 2009). However, since emotion regulation deficits have not only been reported in individuals with BPD but also in those with MDD and ELM, the specific role of emotion regulation for the intergenerational effects of these three maternal risk factors remains unclear. Thus, Paper II of this dissertation addressed the role of emotion regulation deficits in mothers with MDD, BPD, and ELM for elevated maternal abuse potential (see below) and child psychopathology.

### **3.2.2 Maternal Empathy**

Deficits in social cognition might be an essential risk factor for children of parents with ELM, MDD, and BPD. The maternal capacity to understand their children's mind, intentions and feelings, and react upon them has been associated with more secure attachment behavior in their children and identified as an important factor for promoting child mental health (Camoirano, 2017; Grienberger, Kelly, & Slade, 2005; Slade, Grienberger, Bernbach, Levy, & Locker, 2005).

Different definitions of empathy can be found in the literature. For some authors, the term 'empathy' exclusively describes the ability to share the feelings of others, whereas the ability to understand mental states (including emotional states) on a cognitive level is then referred to as the theory of mind (de Vignemont and Singer, 2006; Preckel et al., 2018). For others, empathy in general more broadly refers to an individual's affective or cognitive reaction to observing another person's experiences (Davis, 1983; de Vignemont & Singer, 2006). A general consensus exists that a more cognitive reaction – including reasoning about other people's mental states – and a more affective reaction – including the sharing of affective states and feeling of concern for others – can be distinguished (Davis, 1983; Preckel et al., 2018). Thus, empathy is often assessed on distinct dimensions taking into account the multi-dimensionality of the concept; for example, with the Interpersonal Reactivity Index (IRI) as a self-report measure (Davis, 1983). Affective dimensions of empathy assessed with the IRI are personal distress, which includes uncomfortable feelings when confronted with another's suffering, and empathic concern, reflecting compassion and concern for others. By contrast, cognitive components are perspective-taking, a measure of cognitive empathy that touches on the understanding of other people's emotional states, and fantasy, the tendency to imaginatively transpose oneself into fictitious characters.

Lower levels of cognitive empathy have been reported in patients with BPD and MDD, as well as individuals with ELM (New et al., 2012; Parlar et al., 2014; Schreiter, Pijnenborg, &

Aan Het Rot, 2013). Regarding affective empathy, most studies report higher levels of personal distress in individuals with MDD, BPD, and ELM (Guttman & Laporte, 2000; New et al., 2012; Parlar et al., 2014; Schreiter et al., 2013). Measures of empathic concern have yielded mixed results, with the majority of studies finding no effect in patients with MDD and BPD (New et al., 2012; Schreiter et al., 2013), although there is some evidence of impairments in individuals with ELM (Parlar et al., 2014). There is also growing evidence that impairments in maternal social cognition are associated with higher emotional and behavioral problems in children (Camoirano, 2017; Psychogiou, Daley, Thompson, & Sonuga-Barke, 2008). However, the question whether affective and cognitive empathy mediate the association between maternal risk factors like ELM, MDD, and BPD and child psychopathology remains unclear and has thus been addressed in Paper III of this dissertation.

### **3.3 Maternal Abuse Potential**

Substantiated maltreatment rates – as measured by parent and child interviews (Miranda et al., 2011; Plant et al., 2013; Thompson, 2007) or child protective service records (Babcock Fenerci & Allen, 2018) – are a popular way of assessing the risk of child abuse in different populations. As substantiated cases of maltreatment may only reflect a proportion of maltreating parents – thus probably causing an underreporting of these problems (Cross & Casanueva, 2009) – another approach that has gained interest is assessing child abuse potential. The parental risk of maltreating one's offspring is thereby measured by assessing several parental characteristics associated with violence against children, such as with the Child Abuse Potential Inventory (CAPI; Milner, 1994). These characteristics include indicators of fatigue and distress, low self-esteem, a rigid parenting style and rigid expectations about the child, unhappiness and problems with several aspects of life including the child (Deegener, Spangler, Körner, & Becker, 2009). The CAPI was originally developed to assess the risk of physical abuse, although studies have also reported association with other forms of abuse and neglect (Deegener et al., 2009). Several studies have shown that the CAPI as a measure of abuse potential could correctly classify abusive and comparison parents with rates of above 90 % (see Milner, 1994 for overview; Milner & Robertson, 1989; Milner & Wimberley, 1980).

For parents with a history of ELM, an intergenerational “cycle of abuse” has been discussed (Widom, 1989). A recent meta-analysis by Assink et al. (2018) including 84 studies between 1975 and 2017 found solid evidence of the intergenerational transmission of abuse and showed that the risk of children of abused parents experiencing ELM themselves was three times higher than in the general population. In line with higher substantiated abuse rates in parents with ELM, elevated child abuse potential has also been reported in these parents (Romero-Martínez, Figueiredo, & Moya-Albiol, 2014; Smith et al., 2014).



Parental MDD and BPD have also been identified as predictors of abusive parenting, although fewer studies have been published than for the effects of ELM. Higher rates of BPD features have been reported in samples of mothers with substantiated cases of child abuse (Laulik et al., 2014) and have been associated with elevated child abuse potential (Hiraoka et al., 2016). Similarly, studies have shown that MDD may be a potential risk factor for child abuse (Burke, 2003; Shay & Knutson, 2008).

An elevated abuse potential reflects a familial context of high risk of child abuse. We argue that such a context may also be harmful for child mental health. To date, extensive research has demonstrated the negative effects of child abuse on child mental health (Maguire et al., 2015; Naughton et al., 2013), although the question whether child abuse potential is linked to child mental health has received almost no attention. Only Haskett et al. (1995) studied a mixed sample of parents who had been either identified as demonstrating a high risk of maltreatment or showed substantiated cases of maltreatment (with majority of the latter) and found associations with child psychopathology. Child maltreatment has also been discussed as a potential mediator between parental ELM and offspring mental health problems (Plant, Pawlby, et al., 2017). However, to date studies are scarce and the results have been mixed (Babcock Fenerci & Allen, 2018; Miranda et al., 2011; Thompson, 2007), whereby no firm conclusions can be drawn (Plant et al., 2013). Thus, questions that have been left unaddressed concern whether mere child abuse potential has a negative impact on child mental health and whether abuse potential even mediates the association between parental risk factors such as ELM, MDD, and BPD and child psychopathology.

Interestingly, independent studies have shown that the association of BPD features and ELM with child abuse potential is mediated by difficulties in emotion regulation (Hiraoka et al., 2016; Smith et al., 2014). Even though emotion regulation problems also play a significant role in depression (Joormann & Stanton, 2016), this issue has not yet been investigated for MDD. Moreover, because these existing studies have not accounted for the co-occurrence of ELM and BPD or MDD, it remains unclear whether the mediating role of emotion regulation difficulties for effects of ELM might not actually be due to mental disorders resulting from ELM that are characterized by these emotion regulation deficits. Thus, Paper II of this dissertation addressed the effect of maternal abuse potential on child psychopathology and the mediating role of emotion regulation deficits and abuse potential for the effects of maternal ELM, MDD and BPD child psychopathology.

#### 4. Aims of this Dissertation and Overview of Papers

As shown in the previous sections, the current research mostly treats parental MDD, BPD, and ELM as isolated predictors of child mental health, not considering their comorbidity and co-occurrence. The majority of research has focused on child psychopathology as outcomes, not considering QoL as an important aspect of child mental health. Moreover, similar pathways of transmission have been proposed for these parental risk factors. The specific contribution of MDD, BPD, and MDD to child mental health and mediating pathways remains unclear. We have already presented an overarching and combined transmission model based on the depression transmission model by Goodman and Gotlib (1999) above (Figure 1) as a guiding framework. Derived from this model and based on the literature review of the previous chapter, Figure 2 (bottom) shows a more detailed research model focusing specifically on maternal emotional and behavioral characteristics as a pathway of transmission.

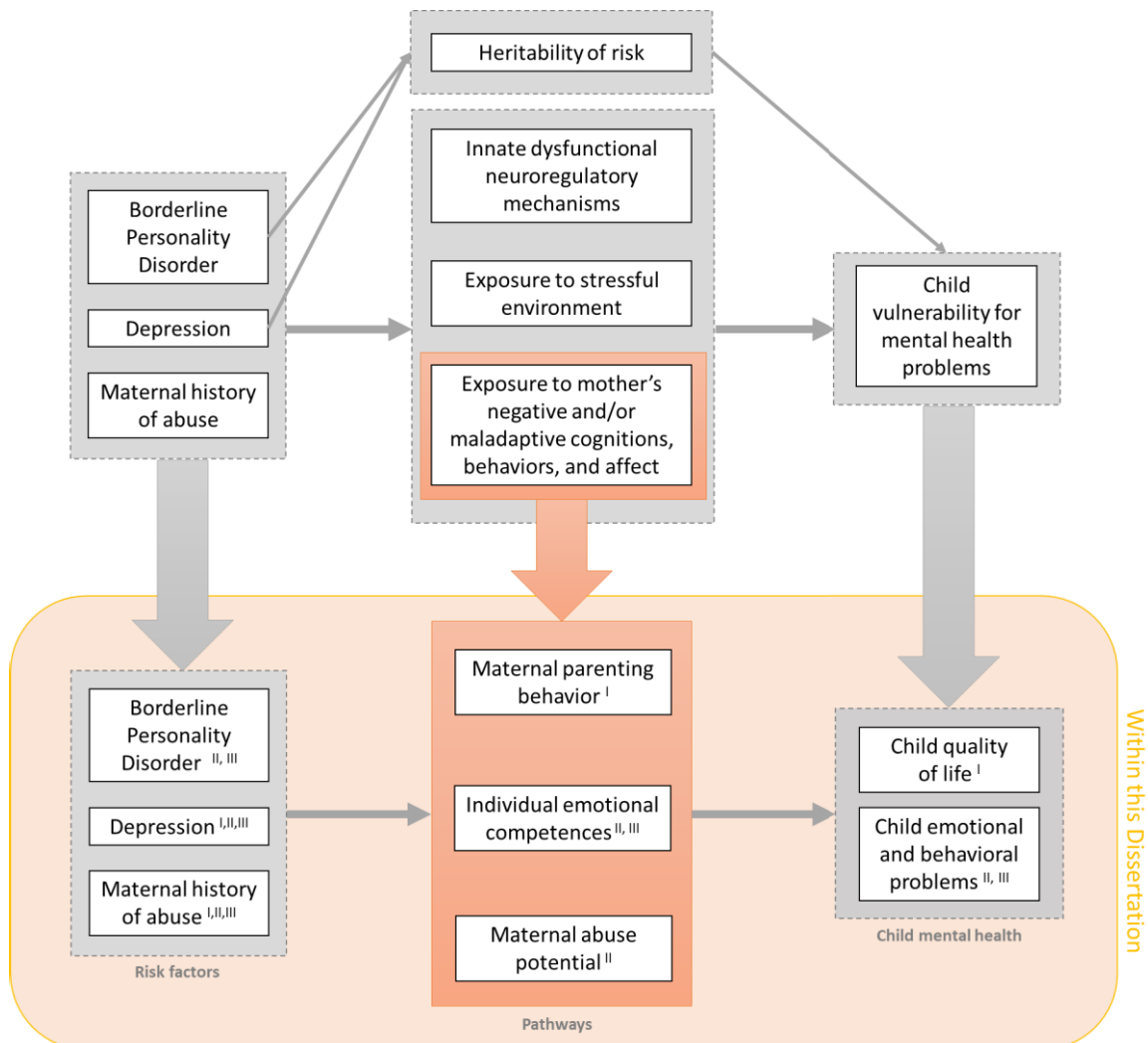


Figure 2: Research model derived from the overarching transmission model (Figure 1) focusing on maternal emotional and behavioral characteristics as a pathway of transmission. Roman numerals indicate the different papers in this dissertation.

This dissertation incorporates three studies examining different aspects of intergenerational transmission processes that are embedded in the theoretical framework of our model (Figure 2). The *first aim* was to identify whether maternal ELM and MDD not only bear a risk of child psychopathology – which has previously been shown – but might also affect child QoL (Paper I). Given that both maternal ELM and MDD have been associated with child psychopathology – even when both considered in one study (Bödeker et al., 2018; Goodman et al., 2011) – we hypothesized that:

- I) Both higher severity of a maternal history of ELM and a maternal diagnosis of MDD predict lower child QoL (Paper I).

A *second aim* was to identify mediating pathways leading from maternal ELM, MDD, and BPD to child mental health regarding child QoL (Paper I, ELM and MDD only) and child psychopathology (Paper II, III). Concerning the effects on child QoL, our hypothesis was that:

- II) Maternal sensitivity and parenting stress mediate the effects of ELM and MDD on child QoL, given that severity of ELM and diagnosis of MDD both predict lower sensitivity and higher parenting stress, which in turn predict lower child QoL (Paper I).

Before addressing the mediating role of abuse potential, we wanted to disentangle the separate contribution of maternal ELM, MDD, and BPD to this potential pathway of transmission. Because ELM, MDD, and BPD have all independently been shown to increase the risk of child abuse (Hiraoka et al., 2016; Shay & Knutson, 2008; Smith et al., 2014), we hypothesized that:

- III) Maternal diagnosis of MDD, diagnosis of BPD, and higher severity of ELM all predict higher levels of abuse potential (Paper II).

We thereby addressed the specific role of emotion regulation problems, which have been identified as a mediator for the effect of ELM and BPD on abuse potential in independent studies (Hiraoka et al., 2016; Smith et al., 2014). However, since MDD and BPD are common sequelae of ELM, the link between ELM and emotion regulation may no longer persist when these disorders are accounted for. Thus, our hypothesis was that:

- IV) The effects of BPD and MDD – but not ELM – on abuse potential are mediated by emotion regulation difficulties when considered in one study, given that the diagnoses of BPD and MDD both lead to higher emotion regulation difficulties, which in turn lead to higher abuse potential (Paper II).

In order to test whether emotion regulation difficulties and abuse potential are potential pathways of transmission to child psychopathology, the following hypotheses were formulated:

- V) Higher maternal emotion regulation difficulties predict higher child psychopathology (Paper II);
- VI) Higher maternal abuse potential predicts higher child psychopathology (Paper II);
- VII) Emotion regulation problems and abuse potential mediate the effects from maternal ELM, MDD, and BPD on child psychopathology, given that higher severity of ELM, diagnosis of MDD and diagnosis of BPD lead to higher emotion regulation problems, which in turn lead to higher abuse potential and subsequently higher child psychopathology (Paper II).

Finally, we wanted to disentangle the effects of ELM, MDD, and BPD on different facets of empathy and investigate whether alterations in maternal empathy mediate the effects of maternal ELM, MDD, and BPD on child psychopathology. Even though previous results have been somewhat mixed especially concerning parental ELM (see chapter 3.2.2), we developed the following hypotheses:

- VIII) The maternal severity of ELM, diagnosis of MDD, and diagnosis of BPD predict higher levels of personal distress and lower levels of perspective-taking, while the severity of ELM also predicts lower empathic concern (Paper III).
- IX) Personal distress and perspective-taking mediate the effects of maternal ELM, MDD, and BPD on child psychopathology, given that higher severity of ELM and diagnosis of MDD and diagnosis of BPD lead to higher personal distress and lower perspective-taking, which in turn lead to higher child psychopathology. Empathic concern also mediates the effect of ELM on child psychopathology, given that higher severity of ELM also leads to lower empathic concern, which in turn leads to higher child psychopathology (Paper III).

All these studies were carried out within the framework of the UBICA (Understanding and Breaking the Intergenerational Cycle of Abuse) multicenter project. The overall goal of the project was to understand the mechanisms of transmission of abuse and psychopathology on the next generation, which might promote developing effective interventions for breaking these intergenerational cycles. UBICA was funded by the German Federal Ministry of Education and Research (BMBF) and the German Research Foundation (DFG) and it ran from 2012 to 2016. The participants were women with ELM and/or remitted MDD and/or BPD and their five- to

twelve-year-old children. The project was set at the Department of Child and Adolescent Psychiatry and the Department of General Psychiatry of the University Hospital Heidelberg and the Department of Child and Adolescent Psychiatry, Psychosomatics, and Psychotherapy and the Department of Psychiatry and Psychotherapy at Charité - Universitätsmedizin Berlin.

We chose mothers with depression in remission (rMDD) to avoid the effects of acute depression overriding those of ELM and BPD, interfering with participation in the study or causing bias in response behavior (Fergusson, Lynskey, & Horwood, 1993). Thus, patients with MDD in remission were chosen as a more adequate comparison group than acute MDD. Accordingly, we chose mothers with BPD who had to be stable in terms of being non-suicidal and currently not in in-patient treatment.

#### **4.1 Paper I: “Effects of maternal history of depression and early life maltreatment on children's health-related quality of life”**

Dittrich K, Fuchs A, Bempohl F, Meyer J, Fuehrer D, Reichl C, Reck C, Kluczniok D, Kaess M, Hindi Attar C, Moehler E, Bierbaum AL, Zietlow AL, Jaite C, Winter SM, Herpertz SC, Brunner R, Boedeker K, Resch F. (2018) Effects of maternal history of depression and early life maltreatment on children's health-related quality of life. *Journal of Affective Disorders*, 225, 280-288. doi: 10.1016/j.jad.2017.08.053.

##### *Theoretical Background*

There is a well-established link between maternal MDD and child psychopathology (Goodman & Gotlib, 1999), while similar effects have been found for a maternal history of ELM (Plant, Pawlby, et al., 2017). However, studies investigating the relationship of children's QoL and maternal MDD are scarce (Wiegand-Grefe et al., 2010) and none have explored the association with maternal ELM. The aim of the present study was to investigate the effects of a maternal history of ELM and MDD on children's HRQoL and identify mediating factors accounting for these effects. We investigated HRQoL (as opposed to child psychopathology) to gain a more comprehensive picture of child mental health in these families, as it comprises several aspects of a person's well-being and function in everyday life (Ravens-Sieberer et al., 2001). Maternal ELM and MDD have been related to lower levels of sensitivity and higher levels of parenting stress (Campbell et al., 2007; Driscoll & Easterbrooks, 2007; Milgrom, 1996; Pereira et al., 2012), which in turn have been associated with low child QoL (Campbell, 1995; Kidwell et al., 2015). Thus, both maternal sensitivity and parenting stress were considered as potential mediators.

### *Methods*

Our study involved 194 mothers with and without a history of MDD and/or ELM and their children between five and twelve years of age. Interview measures were used to assess maternal psychopathology (Mini-International Neuropsychiatric Interview; Sheehan et al., 1997) and a history of ELM (Childhood Experience of Care and Abuse Interview; Bifulco, Brown, & Harris, 1994; Kaess et al., 2011). Children's HRQoL was assessed by maternal proxy and child self-ratings using the KIDSCREEN-27 (The Kidscreen Group Europe, 2006). The KIDSCREEN provides parallel forms of parental proxy rating and child self-rating and covers five dimensions of HRQoL: physical well-being, psychological well-being, autonomy and parent relation, peers and social support, and school environment. Moreover, the KIDSCREEN-27 contains the ten items of the shorter KIDSCREEN-10 version, which can thus be used as a global score of HRQoL.

We considered maternal sensitivity and maternal parenting stress as potential mediators. Maternal sensitivity was assessed during a standardized playroom setting and rated according to the Emotional Availability Scales (Biringen, 2008) by at least two trained coders. We assessed parenting stress with the Eltern-Belastungs-Inventar (Tröster, 2011), the German adaptation of the Parenting Stress Index (Abidin, 1995), which is an established self-report instrument. Regression analyses were conducted with each KIDSCREEN dimension as an outcome. Mediation analyses with sensitivity and parenting stress as parallel mediators were solely run for those KIDSCREEN dimensions that showed significant effects in the regression analyses.

### *Major findings*

We found a negative effect of maternal MDD – but not maternal ELM – on child HRQoL. These results extend the existing literature on the intergenerational effects of parental MDD on child psychopathology (Goodman & Gotlib, 2002) and acute depressive symptoms on child QoL (Wiegand-Grefe et al., 2010), as we investigated child HRQoL in children of mothers with MDD in remission. While previous research has shown an effect of maternal ELM on child psychopathology (Plant, Pawlby, et al., 2017) – including when considering co-occurring MDD (Bödeker et al., 2018) – it had no effect on child QoL in our study. Our results suggest that regarding everyday functioning, maternal MDD – which is a common sequela of ELM – plays a more important role for these children than maternal ELM in isolation.

In our study, maternal MDD had significant negative effects on the child HRQoL dimensions of physical well-being, autonomy and parent relation, and school environment. Children of mothers with a history of MDD may express stress with psychosomatic complaints,

could be less physically active, or engage less in child's health-promoting behaviors, resulting in lower physical well-being. The effects on autonomy and parent relation could be explained by the negative effects of maternal MDD on parenting behavior (Lovejoy et al., 2000) and emotional availability in mother-child interactions (Kluczniok et al., 2016). QoL in the school environment might be especially impaired as the school context poses particular demands on child functioning and maternal MDD has also been related to lower levels of child social competence, self-esteem and social and academic adjustment problems at school (Cummings & Davies, 1994).

Maternal parenting stress mediated the negative effects of maternal MDD on child global HRQoL on all of the dimensions tested: global HRQoL, autonomy and parent relation, school environment (child and mother rating in each) and physical well-being (child rating) – i.e. maternal MDD predicted higher parenting stress, which in turn predicted lower child QoL on these dimensions. Sensitivity mediated the negative effects of maternal MDD on child global HRQoL, as well as the dimensions of autonomy and parent relation and school environment (mother ratings only) – i.e. maternal MDD predicted lower sensitivity, which in turn predicted lower child QoL on these dimensions. Other researchers have shown that parenting stress predicts more authoritarian parenting behavior (Deater-Deckard & Scarr, 1996), which could lead to child problems in the aforementioned areas. Furthermore, as high parenting stress represents a lack of parental resources (Deater-Deckard, 1998), it may limit the parental ability to meet the child's needs in daily contexts. The mother may also be a model for insufficient stress coping, leading to a lack of stress-coping skills in the child. Maternal sensitivity is one of the main determinants of secure attachment between the mother and child (De Wolff & Van Ijzendoorn, 1997) and it may thus affect the parent relation. It also holds fundamental significance for mental health as it buffers against anxiety and promotes stress coping (Mikulincer & Shaver, 2012), which might affect child HRQoL in the school environment.

#### **4.2 Paper II: “Child abuse potential in mothers with early life maltreatment, borderline personality disorder and depression”**

Dittrich K, Boedeker K, Kluczniok D, Jaite C, Hindi Attar C, Fuehrer D, Herpertz SC, Brunner R, Winter SM, Heinz A, Roepke S, Heim C, BERPohl F. (2018) Child abuse potential in mothers with early life maltreatment, borderline personality disorder and depression. *British Journal of Psychiatry*, 213 (1), 412-418.

### *Theoretical Background*

Parental ELM, MDD, and BPD have independently been shown to increase the risk of child abuse (Hiraoka et al., 2016; Shay & Knutson, 2008; Smith et al., 2014). Emotion regulation problems may adversely affect children's psychosocial development and parenting behavior (Herr et al., 2008). Deficits in emotion regulation have also been identified as a mediator for the effect of ELM and BPD on abuse potential in independent studies (Hiraoka et al., 2016; Smith et al., 2014). The role of emotion regulation difficulties as a mediator for the effect of MDD has not been investigated. Moreover, no study to date has accounted for the co-occurrence of these risk factors in one analysis, even though BPD and MDD are known as common sequelae of ELM (Heim & Nemeroff, 2001; Zanarini, 2000). Although extensive research has demonstrated the negative effects of child abuse on mental health (Maguire et al., 2015; Vachon, Krueger, Rogosch, & Cicchetti, 2015), there is a lack of studies investigating the effects of abuse potential on child mental health. This study aimed to (a) disentangle the effects of maternal ELM, MDD and BPD on abuse potential, (b) test the mediating role of emotion regulation difficulties for these effects, and c) explore the effect of maternal emotion regulation difficulties and abuse potential on child psychopathology.

### *Methods*

The research design included 114 mothers with/without ELM, BPD and MDD in remission and their children between five and twelve years of age, who were part of the UBICA project in Berlin. We used clinical interviews to assess maternal psychopathology (International Personality Disorder Examination: Mombour et al., 1996; Mini-International Neuropsychiatric Interview: Sheehan et al., 1997) and a history of ELM (Childhood Experience of Care and Abuse Interview; Bifulco et al., 1994; Kaess et al., 2011). We administered the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004) and the German version of the Child Abuse Potential Inventory (Deegener et al., 2009; Milner, 1994), which are self-report questionnaires. The CAPI assesses multiple factors associated with an elevated risk of abuse. Child psychopathology was assessed using the Teacher Report Form (Achenbach, 1991a; Arbeitsgruppe Deutsche Child Behavior Checklist, 1993), which is a teacher report on child emotional and behavioral problems. A path analysis was conducted to investigate the multiple associations between our variables and investigate the significance of indirect effects in the model.

### *Major findings*

The severity of ELM, diagnosis of MDD, and diagnosis of BPD all predicted higher abuse potential. We found indirect effects of BPD and MDD on child abuse potential with the



severity of emotion regulation difficulties acting as a mediator. More precisely, a maternal diagnosis of MDD and a maternal diagnosis of BPD predicted higher emotion regulation difficulties, which in turn predicted higher abuse potential. The severity of ELM had a direct effect on abuse potential, although no indirect effects emerged via emotion regulation. This suggests that the previously-observed mediation effect of emotion regulation difficulties in ELM (Smith et al., 2014) was at least partly related to co-occurring disorders like MDD and BPD that are characterized by emotion regulation difficulties (Glenn & Klonsky, 2009; Joormann & Stanton, 2016). Furthermore, our findings support previous results identifying emotion regulation as a mediator for BPD (Hiraoka et al., 2016) and extend them as we controlled for ELM – a frequent precursor of BPD – and MDD, which shows high comorbidity with BPD (Zanarini et al., 1998). Regarding maternal MDD, this is the first study to address the role of emotion regulation in relation to abuse potential.

Furthermore, an elevated abuse potential predicted higher psychopathology in the child, which extends existing literature on child mental health problems in substantiated cases of child abuse (Naughton et al., 2013). Emotion regulation difficulties did not predict child psychopathology. The indirect effects of ELM via abuse potential and MDD and BPD via emotion regulation and abuse potential on child psychopathology were not significant (only trend towards significance). As our sample size was quite limited for serial mediation analyses, an investigation involving larger sample sizes would be desirable.

We conclude that an accumulation of familial risk factors for abuse may affect child well-being. Elevated emotion regulation difficulties may be a risk factor for higher abuse potential specifically in mothers with common sequelae of ELM, namely MDD and BPD. An elevated abuse potential may in turn lead to child mental health problems. Thus, an elevated abuse potential may be one potential mechanism for intergenerational effects of maternal ELM and psychopathology on child well-being.

#### **4.3 Paper III: “Alterations of empathy in mothers with early life maltreatment, depression and borderline personality disorder and their effects on child psychopathology”**

Dittrich, K., BERPPOHL, F., KLUCZNIOK, D., HINDI ATTAR, C., JAITE, C., FUCHS, A., NEUKEL, C., HERPERTZ, S.C., BRUNNER, R., WINTER, S.M., ROEPKE, S., KAESS, M., HEIM, C., BOEDEKER, K. (2019). Alterations of empathy in mothers with early life maltreatment, depression and borderline personality disorder and their effects on child psychopathology. *Psychological Medicine*. Advance online publication.

### *Theoretical Background*

ELM, MDD, and BPD have been associated with deficits in different aspects of empathy. The Interpersonal Reactivity Index (IRI; Davis, 1983) assesses trait empathy on four different dimensions: *personal distress*, describing uncomfortable feeling when confronted with the suffering of another person; *empathic concern*, compassion and concern for others; *perspective-taking*, the understanding of other people's mental states; and *fantasy*, the tendency to imaginatively transpose oneself into fictitious characters. The majority of studies have reported higher levels of personal distress in individuals with ELM, MDD, and BPD (Guttman & Laporte, 2000; New et al., 2012; Parlar et al., 2014; Schreiter et al., 2013). Lower levels of empathic concern have been found in individuals who experienced ELM (Parlar et al., 2014), but mostly not for MDD and BPD (Guttman & Laporte, 2000; New et al., 2012; Schreiter et al., 2013). Results on perspective-taking are less consistent, although a number of studies have found lower levels in individuals with ELM, MDD, and BPD (Harari, Shamay-Tsoory, Ravid, & Levkovitz, 2010; New et al., 2012; Parlar et al., 2014; Schreiter et al., 2013). None of the studies investigating trait empathy with the IRI have found effects on fantasy. A lack of maternal empathy has also been related to child behavioral problems (Psychogiou et al., 2008). As ELM, BPD, and MDD often co-occur (Heim & Nemeroff, 2001; Zanarini et al., 1998, 1997), we aimed to identify dissociable effects on empathy due to these three factors. In addition, we aimed to investigate their indirect effects via empathy on child psychopathology.

### *Methods*

We included 251 mothers with and without MDD (in remission), BPD and ELM and their children aged five to twelve, who participated in the UBICA project in Berlin and Heidelberg. Interview measures were used to assess maternal psychopathology (International Personality Disorder Examination: Mombour et al., 1996; Mini-International Neuropsychiatric Interview: Sheehan et al., 1997) and a history of ELM (Childhood Experience of Care and Abuse Interview; Bifulco et al., 1994; Kaess et al., 2011). We used the IRI (Davis, 1983) as a measure of empathy and the Child Behavior Checklist (Achenbach, 1991b; Arbeitsgruppe Deutsche Child Behavior Checklist, 1998) as a measure of child psychopathology. We ran regression analyses with ELM, MDD, and BPD as predictors and each of the four empathy dimensions as outcomes. Mediation analyses were performed for the maternal empathy dimensions that were significantly affected by ELM, MDD, or BPD to investigate indirect effects of these maternal risk factors on child psychopathology via empathy.

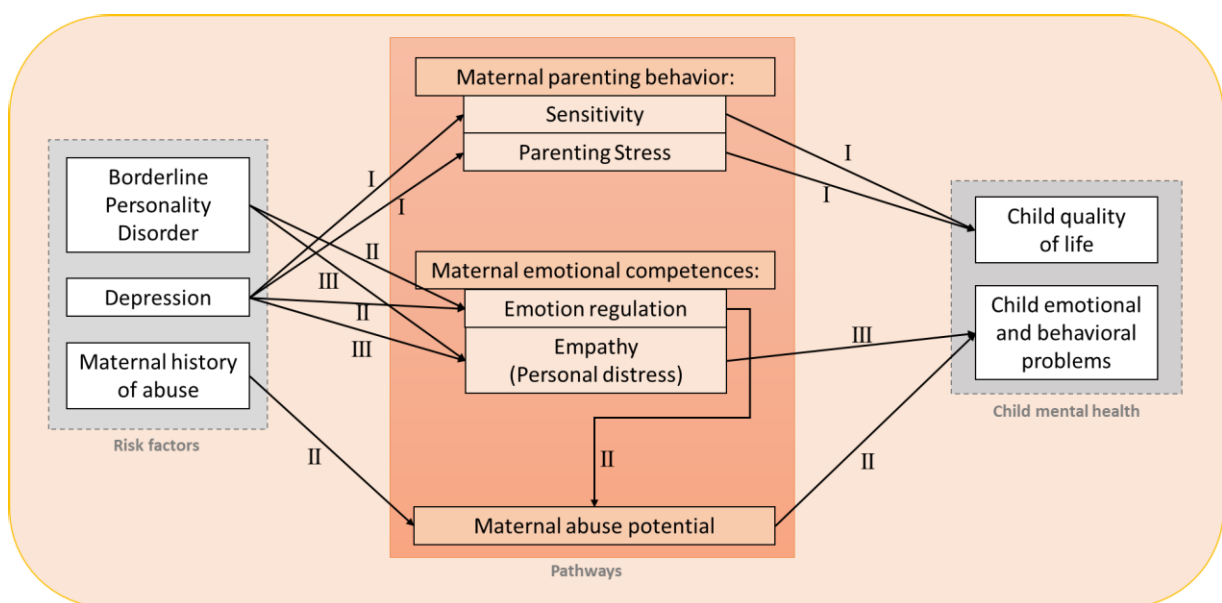
*Major findings*

Having included all three factors (ELM, MDD, BPD) in one analysis, we found MDD and BPD – but not ELM – to predict higher personal distress. Lower levels of perspective-taking were predicted by maternal BPD, but not by MDD or the severity of ELM. We found no effects of any maternal variables on empathic concern or fantasy. The results on MDD and BPD are in line with previous research (Guttman & Laporte, 2000; New et al., 2012; Schreiter et al., 2013), although these findings are extended by including ELM as a common precursor and accounting for the comorbidity of BPD and MDD. While there was a lack of studies addressing the effects of ELM on empathy when accounting for co-occurring mental disorders, we have closed this gap and found no effects for ELM on any of the empathy dimensions.

Interestingly, personal distress in MDD and BPD but not perspective-taking in BPD mediated the effect on child psychopathology. More precisely, both MDD and BPD predicted higher personal distress, which in turn predicted higher child psychopathology. High personal distress may lead to stress, aggression, withdrawal and non-social behaviors during emotional interpersonal situations (Schreiter et al., 2013; Singer & Klimecki, 2014), which might hold strong importance for the close relationship between the mother and child. Mothers might interpret their child's emotional reactions as stressful and aversive and may react with withdrawal and aggression instead of comforting behavior. Moreover, when the mother shows intense emotional reactions to the child's emotional expressions, the child may experience less dyadic emotion co-regulation. This in turn might impair the child's emotional development and acquisition of one's own appropriate emotion regulation strategies and impair mental health.

## 5. General Discussion

A maternal history of ELM, MDD, and BPD have all been linked to mental health problems in children. One major problem of these research efforts is that these maternal conditions that pose a risk for child mental health – namely maternal ELM, MDD, and BPD – often co-occur. Similar mediating pathways have been proposed for all three risk factors but not integrated in one model. Thus, the present set of studies sought to address the specific contribution of ELM, MDD, and BPD to child mental health and identify mediating pathways. As a first aim, it was evaluated whether ELM and MDD not only bear a risk for child psychopathology – which has previously been shown – but might also affect child QoL, which is another important aspect of mental health (Paper I). The second aim was to identify specific mediating pathways that might explain these intergenerational effects of ELM, MDD, and BPD on child mental health regarding child QoL (Paper I, MDD and ELM only) and psychopathology (Papers II and III). Instead of considering ELM, MDD, and BPD separately or maternal psychopathology as a mediator for the effects of ELM – as previous research has done – we included these three maternal risk factors as equivalent predictors in one study (Paper I only ELM and MDD) and considered several potential mediators. This work thereby focused on maternal emotional and behavioral characteristics like parenting behavior, emotional competences and abuse potential in mothers with ELM, MDD and BPD as mediators for the effects on child mental health. The results are integrated in one combining model (Figure 3) and interpreted in further detail in the following sections.



*Figure 3.* Model summarizing the results of the three papers included in this dissertation. All depicted arrows represent significant findings. Roman numerals indicate the different papers in this dissertation.

## **5.1 Effects of ELM, MDD, and BPD on Child Mental Health**

Regarding our first aim, we found that MDD not only bears a risk of increased child psychopathology – which has previously been shown before by other researchers (Goodman et al., 2011; Plant, Pawlby, et al., 2017) – but that it might also affect child QoL. There was a negative effect of maternal MDD on child QoL in both child and maternal ratings of child QoL (Paper I). ELM had no effect on child QoL in our study. Thus, our first hypothesis that both ELM and MDD would have an effect on child QoL was only partially confirmed. This seems to hold particular importance as previous research has shown that maternal ELM has an impact on child psychopathology, including when controlling for co-occurring MDD (Bödeker et al., 2018). The diverging results between child QoL and child psychopathology underline the notion of considering both aspects of health as distinct outcomes. One possible conclusion might be that while both ELM and MDD pose a risk of child psychopathology, only MDD but not ELM may cause impairments regarding the child's everyday functioning as perceived by the child him-/herself.

We considered various dimensions of child QoL to further explore which areas of everyday functioning might be affected. Children of mothers with MDD showed lower QoL in the dimensions of parent relation and autonomy, school environment, and physical well-being, whereas the dimensions of psychological well-being and peers and social support remained unaffected by maternal MDD. This might suggest that the effects of maternal MDD are related to problems in parenting, academic competencies of the child and psychosomatic complaints or physical activity (see Paper I for further detail). Future research might elucidate why certain aspects of QoL are more strongly affected than others. However, mediation analyses may already help to further understand these findings, which leads to the results regarding the next aim of this dissertation.

## **5.2 Mediating Pathways from ELM, MDD, and BPD to Child Mental Health**

### **5.2.1 Sensitivity and Parenting Stress as Mediators for the Effect on Child QoL**

The second aim of this dissertation was to identify specific mediating pathways that might explain the intergenerational effects of ELM, MDD, and BPD on child mental health. Regarding the effects of maternal ELM and MDD on child QoL, we considered parenting – more precisely, maternal sensitivity and parenting stress – as potential mediators (Paper I). Both sensitivity and parenting stress emerged as significant mediators for the association between maternal MDD and child QoL. As neither direct nor indirect effects of maternal ELM on child

QoL were found, our second hypotheses that maternal sensitivity and parenting stress would function as mediators for both ELM and MDD was partially confirmed.

Sensitivity – which has been assessed during the mother-child interaction – represents an authentic, warm and positive appearance towards the child and an accurate perception, interpretation, and adequate response to the child's signals and communications. Low sensitivity may affect the supportive presence of the mother, which normally buffers against anxiety and might promote stress coping (Mikulincer & Shaver, 2012) and a positive child-parent relation in general. Parenting stress represents the subjective perception of the mother that her resources (including psychological ones) are insufficient to meet the demands of being a parent (Deater-Deckard, 1998; Deater-Deckard & Scarr, 1996). Limited parental resources and a lacking model for functional stress coping might also limit the child's ability to cope with everyday life requirements. A mother who is permanently experiencing stress may have fewer resources available to meet the child's emotional needs. This might explain why not only global child QoL but also especially the dimensions of parent relation and autonomy and school environment were affected by maternal sensitivity and parenting stress. Children may experience their mothers as less supporting for the coping of everyday life struggles, which might impair the mother-child relationship. The school environment could be an especially challenging context for children in this age group. Parenting stress has also been associated with more authoritarian parenting behavior (Deater-Deckard & Scarr, 1996), which could lead to more conflicts between mothers and their children.

### **5.2.2 Emotion Regulation, Empathy, and Abuse Potential as Mediators for the Effect on Child Psychopathology**

Concerning the effects of ELM, MDD, and BPD on child psychopathology, we considered maternal emotional competences – namely emotion regulation (Paper II) and empathy (Paper III), as well as child abuse potential (Paper II) – as possible mediators. We also highlighted the role of emotion regulation difficulties as a potential pathway to elevated abuse potential (Paper II).

#### **5.2.2.1 Emotion Regulation and Abuse Potential**

While all three maternal conditions – ELM, MDD, and BPD – predicted higher abuse potential, emotion regulation deficits only functioned as a mediator for this effect for MDD and BPD (Paper II). This confirms our third and fourth hypotheses. It leads to the conclusion that

emotion regulation is a specific pathway for MDD and BPD – both of which are common sequelae of ELM – but not for ELM itself. Emotion regulation deficits is a prominent feature of BPD (Glenn & Klonsky, 2009) and has previously been shown to mediate the effect of maternal BPD on abuse potential (Hiraoka et al., 2016). Our study indicates that emotion regulation plays a similarly important role as a pathway to abuse potential in mothers with MDD. Previous findings of emotion regulation as significant mediator for the effect of ELM on abuse potential (Smith et al., 2014) were probably at least partly related to co-occurring disorders like MDD and BPD. Future research should address additional mediators that might explain elevated abuse potential in mothers with ELM, such as maternal knowledge on child development and behavior or attitude towards parenting, which has previously been associated with abuse potential (Crouch & Behl, 2001; Fulton, Murphy, & Anderson, 1991).

We found a significant effect of abuse potential and child psychopathology, although emotion regulation difficulties did not directly affect child psychopathology. Thus, our sixth but not our fifth hypothesis could be confirmed. These findings extend prior research reporting higher child psychopathology in substantiated maltreatment cases (Jaffee, 2017) by showing that a composite measure of abuse potential likewise affect child mental health. A composite measure like the CAPI includes several aspects that have been found to predict child abuse and might be an indication that familial or parental distress is at a level that might already impair child mental health even though actual acts of abuse have not taken place. Previous studies have found negative indirect effects of maternal emotion regulation deficits on child mental health via child emotion regulation problems (Crespo et al., 2017; Gratz et al., 2014). In our study, we investigated the direct effect of maternal emotion regulation difficulties on child psychopathology while also considering maternal abuse potential as a predictor and found no effect. This suggests that maternal emotion regulation plays an important role in the intergenerational pathways that affect child mental health by affecting other risk factors.

Concerning our seventh hypothesis, indirect effects leading from ELM to child psychopathology via abuse potential and from MDD and BPD to child psychopathology via emotion regulation and abuse potential were not significant. The previous presented results indicate that this complex pathway might be relevant for intergenerational transmission. However, these results might need testing in a larger sample, as our sample size was quite small for serial mediation testing.

### 5.2.2.2 Maternal Empathy

Maternal empathy was assessed on four distinct dimensions: personal distress, empathic concern, perspective-taking, and fantasy. We first disentangled the individual effects of ELM, MDD, and BPD on these dimensions and found that personal distress was predicted by MDD and BPD, and perspective-taking was only predicted by BPD. No significant results emerged for maternal ELM. Thus, our eighth hypothesis was partially confirmed. Previous research reported lower levels of perspective-taking in individuals with acute MDD (Cusi, MacQueen, Spreng, & McKinnon, 2011; Schreiter et al., 2013), whereas we assessed mothers with MDD in remission. While longitudinal studies have found improvements in the theory of mind after remission (Berez, Tényi, & Herold, 2016), mild social cognitive deficits still seem to persist (Ladegaard, Videbech, Lysaker, & Larsen, 2015). However, in contrast to these studies that applied behavioral (state) assessments, we assessed cognitive empathy (perspective-taking) as a self-reported trait measure. Thus, possible explanations for our findings could be either that individuals with MDD in remission overestimate their own current performance or that they show lower performance in behavioral tasks than in everyday life. When controlling for MDD and BPD, we did not find effects of ELM on empathy. Of note, previous studies that reported effects of ELM on empathy studied individuals with ELM and concurrent PTSD (Nazarov et al., 2014; Parlar et al., 2014) and thus the results are hardly comparable. We conclude that ELM isolated from any mental disorder does not directly affect trait empathy.

We next investigated whether these alterations in empathy would mediate the effect of MDD and BPD on child psychopathology. We found that personal distress was a significant mediator for the effect of MDD and BPD but not perspective-taking for the effect BPD. Thus, our ninth hypothesis was also partially confirmed. Personal distress represents a self-oriented reaction during empathic processing such as discomfort, unease, and anxiety. Such a highly negative reaction during tense interpersonal situation might be especially important for the relationship between the mother and child. It may limit the ability to react adequately to the child's emotional distress and might even lead to aggression, withdrawal and non-social behaviors of the mother (Schreiter et al., 2013; Singer & Klimecki, 2014). As the child may then experience less dyadic emotion co-regulation, the acquisition of own appropriate emotion regulation strategies might be impaired. A child comes to the understanding that emotions can be tolerated or even changed when he/she can anticipate the parents help to regulate these emotions, which allows emotional exploration and the development of own regulatory capabilities over time (Driscoll & Easterbrooks, 2007; Easterbrooks, Biesecker, & Lyons-Ruth,



2000). Disruptions in this developmental process in turn might be a risk factor for child psychopathology and behavior problems (Cicchetti et al., 1995; Eisenberg et al., 2001; Suveg et al., 2009).

### **5.3 Summary of Findings on Intergenerational Pathways and Impulses for Future Research**

In summary, in our analyses we identified maternal sensitivity and parenting stress as pathways from maternal MDD to child QoL, emotion regulation deficits and abuse potential (indirect effect only trend towards significance) and personal distress as pathways from maternal MDD and BPD to child psychopathology. For ELM, only abuse potential emerged as a possible pathway (indirect effect only trend towards significance) from ELM to child psychopathology (see Figure 3 for overview). It still needs to be elucidated what factors may lead to elevated abuse potential, possibly also in the absence of mental health problems in these mothers who experienced ELM. Furthermore, other factors that may function as potential pathways of transmission have not been addressed and their potential role could be subject to future research.

For example, there is evidence that contextual factors such as lower social support, greater psychosocial adversity and a range of negative life events mediate the effects of maternal ELM and child mental health (Bosquet Enlow et al., 2016a; Collishaw et al., 2007; Min et al., 2013; Miranda et al., 2013b). Moreover, neighborhood, socioeconomic status, support and sources of stress have been shown to affect parenting practices and attitudes (Kotchick & Forehand, 2002). Thus, the role of these contextual factors for the effects of MDD on parenting and of ELM, MDD, and BPD on abuse potential could be the target of further research efforts.

In addition, other behavioral characteristics that have not been addressed in this dissertation could play an important role in child mental health: for example, higher impulsiveness has been reported in mothers with ELM (Möhler et al., 2009), and children of those mothers with ELM and high levels of impulsivity have been found to show lower levels of inhibition (Fuchs et al., 2016), which in turn could be a precursor for mental health problems in these children. Furthermore, women who experienced ELM showed higher scores on preoccupied and avoidant attachment compared with women without ELM (Zietlow et al., 2017), which could affect child mental health. Moreover, the impact of other attachment figures – such as the father – could be incorporated in future research.

While this dissertation has focused on behavioral measures as mentioned above (chapter 3 and Fig. 1), genetics, epigenetics, and dysfunctional neuroregulatory mechanisms might also play an important role in the intergenerational effects of ELM, MDD, and BPD, albeit which is beyond the scope of this work.

Future studies could also address the effects of the time of occurrence of MDD (before, during, after pregnancy) and the onset of BPD, as this probably has different effects on child stress systems (Yehuda & Lehrner, 2018). In addition, multi-generational studies would be of interest, as the effects of ELM and psychopathology might have been passed on over several generations.

#### **5.4 Clinical Implications**

Our results implicate that the improvement of certain emotional competences could be a target for intervention programs in mothers with MDD or BPD. Special focus should be placed on adaptive emotion regulation and stress-coping skills regarding the specific demands of parenting. Maladaptive emotion regulation strategies have been associated with increased personal distress in response to the suffering of others (Grynberg & López-Pérez, 2018). Moreover, the availability of adaptive emotion regulation strategies has been shown to promote resilience during stressful life episodes (Vanderhasselt et al., 2014). MDD is often characterized by an egocentric bias in empathic judgment, while individuals with BPD show a focus on signals of threat and anger (Baer, Peters, Eisenlohr-Moul, Geiger, & Sauer, 2012; Hoffmann et al., 2016; Schreiter et al., 2013), both of which may lead to high personal distress in emotional interactive situations. Another target of intervention could thus be the attentional focus during empathic processes in the mother-child interaction. This might also improve maternal sensitivity, which depends on a timed and appropriate response to the child's signals.

Several interventions for parents with mental disorders and their children have already been developed in which these new findings could be integrated. In Germany, several prevention programs exist for mentally-ill parents and their children, which are mostly held in group settings (Plass & Wiegand-Grefe, 2012). One example is a group program specifically designed for mothers with BPD, "Borderline und Mutter sein" (engl. "Being Borderline and a Mother"), which includes sessions on stress coping and emotion regulation and possible effects on the child and the mother-child interaction (Buck-Horstkotte et al., 2015). The empirically best-evaluated prevention program for children of mentally-ill parents in Germany is the CHIMPs (children of mentally-ill parents) concept, which is an intervention approach involving the entire family and comprising separate parent and child sessions as well as family sessions

(Wiegand-Grefe et al., 2012). While most programs do not specifically or exclusively address emotional deficits, our results imply that they could play an even more prominent role.

An international meta-analysis including 37 studies showed that parenting programs significantly reduce substantiated and self-reported child maltreatment rates and child abuse potential in high-risk families (Chen & Chan, 2015). This is important as we found that even higher child abuse potential might lead to child mental health problems (Paper II). Our results imply that not only mothers with MDD or BPD, but also mothers with ELM (when controlling for mental disorders) show elevated abuse potential. Unfortunately, it seems unlikely that mothers with ELM but without mental disorders gain access to such aforementioned programs, as they are would not be integrated in the mental health care system. Furthermore, knowledge about mental disorders and psychotherapeutic interventions is limited in the population and a fear of stigmatization might limit help-seeking (Franz, 1999; Gulliver, Griffiths, & Christensen, 2010; Plass & Wiegand-Grefe, 2012). Thus, suitable interventions might not reach all families in need. In order to lower the threshold for participation in mothers with mental disorders as well as mothers with ELM who never developed any mental disorders and limit stigmatization, psycho-educative measures including information about risk factors and corresponding interventions could be implemented in general parental education before birth or during the first years of life. They could also be implemented as part of Child and Youth Welfare Services (German: “Kinder- und Jugendhilfe”) or Child and Youth Health Services (German: “Kinder- und Jugendgesundheitsdienst”) in the context of the statutory examination before school enrolment.

Another important aspect that needs to be highlighted is that we investigated mothers with MDD in remission. While psychotherapeutic interventions might end with the remission of the treated disorder, our results imply that effects on the next generation do not. There are two possible explanations for the negative mental health outcomes in children of parents with remitted mental disorders: effects of the past acute episode on child mental health might persist even after remission of the maternal symptoms; and maternal emotional-cognitive deficits (Joormann & Gotlib, 2007; Lange et al., 2012) and negative parenting behaviors (Lovejoy et al., 2000) might persist after remission and still affect child mental health. Our results imply that the second explanation seems more applicable as we found effects of MDD in remission on stress related to parenting (Paper I), parenting behavior (Paper I) and emotional competences like emotion regulation (Paper II) and personal distress in empathic contexts (Paper III). This underlines the above suggestion to make these parenting interventions accessible to a broader public and to patients who are not currently or no longer in psychiatric or psychotherapeutic treatment.

## 5.5 Strengths and Limitations of this Dissertation

Our studies show several important strengths: First, in contrast to the majority of studies in this area that have investigated ELM, MDD, and BPD separately or maternal psychopathology as a mediator for the effects of ELM, we addressed these maternal risk factors – namely ELM, MDD, and BPD – for child mental health simultaneously to disentangle their specific effects. Second, in studies on intergenerational transmission of abuse, there has been only limited use of psychometric measures of maltreatment, which resulted in wide variation in definitions of maltreatment, while only a minority of studies assessed psychopathology at the level of clinical disorders instead of self-report measures of symptoms (review by Plant, Pawlby, et al., 2017). We used well-validated interview measures instead of self-report questionnaires to assess ELM, MDD and BPD in mothers. Third, maternal sensitivity was rated during mother-child interaction in accordance with an established observational measure instead of a self-report measure on parenting behavior or sensitivity. Thus, we gained an objective insight into parenting behavior. Fourth, we integrated child QoL in one of our studies to gain a more comprehensive assessment of child mental health in accordance with the definition of health by the WHO (World Health Organization, 1946). Health-related QoL is an often-neglected component of health that comprises several aspects of a person's well-being and functioning perceived by the person him-/herself and related individuals. Fifth, in order to measure child mental health, we included maternal reports as well as teacher and child reports. For child QoL in Paper I, we used a multi-informant approach by including parallel mother and child reports of QoL. In order to assess child psychopathology, we included a teacher report (Paper II) and a parent report (Paper III).

There are also several limitations to the research reported in this dissertation that need to be mentioned. First, due to the cross-sectional design of the study, causal interpretations must be made with caution. Even though maternal ELM took place before the age of 18 and prior to the birth of the participating child, bi-directional associations could exist between maternal psychopathology, maternal emotional and behavioral deficits and child mental health problems. In our papers, we investigated one direction of these effects from mother to child and found significant results. However, child characteristics and child psychopathology might also have an effect on the mental well-being and emotional and behavioral characteristics of the mother. For example, prior studies suggest that not a difficult child temperament alone but rather certain aspects of child temperament in interaction with low parenting competences and high stress might increase abuse risk (Deegener & Körner, 2005). A sole unidirectional effect from the child to mother at a behavioral level seems unlikely but would still be possible if mental health problems of the child were completely caused by genetic factors (one pathway of

intergenerational transmission discussed in the beginning of chapter 3), which then caused emotional and behavioral problems in the mother. Prospective, longitudinal studies would be needed to draw causal conclusions and reveal possible bi-directional relationships. Second, the sample size varied somewhat between the three papers included in this dissertation due to the availability of data at different study sites and incomplete responses (i.e. not all teachers returned their questionnaires on child psychopathology). Furthermore, the number of mothers with BPD was lower than the number of mothers with ELM and MDD. Third, in Paper III we only used maternal ratings of child psychopathology, which might be prone to bias. Fourth, for the assessment of emotion regulation, empathy, and parenting stress, we administered maternal self-report measures, which require some level of self-reflection from the participants, which might be limited under certain conditions. Behavioral tasks may result in different outcomes as they rather touch state aspects of behavior. Thus, future studies would ideally incorporate both. In order to assess child abuse potential, we also used a maternal self-report questionnaire. However, this measure includes validity indices for random responding and faking, which did not indicate any bias in our study.

Fifth, MDD and BPD are common reactions to ELM, although other mental health issues that we did not investigate have also been related to a history of ELM, such as substance use disorder, bipolar disorder, anxiety disorders, schizophrenia, post-traumatic stress disorder, antisocial personality disorder, and several other personality disorders (Cicchetti & Doyle, 2016; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999). Sixth, our study only included mothers, even though the investigation of these issues in fathers seems equally important. Some studies have already shown that in fathers the experience of ELM and MDD might also lead to less child-focused and harsher parenting behavior and higher potential for abuse and neglect (Fulu et al., 2017; Romero-Martínez et al., 2014; Sethna, Murray, & Ramchandani, 2012; Takehara, Suto, Kakee, Tachibana, & Mori, 2017). Future studies would preferably investigate cohorts in which both parental and maternal trauma are assessed in addition to child symptomatology.

## **5.6 Conclusion**

The aim of the present dissertation was to disentangle effects of maternal ELM and associated disorders – namely MDD and BPD – on child mental health and identify mediating pathways of intergenerational transmission. In order to achieve this aim, we included all three maternal risk factors in our analyses and estimated their direct and indirect effects on child mental health. We addressed maternal emotional competences like emotion regulation and empathy, parenting variables like sensitivity and parenting stress, and abuse potential as potential mediators on child mental health. We found that maternal MDD but not ELM has a

negative effect on child quality of life. Maternal parenting stress and maternal sensitivity during the mother-child interaction mediated this effect. In mothers with MDD and BPD, we found indirect effects via emotion regulation difficulties on abuse potential, which in turn had an effect on child psychopathology. Moreover, higher personal distress (a negative dimension of empathy) in mothers with MDD and BPD led to higher child psychopathology. These effects did not emerge for maternal ELM. However, maternal ELM had a direct effect on abuse potential that was not mediated by emotion regulation. Our findings of higher abuse potential in mothers with higher severity ELM, MDD, and BPD and the link of abuse potential with child psychopathology demonstrate the need for interventions in these populations to lower the risk even though actual abuse might not have occurred or been detected yet. In mothers with MDD and BPD, deficits in emotional competences might be a specific risk factor that interventions could focus on. Mediating processes that explain elevated abuse potential in mothers with ELM still need to be identified in future research. In general, understanding these processes of transmission may provide the required knowledge to develop more customized long-term interventions to break the cycle of intergenerational transmission and promote child well-being.

## 6. References

- Abidin, R. R. (1995). *Parenting Stress Index, Third Edition: Professional Manual*. Odessa, FL: Psychological Assessment Resources, Inc.
- Achenbach, T. M. (1991a). *Manual for Teacher's Report Form and 1991 profile*. Burlington, VT: University of VT, Department of Psychiatry.
- Achenbach, T. M. (1991b). *Manual for the Child Behavior Checklist/4-18 and 1991 profile*. Burlington, VT: University of VT, Department of Psychiatry.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Oxford, England: Lawrence Erlbaum.
- Appleyard, K., Egeland, B., Dulmen, M. H. M. Van, & Sroufe, L. A. (2005). When more is not better: the role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry*, 3, 235–245. <https://doi.org/10.1111/j.1469-7610.2004.00351.x>
- Arbeitsgruppe Deutsche Child Behavior Checklist. (1993). *Lehrerfragebogen über das Verhalten von Kindern und Jugendlichen; deutsche Bearbeitung der Teacher's Report Form der Child Behavior Checklist (TRF). Einführung und Anleitung zur Handauswertung, bearbeitet von M. Döpfner & P. Melchers*. Cologne, Germany: Arbeitsgruppe Kinder-, Jugend- und Familiendiagnostik (KJFD).
- Arbeitsgruppe Deutsche Child Behavior Checklist. (1998). *Elternfragebogen über das Verhalten von Kindern und Jugendlichen; deutsche Bearbeitung der Child Behavior Checklist (CBCL/4-18). Einführung und Anleitung zur Handauswertung mit deutschen Normen, bearbeitet von M. Döpfner, J. Plücker, S. Bölte, K. Lenz, P. M.* Cologne (Germany): Arbeitsgruppe Kinder-, Jugend- und Familiendiagnostik (KJFD).
- Babcock Fenerci, R. L., & Allen, B. (2018). From mother to child: Maternal betrayal trauma and risk for maltreatment and psychopathology in the next generation. *Child Abuse and Neglect*, 82, 1–11. <https://doi.org/10.1016/j.chiabu.2018.05.014>
- Baer, R. A., Peters, J. R., Eisenlohr-Moul, T. A., Geiger, P. J., & Sauer, S. E. (2012). Emotion-related cognitive processes in borderline personality disorder: A review of the empirical literature. *Clinical Psychology Review*, 32(5), 359–369. <https://doi.org/https://doi.org/10.1016/j.cpr.2012.03.002>
- Barnow, S., Spitzer, C., Grabe, H. J., Kessler, C., & Freyberger, H. J. (2006). Individual characteristics, familial experience, and psychopathology in children of mothers with borderline personality disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 45(8), 965–972. <https://doi.org/10.1097/01.chi.0000222790.41853.b9>
- Berez, H., Tényi, T., & Herold, R. (2016). Theory of Mind in Depressive Disorders: A Review of the Literature. *Psychopathology*, 49(3), 125–134. <https://doi.org/10.1159/000446707>
- Berger, M. (2004). Die Versorgung psychisch Erkrankter in Deutschland. *Der Nervenarzt*, 75(2), 195–204. <https://doi.org/10.1007/s00115-004-1681-z>

- Bernet, C. Z., & Stein, M. B. (1999). Relationship of childhood maltreatment to the onset and course of major depression in adulthood. *Depression and Anxiety*, *9*(4), 169–174.
- Bifulco, A., Brown, G. W., & Harris, T. O. (1994). Childhood experience of care and abuse (CECA): A retrospective interview measure. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *35*(8), 1419–1435. <https://doi.org/10.1111/j.1469-7610.1994.tb01284.x>
- Biringen, Z. (2000). Emotional availability: Conceptualization and research findings. *American Journal of Orthopsychiatry*, *70*(1), 104–114. <https://doi.org/http://dx.doi.org/10.1037/h0087711>
- Biringen, Z. (2008). *Emotional Availability (EA) Scales: 4th Edition. Middle Childhood/Youth Version*. Published by: emotionalavailability.com, PO Box, 3615, Colorado 80307.
- Bödeker, K., Fuchs, A., Führer, D., Kluczniok, D., Dittrich, K., Reichl, C., ... Resch, F. (2018). Impact of Maternal Early Life Maltreatment and Maternal History of Depression on Child Psychopathology: Mediating Role of Maternal Sensitivity? *Child Psychiatry & Human Development*. <https://doi.org/10.1007/s10578-018-0839-z>
- Bosquet Enlow, M., Englund, M. M., & Egeland, B. (2018). Maternal Childhood Maltreatment History and Child Mental Health: Mechanisms in Intergenerational Effects. *Journal of Clinical Child and Adolescent Psychology*, *47*, S47–S62. <https://doi.org/10.1080/15374416.2016.1144189>
- Briggs, R. D., Silver, E. J., Krug, L. M., Mason, Z. S., Schrag, R. D. A., Chinitz, S., & Racine, A. D. (2014). Healthy steps as a moderator: The impact of maternal trauma on child social-emotional development. *Clinical Practice in Pediatric Psychology*, *2*(2), 166–175. <https://doi.org/10.1037/cpp0000060>
- Buck-Horstkotte, S., Renneberg, B., Rosenbach, C., Buck-Horstkotte, S., Renneberg, B., & Rosenbach, C. (2015). *Mütter mit Borderline-Persönlichkeitsstörung: Das Trainingsmanual "Borderline und Mutter sein."* Weinheim Basel: Beltz Verlag.
- Bullinger, M. (2011). Lebensqualität von Kindern psychisch kranker Eltern. In S. Wiegand-Grefe, F. Mattejat, & A. Lenz (Eds.) (pp. 401–415). Göttingen, Germany: Vandenhoeck & Ruprecht.
- Camoirano, A. (2017). Mentalizing makes parenting work: A review about parental reflective functioning and clinical interventions to improve it. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2017.00014>
- Campbell, S. B. (1995). Behavior problems in preschool children: A review of recent research. *Journal of Child Psychology and Psychiatry*, *36*(1), 113–149. <https://doi.org/10.1111/j.1469-7610.1995.tb01657.x>
- Campbell, S. B., Matestic, P., von Stauffenberg, C., Mohan, R., & Kirchner, T. (2007). Trajectories of maternal depressive symptoms, maternal sensitivity, and children's functioning at school entry. *Developmental Psychology*, *43*(5), 1202–1215. <https://doi.org/10.1037/0012-1649.43.5.1202>



- Chen, M., & Chan, K. L. (2015). Effects of parenting programs on child maltreatment prevention: A meta-analysis. *Trauma, Violence, & Abuse, 17*(1), 88–104. <https://doi.org/10.1177/1524838014566718>
- Cicchetti, D., Ackerman, B. P., & Izard, C. E. (1995). Emotions and emotion regulation in developmental psychopathology. *Development and Psychopathology, 7*(1), 1–10. [https://doi.org/DOI: 10.1017/S0954579400006301](https://doi.org/DOI:10.1017/S0954579400006301)
- Cicchetti, D., & Doyle, C. (2016). Child maltreatment, attachment and psychopathology: mediating relations. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA), 15*(2), 89–90. <https://doi.org/10.1002/wps.20337>
- Collishaw, S., Dunn, J., O'Connor, T. G., Golding, J., & Avon Longitudinal Study of Parents and Children Study Team. (2007). Maternal childhood abuse and offspring adjustment over time. *Development and Psychopathology, 19*(2), 367–383. <https://doi.org/10.1017/S0954579407070186>
- Corruble, E., Ginestet, D., & Guelfi, J. D. (1996). Comorbidity of personality disorders and unipolar major depression: A review. *Journal of Affective Disorders, 37*(2–3), 157–170.
- Crandell, L. E., Patrick, M. P. H., & Hobson, R. P. (2003). “Still-face” interactions between mothers with borderline personality disorder and their 2-month-old infants. *British Journal of Psychiatry*. <https://doi.org/10.1192/bjp.183.3.239>
- Crespo, L. M., Trentacosta, C. J., Aikins, D., & Wargo-Aikins, J. (2017). Maternal emotion regulation and children’s behavior problems: The mediating role of child emotion regulation. *Journal of Child and Family Studies, 26*(10), 2797–2809. <https://doi.org/10.1007/s10826-017-0791-8>
- Crnic, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: relations to maternal parenting and child behaviour at age 5. *Infant and Child Development, 14*(2), 117–132. <https://doi.org/10.1002/icd.384>
- Crouch, J. L., & Behl, L. E. (2001). Relationships among parental beliefs in corporal punishment, reported stress, and physical child abuse potential. *Child Abuse and Neglect*. [https://doi.org/10.1016/S0145-2134\(00\)00256-8](https://doi.org/10.1016/S0145-2134(00)00256-8)
- Crouch, J. L., McKay, E. R., Lelakowska, G., Hiraoka, R., Rutledge, E., Bridgett, D. J., & Milner, J. S. (2018). Do emotion regulation difficulties explain the association between executive functions and child physical abuse risk? *Child Abuse & Neglect, 80*, 99–107. <https://doi.org/https://doi.org/10.1016/j.chiabu.2018.03.003>
- Cummings, E. M., & Davies, P. T. (1994). Maternal depression and child development. *Journal of Child Psychology and Psychiatry, 35*(1), 73–122. <https://doi.org/10.1111/j.1469-7610.1994.tb01133.x>
- Cusi, A. M., MacQueen, G. M., Spreng, R. N., & McKinnon, M. C. (2011). Altered empathic responding in major depressive disorder: Relation to symptom severity, illness burden, and psychosocial outcome. *Psychiatry Research, 188*(2), 231–236. <https://doi.org/10.1016/j.psychres.2011.04.013>

- Dannehl, K., Rief, W., & Euteneuer, F. (2017). Childhood adversity and cognitive functioning in patients with major depression. *Child Abuse & Neglect*, *70*, 247–254. <https://doi.org/https://doi.org/10.1016/j.chiabu.2017.06.013>
- Davis, M. H. (1983). A multidimensional approach to individual differences in empathy. *Journal of Personality and Social Psychology*, *44*(1), 113–126. <https://doi.org/10.1037/0022-3514.44.1.113>
- de Vignemont, F., & Singer, T. (2006). The empathic brain: how, when and why? *Trends in Cognitive Sciences*, *10*(10), 435–441. <https://doi.org/10.1016/j.tics.2006.08.008>
- De Wolff, M. S., & Van Ijzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, *68*(4), 571–591.
- Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice*, *5*(3), 314–332. <https://doi.org/10.1111/j.1468-2850.1998.tb00152.x>
- 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. <https://doi.org/10.1037/0893-3200.10.1.45>
- Deegener, G., Spangler, G., Körner, W., & Becker, N. (2009). *Eltern-Belastungs-Screening zur Kindeswohlgefährdung: Deutsche Form des Child Abuse Potential Inventory (CAPI) von Joel S. Milner*. Göttingen, Germany: Hogrefe.
- Driscoll, J. R., & Easterbrooks, M. A. (2007). Young mothers' play with their toddlers: Individual variability as a function of psychosocial factors. *Infant and Child Development*, *16*(6), 649–670. <https://doi.org/10.1002/icd.515>
- Dubowitz, H., Black, M. M., Kerr, M. A., Hussey, J. M., Morrel, T. M., Everson, M. D., & Starr, R. H. (2001). Type and timing of mothers' victimization: Effects on mothers and children. *Pediatrics*, *107*(4), 728–735. <https://doi.org/10.1542/peds.107.4.728>
- Easterbrooks, M. A., Biesecker, G., & Lyons-Ruth, K. (2000). Infancy predictors of emotional availability in middle childhood: The roles of attachment security and maternal depressive symptomatology. *Attachment & Human Development*, *2*(2), 170–187.
- Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., ... Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, *72*(4), 1112–1134.
- Elgar, F. J., Mills, R. S. L., McGrath, P. J., Waschbusch, D. A., & Brownridge, D. A. (2007). Maternal and Paternal Depressive Symptoms and Child Maladjustment: The Mediating Role of Parental Behavior. *Journal of Abnormal Child Psychology*, *35*(6), 943–955. <https://doi.org/10.1007/s10802-007-9145-0>
- Eyberg, S. M., Boggs, S. R., & Rodriguez, C. M. (1993). Relationships Between Maternal Parenting Stress and Child Disruptive Behavior. *Child & Family Behavior Therapy*, *14*(4), 1–9. [https://doi.org/10.1300/J019v14n04\\_01](https://doi.org/10.1300/J019v14n04_01)

- Eyden, J., Winsper, C., Wolke, D., Broome, M. R., & MacCallum, F. (2016). A systematic review of the parenting and outcomes experienced by offspring of mothers with borderline personality pathology: Potential mechanisms and clinical implications. *Clinical Psychology Review, 47*, 85–105. <https://doi.org/10.1016/j.cpr.2016.04.002>
- Feldman, R. B., Zelkowitz, P., Weiss, M., Vogel, J., Heyman, M., & Paris, J. (1995). A comparison of the families of mothers with borderline and nonborderline personality disorders. *Comprehensive Psychiatry, 36*(2), 157–163.
- Fergusson, D. M., Lynskey, M. T., & Horwood, L. J. (1993). The effect of maternal depression on maternal ratings of child behavior. *Journal of Abnormal Child Psychology, 21*(3), 245–269. <https://doi.org/10.1007/BF00917534>
- Field, T., Hernandez-Reif, M., Diego, M., Feijo, L., Vera, Y., Gil, K., & Sanders, C. (2007). Still-face and separation effects on depressed mother-infant interactions. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health, 28*(3), 314–323. <https://doi.org/10.1002/imhj.20138>
- Field, T., Vega-Lahr, N., Scafidi, F., & Goldstein, S. (1986). Effects of maternal unavailability on mother-infant interactions. *Infant Behavior and Development, 9*(4), 473–478.
- Franz, M. (1999). Was bewirken Therapieempfehlungen bei psychogen erkrankten Patienten einer psychosomatischen Konsiliarambulanz? Eine katamnestiche Untersuchung. *Zeitschrift Fur Psychosomatische Medizin Und Psychotherapie, 45*(2), 95–112.
- Fuchs, A., Fuhrer, D., Bierbaum, A. L., Zietlow, A. L., Hindi-Attar, C., Neukel, C., ... Boedeker, K. (2016). [Transgenerational Effects on Child Inhibition: The Role of Maternal History of Abuse, Depression and Impulsivity]. *Prax Kinderpsychol Kinderpsychiatr, 65*(6), 423–440. <https://doi.org/10.13109/prkk.2016.65.6.423>
- Fulton, A. M., Murphy, K. R., & Anderson, S. L. (1991). Increasing adolescent mothers' knowledge of child development: an intervention program. *Adolescence, 26*(101), 73–81.
- Fulu, E., Miedema, S., Roselli, T., McCook, S., Chan, K. L., Haardörfer, R., ... Johnson, S. (2017). Pathways between childhood trauma, intimate partner violence, and harsh parenting: findings from the UN Multi-country Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health, 5*(5), e512–e522. [https://doi.org/https://doi.org/10.1016/S2214-109X\(17\)30103-1](https://doi.org/https://doi.org/10.1016/S2214-109X(17)30103-1)
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review, 10*(3), 329–353. [https://doi.org/10.1016/0272-7358\(90\)90065-I](https://doi.org/10.1016/0272-7358(90)90065-I)
- Giannakopoulos, G., Dimitrakaki, C., Pedeli, X., Kolaitis, G., Rotsika, V., Ravens-Sieberer, U., & Tountas, Y. (2009). Adolescents' wellbeing and functioning: Relationships with parents' subjective general physical and mental health. *Health and Quality of Life Outcomes, 7*, 100. <https://doi.org/10.1186/1477-7525-7-100>
- Glenn, C. R., & Klonsky, E. D. (2009). Emotion Dysregulation as a Core Feature of Borderline Personality Disorder. *Journal of Personality Disorders, 23*(1), 20–28. <https://doi.org/10.1521/pedi.2009.23.1.20>

- Goodman, S. H., & Gotlib, I. (2002). Children of depressed parents: Mechanisms of risk and implications for treatment. *Psychological Review*, *106*(3), 458–490. <https://doi.org/10.1037/10449-000>
- Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review*, *106*(3), 458–490. <https://doi.org/10.1037/0033-295X.106.3.458>
- Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal Depression and Child Psychopathology: A Meta-Analytic Review. *Clinical Child and Family Psychology Review*, *14*(1), 1–27. <https://doi.org/10.1007/s10567-010-0080-1>
- Gratz, K. L., Kiel, E. J., Litzman, R. D., David Elkin, T., Moore, S. A., & Tull, M. T. (2014). Maternal borderline personality pathology and infant emotion regulation: Examining the influence of maternal emotion-related difficulties and infant attachment. *Journal of Personality Disorders*, *28*(1), 52–69. <https://doi.org/10.1521/pedi.2014.28.1.52>
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41–54. <https://doi.org/10.1023/B:JOBA.0000007455.08539.94>
- Grienenberger, J., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother-infant affective communication, and infant attachment: Exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment and Human Development*, *7*(3), 299–311. <https://doi.org/10.1080/14616730500245963>
- Grynberg, D., & López-Pérez, B. (2018). Facing others' misfortune: Personal distress mediates the association between maladaptive emotion regulation and social avoidance. *PLOS ONE*, *13*(3), e0194248. <https://doi.org/10.1371/journal.pone.0194248>
- Gulliver, A., Griffiths, K. M., & Christensen, H. (2010). Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. *BMC Psychiatry*, *10*(1), 113. <https://doi.org/10.1186/1471-244X-10-113>
- Guttman, H. A., & Laporte, L. (2000). Empathy in families of women with borderline personality disorder, anorexia nervosa, and a control group. *Family Process*, *39*(3), 345–358. <https://doi.org/10.1111/j.1545-5300.2000.39306.x>
- Harari, H., Shamay-Tsoory, S., Ravid, M., & Levkovitz, Y. (2010). Double dissociation between cognitive and affective empathy in borderline personality disorder. *Psychiatry Research*, *175*(3), 277–279. <https://doi.org/10.1016/j.psychres.2009.03.002>
- Haskett, M. E., Scott, S. S., & Fann, K. D. (1995). Child abuse potential inventory and parenting behavior: Relationships with high-risk correlates. *Child Abuse and Neglect*. [https://doi.org/10.1016/0145-2134\(95\)00107-4](https://doi.org/10.1016/0145-2134(95)00107-4)
- Heim, C., & Nemeroff, C. B. (2001). The role of childhood trauma in the neurobiology of mood and anxiety disorders: Preclinical and clinical studies. *Biological Psychiatry*, *49*(12),

1023–1039. [https://doi.org/10.1016/S0006-3223\(01\)01157-X](https://doi.org/10.1016/S0006-3223(01)01157-X)

- Heim, C., Newport, D. J., Mletzko, T., Miller, A. H., & Nemeroff, C. B. (2008). The link between childhood trauma and depression: Insights from HPA axis studies in humans. *Psychoneuroendocrinology*, *33*(6), 693–710. <https://doi.org/10.1016/j.psyneuen.2008.03.008>
- Herr, N. R., Hammen, C., & Brennan, P. A. (2008). Maternal borderline personality disorder symptoms and adolescent psychosocial functioning. *Journal of Personality Disorders*, *22*(5), 451–465. <https://doi.org/10.1521/pedi.2008.22.5.451>
- Hiraoka, R., Crouch, J. L., Reo, G., Wagner, M. F., Milner, J. S., & Skowronski, J. J. (2016). Borderline personality features and emotion regulation deficits are associated with child physical abuse potential. *Child Abuse & Neglect*, *52*, 177–184. <https://doi.org/10.1016/j.chiabu.2015.10.023>
- Hoffmann, F., Banzhaf, C., Kanske, P., Gärtner, M., Bermpohl, F., & Singer, T. (2016). Empathy in depression: Egocentric and altercentric biases and the role of alexithymia. *Journal of Affective Disorders*, *199*, 23–29. <https://doi.org/10.1016/j.jad.2016.03.007>
- Jaffee, S. R. (2017). *Child Maltreatment and Risk for Psychopathology in Childhood and Adulthood. Annual Review of Clinical Psychology* (Vol. 13). <https://doi.org/10.1146/annurev-clinpsy-032816-045005>
- Janet, P. (1925). *Psychological Healing (Bd 1)*. London: Allen & Unwin.
- Jennissen, S., Holl, J., Mai, H., Wolff, S., & Barnow, S. (2016). Emotion dysregulation mediates the relationship between child maltreatment and psychopathology: A structural equation model. *Child Abuse & Neglect*, *62*, 51–62. <https://doi.org/10.1016/j.chiabu.2016.10.015>
- Jeske, J., Bullinger, M., Plaß, A., Petermann, F., & Wiegand-Grefe, S. (2009). Risikofaktor Krankheitsverarbeitung - Zusammenhänge zwischen der Krankheitsverarbeitung einer elterlichen psychischen Erkrankung und der gesundheitsbezogenen Lebensqualität der Kinder. *Zeitschrift Für Psychiatrie, Psychologie Und Psychotherapie*, *57*(3), 207–213. <https://doi.org/10.1024/1661-4747.57.3.207>
- Johnson, J., Cohen, P., Brown, J., Smailes, E., & Bernstein, D. (1999). Childhood maltreatment increases risk for personality disorders during early adulthood. *Archives of General Psychiatry*, *56*(7), 600–606. <https://doi.org/10.1001/archpsyc.56.7.600>
- Joormann, J., & Gotlib, I. H. (2007). Selective attention to emotional faces following recovery from depression. *Journal of Abnormal Psychology*, *116*(1), 80–85. <https://doi.org/10.1037/0021-843X.116.1.80>
- Joormann, J., & Stanton, C. H. (2016). Examining emotion regulation in depression: A review and future directions. *Behaviour Research and Therapy*, *86*, 35–49. <https://doi.org/10.1016/j.brat.2016.07.007>
- Kaess, M., Parzer, P., Mattern, M., Resch, F., Bifulco, A., & Brunner, R. (2011). [Childhood Experiences of Care and Abuse (CECA) - validation of the German version of the

- questionnaire and interview, and results of an investigation of correlations between adverse childhood experiences and suicidal behaviour]. *Zeitschrift Fur Kinder- Und Jugendpsychiatrie Und Psychotherapie*, 39(4), 243–252. <https://doi.org/10.1024/1422-4917/a000115>
- Kellermann, N. (2013). Epigenetic Transmission of Holocaust Trauma: Can Nightmares Be Inherited? *The Israel Journal of Psychiatry and Related Sciences*, 50(1), 33–39.
- Kidwell, K. M., Nelson, T. D., & Van Dyk, T. (2015). Parenting stress and child physical health among a low-income sample: The moderating role of child anxiety. *Journal of Health Psychology*, 20(11), 1377–1387. <https://doi.org/10.1177/1359105313512352>
- Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 51(6), 706–716. <https://doi.org/10.1111/j.1469-7610.2009.02202.x>
- Kluczniok, D., Boedeker, K., Fuchs, A., Hindi Attar, C., Fydrich, T., Fuehrer, D., ... BERPpohl, F. (2016a). Emotional availability in mother-child interaction: the effects of maternal depression in remission and additional history of childhood abuse. *Depression and Anxiety*, 33(7), 648–657. <https://doi.org/10.1002/da.22462>
- Kohlhoff, J., Hawes, D. J., Mence, M., Russell, A. M. T., Wedgwood, L., & Morgan, S. (2016). Emotion Regulation Strategies and Parenting Practices among Parents of Children With Clinic-Referred Conduct Problems. *Parenting*, 16(4), 302–319. <https://doi.org/10.1080/15295192.2016.1184942>
- Kotchick, B. A., & Forehand, R. (2002). Putting parenting in perspective: A discussion of the contextual factors that shape parenting practices. *Journal of Child and Family Studies*. <https://doi.org/10.1023/A:1016863921662>
- Ladegaard, N., Videbech, P., Lysaker, P. H., & Larsen, E. R. (2015). The course of social cognitive and metacognitive ability in depression: Deficit are only partially normalized after full remission of first episode major depression. *British Journal of Clinical Psychology*, 55(3), 269–286. <https://doi.org/10.1111/bjc.12097>
- Lange, C., Adli, M., Zschucke, E., Beyer, R., Ising, M., Uhr, M., & BERPpohl, F. (2012). Affective set-shifting deficits in patients with major depression in remission. *Journal of Psychiatric Research*, 46(12), 1623–1626. <https://doi.org/10.1016/j.jpsychires.2012.09.007>
- Leijdesdorff, S., Doesum, K. Van, Popma, A., & Klaassen, R. (2017). Prevalence of psychopathology in children of parents with mental illness and / or addiction: an up to date narrative review, 30(4), 312–317. <https://doi.org/10.1097/YCO.0000000000000341>
- Lieb, K., Rexhausen, J. E., Kahl, K. G., Schweiger, U., Philipsen, A., Hellhammer, D. H., & Bohus, M. (2004). Increased diurnal salivary cortisol in women with borderline personality disorder. *Journal of Psychiatric Research*, 38(6), 559–565. <https://doi.org/https://doi.org/10.1016/j.jpsychires.2004.04.002>
- Lorber, M. F. (2012). The role of maternal emotion regulation in overreactive and lax discipline.

- Journal of Family Psychology*, 26(4), 642–647. <https://doi.org/10.1037/a0029109>
- Lovejoy, M. C., Graczyk, P. A., O’Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review*, 20(5), 561–592. [https://doi.org/10.1016/S0272-7358\(98\)00100-7](https://doi.org/10.1016/S0272-7358(98)00100-7)
- Macfie, J. (2009). Development in children and adolescents whose mothers have borderline personality disorder. *Child Development Perspectives*, 3(1), 66–71. <https://doi.org/10.1111/j.1750-8606.2008.00079.x>
- MacFie, J., & Swan, S. A. (2009). Representations of the caregiver-child relationship and of the self, and emotion regulation in the narratives of young children whose mothers have borderline personality disorder. *Development and Psychopathology*. <https://doi.org/10.1017/S0954579409000534>
- Maguire, S. A., Williams, B., Naughton, A. M., Cowley, L. E., Tempest, V., Mann, M. K., ... Kemp, A. M. (2015). A systematic review of the emotional, behavioural and cognitive features exhibited by school-aged children experiencing neglect or emotional abuse. *Child: Care, Health and Development*, 41(5), 641–653. <https://doi.org/10.1111/cch.12227>
- Mahler, M. S., Pine, F., & Bergman, A. (1975). *The psychological birth of the human infant: Symbiosis and individuation*. New York: Basic Books Inc.
- Mattejat, F. (2009). Kinder mit psychisch kranken Eltern: Was wir wissen und was zu tun ist. In F. Mattejat & B. Lisofsky (Eds.), *Nicht von schlechten Eltern. Kinder psychisch Kranker* (pp. 68–95). Bonn: Balance Buch und Medien.
- Mikulincer, M., & Shaver, P. R. (2012). An attachment perspective on psychopathology. *World Psychiatry*, 11(1), 11–15. <https://doi.org/10.1016/j.wpsyc.2012.01.003>
- Milgrom, J. (1996). Parenting stress and postnatal depression. *Stress Medicine*, 12(3), 177–186. [https://doi.org/10.1002/\(SICI\)1099-1700\(199607\)12:3<177::AID-SMI699>3.0.CO;2-W](https://doi.org/10.1002/(SICI)1099-1700(199607)12:3<177::AID-SMI699>3.0.CO;2-W)
- Milner, J. S. (1994). Assessing physical child abuse risk: The child abuse potential inventory. *Clinical Psychology Review*, 14(6), 547–583. [https://doi.org/10.1016/0272-7358\(94\)90017-5](https://doi.org/10.1016/0272-7358(94)90017-5)
- Milner, J. S., & Robertson, K. R. (1989). Inconsistent response patterns and the prediction of child maltreatment. *Child Abuse & Neglect*, 13(1), 59–64. [https://doi.org/https://doi.org/10.1016/0145-2134\(89\)90029-X](https://doi.org/https://doi.org/10.1016/0145-2134(89)90029-X)
- Milner, J. S., & Wimberley, A. C. (1980). Prediction and explanation of child abuse. *Journal of Clinical Psychology*, 36(4), 875–884. [https://doi.org/10.1002/1097-4679\(198010\)36:4<875::AID-JCLP2270360407>3.0.CO;2-1](https://doi.org/10.1002/1097-4679(198010)36:4<875::AID-JCLP2270360407>3.0.CO;2-1)
- Min, M. O., Singer, L. T., Minnes, S., Kim, H., & Short, E. (2013). Mediating Links Between Maternal Childhood Trauma and Preadolescent Behavioral Adjustment. *Journal of Interpersonal Violence*, 28(4), 831–851. <https://doi.org/10.1177/0886260512455868>
- Miranda, J. K., de la Osa, N., Granero, R., & Ezpeleta, L. (2011). Maternal experiences of childhood abuse and intimate partner violence: Psychopathology and functional

- impairment in clinical children and adolescents. *Child Abuse and Neglect*, 35(9), 700–711. <https://doi.org/10.1016/j.chiabu.2011.05.008>
- Miranda, J. K., de la Osa, N., Granero, R., & Ezpeleta, L. (2013a). Maternal Childhood Abuse, Intimate Partner Violence, and Child Psychopathology: The Mediator Role of Mothers' Mental Health. *Violence Against Women*, 19(1), 50–68. <https://doi.org/10.1177/1077801212475337>
- Miranda, J. K., de la Osa, N., Granero, R., & Ezpeleta, L. (2013b). Multiple mediators of the relationships among maternal childhood abuse, intimate partner violence, and offspring psychopathology. *Journal of Interpersonal Violence*, 28(14), 2941–2965.
- Möhler, E., Matheis, V., Poustka, L., Marysko, M., Finke, P., Kaufmann, C., ... Resch, F. (2009). Mothers with a history of abuse tend to show more impulsiveness. *Child Abuse and Neglect*, 33(3), 123–126. <https://doi.org/10.1016/j.chiabu.2008.06.002>
- Mombour, W., Zaudig, M., Berger, P., Gutierrez, K., Berner, W., Berger, K., ... von Bose, M. (1996). *IPDE, International Personality Disorder Examination von A.W. Loranger. Deutschsprachige Ausgabe*. Bern, Switzerland: Huber.
- Morgan, J., Robinson, D., & Aldridge, J. (2002). Parenting stress and externalizing child behaviour. *Child and Family Social Work*, 7(3), 219–225. <https://doi.org/10.1046/j.1365-2206.2002.00242.x>
- Myhre, M. C., Dyb, G. A., Wentzel-Larsen, T., Grøgaard, J. B., & Thoresen, S. (2014). Maternal childhood abuse predicts externalizing behaviour in toddlers: A prospective cohort study. *Scandinavian Journal of Public Health*, 42(3), 263–269. <https://doi.org/10.1177/1403494813510983>
- Naughton, A. M., Maguire, S. A., Mann, M. K., Lumb, R. C., Tempest, V., Gracias, S., & Kemp, A. M. (2013). Emotional, behavioral, and developmental features indicative of neglect or emotional abuse in preschool children a systematic review. *JAMA Pediatrics*. <https://doi.org/10.1001/jamapediatrics.2013.192>
- Nazarov, A., Frewen, P., Parlar, M., Oremus, C., Macqueen, G., Mckinnon, M., & Lanius, R. (2014). Theory of mind performance in women with posttraumatic stress disorder related to childhood abuse. *Acta Psychiatrica Scandinavica*, 129(3), 193–201. <https://doi.org/10.1111/acps.12142>
- Negele, A., Kaufhold, J., Kallenbach, L., & Leuzinger-Bohleber, M. (2015). Childhood Trauma and Its Relation to Chronic Depression in Adulthood. *Depression Research and Treatment*, 2015, 650804. <https://doi.org/10.1155/2015/650804>
- New, A. S., aan het Rot, M., Ripoll, L. H., Perez-Rodriguez, M. M., Lazarus, S., Zipursky, E., ... Siever, L. J. (2012). Empathy and alexithymia in borderline personality disorder: clinical and laboratory measures. *J Pers Disord*, 26(5), 660–675. <https://doi.org/10.1521/pedi.2012.26.5.660>
- Parlar, M., Frewen, P., Nazarov, A., Oremus, C., MacQueen, G., Lanius, R., & McKinnon, M. C. (2014). Alterations in empathic responding among women with posttraumatic stress disorder associated with childhood trauma. *Brain and Behavior*, 4(3), 381–389.



<https://doi.org/10.1002/brb3.215>

- Pasalich, D. S., Cyr, M., Zheng, Y., McMahon, R. J., & Spieker, S. J. (2016). Child abuse history in teen mothers and parent-child risk processes for offspring externalizing problems. *Child Abuse and Neglect*, *56*, 89–98. <https://doi.org/10.1016/j.chiabu.2016.04.011>
- Pereira, J., Vickers, K., Atkinson, L., Gonzalez, A., Wekerle, C., & Levitan, R. (2012). Parenting stress mediates between maternal maltreatment history and maternal sensitivity in a community sample. *Child Abuse and Neglect*, *36*(5), 433–437. <https://doi.org/10.1016/j.chiabu.2012.01.006>
- Petfield, L., Startup, H., Droscher, H., & Cartwright-Hatton, S. (2015). Parenting in mothers with borderline personality disorder and impact on child outcomes. *Evidence-Based Mental Health*, *18*(3), 67–75. <https://doi.org/10.1136/eb-2015-102163>
- Plant, D. T., Barker, E. D., Waters, C. S., Pawlby, S., & Pariante, C. M. (2013). Intergenerational transmission of maltreatment and psychopathology: The role of antenatal depression. *Psychological Medicine*, *43*(3), 519–528. <https://doi.org/10.1017/S0033291712001298>
- Plant, D. T., Jones, F. W., Pariante, C. M., & Pawlby, S. (2017). Association between maternal childhood trauma and offspring childhood psychopathology: Mediation analysis from the ALSPAC cohort. *British Journal of Psychiatry*, *211*(3), 144–150. <https://doi.org/10.1192/bjp.bp.117.198721>
- Plant, D. T., Pawlby, S., Pariante, C. M., & Jones, F. W. (2017). When one childhood meets another – maternal childhood trauma and offspring child psychopathology: A systematic review. *Clinical Child Psychology and Psychiatry*, 135910451774218. <https://doi.org/10.1177/1359104517742186>
- Plass, A., & Wiegand-Grefe, S. (2012). *Kinder psychisch kranker Eltern*. Weinheim Basel: Beltz Verlag.
- Psychogiou, L., Daley, D., Thompson, M. J., & Sonuga-Barke, E. J. S. (2008). Parenting empathy: Associations with dimensions of parent and child psychopathology. *British Journal of Developmental Psychology*, *26*(2), 221–232. <https://doi.org/10.1348/02615100X238582>
- Putnam, F. W. (2003). Ten-year research update review: Child sexual abuse. *Journal of the American Academy of Child and Adolescent Psychiatry*, *42*(3), 269–278. <https://doi.org/10.1097/00004583-200303000-00006>
- Rakoff, V. (1966). A long term effect of the concentration camp experience. *Viewpoints*, *1*, 17–22.
- Ravens-Sieberer, U., Gosch, A., Abel, T., Auquier, P., Bellach, B.-M., Bruil, J., ... the European KIDSCREEN Group. (2001). Quality of life in children and adolescents: a European public health perspective. *Sozial- Und Präventivmedizin*, *46*(5), 294–302. <https://doi.org/10.1007/BF01321080>

- Ravens-Sieberer, U., Herdman, M., Devine, J., Otto, C., Bullinger, M., Rose, M., & Klasen, F. (2014). The European KIDSCREEN approach to measure quality of life and well-being in children: Development, current application, and future advances. *Quality of Life Research*, 23(3), 791–803. <https://doi.org/10.1007/s11136-013-0428-3>
- Reinelt, E., Stopsack, M., Aldinger, M., Ulrich, I., Grabe, H. J., & Barnow, S. (2013). Longitudinal transmission pathways of borderline personality disorder symptoms: From mother to child? *Psychopathology*, 47(1), 10–16. <https://doi.org/10.1159/000345857>
- Richter, L. (2004). *The importance of caregiver-child interactions for the survival and healthy development of young children: A review*. Geneva, Switzerland: World Health Organization.
- Rijlaarsdam, J., Stevens, G. W., Jansen, P. W., Ringoot, A. P., Jaddoe, V. W., Hofman, A., ... Tiemeier, H. (2014). Maternal Childhood Maltreatment and Offspring Emotional and Behavioral Problems: Maternal and Paternal Mechanisms of Risk Transmission. *Child Maltreat*, 19(2), 67–78. <https://doi.org/10.1177/1077559514527639>
- Riva Crugnola, C., Ierardi, E., Ferro, V., Gallucci, M., Parodi, C., & Astengo, M. (2016). Mother-Infant Emotion Regulation at Three Months: The Role of Maternal Anxiety, Depression and Parenting Stress. *Psychopathology*, 49(4), 285–294. <https://doi.org/10.1159/000446811>
- Roberts, R., O'Connor, T., Dunn, J., & Golding, J. (2004). The effects of child sexual abuse in later family life; mental health, parenting and adjustment of offspring. *Child Abuse and Neglect*. <https://doi.org/10.1016/j.chiabu.2003.07.006>
- Romero-Martínez, A., Figueiredo, B., & Moya-Albiol, L. (2014). Childhood history of abuse and child abuse potential: The role of parent's gender and timing of childhood abuse. *Child Abuse and Neglect*, 38(3), 510–516. <https://doi.org/10.1016/j.chiabu.2013.09.010>
- Rosenheck, R., & Nathan, P. (1985). Secondary traumatization in children of Vietnam veterans. *Hospital and Community Psychiatry*, 36(5), 538–539. <https://doi.org/10.1176/ps.36.5.538>
- Rutter, M. (1998). Some research considerations on intergenerational continuities and discontinuities: comment on the special section. *Developmental Psychology*, 34(6), 1269–1273. <https://doi.org/10.1037/0012-1649.34.6.1269>
- Salloum, A., Stover, C., Swaidan, V., & Storch, E. (2015). Parent and Child PTSD and Parent Depression in Relation to Parenting Stress Among Trauma-Exposed Children. *Journal of Child & Family Studies*, 24(5), 1203–1212. <https://doi.org/10.03.239/s10826-014-9928-1>
- Santana, G. L., Coelho, B. M., Borges, G., Viana, M. C., Wang, Y. P., & Andrade, L. H. (2015). The influence of parental psychopathology on offspring suicidal behavior across the lifespan. *PLoS ONE*, 10(7), 1–11. <https://doi.org/10.1371/journal.pone.0134970>
- Sarıtaş, D., Grusec, J. E., & Gençöz, T. (2013). Warm and harsh parenting as mediators of the relation between maternal and adolescent emotion regulation. *Journal of Adolescence*, 36(6), 1093–1101. <https://doi.org/https://doi.org/10.1016/j.adolescence.2013.08.015>

- Schreiter, S., Pijnenborg, G. H. M., & Aan Het Rot, M. (2013). Empathy in adults with clinical or subclinical depressive symptoms. *Journal of Affective Disorders, 150*(1), 1–16. <https://doi.org/10.1016/j.jad.2013.03.009>
- Schwerdtfeger, K. L., Larzelere, R. E., Werner, D., Peters, C., & Oliver, M. (2013). Intergenerational transmission of trauma: The mediating role of parenting styles on toddlers' DSM-related symptoms. *Journal of Aggression, Maltreatment and Trauma, 22*(2), 211–229. <https://doi.org/10.1080/10926771.2013.743941>
- Sethna, V., Murray, L., & Ramchandani, P. G. (2012). Depressed fathers' speech to their 3-month-old infants: a study of cognitive and mentalizing features in paternal speech. *Psychological Medicine, 42*(11), 2361–2371. <https://doi.org/DOI:10.1017/S0033291712000487>
- Shay, N. L., & Knutson, J. F. (2008). Maternal depression and trait anger as risk factors for escalated physical discipline. *Child Maltreatment. https://doi.org/10.1177/1077559507310611*
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Janavs, J., Weiller, E., Keskiner, A., ... Dunbar, G. C. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry, 12*(5), 232–241. [https://doi.org/10.1016/S0924-9338\(97\)83297-X](https://doi.org/10.1016/S0924-9338(97)83297-X)
- Sigal, J. J., & Rakoff, V. (1971). Concentration Camp Survival: A Pilot Study of Effects on the Second Generation. *Canadian Psychiatric Association Journal, 16*(5), 393–397. <https://doi.org/10.1177/070674377101600503>
- Singer, T., & Klimecki, O. M. (2014). Empathy and compassion. *Current Biology, 24*(18), R875–R878. <https://doi.org/https://doi.org/10.1016/j.cub.2014.06.054>
- Skodol, A. E., Siever, L. J., Livesley, W. J., Gunderson, J. G., Pfohl, B., & Widiger, T. A. (2002). The borderline diagnosis II: biology, genetics, and clinical course. *Biological Psychiatry, 51*(12), 951–963. [https://doi.org/https://doi.org/10.1016/S0006-3223\(02\)01325-2](https://doi.org/https://doi.org/10.1016/S0006-3223(02)01325-2)
- Slade, A., Grienberger, J., Bernbach, E., Levy, D., & Locker, A. (2005). Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment and Human Development. https://doi.org/10.1080/14616730500245880*
- Smith, A. L., Cross, D., Winkler, J., Jovanovic, T., & Bradley, B. (2014). Emotional Dysregulation and Negative Affect Mediate the Relationship Between Maternal History of Child Maltreatment and Maternal Child Abuse Potential. *Journal of Family Violence, 29*(5), 483–494. <https://doi.org/10.1007/s10896-014-9606-5>
- Springer, K. W., Sheridan, J., Kuo, D., & Carnes, M. (2003). The Long-term Health Outcomes of Childhood Abuse: An Overview and a Call to Action. *Journal of General Internal Medicine, 18*(10), 864–870. <https://doi.org/10.1046/j.1525-1497.2003.20918.x>
- Stoltenborgh, M., Bakermans-Kranenburg, M. J., Alink, L. R. A., & van IJzendoorn, M. H. (2015). The Prevalence of Child Maltreatment across the Globe: Review of a Series of Meta-Analyses. *Child Abuse Review, 24*(1), 37–50. <https://doi.org/10.1002/car.2353>

- Suveg, C., Hoffman, B., Zeman, J. L., & Thomassin, K. (2009). Common and specific emotion-related predictors of anxious and depressive symptoms in youth. *Child Psychiatry and Human Development, 40*(2), 223.
- Takehara, K., Suto, M., Kakee, N., Tachibana, Y., & Mori, R. (2017). Prenatal and early postnatal depression and child maltreatment among Japanese fathers. *Child Abuse & Neglect, 70*, 231–239. <https://doi.org/https://doi.org/10.1016/j.chiabu.2017.06.011>
- The Kidscreen Group Europe. (2006). *The KIDSCREEN Questionnaires. Quality of life questionnaires for children and adolescents*. Lengerich, Germany: Pabst Science Publishers.
- Thompson, R. (2007). Mothers' violence victimization and child behavior problems: Examining the link. *American Journal of Orthopsychiatry, 77*(2), 306–315. <https://doi.org/10.1037/0002-9432.77.2.306>
- Trossman, B. (1968). Adolescent children of concentration camp survivors. *Canadian Psychiatric Association Journal, 13*, 121–123.
- Tröster, H. (2011). *Eltern-Belastungs-Inventar (EBI). Deutsche Version des Parenting Stress Index (PSI) von R. R. Abidin*. Göttingen, Germany: Hogrefe.
- Vachon, D. D., Krueger, R. F., Rogosch, F. A., & Cicchetti, D. (2015). Assessment of the harmful psychiatric and behavioral effects of different forms of child maltreatment. *JAMA Psychiatry, 72*(11), 1135–1142. <https://doi.org/10.1001/jamapsychiatry.2015.1792>
- Vanderhasselt, M.-A., Koster, E. H. W., Onraedt, T., Bruyneel, L., Goubert, L., & De Raedt, R. (2014). Adaptive cognitive emotion regulation moderates the relationship between dysfunctional attitudes and depressive symptoms during a stressful life period: A prospective study. *Journal of Behavior Therapy and Experimental Psychiatry, 45*(2), 291–296. <https://doi.org/https://doi.org/10.1016/j.jbtep.2014.01.003>
- Weiss, M., Zelkowitz, P., Feldman, R. B., Vogel, J., Heyman, M., & Paris, J. (1996). Psychopathology in offspring of mothers with borderline personality disorder: A pilot study. *Canadian Journal of Psychiatry, 41*(5), 285–290. <https://doi.org/10.1177/070674379604100505>
- Widom, C. (1989). The cycle of violence. *Science, 244*(4901), 160–166. <https://doi.org/10.1126/science.2704995>
- Wiegand-Grefe, S., Geers, P., Plaß, A., Peterman, F., & Riedesser, P. (2009). Children of mentally ill parents: Associations between subjective parental impairment and psychological problems of the children. *Kindheit Und Entwicklung, 18*(2), 111. <https://doi.org/10.1026/0942-5403.18.2.111>
- Wiegand-Grefe, S., Halverscheid, S., & Plass, A. (2011). *Kinder und ihre psychisch kranken Eltern: Familienorientierte Prävention - Der CHIMPs-Beratungsansatz*. Göttingen: Hogrefe.
- Wiegand-Grefe, S., Jeske, J., Bullinger, M., Plaß, A., & Petermann, F. (2010). Lebensqualität von Kindern psychisch kranker Eltern. *Zeitschrift Für Psychiatrie, Psychologie Und*

- Psychotherapie*, 58(4), 315–322. <https://doi.org/10.1024/1661-4747/a000042>
- Wiegand-Grefe, S., Werkmeister, S., Bullinger, M., Plass, A., & Petermann, F. (2012). Gesundheitsbezogene Lebensqualität und soziale Unterstützung von Kindern psychisch kranker Eltern: Effekte einer manualisierten Familienintervention. *Kindheit Und Entwicklung*, 21(1), 64–73. <https://doi.org/10.1026/0942-5403/a000071>
- Witt, A., Brown, R. C., Plener, P. L., Brähler, E., & Fegert, J. M. (2017). Child maltreatment in Germany: Prevalence rates in the general population. *Child and Adolescent Psychiatry and Mental Health*, 11(1), 1–9. <https://doi.org/10.1186/s13034-017-0185-0>
- World Health Organization. (1946). *Preamble to the Constitution of the World Health Organization as adopted at the International Health Conference by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Official Records of the World Health Organization*. Retrieved from <http://www.who.int/about/definition/en/print.html>
- Yehuda, R., & Lehrner, A. (2018). Intergenerational transmission of trauma effects: putative role of epigenetic mechanisms. *World Psychiatry*, 17(3), 243–257. <https://doi.org/10.1002/wps.20568>
- Zalewski, M., Cyranowski, J. M., Cheng, Y., & Swartz, H. A. (2013). Role of maternal childhood trauma on parenting among depressed mothers of psychiatrically ill children. *Depression and Anxiety*. <https://doi.org/10.1002/da.22116>
- Zanarini, M. C. (2000). Childhood experiences associated with the development of borderline personality disorder. *Psychiatric Clinics of North America*, 23(1), 89–101. [https://doi.org/10.1016/S0193-953X\(05\)70145-3](https://doi.org/10.1016/S0193-953X(05)70145-3)
- Zanarini, M. C., Frankenburg, F. R., Dubo, E. D., Sickel, A. E., Trikha, A., Levin, A., & Reynolds, V. (1998). Axis I comorbidity of borderline personality disorder. *American Journal of Psychiatry*, 155(12), 1733–1739. <https://doi.org/10.1176/ajp.155.12.1733>
- Zanarini, M. C., Williams, A. A., Lewis, R. E., Bradford Reich, R., Vera, S. C., Marino, M. F., ... Frankenburg, F. R. (1997). Reported pathological childhood experiences associated with the development of borderline personality disorder. *American Journal of Psychiatry*, 154(8), 1101–1106. <https://doi.org/10.1176/ajp.154.8.1101>
- Zietlow, A. L., Nonnenmacher, N., Reck, C., Mueller, M., Herpertz, S. C., Neukel, C., ... Boedeker, K. (2017). Early life maltreatment but not lifetime depression predicts insecure attachment in women. *Archives of Women's Mental Health*, 20(4), 477–486. <https://doi.org/10.1007/s00737-017-0731-z>
- Ziv IV, Y., Aviezer, O., Gini, M., Sagi, A., & Karie, N. K.-. (2000). Emotional availability in the mother–infant dyad as related to the quality of infant–mother attachment relationship. *Attachment & Human Development*, 2(2), 149–169.

## 7. Appendix

### 7.1 Original Manuscripts

#### 7.1.1 Paper I

Effects of Maternal History of Depression and Early Life Maltreatment on Children's health-related Quality of Life

<sup>1</sup>Dittrich, Katja; <sup>2</sup>Fuchs, Anna; <sup>3</sup>Berpohl, Felix; <sup>1,4</sup>Meyer, Justus; <sup>1</sup>Führer, Daniel; <sup>2</sup>Reichl, Corinna; <sup>5</sup>Reck, Corinna; <sup>3</sup>Kluczniok, Dorothea; <sup>2,6</sup>Kaess, Michael; <sup>3</sup>Hindi Attar, Catherine; <sup>2</sup>Möhler, Eva; <sup>1</sup>Bierbaum, Anna-Lena; <sup>7</sup>Zietlow, Anna-Lena; <sup>1</sup>Jaite, Charlotte; <sup>1</sup>Winter, Sibylle Maria; <sup>8</sup>Herpertz, Sabine C.; <sup>2</sup>Brunner, Romuald; <sup>1</sup>Bödeker, Katja\*; <sup>2</sup>Resch, Franz\*

\*shared last-authorship, both authors contributed equally

<sup>1</sup> Charité – Universitätsmedizin Berlin, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Berlin, Germany

<sup>2</sup> University Hospital Heidelberg, Centre for Psychosocial Medicine, Department of Child and Adolescent Psychiatry, Heidelberg, Germany

<sup>3</sup> Charité – Universitätsmedizin Berlin, Department of Psychiatry and Psychotherapy, Berlin, Germany

<sup>4</sup> Vivantes Clinical Centre Spandau, Department of Psychiatry, Psychotherapy and Psychosomatics, Berlin, Germany

<sup>5</sup> Ludwig-Maximilians-University Munich, Department of Child and Adolescent Clinical Psychology and Counseling Psychology, Munich, Germany

<sup>6</sup> University Hospital of Child and Adolescent Psychiatry and Psychotherapy, Bern, Switzerland

<sup>7</sup> University Hospital Heidelberg, Center for Psychosocial Medicine, Institute of Medical Psychology

<sup>8</sup> University Hospital Heidelberg, Center for Psychosocial Medicine, General Psychiatry

Corresponding Author is Katja Dittrich, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Charité Campus Virchow, Charité – Universitätsmedizin Berlin, Augustenburger Platz 1, 13353 Berlin, Germany, katja.dittrich@charite.de, Tel 0049 30 450 666 227, Fax 0049 30 450 529 905.

*Acknowledgements:*

This work was supported by the German Federal Ministry of Education and Research (BMBF) [Grant number: 01KR1207C] and the German Research Foundation (DFG) [Grant number: BE2611/2-1].

*Declaration of Interest:*

There is no conflict of interests, financial or otherwise, to declare.

This is an accepted manuscript of the following article:

Dittrich, K. et al. (2018). Effects of maternal history of depression and early life maltreatment on children's health-related quality of life. *Journal of Affective Disorders*, 225, 280–288.

© 2018 (Elsevier). The final version is available at DOI: 10.1016/j.jad.2017.08.053

### Abstract

*Background:* There is a well-established link between maternal depression and child mental health. Similar effects have been found for maternal history of early life maltreatment (ELM). However, studies investigating the relationship of children's quality of life and maternal depression are scarce and none have been conducted for the association with maternal ELM. The aim of the present study was to investigate the effects of maternal history of ELM and depression on children's health-related quality of life and to identify mediating factors accounting for these effects. *Method:* Our study involved 194 mothers with and without a history of depression and/or ELM and their children between five and 12 years. Children's quality of life was assessed as maternal proxy- and child self-ratings using the KIDSCREEN. We considered maternal sensitivity and maternal parenting stress as potential mediators. *Results:* We found an effect of maternal history of depression but not of maternal history of ELM on health-related quality of life. Maternal stress and sensitivity mediated the effects of maternal depression on child global health-related quality of life, as well as on the dimensions Autonomy & Parent Relation, School Environment (maternal and child rating), and Physical Well-being (child rating). *Limitations:* Due to the cross-sectional design of the study, causal interpretations must be made with caution. Some scales yielded low internal consistency. *Conclusions:* Maternal impairments in areas of parenting which possibly developed during acute depression persist even after remission of acute affective symptoms. Interventions should target parenting stress and sensitivity in parents with prior depression.

*Keywords:* quality of life; depression; maltreatment; child; sensitivity; stress



## Introduction

A common reaction to early life maltreatment (ELM) experiences is a depressive disorder in adulthood (Heim and Nemeroff, 2001; Putnam, 2003; Springer et al., 2007). A growing body of research suggests that ELM not only has negative implications for the person concerned but may provoke intergenerational effects by acting as a risk factor for impaired mental health in the offspring. More precisely, children of mothers that experienced ELM show deficits in their social-emotional development and are at an elevated risk for emotional and behavioral problems that are considered precursors of oppositional defiant and affective disorders (Bosquet Enlow et al., 2016; Briggs et al., 2014; Schwerdtfeger et al., 2013). Intergenerational effects have also been demonstrated in depressive disorders as children of depressed mothers are more likely to exhibit a range of maladaptive behaviors, including difficulties in emotion regulation, academic and social problems at school, internalizing and externalizing behaviors, and insecure attachment (Gelfand and Teti, 1990; Goodman and Gotlib, 1999).

The above-mentioned studies have focused on the prevalence of psychiatric symptoms or disorders in offspring as outcome measures. However, measuring the occurrence of symptoms or disease poses only a partial aspect of health and wellbeing and lacks the subjective representation of function (Ravens-Sieberer et al., 2001). More precisely, the World Health Organization (WHO) defines health as “not merely the absence of disease”, but furthermore “a state of complete physical, mental and social well-being” (World Health Organisation, 1948). Also referred to as health-related quality of life (HRQoL), this often neglected component of health is a multidimensional construct that comprises several aspects of a person’s well-being and function including physical, mental, behavioral, emotional, and social components as perceived by the person him- or herself and related individuals (Bullinger, 2011; Ravens-Sieberer et al., 2001). In conclusion, to fully understand how a person feels and copes with everyday life, researchers need to address measures of quality of life.

However, studies investigating the relationship of maternal history of ELM and depression on child HRQoL are scarce. So far, a negative association between general parental mental health problems and HRQoL of their children has been reported in previous research: Children of mentally ill parents show lower HRQoL than reference samples derived from the general population –whereas the quality of life is particularly affected in children with parents displaying a more depressive coping style (Giannakopoulos et al., 2009; Jeske et al., 2009;

Wiegand-Grefe et al., 2012). Concordantly, parental depressive symptoms have been identified as significant predictor of lower child HRQoL (Wiegand-Grefe et al., 2010). Thus, the literature indicates a negative effect of parental depression on their children's HRQoL. However, previous research has solely focused on acute depressive symptoms in parents and relied on parent-ratings of child HRQoL. Furthermore, mediating factors between parental depression and child HRQoL remain to be elucidated.

Even though previous work has given some insight into maternal psychopathology as a risk factor for child HRQoL, research to date has not explored how maternal history of ELM may affect child HRQoL. Importantly, ELM is often associated with major depression in adulthood (Springer et al., 2007). The majority of studies fails to account for the co-occurrence of both maternal risk factors, although effects of depression might be confounded by effects of ELM and vice versa. To address this issue, the present study included the investigation of both maternal depression and maternal ELM in one study allowing us to disentangle the effects of these factors. Thus, the first aim of our study was to investigate the effects of maternal history of ELM and depression in remission on child HRQoL.

Acute symptoms of depression may affect response patterns in psychometric instruments and lead to over-reporting of child behavior problems (Fergusson et al., 1993). In our study, we examined mothers with depression in remission only in order to prevent this often-neglected problem and to address the question whether maternal depression impacts on child HRQoL even after full remission. There are two reasons why children of mothers with fully remitted depression would still exhibit lower HRQoL: (1) even though maternal symptoms are remitted, child HRQoL might not recover from impairments caused by maternal acute depressive symptoms in the past; (2) maternal emotional-cognitive deficits (Joormann and Gotlib, 2007; Lange et al., 2012) and negative parenting behaviors (Lovejoy et al., 2000) might persist after full remission of affective symptoms.

An important aim in the research of intergenerational transmission is the identification of underlying mechanisms (Rutter, 1998). Prior research has identified parenting behavior as a potential pathway of intergenerational transmission of maternal depression and ELM (Dixon et al., 2005; McCarty et al., 2003). Specifically, previous studies found maternal depression and a maternal history of ELM to be associated with higher levels of parenting stress (Milgrom and McCloud, 1996; Pereira et al., 2012) and lower levels of maternal sensitivity (Campbell et al., 2007; Driscoll and Easterbrooks, 2007; Kluczniok et al., 2016), which is the accurate and timed

responsiveness to and perception of the child's signals. Furthermore, studies indicate an association of high parenting stress and low maternal sensitivity with low child HRQoL (Campbell, 1995; Kidwell et al., 2015). Consequently, both maternal sensitivity and parenting stress could function as mediators for the effects of maternal history of ELM and depression on child HRQoL; however, this link has not been examined so far. Hence, we aim to fill this gap and investigate whether maternal sensitivity and parenting stress mediate effects of maternal history of ELM and depression on child HRQoL.

The present study tested two hypotheses: (1) both, severity of maternal history of ELM and depression predict child HRQoL. (2) Maternal sensitivity and perceived parenting stress mediate these associations. In addition, in contrast to previous investigations, we did not solely rely on parent-ratings of child HRQoL but also considered the child's individual perspective.

## **Method**

### **Participants and Procedure**

The current study was performed within the framework of the UBICA (Understanding and Breaking the Intergenerational Cycle of Abuse) multicenter project which investigates the effects of maternal history of ELM on mother-child interaction and child well-being. The present study involved 194 mothers and their children between five and 12 years of age who all attended primary school (see Table 1 for demographic variables). As an inclusion criteria mother and child had to live together.

Mother-child dyads were recruited by advertisement (e.g. gynecologists' and psychiatrists' outpatient clinics) in Berlin and Heidelberg. Additionally, we re-contacted mothers from a previous study in Heidelberg (Moehler et al., 2007). We included mothers who experienced physical and sexual abuse in their childhood before the age of 17 (moderate or severe score in CECA interview; Bifulco et al., 1994) with or without at least one episode of Major Depression (MD) later in life (M.I.N.I., Sheehan et al., 1998), mothers with at least one lifetime MD and no history of childhood maltreatment, and healthy mothers with no history of childhood maltreatment nor lifetime MD. Mothers who had experienced an episode of MD had to be currently in full remission as defined by a Hamilton Depression Scale (HAM-D; Hamilton, 1960) score of below or equal seven.

Exclusion criteria were severe physical or neurological diseases, severe physical or mental disabilities of mother (Schmidt and Metzler, 1992) or child (CFT 20-R; Weiss et al., 2006; CFT 1-R; Weiss and Osterland, 1997), and the following psychiatric disorders that would have a negative impact on the participation in the study: substance addictions in the last half year, schizophrenic disorders, bipolar and manic disorders, acute depression, posttraumatic stress disorder as assessed by the Mini International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998), and borderline personality disorder or antisocial personality disorder as assessed by the International Personality Disorder Examination (IPDE; Loranger et al., 1997). None of the participating mothers included in these analyses suffered from any current psychiatric disorder as assessed by the M.I.N.I. (Sheehan et al., 1998). Psychotropic drug medication did not represent an exclusion criterion; however, dosage had to be stable for at least two weeks before study entrance.

Approval for the study was obtained by the ethics committees of the Charité – Universitätsmedizin Berlin and the Faculty of Medicine of Heidelberg. Written informed consent was obtained from all participants after the nature of the procedure was explained.

## **Measures**

### **Maternal depression.**

We implemented the Mini-International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998) to assess maternal history of depression (and other diagnoses of DSM-IV axis I disorders). The M.I.N.I. is a fully structured diagnostic interview for screening DSM axis I disorders. Previous research has shown good interrater reliability (Sheehan et al., 1997).

### **Maternal history of ELM.**

We conducted the Childhood Experience of Care and Abuse (CECA) Interview (Bifulco et al., 1994; German Version: Kaess et al., 2011) to assess maternal experiences of ELM. The CECA is a retrospective semi-structured clinical interview that uses investigator-based ratings to collect retrospective accounts of adverse childhood experiences (up to an age of 17 years), such as sexual, physical, and emotional abuse, neglect, and antipathy, which are rated on a 4-point scale of severity (“severe,” “moderate,” “mild,” or “little/none”) according to predetermined criteria and manualized threshold examples. Interviewers had been intensively trained by the developer of the interview.

---

### **Child Quality of Life.**

To assess children's health-related quality of life (HRQoL) we implemented the KIDSCREEN-27 questionnaire (The Kidscreen Group Europe, 2006). The KIDSCREEN is available in three versions of 52, 27 and 10 items, each providing parallel forms of parental proxy-rating and child self-rating. Underlying a multidimensional construct of quality of life that covers various aspects of well-being and functioning, the 27-item version covers five dimensions of HRQoL (KIDSCREEN-27). In brief, *Physical Well-being* explores levels of physical activity, energy, and fitness; *Psychological Well-being* comprises positive emotions and satisfaction with life; *Autonomy & Parent Relation* addresses the quality of interaction between child and parent and the child's perceived level of autonomy; *Social Support and Peers* includes the quality of interactions with and support of friends and peers; and *School Environment* comprises the child's perception on concentration and learning capacity and feelings about school and teachers (see Ravens-Sieberer et al., 2014 for more detailed descriptions). The KIDSCREEN-27 contains the 10 items of the shorter KIDSCREEN-10 version that does not provide dimensional scores, but results in a global score of HRQoL. In this study, we report results on all five KIDSCREEN-27 dimensions as well as the global KIDSCREEN-10 (Figure 1). We like to emphasize that the global HRQoL score is not merely a sum score of the KIDSCREEN-27 dimensions, but an index that comprises the most important aspects of HRQoL across all dimensions to allow a more comprehensive conclusion.

The KIDSCREEN measures provide norms for children from eight to 18 years of age. Because children in our study were aged five to twelve we report raw scores, which were standardized to a scale ranging from 0 to 100 (whereby higher scores indicate higher HRQoL) to ease interpretation. We administered the child self-rating version of the KIDSCREEN as a face-to-face interview. Response categories were visualized using decks of LEGO bricks with different heights.

### **Parenting stress.**

We implemented the *Eltern-Belastungs-Inventar* (EBI; Tröster, 2011), the German adaptation of the Parenting Stress Index (PSI; Abidin, 1995), which is an established instrument that provides indications for difficulties in the parent-child relationship caused by elevated parenting stress. Tröster (2011) reports high reliabilities for the global (Cronbach's  $\alpha=.95$ ), child ( $\alpha=.91$ ), and parental scale ( $\alpha=.93$ ). The parental domain comprises constraints in parental functionality that result from specific behavioral dispositions and availability of resources

relevant for child-rearing. To avoid confounding effects with the KIDSCREEN questionnaire, which shows some similarity to the child domain questions of the EBI, the results reported in this study refer solely to the parent domain of the EBI. However, analyses including the global parenting stress score produced similar results.

### **Maternal sensitivity.**

We observed maternal sensitivity as a dimension of the Emotional Availability Scales (EA Scales, 4th Edition; Biringen, 2008) in a standardized playroom setting. During the first 15 minutes, mothers and children were told to play as they would normally do. We provided a set of different toys. For further 6 minutes, dyads were instructed to solve a hardly solvable puzzle task (“shape by shape”). In order to induce stress, a time limit was set and the extreme difficulty of the task was pointed out. Mothers were instructed to support the child but not to solve the puzzle for the child. The EA Scales were rated on a one to seven scale across the two situations. We were particularly interested in maternal sensitivity, which constitutes the core dimension of parental EA, and will therefore report only on this scale. Maternal sensitivity refers to an accurate and timed responsiveness to and perception of the child’s signals. It includes the emotional connection to the child as well as a positive and authentic maternal affect. EA was rated by three coders that had been approved as reliable to code by Zeynep Biringen after an extensive training period. All raters were blind to background information of the dyad. Every video was rated independently by at least two coders; coding discrepancies were resolved through discussion. The interrater reliability (average-measure intra-class correlations) for pairs of raters before discrepancy resolution ranged from  $r=.81$  to  $r=.88$ . Coders were blind to maternal history of depression and childhood abuse and videos were randomly assigned to them.

### **Statistical Analyses**

Cronbach’s  $\alpha$  was computed for the global KIDSCREEN-10 and five KIDSCREEN-27 dimensions as an estimate of reliability (internal consistency). Levels of agreement between the maternal proxy-rating and child self-rating were estimated using intra-class correlation coefficients (ICC). Regression diagnostics were applied and extreme outliers with a  $z$ -score greater  $| 3.29 |$  (thus located outside the limits of the normal distribution) were removed for each dependent variable, respectively, before regression and mediation analyses were run.

For each scale of the KIDSCREEN, a hierarchical regression analysis was run. The control variables age of child, sex of child and mother's years of education were entered in the first step. Maternal history of ELM and history of depression were entered in the second step.

Mediation analyses were solely run for those KIDSCREEN dimensions that showed significant effects in regression analyses. We tested the significance of the indirect effects using bootstrapping procedures. Bias-corrected bootstrap confidence intervals for the indirect effect (based on 10,000 bootstrap samples) entirely above or below zero were considered significant. All mediation analyses were controlled for maternal years of education, child sex and child age.

All analyses were run with IBM SPSS Statistics Version 23. For mediation analyses, the SPSS macro PROCESS by Hayes (2013) was used.

## Results

### Descriptive Statistics

Descriptive statistics on all dimensions of the KIDSCREEN can be found in Table 2. Cronbach's alpha as a measure of internal consistency and intra-class correlation coefficients as a measure of interrater reliability between maternal and child ratings of the global KIDSCREEN-10 and five KIDSCREEN-27 dimensions are presented in Table 3 and 4.

### Impact of Maternal History of Depression and ELM on Child HRQoL

#### **KIDSCREEN-10: Global HRQoL.**

Child and Maternal Rating: Maternal history of depression significantly predicted child global HRQoL, maternal history of childhood maltreatment did not (Table 5).

#### **KIDSCREEN-27: Physical well-being.**

Child rating: Maternal history of depression significantly predicted children's physical wellbeing, maternal history of childhood maltreatment did not (Table 5). Maternal rating: Neither maternal history of depression,  $\beta=.26$ ,  $t=0.314$  (171),  $p=.754$ , nor maternal history of childhood maltreatment,  $\beta=-.039$ ,  $t=-0.480$  (171),  $p=.632$ , predicted child physical wellbeing.

**KIDSCREEN-27: Psychological well-being.**

Child rating: Neither maternal history of depression,  $\beta=-.115$ ,  $t=-1.425$  (184),  $p=.156$ , nor maternal history of childhood maltreatment,  $\beta=-.080$ ,  $t=-1.015$  (184),  $p=.312$ , predicted child psychological wellbeing. Maternal rating: Neither maternal history of depression,  $\beta=-.093$ ,  $t=-1.113$  (174),  $p=.267$ , nor maternal history of childhood maltreatment,  $\beta=-.112$ ,  $t=-1.362$  (174),  $p=.175$ , predicted child psychological wellbeing.

**KIDSCREEN-27: Autonomy & parent relation.**

Child and Maternal Rating: Maternal history of depression significantly predicted child HRQoL regarding Autonomy & Parent Relation, maternal history of childhood maltreatment did not (Table 5).

**KIDSCREEN-27: Peers and social support.**

Child rating: Neither maternal history of depression,  $\beta=-.056$ ,  $t=-0.675$  (186),  $p=.501$ , nor maternal history of childhood maltreatment,  $\beta=.031$ ,  $t=0.383$  (186),  $p=.702$ , predicted child HRQoL regarding peers and social support. Maternal rating: Neither maternal history of depression,  $\beta=-.105$ ,  $t=-1.287$  (178),  $p=.200$ , nor maternal history of childhood maltreatment,  $\beta=-.008$ ,  $t=-0.096$  (178),  $p=.924$ , predicted child HRQoL regarding peers and social support.

**KIDSCREEN-27: School environment.**

Child and Maternal Rating: Maternal history of depression significantly predicted child HRQoL regarding School Environment, maternal history of childhood maltreatment did not (Table 5).

**Mediation Analyses**

Mediation analyses were solely conducted for the global HRQoL scale and those subscales of HRQoL (Physical Well-being in the child rating, Autonomy & Parent Relation, and School Environment) that were predicted by maternal history of depression on a statistically significant level in the regression analyses above. In order to test our mediation hypotheses, we conducted multiple mediation analyses using ordinary least squares path analyses. Maternal history of depression was entered as the independent variable, global HRQoL/dimensions of HRQoL were entered as outcome variables, and parenting stress and maternal sensitivity were



---

entered as mediator variables. Figure 2 depicts the path analytic model. Maternal sensitivity and parenting stress were not correlated,  $r=.05$ ,  $p=.51$ .

### **Maternal proxy-rating.**

As seen in Table 6, maternal history of depression significantly predicted parenting stress (path  $a_1$ ) and maternal sensitivity (path  $a_2$ ). Moreover, parenting stress (path  $b_1$ ) and maternal sensitivity (path  $b_2$ ) significantly predicted global HRQoL, and the KIDSCREEN-27 dimensions Autonomy & Parent Relation and School Environment. Bias-corrected bootstrap confidence intervals for the indirect effects (paths  $a_1b_1$  and  $a_2b_2$ ) based on 10,000 bootstrap samples were entirely below zero (see Table 6). Thus, the indirect effects were statistically significant. There was no evidence that maternal history of depression influenced child HRQoL independent of its effects on parenting stress and sensitivity (path  $c'$ ), therefore full mediation was present.

### **Child self-rating.**

Maternal history of depression indirectly influenced child global HRQoL, and the KIDSCREEN-27 subscales Physical Well-being, Autonomy & Parent Relation, and School Environment through its effect on parenting stress. Children of mothers with higher levels of parenting stress (path  $b_1$ ) showed lower HRQoL on all scales included except of Physical Well-being. However, no associations of maternal sensitivity and child HRQoL were found for the child self-ratings. Bias-corrected bootstrap confidence intervals for the indirect effects via parenting stress (paths  $a_1b_1$ ) were below zero and thus statistically significant. The direct effects of maternal history of depression on child global HRQoL and Autonomy & Parent Relation were still significant, suggesting that partial mediation was present.

## **Discussion**

The present study was the first to investigate the effects of maternal history of early life maltreatment (ELM) and depression on child quality of life, including 194 mothers and their children between five to 12 years of age. We found a negative effect of maternal history of depression but not of maternal history of ELM on child HRQoL. Specifically, significant effects of maternal depression emerged in both maternal proxy-rating and child self-rating on global HRQoL as well as on the HRQoL dimensions Autonomy & Parent Relation and School

Environment. Furthermore, we found an effect of maternal history of depression for the child-rating of the HRQoL dimension Physical Well-being. Additionally, we provide evidence for potential pathways of this intergenerational transmission. Both parenting stress and maternal sensitivity mediated the effects of maternal history of depression on HRQoL in maternal proxy-ratings. As for the child self-ratings, effects of maternal history of depression on HRQoL were mediated by parenting stress.

### **Impact of Maternal History of ELM and Depression on Child Quality of Life**

Our first hypothesis was partially confirmed as we found an effect of maternal history of depression on child HRQoL. However, there was no evidence that maternal experience of ELM alone had an impact on child HRQoL.

The present study adds to the existing literature in the following regards: First, the majority of studies investigating the effects of maternal depression on children's well-being have mostly used maternal assessments of child outcomes. The present study provides results based on assessments of the child him- or herself. Second, previous studies showed evidence for a negative effect of maternal acute depressive symptoms on child HRQoL (Wiegand-Grefe et al., 2010). We found similar results for mothers who were fully remitted from depression. There are two possible factors that could explain this finding: On the one hand, cognitive-emotional and behavioral alterations (including alterations concerning maternal behavior) may persist even after complete remission of affective symptoms (Lange et al., 2012; Lovejoy et al., 2000). On the other hand, effects of maternal acute depressive episodes on child HRQoL may persist after remission of depression. Third, including both maternal depression and maternal ELM in one study allowed us to disentangle the effects of these two factors. In our study, we did not find an effect of ELM on child HRQoL while significant results emerged for maternal history of depression. We can exclude confounding effects of ELM on the association of maternal history of depression and child HRQoL.

Taking a further look into the five dimensions of the KIDSCREEN-27 instrument, certain aspects of children's HRQoL showed to be more affected by maternal depression than others. In line with work by Wiegand-Grefe et al. (2010) which demonstrated negative associations between acute maternal depressive symptoms and child HRQoL on the dimensions "Family" and "School" (of the KINDL-R questionnaire; Ravens-Sieberer and Bullinger, 2000), offspring of mothers with a history of depression were also most affected on the HRQoL dimensions Autonomy & Parent Relation and School Environment in our study. Our finding of

perceived impairments in parent relationship is in accordance with findings of previous studies showing that maternal depression has a negative impact on parenting behavior (Lovejoy et al., 2000) and quality of mother-child interaction (Kluczniok et al., 2016). Maternal depression may also lead to children's impairments in different areas of psychosocial functioning, including the development of behavior problems or psychopathology, lower levels of social competence and self-esteem (Cummings and Davies, 1994), and social and academic adjustment to problems at school (Downey and Coyne, 1990). Impairments in the academic context might be especially relevant as this context poses particular demands on the child's functioning and may thus explain lower HRQoL observed in the School Environment in the present study.

We found a negative association between maternal history of depression and the HRQoL dimension of Physical Well-being in the child-ratings but not the maternal ratings. Similarly, Wiegand-Grefe et al. (2010) found no significant associations of child physical well-being, as assessed by maternal ratings (KINDL-R), and maternal depressive symptoms (Wiegand-Grefe, Jeske, Bullinger, Plaß, & Petermann, 2010) not taking into account the child's individual perspective. There are two possible explanations for our findings: first, children of mothers with history of depression may express stress with psychosomatic complaints; and second, as questions of this scale refer to general health, fitness, energy and amount of physical activity, children of mothers with history of depression could be less physically active. Other researchers have found a negative association between caregivers' depressive symptoms and child's health-promoting behaviors (Yoo et al., 2015) supporting this notion. Mothers with a history of depression might be less aware of these two issues of child physical well-being leading to discrepancies in maternal and child ratings.

In contrast to previous findings by Wiegand-Grefe et al. (2010) we found no associations of maternal depression on Psychological Well-being of the child. A possible explanation could be that we examined mothers with depression in remission as opposed to mothers with an acute depressive episode. As acute depressive symptoms include negative emotionality, hopelessness and lack of motivation, these maternal symptoms might directly affect mood and psychological well-being in children, but no longer persist when maternal depression has remitted. Another explanation would be that the KIDSCREEN dimension Psychological Well-being exclusively examines internalizing behaviors (like mood, loneliness, motivation, self-esteem) and thus does not represent the wider scope of psychological problems children at this age may experience.

In accordance with previous research (Wiegand-Grefe et al., 2010), we found no effects on the dimension Peers & Social Support. In fact, Wiegand-Grefe et al. (2010) found even positive associations with duration of parental mental disorder and the quality of life subscale “Friends” (KINDL-R). They concluded that with increasing exposure to parental mental illness children rely on compensatory resources outside of their home and family such as supportive peer groups.

We found no effect of maternal history of ELM on child HRQoL even though previous research has shown that ELM poses a general risk factor for child functioning in terms of psychiatric and attachment problems (Bosquet Enlow et al., 2016; Mizuki et al., 2015). We conclude that maternal history of ELM has differential effects on distinct aspects of health as defined by the WHO (1948): Maternal ELM may not affect children’s subjective experience of well-being even though it poses a higher risk for psychopathology. In contrast, maternal depressive symptoms might cause greater impairments on family function and everyday life and therefore lead to broader effects on children’s well-being.

### **Mediating Effect of Maternal Parenting Stress and Sensitivity**

In concordance with our second hypothesis, we identified two potential pathways for the relationship between maternal history of depression and offspring HRQoL. For the maternal ratings of children’s HRQoL, maternal parenting stress and sensitivity fully mediated the associations between maternal history of depression and children’s HRQoL (global score and dimensions Autonomy & Parent Relation and School Environment). For the child ratings of HRQoL, maternal parenting stress fully mediated the effects of maternal history of depression on child HRQoL on the dimensions Physical Well-Being and School Environment and partially on child global HRQoL and the dimension Autonomy & Parent Relation. Regarding child ratings, maternal sensitivity was not a significant mediator between maternal depression and child HRQoL. Thus, our second hypothesis was only partially confirmed.

With these findings, we contribute to explaining the transmission of maternal depression onto the next generation. To the best of our knowledge, this is the first study to investigate quality of life in children of mothers with depression in remission as well as mechanisms of transmission of maternal psychopathology on child quality of life. Not only were we able to show in our first analysis that even after remission of maternal depression children show lower HRQoL, the results of our second analysis scrutinizing mediating variables help to understand why reduced HRQoL may be present also during remission. Even though depressive symptoms

were fully remitted in mothers included in the study, parenting stress was elevated and maternal sensitivity was reduced. Thus, children's HRQoL may be related to altered maternal behavior not solely present during acute depressive episodes but also during remission of depressive symptoms.

Of the two possible explanations how mothers' depression could still affect child HRQoL after full remission of symptoms that we presented earlier, the second one seems even more important in consideration of our latter findings: impairments in child HRQoL caused by prior maternal depression do not appear to be simply persistent, but child HRQoL seems to be continuously affected by maternal emotional-cognitive deficits (Joormann and Gotlib, 2007; Lange et al., 2012) and negative parenting behaviors (Lovejoy et al., 2000) which might lead to lower sensitivity and elevated parenting stress even after full remission of affective symptoms.

### **Strength, Limitations and Future Studies**

This is the first study to examine maternal history of ELM and depression on children's quality of life. The multi-informant approach in the assessment of quality of life is an important strength of the present study. We utilized well-validated interview measures instead of self-report questionnaires to evaluate maternal history of ELM and depression and assessed maternal sensitivity with an established observational measure in contrast to most past research in the field. However, due to the cross-sectional design of the study, causal interpretations must be made with caution and prospective longitudinal studies are needed to highlight the exact mechanisms of transmission processes.

Another limitation concerns the psychometric properties of our main outcome variable. Considering that a Cronbach's  $\alpha \geq .70$  is commonly considered acceptable (Nunnally, 1978), some of the HRQoL subscales yielded low internal consistency in the present study. One explanation for the low internal consistency may be that the KIDSCREEN-27 is a reduced version of the KIDSCREEN-52 instrument with relatively short scales of four to seven items. Shorter scales often show lower reliability, as alpha is a function of the number of items. Therefore, outcomes on these dimensions with low reliability should be interpreted with caution. Despite of the low internal consistency, we decided to report results on these scales in order to give a full picture of the effects on all dimensions of HRQoL. The fact that similar results emerged for child and maternal ratings on the HRQoL subscales Autonomy & Parent Relation and School Environment supports the validity of our results despite of low internal

consistencies. However, the results on the child rating scale of Physical Well-being might need further replication as they deviate from results on the maternal scale and internal consistency on this scale was noticeably lower.

Mother and child agreement (intra-class correlation coefficients) ranged between .34 and .51 on the dimensions of HRQoL. ICCs were thus lower than in the healthy norm population, where ICCs between .44 and .61 have been reported (The Kidscreen Group Europe, 2006), but consistent with a longitudinal study applying the KIDSCREEN measure in a general population sample (Rajmil et al., 2013). Importantly, maternal and child rating led to similar results in our study. The discrepancy between proxy and self-ratings is an important issue in child psychology and underlines the necessity of the multi-informant approach (Eiser and Morse, 2001).

## **Conclusion**

Our results highlight the impact of a maternal depressive disorder on the well-being of the following generation. Even though the mothers included in our study were fully remitted from depression, children showed reduced quality of life. We identified maternal sensitivity and parenting stress as mediators accounting for the relationship between maternal history of depression and offspring quality of life. Our data suggest that impairments in parenting, specifically parenting stress and sensitivity, which possibly developed during acute depression, persist during remission and continue to affect the children's quality of life. The present study contributes to understanding the intergenerational cycle of transmission in maternal depressive disorders. Future research appears desirable addressing the issue of breaking this cycle by developing interventions that target the identified mechanisms.

---

## References

- Abidin, R. R. (1995). *Parenting Stress Index, Third Edition: Professional Manual*. Odessa, FL: Psychological Assessment Resources, Inc.
- Afifi, T. O., Enns, M. W., Cox, B. J., de Graaf, R., ten Have, M., & Sareen, J. (2007). Child Abuse and Health-Related Quality of Life in Adulthood. *The Journal of Nervous and Mental Disease*, *195*(10), 797-804. doi:10.1097/NMD.0b013e3181567fdd
- Bifulco, A., Brown, G. W., & Harris, T. O. (1994). Childhood experience of care and abuse (CECA): A retrospective interview measure. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *35*(8), 1419-1435. doi:10.1111/j.1469-7610.1994.tb01284.x
- Biringen, Z. (2008). *Emotional Availability (EA) Scales: 4th Edition. Middle Childhood/Youth Version*. PO Box, 3615, Colorado 80307: emotionalavailability.com.
- Bosquet Enlow, M., Englund, M. M., Egeland, B. (2016). Maternal Childhood Maltreatment History and Child Mental Health: Mechanisms in Intergenerational Effects. *Journal of Clinical Child & Adolescent Psychology*, *00*(00), 1-16. doi:10.1080/15374416.2016.1144189
- Briggs, R. D., Silver, E., Krug, L., Mason, Z., Schrag, R., Chinitz, S., & Racine, A. (2014). Healthy Steps as a Moderator: The Impact of Maternal Trauma on Child Social-Emotional Development. *Clin. pract. pediatr. psychol.*, *2*(2), 166-175. doi:10.1037/cpp0000060
- Bullinger, M. (2011). Lebensqualität von Kindern psychisch kranker Eltern. In S. Wiegand-Grefe, F. Mattejat, & A. Lenz (Eds.), (pp. 401-415). Göttingen: Vandenhoeck & Ruprecht.
- Campbell. (1995). Behavior problems in preschool children: A review of recent research. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *36*(1), 113-149. doi:10.1111/j.1469-7610.1995.tb01657.x
- Campbell, Matestic, P., von Stauffenberg, C., Mohan, R., & Kirchner, T. (2007). Trajectories of maternal depressive symptoms, maternal sensitivity, and children's functioning at school entry. *Dev Psychol*, *43*(5), 1202-1215. doi:10.1037/0012-1649.43.5.1202
- Collishaw, S., Dunn, J., O'Connor, T. G., & Golding, J. (2007). Maternal childhood abuse and offspring adjustment over time. *Dev Psychopathol*, *19*(02), 367-383. doi:10.1017/S0954579407070186

- Corso, P. S., Edwards, V. J., Fang, X., & Mercy, J. A. (2008). Health-related quality of life among adults who experienced maltreatment during childhood. *American journal of public health, 98*(6), 1094-1100. doi:10.2105/AJPH.2007.119826
- Cummings, E. M., & Davies, P. T. (1994). Maternal depression and child development. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 35*(1), 73-112. doi:10.1111/j.1469-7610.1994.tb01133.x
- Dickinson, L. M., DeGruy, F. V., Dickinson, W. P., & Candib, L. M. (1999). Health-related quality of life and symptom profiles of female survivors of sexual abuse. *Archives of family medicine, 8*(1), 35-43.
- Dixon, L., Hamilton-Giachritsis, C., & Browne, K. (2005). Attributions and behaviours of parents abused as children: a mediational analysis of the intergenerational continuity of child maltreatment (Part II). *Journal of Child Psychology and Psychiatry, 46*(1), 58-68. doi:10.1111/j.1469-7610.2004.00340.x
- Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological bulletin, 108*(1), 50-76. doi:10.1037/0033-2909.108.1.50
- Driscoll, J. R., & Ann Easterbrooks, M. (2007). Young mothers' play with their toddlers: Individual variability as a function of psychosocial factors. *Infant and Child Development, 16*(6), 649-670. doi:10.1002/icd.515
- Eiser, C., & Morse, R. (2001). Can parents rate their child's health-related quality of life? Results of a systematic review. *Quality of Life Research, 10*(4), 347-357. doi:10.1023/A:1012253723272
- Fergusson, D. M., Lynskey, M. T., & Horwood, L. J. (1993). The effect of maternal depression on maternal ratings of child behavior. *Journal of Abnormal Child Psychology, 21*(3), 245-269. doi:10.1007/BF00917534
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review, 10*(3), 329-353. doi:10.1016/0272-7358(90)90065-I
- Giannakopoulos, G., Dimitrakaki, C., Pedeli, X., Kolaitis, G., Rotsika, V., Ravens-Sieberer, U., & Tountas, Y. (2009). Adolescents' wellbeing and functioning: relationships with parents' subjective general physical and mental health. *Health Qual Life Outcomes, 7*, 100. doi:10.1186/1477-7525-7-100
- Hamilton, M. (1960). A Rating Scale for Depression. *J. Neurol. Neurosurg. Psychiat, 23*, 56-62. doi:10.1136/jnmp.23.1.56
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis : a regression-based approach*.



- 
- Heim, C., & Nemeroff, C. B. (2001). The role of childhood trauma in the neurobiology of mood and anxiety disorders: Preclinical and clinical studies. *Biological Psychiatry, 49*(12), 1023-1039. doi:10.1016/S0006-3223(01)01157-X
- Jeske, J., Bullinger, M., Plaß, A., Petermann, F., & Wiegand-Grefe, S. (2009). Risikofaktor Krankheitsverarbeitung. *Zeitschrift für Psychiatrie, Psychologie und Psychotherapie, 57*(3), 207-213. doi:10.1024/1661-4747.57.3.207
- Joormann, J., & Gotlib, I. H. (2007). Selective attention to emotional faces following recovery from depression. *J Abnorm Psychol, 116*(1), 80-85. doi:10.1037/0021-843x.116.1.80
- Jud, A., Landolt, M. A., Tatalias, A., Lach, L. M., & Lips, U. (2013). Health-related quality of life in the aftermath of child maltreatment: follow-up study of a hospital sample. *Quality of Life Research, 22*(6), 1361-1369. doi:10.1007/s11136-012-0262-z
- Kaess, M., Parzer, P., Mattern, M., Resch, F., Bifulco, A., & Brunner, R. (2011). Childhood Experiences of Care and Abuse (CECA) - Validierung der deutschen version von fragebogen und korrespondierendem interview sowie ergebnisse einer untersuchung von zusammenh??ngen belastender kindheitserlebnisse mit suizidalen verhaltensweisen. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie, 39*(4), 243-252. doi:10.1024/1422-4917/a000115
- Kidwell, K. M., Nelson, T. D., & Van Dyk, T. (2015). Parenting stress and child physical health among a low-income sample: The moderating role of child anxiety. *J Health Psychol, 20*(11), 1377-1387. doi:10.1177/1359105313512352
- Kluczniok, D., Boedeker, K., Fuchs, A., Hindi Attar, C., Fydrich, T., Fuehrer, D., . . . BERPohl, F. (2015). Emotional availability in mother-child interaction: the effects of maternal depression in remission and additional history of childhood abuse. *Depression and anxiety*. doi:10.1002/da.22462
- Lange, C., Adli, M., Zschucke, E., Beyer, R., Ising, M., Uhr, M., & BERPohl, F. (2012). Affective set-shifting deficits in patients with major depression in remission. *J Psychiatr Res, 46*(12), 1623-1626. doi:10.1016/j.jpsychires.2012.09.007
- Loranger, A. W., Janca, A., & Sartorius, N. (1997). *Assessment and Diagnosis of Personality Disorders: the ICD-10 International Personality Disorder Examination (IPDE)*. Cambridge, U.K.: Cambridge University Press.
- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review, 20*(5), 561-592. doi:10.1016/S0272-7358(98)00100-7

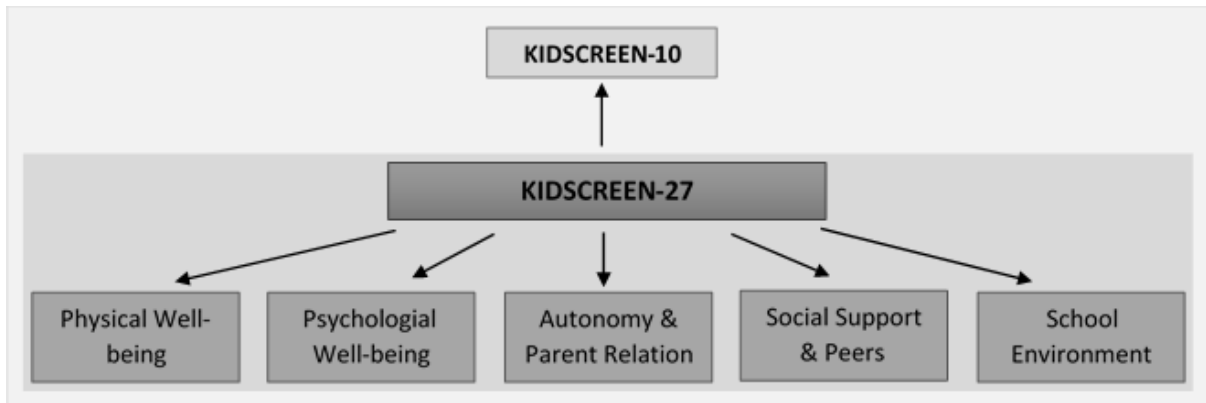
- McCarty, C. A., McMahon, R. J., & Conduct Problems Prevention Research Group, C. P. P. R. (2003). Mediators of the relation between maternal depressive symptoms and child internalizing and disruptive behavior disorders. *Journal of family psychology : JFP : journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, *17*(4), 545-556. doi:10.1037/0893-3200.17.4.545
- Milgrom, J., & McCloud, P. (1996). Parenting stress and postnatal depression. *Stress Medicine*, *12*(3), 177-186. doi:10.1002/(SICI)1099-1700(199607)12:3<177::AID-SMI699>3.0.CO;2-W
- Mizuki, R., Fujiwara, T., & Okuyama, M. (2015). Impact of maternal childhood abuse history on child's attachment problems. *Paediatrics and Health*, *3*(1), 3-3. doi:10.7243/2052-935X-3-3
- Moehler, E., Biringen, Z., & Poustka, L. (2007). Emotional availability in a sample of mothers with a history of abuse. *The American journal of orthopsychiatry*, *77*(4), 624-628. doi:10.1037/0002-9432.77.4.624
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Pereira, J., Vickers, K., Atkinson, L., Gonzalez, A., Wekerle, C., & Levitan, R. (2012). Parenting stress mediates between maternal maltreatment history and maternal sensitivity in a community sample. *Child Abuse & Neglect*, *36*(5), 433-437. doi:10.1016/j.chiabu.2012.01.006
- Putnam, F. W. (2003). Ten-year research update review: child sexual abuse. *J Am Acad Child Adolesc Psychiatry*, *42*(3), 269-278. doi:10.1097/00004583-200303000-00006
- Rajmil, L., Lopez, A. R., Lopez-Aguila, S., & Alonso, J. (2013). Parent-child agreement on health-related quality of life (HRQOL): a longitudinal study. *Health Qual Life Outcomes*, *11*(1), 101. doi:10.1186/1477-7525-11-101
- Ravens-Sieberer, U., & Bullinger, M. (2000). *KINDL-R: Questionnaire for measuring health-related quality of life in children and adolescents. Revised Version. Manual*. Retrieved from <https://www.kindl.org/english/manual/>
- Ravens-Sieberer, U., Gosch, A., Abel, T., Auquier, P., Bellach, B. M., Bruil, J., . . . European Kidscreen Group. (2001). Quality of life in children and adolescents: a European public health perspective. *Soz Praventivmed*, *46*(5), 294-302.
- Ravens-Sieberer, U., Herdman, M., Devine, J., Otto, C., Bullinger, M., Rose, M., & Klasen, F. (2014). The European KIDSCREEN approach to measure quality of life and well-being in children: development, current application, and future advances. *Qual Life Res*, *23*(3), 791-803. doi:10.1007/s11136-013-0428-3

- Rutter, M. (1998). Some research considerations on intergenerational continuities and discontinuities: comment on the special section. *Dev Psychol*, *34*(6), 1269-1273.
- Schmidt, K.-H., & Metzler, P. (1992). *WST: Wortschatztest*. Weinheim, Germany: Beltz Test.
- Schwerdtfeger, K. L., Larzelere, R. E., Werner, D., Peters, C., & Oliver, M. (2013). Intergenerational Transmission of Trauma: The Mediating Role of Parenting Styles on Toddlers' DSM-Related Symptoms. *Journal of Aggression, Maltreatment & Trauma*, *22*(2), 211-229. doi:10.1080/10926771.2013.743941
- Sheehan, D. V., Lecrubier, Y., Harnett Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., . . . Dunbar, G. C. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry*, *12*(5), 232-241. doi:10.1016/S0924-9338(97)83297-X
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., . . . Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of clinical psychiatry*, *59 Suppl 2*, 22-33; 34-57.
- Springer, K. W., Sheridan, J., Kuo, D., & Carnes, M. (2007). Long-term physical and mental health consequences of childhood physical abuse: results from a large population-based sample of men and women. *Child Abuse & Neglect*, *31*(5), 517-530. doi:10.1016/j.chiabu.2007.01.003
- The Kidscreen Group Europe. (2006). *The KIDSCREEN Questionnaires. Quality of life questionnaires for children and adolescents*. Lengerich, Germany: Pabst Science Publishers.
- Tröster, H. (2011). *Eltern-Belastungs-Inventar (EBI). Deutsche Version des Parenting Stress Index (PSI) von R. R. Abidin. Manual*. Göttingen: Hogrefe.
- Weiss, R., Albinus, B., & Arzt, D. (2006). *Grundintelligenztest Skala 2-Revision CFT 20-R [Culture Fair Intelligence Test, Scale 2]*. Goettingen, Germany: Hogrefe.
- Weiss, R., & Osterland, J. (1997). *CFT1, Grundintelligenztest Skala 1 CFT 1 [Culture Fair Intelligence Test, Scale 1], 5th rev. ed.* Goettingen, Germany: Hogrefe.
- Wiegand-Grefe, S., Jeske, J., Bullinger, M., Plaß, A., & Petermann, F. (2010). Lebensqualität von Kindern psychisch kranker Eltern. In S. Wiegand-Grefe, F. Matzejat, & A. Lenz (Eds.), (Vol. 58, pp. 315-322). Göttingen: Vandenhoeck & Ruprecht.
- Wiegand-Grefe, S., Werkmeister, S., Bullinger, M., Plaß, A., & Petermann, F. (2012). Gesundheitsbezogene Lebensqualität und soziale Unterstützung von Kindern psychisch

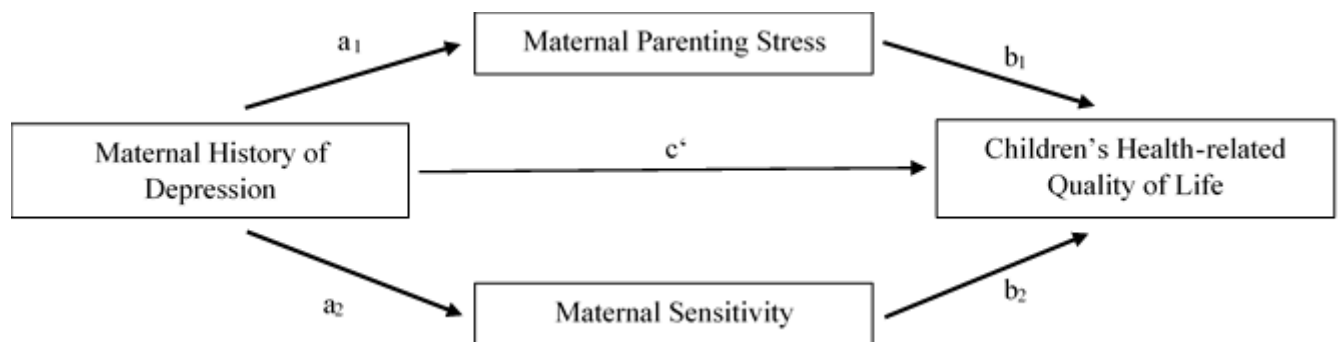
kranker Eltern: Effekte einer manualisierten Familienintervention. *Kindheit und Entwicklung*, 21(1), 64-73. doi:10.1026/0942-5403/a000071

World Health Organisation. (1948). *Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19–22 June 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no.*

Yoo, J. P., Chung, G. H., & Lee, S.-G. (2015). The Associations Between Socioeconomic Status, Caregivers' Depressive Symptoms, Children's Health-Promoting Behavior, and Children's Physical Health: A Mediation Model. *Asian Social Work and Policy Review*, 9(2), 177-193. doi:10.1111/aswp.12056



*Figure 1.* Structure of the KIDSCREEN Instrument including the KIDSCREEN-10 Global Score and the five KIDSCREEN-27 Dimensions



*Figure 2.* Mediation model for the relationship between maternal history of depression and child HRQoL as mediated by maternal stress and maternal sensitivity

Table 1

*Demographic and clinical characteristics*

<b>Mothers</b>	<b>Sample (N=194) M (SD) / %</b>
Age in years	39.78 (5.62)
IQ	106.30 (11.29)
Years of education	17.22 (3.62)
Partnership status	
- married/in a relationship either with the father of the child or another partner	70.6%
- single, separated from partner/husband, divorced or widowed	29.4%
Nationality (German)	90.7 %
Mothers with a history of moderate/severe ELM	46.9 %
Mothers with diagnosis of rMDD	45.9 %
Age at onset (years)	27.92 (9.01)
Number of episodes	2.30 (1.46)
HAMD	1.82 (1.98)
Current Medication	47.2 %
<b>Children</b>	<b>M (SD) / %</b>
Age in years	8.03 (1.58)
IQ	105.79 (13.11)
Sex (Girls)	108 (55.7%)
Psychiatric disorders <sup>1</sup>	
Anxiety disorders	5.1%
Attention-Deficit and Disruptive Behavior Disorders	6.6 %
Tic disorders	2.0 %
Elimination disorders	6.7 %

PTSD 0.5 %

Other disorders of infancy, childhood, or adolescence 0.5 %

*Notes: M=Mean; SD=standard deviation; IQ=intelligence quotient; rMDD=major depressive disorder in remission; HAMD=Hamilton Rating Scale of Depression; <sup>1</sup>in total, 38 children (19.6 %) fulfilled diagnostic criteria for one or more psychiatric disorders*

Table 2

*Descriptive Statistics of KIDSCREEN-10 and KIDSCREEN-27 dimensions for child self-rating and maternal proxy-rating*

	Child Self-Rating				Maternal Proxy-Rating			
	n	Mean	SD	Range	n	Mean	SD	Range
Physical Well-being	191	76.0	15.1	30.0-100	178	77.7	14.4	35.0-100
Psychological Well-being	192	81.8	13.7	35.7-100	182	79.7	11.9	39.3-100
Autonomy & Parent relation	190	75.2	15.8	28.6-100	142	77.0	10.3	46.4-100
Peers & Social Support	189	80.4	16.2	25.0-100	180	73.6	12.9	37.5-100
School Environment	192	80.6	15.9	25.0-100	178	79.6	15.1	31.3-100
Global HRQoL Index (KIDSCREEN-10)	190	79.1	12.3	40.0-100	174	76.9	10.7	45.0-100

Table 3

*Reliability of KIDSCREEN-10 and KIDSCREEN-27 dimensions for maternal proxy-rating and child self-rating by age group*

	Cronbach's alpha			
	5 to 7 years	8 to 12 years	Children Total	Mothers Total
Physical Well-being	.460 (n=84)	.655 (n=107)	.566 (n=191)	.791 (n=178)
Psychological Well-being	.702 (n=83)	.779 (n=109)	.747 (n=192)	.818 (n=182)
Autonomy & Parent relation	.694 (n=82)	.667 (n=108)	.711 (n=190)	.655 (n=142)

Peers & Social Support	.551 ( <i>n</i> =81)	.582 ( <i>n</i> =108)	.563 ( <i>n</i> =189)	.750 ( <i>n</i> =180)
School Environment	.703 ( <i>n</i> =84)	.657 ( <i>n</i> =108)	.680 ( <i>n</i> =192)	.861 ( <i>n</i> =178)
General HRQoL Index (KIDSCREEN-10)	.705 ( <i>n</i> =82)	.734 ( <i>n</i> =108)	.719 ( <i>n</i> =190)	.801 ( <i>n</i> =174)

Table 4

*Intraclass correlation coefficients as a measure of interrater reliability between maternal proxy-rating and child self-rating by age group*

	Intraclass Correlation (ICC)		
	5 to 7 years ( <i>n</i> )	8 to 12 years ( <i>n</i> )	Children Total ( <i>n</i> )
Physical Well-being	.24 (80)	.43 (95)	.34 (175)
Psychological Well-being	.37 (81)	.46 (99)	.42 (180)
Autonomy & Parent relation	.53 (67)	.21 (71)	.37 (138)
Peers & Social Support	.38 (79)	.44 (96)	.41 (175)
School Environment	.37 (80)	.66 (96)	.51 (178)
Global HRQoL Index (KIDSCREEN-10)	.27 (77)	.54 (93)	.42 (170)



Table 5

*Hierarchical Multiple Regression Analysis Predicting Global Health-Related Quality of Life (HRQoL) and dimensions of HRQoL: Physical Well-being (Child Rating), Child Autonomy & Parent Relation (in Child and Parent Rating) from Maternal History of Depression and Childhood Maltreatment – non-significant results are reported in the text*

	Global HRQoL			Physical Well-being			Autonomy & Parent Relation			School Environment						
	rated by			Child			Child			Child						
	Child	Mother		ΔR <sup>2</sup>	β		ΔR <sup>2</sup>	β		ΔR <sup>2</sup>	β		ΔR <sup>2</sup>	β		
<i>Step 1</i>	.025 <sup>ns</sup>			.034 <sup>ns</sup>			.082 <sup>**</sup>			.030 <sup>ns</sup>			.002 <sup>ns</sup>			.060 <sup>*</sup>
Control <sup>a</sup>																
<i>Step 2</i>	.052 <sup>**</sup>			.038 <sup>*</sup>			.050 <sup>**</sup>			.059 <sup>*</sup>			0.051 <sup>**</sup>			.030 <sup>d</sup>
MD <sup>b</sup>			<b>-.225<sup>**</sup></b>		<b>-.191<sup>*</sup></b>			<b>-.240<sup>**</sup></b>		<b>-.292<sup>***</sup></b>		<b>-.261<sup>**</sup></b>		<b>-.161<sup>*</sup></b>		<b>-.170<sup>*</sup></b>
HCM <sup>c</sup>			<b>-.014<sup>ns</sup></b>		<b>-.018<sup>ns</sup></b>		.035 <sup>ns</sup>		.004 <sup>ns</sup>		.036 <sup>ns</sup>		<b>-.108<sup>ns</sup></b>			<b>-.029<sup>ns</sup></b>
Total R <sup>2</sup>	.088 <sup>*</sup>			.072 <sup>*</sup>			.13 <sup>***</sup>		.171 <sup>***</sup>		.089 <sup>*</sup>		.054 <sup>ns</sup>			.093 <sup>**</sup>
<i>n</i>	188			173			188		188		141		190			177

*Note.* <sup>a</sup> Control variables included: age of child, sex of child, and mother's years of education. <sup>b</sup> MD: Major Depression in Remission. <sup>c</sup> HCM: History of Childhood Maltreatment (the maximum score of all five CECA dimensions was entered into analyses with higher scores indicating higher severity).

<sup>d</sup> ΔR<sup>2</sup> was marginal significant with  $p=.050$ . <sup>ns</sup> not significant. \*  $p<.05$ . \*\* $p<.010$ . \*\*\* $p<.001$ .

Table 6

*Regression coefficients for the relationship between maternal history of depression and child HRQoL as mediated by maternal stress and maternal sensitivity*

					Indirect Effects [CI]		Direct
	a <sub>1</sub>	a <sub>2</sub>	b <sub>1</sub>	b <sub>2</sub>	a <sub>1</sub> b <sub>1</sub>	a <sub>2</sub> b <sub>2</sub>	c'
<b>Proxy Rating</b>							
Global HRQoL (n=172)	11.91***	-0.53***	-0.27***	1.91*	<b>-3.25</b> [-5.33, -1.59]	<b>-1.01</b> [-2.27, -0.25]	-0.07 <sup>ns</sup>
Autonomy and Parent Relation (n=140)	11.34**	-0.47**	-0.19***	1.77*	<b>-2.17</b> [-4.45, -0.82]	<b>-0.84</b> [-2.25, -0.08]	-2.32 <sup>ns</sup>
School Environment (n=176)	11.20***	-0.51***	-0.32***	2.61*	<b>-3.59</b> [-6.11, -1.78]	<b>-1.32</b> [-3.10, -0.27]	-0.61 <sup>ns</sup>
<b>Self Rating</b>							
Global HRQoL (n=177)	10.80***	-0.51***	-0.13**	1.02 <sup>ns</sup>	<b>-1.42</b> [-3.03, -0.47]	-0.51 [-1.78, 0.35]	-4.07*
Physical Well-being (n=178)	10.80***	-0.52***	-0.10 <sup>ns</sup>	0.90 <sup>ns</sup>	<b>-1.05</b> [-2.67, -0.04]	-0.47 [-1.96, 0.62]	-4.23 <sup>ns</sup>
Autonomy and Parent Relation (n=177)	10.37***	-0.55***	-0.12*	1.66 <sup>ns</sup>	<b>-1.26</b> [-3.14, -0.23]	-0.91 [-2.54, 0.21]	-7.36**
School Environment (n=179)	11.10***	-0.54***	-0.14*	1.70 <sup>ns</sup>	<b>-1.51</b> [-3.62, -0.31]	-0.92 [-2.45, 0.13]	-4.57 <sup>ns</sup>

*Note.* Indicated paths a, b and ab relate to Figure 2. CI= Bootstrapped confidence intervals. <sup>ns</sup>

not significant \* p<.05 \*\* p<.01 \*\*\*p<.001. Significant indirect effects are bold.

## 7.1.2 Paper II

### Child Abuse Potential in Mothers with Early Life Maltreatment, Borderline Personality Disorder, and Depression

Katja Dittrich, M.Sc.<sup>1</sup>; Katja Bödeker, Ph.D.<sup>1</sup>; Dorothea Kluczniok, Ph.D.<sup>2</sup>; Charlotte Jaite, Ph.D.<sup>1</sup>; Catherine Hindi Attar, Ph.D.<sup>2</sup>; Daniel Führer, M.Sc.<sup>1</sup>; Sabine C. Herpertz, M.D.<sup>3</sup>; Romuald Brunner, M.D.<sup>4</sup>; Sibylle Maria Winter, M.D.<sup>1</sup>; Andreas Heinz, M.D.<sup>2</sup>; Stefan Röpke, M.D.<sup>2</sup>; Christine Heim, Ph.D.<sup>5,6</sup>; Felix Bermpohl, M.D.<sup>2</sup>

<sup>1</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Berlin, Germany

<sup>2</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Department of Psychiatry and Psychotherapy, Berlin, Germany

<sup>3</sup> University Hospital Heidelberg, Centre for Psychosocial Medicine, General Psychiatry, Heidelberg, Germany

<sup>4</sup> University Hospital Heidelberg, Centre for Psychosocial Medicine, Department of Child and Adolescent Psychiatry, Heidelberg, Germany

<sup>5</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Institute of Medical Psychology, Berlin, Germany

<sup>6</sup> Pennsylvania State University, College of Health and Human Development, Department of Biobehavioral Health, Pennsylvania, USA

Correspondence concerning this article should be addressed to Katja Dittrich, Charité – Universitätsmedizin Berlin, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Augustenburger Platz 1, 13353 Berlin, Germany.

#### *Acknowledgements:*

This work was supported by the German Federal Ministry of Education and Research (BMBF) [Grant number: 01KR1207C] and the German Research Foundation (DFG) [Grant number: BE2611/2-1].

*Declaration of Interest:*

There is no conflict of interests, financial or otherwise, to declare.

Reprinted with permission. This is an accepted manuscript of the following article:

Dittrich, K. et al. (2018). Child abuse potential in mothers with early life maltreatment, borderline personality disorder and depression. *The British Journal of Psychiatry*, 213(1), 412–418.

This version is free to view and download for personal use only. Not for re-distribution, re-sale or use in derivative works. © 2018 (The Royal College of Psychiatrists). The final version is available at DOI: [10.1192/bjp.2018.74](https://doi.org/10.1192/bjp.2018.74)

### Abstract

*Background:* Early life maltreatment (ELM), borderline personality disorder (BPD), and major depressive disorder (MDD) have been shown to increase abuse potential. Emotion regulation is an identified mediator for the association of ELM and BPD with abuse potential. Until now, there has been no study to account for the co-occurrence of these risk factors in one analysis, albeit BPD and MDD are known as common sequelae of ELM. This is paired with a lack of studies investigating the effects of abuse potential on child wellbeing. *Aims:* Our study aims at 1) disentangling the effects of maternal ELM, MDD, and BPD on abuse potential, 2) exploring the role of emotion regulation as a mediator, and 3) testing for intergenerational effects of abuse potential on child psychopathology. *Method:* The research design included 114 mothers with/without ELM, BPD, and MDD in remission and their children; all of which were between 5 and 12 years of age. A path analysis was conducted to investigate the multiple associations between our variables. *Results:* ELM, MDD, and BPD were all associated with abuse potential, with emotion regulation acting as a mediator for BPD and MDD. Furthermore, an elevated abuse potential was related to higher psychopathology in the child. *Conclusions:* History of ELM as well as the common sequelae, BPD and MDD, pose risks for child abuse. Our findings suggest improvement of emotion regulation as a potential target for intervention programs. These programs should also aim at non-substantiated cases as even an elevated abuse potential impacted child mental health.

*Keywords:* Emotion Regulation; Abuse Potential; Maltreatment; Borderline Personality; Depression

## Introduction

Major depressive disorder (MDD) and borderline personality disorder (BPD) are two common sequelae of early life maltreatment (ELM) (1-3). Intergenerational effects may emerge as mothers with history of ELM, as well as MDD and BPD, show an increased risk for becoming abusive parents themselves (4-6). Hiraoka et al. (4) found that the association of BPD features and child abuse potential in parents was partially mediated by difficulties in emotion regulation. While this study was able to give an important insight into the mechanisms of transmission, it did not focus on the effects of often co-occurring history of ELM with child abuse potential. This issue has not yet been investigated for MDD, even though emotion regulation problems also play a significant role in this type of disorder (7). With regard to ELM, findings by Smith et al. (5) similarly suggest a mediating role of emotion regulation difficulties for elevated child abuse potential, but did not consider co-occurring psychiatric disorders. The mediating effect of emotion regulation difficulties in the association of ELM and abuse potential may play a prominent role in mothers with BPD or MDD and the link between ELM and emotion regulation may no longer persist when accounting for these disorders. Finally, whereas extensive research has demonstrated the negative effects of child abuse on child wellbeing (e.g. 8), the question whether child abuse potential is linked to child mental health has received only little attention thus far (9).

As MDD and BPD have high comorbidity (10), and both disorders are common reactions to ELM (1, 2), we sought to include all three risk factors in one study. We aimed at disentangling their individual contributions on child abuse potential and investigating the mediating role of maternal emotion regulation to promote the understanding of these factors in the intergenerational transmission of abuse and psychopathology. Further, we wanted to determine whether maternal child abuse potential is associated with child psychopathology. Understanding these processes of transmission may provide the starting point for the development of long-term interventions to break the cycle of intergenerational transmission and promote child well-being. All three maternal risk factors (ELM, BPD, MDD) were considered in this study to be exogenous (predictor) variables in one path analytic model, emotion regulation may be a mediator between these risk factors and abuse potential, and child psychopathology was chosen as the endogenous (outcome) variable linked with abuse potential (Fig. 1). We hypothesized that 1) maternal MDD, BPD, and severity of ELM are associated with higher levels of abuse potential; 2) the effects of BPD and MDD on abuse potential are mediated by emotion regulation difficulties; and 3) there is a positive association between abuse potential and child psychopathology.

---

## Method

### Participants and procedure

The current study was performed within the framework of the UBICA (Understanding and Breaking the Intergenerational Cycle of Abuse, [www.ubica.de](http://www.ubica.de)) multicenter project, which investigates the effects of maternal history of abuse on mother-child interaction and child well-being (11). The present study included 114 mothers and their children between 5 and 12 years of age (see Table 1). BPD was diagnosed in 19 mothers and MDD in remission (rMDD) in 71 mothers. 64 mothers experienced ELM before the age of 17 with at least moderate severity. There was an intended co-occurrence of all three or two risk factors in parts of our sample consisting of mothers with/without ELM and/or rMDD and/or BPD (see Table 1 for detailed information). 13.1 % of mothers did not show any of these three risk factors (i.e., no rMDD, no BPD, not even mild forms of ELM). Please note that prevalence rates of and correlations (co-occurrence) between our predictor variables are due to our recruitment strategy (we specifically and intentionally recruited mothers with ELM, BPD, and/or rMDD) and do not allow conclusions on the general population.

History of ELM was defined as having experienced at least one type of abuse or neglect according to the main scales (sexual, physical, and emotional abuse, neglect, and parental antipathy) of the Childhood Experience of Care and Abuse Interview (CECA; 12). For our analyses, we used a dimensional sum score of all CECA scales. Frequency of experienced types of ELM with at least moderate severity are shown in Table 1.

Mother-child dyads were recruited by advertisement (flyer, poster) in psychiatric, psychotherapeutic, gynecological, and pediatric outpatient clinics, as well as educational counseling and youth welfare offices. The advertisement indicated that we were searching for healthy mothers as well as mothers with history of ELM, rMDD and BPD. Mothers with BPD had to be non-suicidal and stable enough (i.e., not hospitalized) to participate in the study. Mothers with MDD had to be in the remitted state. This way, we excluded the effects of acute depression which may override the effects of BPD and ELM. In addition, acute symptoms of MDD may interfere with participation in the study and cause bias in response behavior. Thus, MDD in remission, with depressive symptoms on a sub-clinical level, was chosen as more adequate comparison group than acute MDD and only mothers with a Hamilton Depression Scale (HAMD; 13) score of below or equal to seven were included. Exclusion criteria for mothers included conditions that could potentially impair the ability to participate in the study: neurological diseases, lifetime history of schizophrenia, manic episodes, an acute depressive

episode, and anxious-avoidant, or antisocial personality disorder as assessed by the Mini International Neuropsychiatric Interview (M.I.N.I.; 14) and International Personality Disorder Examination (IPDE; 15). Intake of benzodiazepines within the last six months was a further exclusion criterion because consumption and withdrawal of these substances may have particularly strong impact on the response behavior in the measures used. However, medication with other psychotropic drugs did not represent an exclusion criterion, as long as dosage had been stable for at least two weeks prior to entering the study. Children participants' exclusion criteria included previous diagnosis of autistic disorder and intellectual disability. Mothers and children had to live together because the aim of our project was to investigate the effect of maternal factors on child behavior. The study was approved by the ethics committee of the Charité – Universitätsmedizin Berlin. Written informed consent was obtained from all participants after the procedure had been fully explained.

## **Measures**

### **Emotion regulation difficulties.**

We assessed maternal difficulties in emotion regulation with the Difficulties in Emotion Regulation Scale (DERS; 16), which is a brief self-report questionnaire. High psychometric properties could be demonstrated for the German Version (17). We entered the total (dimensional) score of the instrument in our analysis.

### **Abuse potential.**

We administered the Eltern-Belastungs-Screening zur Kindeswohlgefährdung (EBSK; 18), the German version of the Child Abuse Potential Inventory (CAPI; 19). The EBSK (CAPI) is a self-report questionnaire that screens for the risk of child abuse by assessing multiple adverse factors associated with child abuse and neglect. The CAPI was originally developed to assess the risk for physical abuse. However, studies (18) demonstrated significant higher scores also in families with other forms of abuse and neglect. Good internal consistency was reported for the German version (18). The CAPI contains validity indices (random responding and faking), which did not indicate any bias in the present study.

### **Maternal psychopathology.**

We implemented the Mini-International Neuropsychiatric Interview (M.I.N.I.; 14) to assess maternal history of depression (and other diagnoses of DSM-IV axis I disorders). The



M.I.N.I. is a fully structured diagnostic interview for screening DSM axis I disorders. Previous research shows good inter-rater reliability (20). We administered the International Personality Disorder Examination (IPDE; 15), a structured clinical interview with an established reliability and validity to assess BPD according to ICD-10 (15, 21). Interviews were conducted by clinical psychologists (holding bachelor or master degrees) after they had been trained by experienced users.

### **Early Life Maltreatment.**

We conducted the Childhood Experience of Care and Abuse Interview (CECA; 12, German version: 22) to assess maternal experiences of ELM. The CECA uses investigator-based ratings to collect retrospective accounts of adverse childhood experiences (up to an age of 17 years), such as sexual, physical, and emotional abuse, neglect, and parental antipathy, in a retrospective semi-structured clinical interview. The data were rated according to predetermined criteria and manualized threshold examples, using a four-point scale of severity (“severe,” “moderate,” “mild,” or “little/none”). Interviews were administered by psychologists (holding bachelor or master degrees) who had been trained (3-day training) and approved by the author of the interview, Antonia Bifulco. Originally, lower scores on the four-point scales indicate higher maltreatment severity. We recoded these scores, with higher scores indicating higher severity, to ease interpretation. The sum score of all five CECA dimensions was entered into analysis.

### **Child Psychopathology.**

Child psychopathology was assessed using the Teacher Report Form (TRF; 23, German Version: 24), which measures teacher-reported emotional and behavioral problems in children. Previous studies reported good psychometric characteristics of the German version (25). We received official permission by the state’s school authority to contact the school teachers of our participants. Mothers signed a release from the pledge of secrecy so we could contact teachers directly instead of having the questionnaires delivered by the mothers of our children themselves which could have caused bias.

### **Data Analytic Plan**

We conducted a path analysis to investigate the multiple associations of our variables according to our hypotheses. We controlled for age of mother and child, gender of child, mother’s years of education, and presence of acute DSM-IV axis I disorders (others than MDD)

in mothers. To address our research questions, we evaluated the statistical significance of each of the paths of interest and their indirect associations with each other. We started by fitting a full, less-restrictive model (see Fig. 1) to the data to determine which paths were significant, and then removed non-significant paths in order to obtain our final, most parsimonious model. Model fit was evaluated regarding a combination of fit indices, including a non-significant  $\chi^2$  test result ( $p < .05$ ) and cut-off values close to .06 for the root mean square error of approximation (*RMSEA*), close to .08 for the standardized root mean square residual (*SRMR*), and .95 for the comparative fit index (*CFI*) as recommended by Hu and Bentler (26). We applied a maximum likelihood estimator with robust standard errors and a mean- and variance-adjusted test statistic as implemented in the *lavaan* package, because CAPI scores were not normally distributed (skewness  $z$ -score higher than 1.96). Finally, we estimated the relevant indirect effects in the model for significance according to  $p$ -values and bootstrapped 95 % confidence intervals adjusting for both bias and skewness in the bootstrap sample's distribution.

The current study initially involved 183 mother-child dyads. Because not all teachers returned the TRF forms and a few mothers did not return their questionnaire sets, 114 dyads entered the described analysis. Missingness of data was unrelated to any of the maternal risk factors evaluated (diagnoses of BPD and rMDD, and severity of ELM) in our analysis. We conducted a series of multiple regressions before running our path analyses, in which each predictor was regressed on all other predictors, and found no signs for multicollinearity.

We addressed issues of sample size limitations as recommended by Steinmetz (27) and Kieffer, Vukovic (28). Following the approach by Muthen and Muthen (29), we conducted a post-hoc Monte Carlo simulation (10,000 replications) for sample size estimation in SEM to assess potential bias of parameter estimates and standard errors, and to assess statistical power of the relations in our model. Muthen and Muthen (29) give precise cut-off criteria for parameters and standard error bias (10%), standard error bias for parameters of interest for which power is assessed (5%), and coverage (remaining between 0.91 and 0.98) Also, they refer to the commonly accepted value for power (0.80). We applied Swain's (30) correction of the maximum likelihood  $\chi^2$  statistic for the estimation of *CFI* and *RMSEA*, which accounts for the potential negative impact of sample size on fit statistics .

Descriptive analyses were executed in *IBM SPSS Statistics 23*. Path analysis, sample size corrections of fit indices, and Monte Carlo simulation were realized in *The R Project for Statistical Computing* software, using the packages *lavaan*, *simsem*, and the public R function *swain*.

## Results

Hypothesis 1: The analysis of the original (less-restrictive) path model (Fig. 1) yielded the following results: Maternal history of ELM (sum severity score) showed a direct effect on abuse potential ( $\beta=.241$ ,  $p=.043$ ). Diagnoses of maternal BPD and rMDD were not directly associated with abuse potential ( $\beta=.118$ ,  $p=.320$  and  $\beta=.188$ ,  $p=.060$ ), but showed an indirect link with abuse potential via emotion regulation difficulties (see hypothesis 2).

Hypothesis 2: Maternal diagnoses of BPD and rMDD were significantly associated with the severity of maternal emotion regulation difficulties ( $\beta=.388$ ,  $p=.002$  and  $\beta=.289$ ,  $p=.007$ ), which was significantly associated with abuse potential scores ( $\beta=.195$ ,  $p=.046$ ). The indirect effects from BPD ( $B(SE)=12.92$  (5.70),  $\beta=.119$ ,  $p=.023$ ,  $BCa$  CI 95% [1.76; 24.09]) and rMDD ( $B(SE)=7.55$  (3.50),  $\beta=.090$ ,  $p=.031$ ,  $BCa$  CI 95% [0.69; 14.41]) through emotion regulation difficulties on child abuse potential were both significant with a  $p<.05$  and a confidence interval entirely above zero. Severity of maternal ELM was not associated with maternal difficulties in emotion regulation ( $\beta=.112$ ,  $p=.312$ ). In a supplemental analysis, we tested which subscales of emotion regulation difficulties showed significant correlations with abuse potential. We found significant associations of emotional awareness, emotional clarity, emotion regulation strategies, and acceptance of emotional responses with abuse potential (Table S1 in supplemental material).

Hypothesis 3: We found a significant association between abuse potential and child problem behavior ( $\beta=.335$ ,  $p<.001$ ). The indirect effect of severity of ELM by way of child abuse potential on child problem behavior ( $B(SE)=0.21$  (0.11),  $\beta=.084$ ,  $p=.063$ ,  $BCa$  CI 95% [-0.01; 0.43]) showed a trend towards significant with a  $p<.10$ . The indirect effects from diagnosis of BPD ( $B(SE)=0.94$  (0.49),  $\beta=.036$ ,  $p=.057$ ,  $BCa$  CI 95% [-0.03; 1.91]) and rMDD ( $B(SE)=0.55$  (0.30),  $\beta=.027$ ,  $p=.062$ ,  $BCa$  CI 95% [-0.03; 1.13]) through severity of emotion regulation difficulties and child abuse potential to child problem behavior were also trend wise significant.

Table 2 shows associations of exogenous (predictor) and endogenous (outcome) variables and demographic control variables in our model. Non-significant paths were removed from the final model (Fig. 2.) in order to obtain the most parsimonious model. Regarding the following fit indices, we conclude that our final model holds good fit according to recommended cut-offs mentioned above:  $SRMR = .028$ ,  $RMSEA = .059$ ,  $CFI = .951$ ,  $Chi^2 = 9.749$ ,  $df = 7$ ,  $p(Chi^2) = .203$ . Swain-corrected indices (for small sample sizes) yielded similar

results with  $RMSEA = .056$  and  $CFI = 0.963$ . A post-hoc Monte Carlo simulation based on the results in our final path model revealed minimal bias in parameter estimates (between 0% and 2.0%), meeting the standard of less than 10% (29). Standard error bias ranged from 0.3% to 2.7%, meeting the standard of less than 5%. Coverage ranged from 0.92 to 0.94, thus falling into the recommended range of 0.91 to 0.98. Additionally, we found sufficient power for relevant relations in our final path model with all values above .80. Therefore, there is little reason to suspect bias in parameter estimates and standard errors, or insufficient statistical power in our model due to small sample size. Our final model accounted for 15.2 % of the variance in child problem behavior, 23.9 % of variance in child abuse potential, and 30.8 % of variance in emotion regulation difficulties.

### **Discussion**

The main findings of our study are: first, all of the three risk factors, i.e. severity of ELM, diagnosis of BPD, and diagnosis of rMDD, were directly or indirectly associated with an elevated abuse potential scores. Secondly, the effects of BPD and rMDD on abuse potential were mediated by severity of emotion regulation difficulties; and finally, we found a positive association between abuse potential and child psychopathology. Our study extends existing research (4-6) in that we considered ELM, BPD, and rMDD in one study and thus disentangled their individual contributions onto abuse potential. We show that the previous finding of emotion regulation as a mediator for ELM and abuse potential seems to be related to co-occurring psychiatric disorders like BPD or MDD. In addition, this is the first study to identify emotion regulation difficulties as a mediator for rMDD and abuse potential. By showing that composite measures of child abuse potential impact on child mental health we extend prior research linking substantiated maltreatment with child psychopathology. The following illuminates these major findings and their implications in more detail.

#### **Effects on Abuse Potential and the Mediating Role of Emotion Regulation**

First, maternal BPD, MDD, and ELM have been previously associated with higher abuse potential scores (4-6). However, none of these studies combined all three risk factors in one study. We took into account that these risk factors often co-occur and disentangled their individual contributions on abuse potential.

Secondly, diagnoses of BPD and rMDD were linked with abuse potential scores through severity of emotion regulation difficulties. Severity of ELM was not associated with emotion regulation and instead showed a direct effect on abuse potential. Severity of emotion regulation difficulties, according to our findings, mediates the effect of BPD on abuse potential scores. This is in line with results generated by Hiraoka et al. (4) who observed that the effect of elevated BPD features on abuse potential was mediated by emotion regulation. In addition to these findings, the present work considers ELM, a frequent precursor of BPD. Deficits in emotion regulation is one of the most prominent feature of BPD (31). Although depression is primarily associated with other characteristics, emotion regulation problems also plays a significant role in this type of disorder (7). In our study, emotion regulation difficulties emerged as a mediator for the association of maternal rMDD with abuse potential. To the best of our knowledge, this is the first study investigating emotion regulation as a pathway from MDD to abuse potential.

Interestingly, Smith et al. (5) identified emotion regulation as a mediator for the effect of maternal ELM on abuse potential. In our study, findings indicate that emotion regulation difficulties partially mediated the effect of ELM severity on abuse potential, when excluding BPD and rMDD from the model (Figure S1 in supplemental material). In a more comprehensive path analytic model (including BPD and rMDD), however, severity of ELM was directly linked to abuse potential, while no association with emotion regulation difficulties emerged. This suggests that the mediation effect observed by Smith et al. (5) was, at least in part, be related to co-occurring psychiatric disorders like BPD or MDD. In our data, there was no indirect effect of ELM on abuse potential via emotion regulation independent of BPD and rMDD.

Future research may address additional factors mediating between severity of ELM and abuse potential, including maternal knowledge on child development and behavior which previously has been associated with abuse potential (32). Attitudes toward parenting, as these were found to influence the effect of parenting stress on abuse potential, are also of interest here (33).

With regard to prevention programs, one may conclude that emotion regulation may be a target of intervention for mothers with BPD and MDD. We found highest associations of abuse potential with emotion regulation difficulties in the areas of emotional awareness, emotional clarity, emotion regulation strategies, and acceptance of emotional responses (Table S1 in supplemental material). These aspects of emotion regulation could be targeted in special interventions catering to parents. Mothers with history of ELM may benefit from such

interventions when they also show signs of BPD and MDD, even though there appear to be other aspects that mediate effects of ELM on child abuse potential that remain to be explored.

### **Maternal Abuse Potential and Child Mental Health**

Finally, our finding that maternal abuse potential scores predicted child psychopathology confirms the final hypothesis, extending the existing literature on the association of child abuse and impaired child mental health (8, 9). Haskett et al. (9) studied samples of parents who had either been identified as high risk for abuse or had substantiated cases of physical abuse. Substantiated maltreatment rates and assessment of abuse potential are the two methodological approaches applied most often in exploring the risk for child abuse in parents. Substantiated cases of maltreatment may reflect only a proportion of maltreating parents, expecting an underreporting of these problems (34). Risk measures of child abuse as an alternative approach attempt to sidestep this distortion of data: The parental risk of maltreating their offspring is measured by assessing psychosocial characteristics associated with violence against children, as for example with the Child Abuse Potential Inventory (CAPI; 19). Haskett et al. (9) found an association of abuse potential and child psychopathology measured with a parent rating questionnaire, but no association with child psychopathology in a teacher rating. Ratings of child psychopathology by parents with high risk for abuse may be biased, however, and the investigation's sample was small ( $n=41$ ), focusing on substantiated cases of abuse ( $n=25$ ). Our findings regarding a teacher rating of child psychopathology underline the relevance of abuse risk measures for child mental health. The CAPI comprises multiple parental aspects that have been found to predict child abuse, including global distress, rigidity (parenting and expectation to child), perception of the child as a "problematic child," restricted physical health, unhappiness with one's own life and interpersonal relationships, problems with family, problems with self, emotional lability, lack of social support, and the feeling of loneliness. Such familial or parental distress may impair child wellbeing even though actual acts of abuse do not take place.

Indirect effects leading from diagnoses BPD and rMDD to child psychopathology via emotion regulation and abuse potential showed a trend towards significance. Likewise, an indirect effect of ELM severity via abuse potential on child psychopathology was found to have a trend towards significance. These results indicate that the pathways studied here may be relevant for intergenerational processes of transmission.

## Limitations

The present study worked under a set of limitations. First, we only studied mothers even though paternal factors may also play an important role for child abuse potential. Second, we did not directly assess substantiated cases of child abuse. However, solely studying substantiated cases of child abuse might lead to underreporting problems as not all abusive behaviors are reported to officials (34). Third, MDD and BPD are common reactions to ELM experiences, but they may only represent a limited range of psychiatric disorders associated with ELM. Fourth, the results reported are based on a cross-sectional study design, causal conclusion cannot be made. Fifth, there might be other important factors like family and child characteristics that impact on child mental health, which we could not consider in our model. This could be realized in studies with very large sample sizes. Sixth, we used a teacher rating of child mental health in contrast to a parent rating to reduce the issue of common-method variance. However, teachers might have a different or even reduced picture of child behavior. Fifth, while the proportion of mothers with at least moderate ELM and rMDD was balanced, it is acknowledged that the number of mothers with BPD was relatively low. Thus, the effects of maternal BPD need to be replicated in larger samples in future studies. Sixth, we did not test inter-rater reliability of the IPDE (diagnostic interview) within our study team. Finally, our sample size was limited for path analytic modeling. Potential issues with smaller sample sizes in SEM of path analysis include: Limitations in statistical power, bias in parameter estimates, standard errors, and goodness-of-fit statistics (28, 29). To cope with this limitation, we performed a post-hoc Monte Carlo simulation (29) and applied Swain's (30) correction of the maximum likelihood *Chi*<sup>2</sup> statistic.

We conclude that ELM directly impacts on risk for child abuse and child wellbeing, while MDD and BPD indirectly affect these factors via emotion regulation. Prevention and intervention programs could address emotion regulation issues for mothers diagnosed with BPD or MDD. Further research is needed to identify other transmitting factors, especially in mothers with ELM who do not have BPD or MDD.

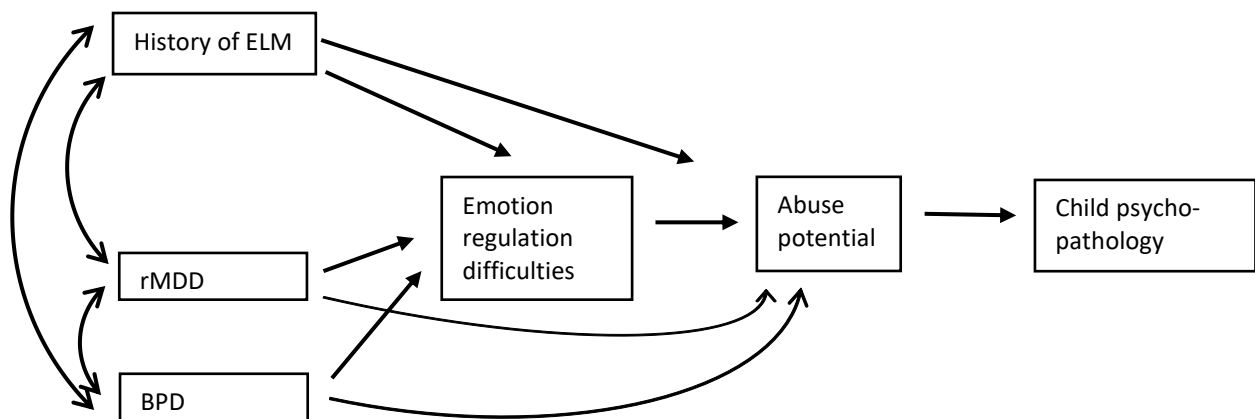
### References

1. Zanarini MC, Williams AA, Lewis RE, Reich RB, Vera SC, Marino MF, et al. Reported pathological childhood experiences associated with the development of borderline personality disorder. *American Journal of Psychiatry*. 1997;154(8):1101-6.
2. Nelson J, Klumparendt A, Doebler P, Ehring T. Childhood maltreatment and characteristics of adult depression: meta-analysis. *The British Journal of Psychiatry*. 2017;210(2):96-104.
3. Scott KM, McLaughlin KA, Smith DAR, Ellis PM. Childhood maltreatment and DSM-IV adult mental disorders: comparison of prospective and retrospective findings. *The British Journal of Psychiatry*. 2012;200(6):469-75.
4. Hiraoka R, Crouch JL, Reo G, Wagner MF, Milner JS, Skowronski JJ. Borderline personality features and emotion regulation deficits are associated with child physical abuse potential. *Child Abuse & Neglect*. 2016;52:177-84.
5. Smith AL, Cross D, Winkler J, Jovanovic T, Bradley B. Emotional Dysregulation and Negative Affect Mediate the Relationship Between Maternal History of Child Maltreatment and Maternal Child Abuse Potential. *Journal of Family Violence*. 2014;29(5):483-94.
6. Shay NL, Knutson JF. Maternal depression and trait anger as risk factors for escalated physical discipline. *Child Maltreatment*. 2008;13(1):39-49.
7. Joormann J, Stanton CH. Examining emotion regulation in depression: A review and future directions. *Behaviour Research and Therapy*. 2016;86:35-49.
8. Jaffee SR. Child Maltreatment and Risk for Psychopathology in Childhood and Adulthood. *Annual Review of Clinical Psychology*. 2017.
9. Haskett ME, Scott SS, Fann KD. Child abuse potential inventory and parenting behavior: Relationships with high-risk correlates. *Child Abuse & Neglect*. 1995;19(12):1483-95.
10. Zanarini MC, Frankenburg FR, Dubo ED, Sickel AE, Trikha A, Levin A, et al. Axis I comorbidity of borderline personality disorder. *American Journal of Psychiatry*. 1998;155(12):1733-1739.
11. Kluczniok D, Boedeker K, Fuchs A, Hindi Attar C, Fydrich T, Fuehrer D, et al. Emotional Availability in Mother-Child Interaction: The Effects of Maternal Depression in Remission and Additional History of Childhood Abuse. *Depress Anxiety*. 2016;33(7):648-57.
12. Bifulco A, Brown GW, Harris TO. Childhood Experience of Care and Abuse (CECA): a retrospective interview measure. *Journal of Child Psychology and Psychiatry*. 1994;35(8):1419-35.

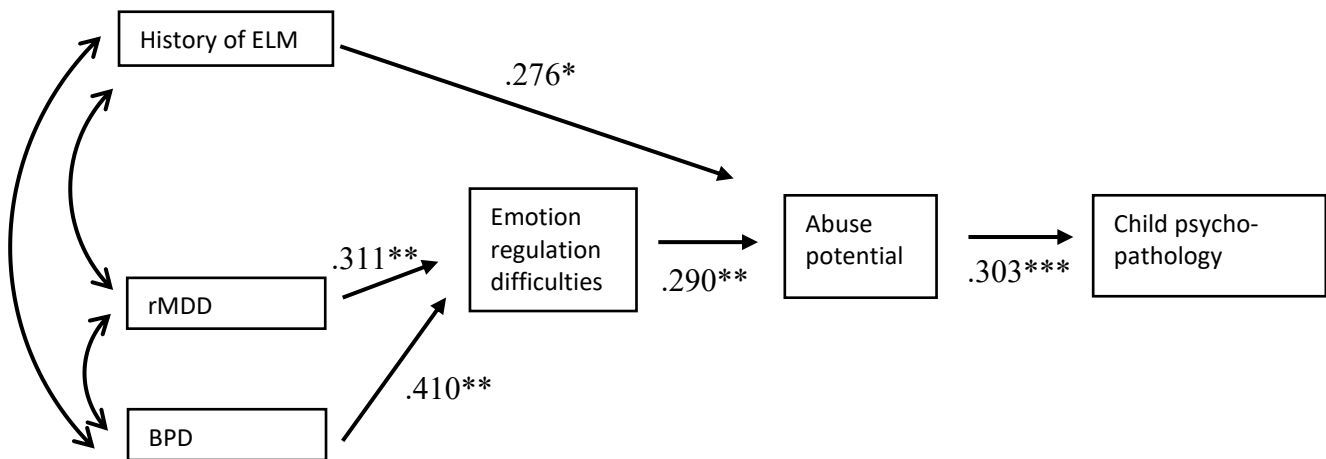


13. Hamilton M. A rating scale for depression. *Journal of Neurology, Neurosurgery, and Psychiatry*. 1960;23:56-62.
14. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*. 1998;59 Suppl 20:22-33; 4-57.
15. Loranger AW, Janca A, Sartorius N. *Assessment and Diagnosis of Personality Disorders: the ICD-10 International Personality Disorder Examination (IPDE)*. Cambridge, U.K.: Cambridge University Press; 1997.
16. Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*. 2004;26(1):41-54.
17. Rusch S, Westermann S, Lincoln TM. Specificity of emotion regulation deficits in social anxiety: an internet study. *Psychology and Psychotherapy: Theory, Research and Practice*. 2012;85(3):268-77.
18. Deegener G, Spangler G, Körner W, Becker N. *Eltern-Belastungs-Screening zur Kindeswohlgefährdung: Deutsche Form des Child Abuse Potential Inventory (CAPI) von Joel S. Milner*. Göttingen: Hogrefe; 2009.
19. Milner JS. Assessing physical child abuse risk: The child abuse potential inventory. *Clinical Psychology Review*. 1994;14(6):547-83.
20. Sheehan DV, Lecrubier Y, Sheehan KH, Janavs J, Weiller E, Keskiner A, et al. The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry*. 1997;12(5):232-41.
21. Mombour W, Zaudig M, Berger P, Gutierrez K, Berner W, Berger K, et al. *IPDE, International Personality Disorder Examination von A.W. Loranger. Deutschsprachige Ausgabe*. Bern, Switzerland: Huber; 1996.
22. Kaess M, Parzer P, Mattern M, Resch F, Bifulco A, Brunner R. [Childhood Experiences of Care and Abuse (CECA) - validation of the German version of the questionnaire and interview, and results of an investigation of correlations between adverse childhood experiences and suicidal behaviour]. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*. 2011;39(4):243-52.
23. Achenbach TM. *Manual for Teacher's Report Form and 1991 Profile*. Burlington, VT: University of VT, Department of Psychiatry; 1991.

24. Arbeitsgruppe Deutsche Child Behavior Checklist. Lehrerfragebogen über das Verhalten von Kindern und Jugendlichen; deutsche Bearbeitung der Teacher's Report Form der Child Behavior Checklist (TRF). Einführung und Anleitung zur Handauswertung, bearbeitet von M. Döpfner & P. Melchers. Köln, Germany: Arbeitsgruppe Kinder-, Jugend- und Familiendiagnostik (KJFD); 1993.
25. Döpfner M, Berner W, Schmeck K, Lehmkuhl G, Poustka F. Internal consistency and validity of the CBCL and the TRF in a German sample - a cross cultural comparison. In: Sergeant J, editor. *Eunethydis European approaches to hyperkinetic disorder*. Zürich, Switzerland: Fotorotar. Egg; 1995. p. 51-81.
26. Hu LT, Bentler PM. Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 1999;6(1):1-55.
27. Steinmetz H. *Lineare Strukturgleichungsmodelle: Eine Einführung mit R*. München, Germany: Rainer Hampp Verlag; 2015.
28. Kieffer MJ, Vukovic RK, Berry D. Roles of Attention Shifting and Inhibitory Control in Fourth-Grade Reading Comprehension. *Reading Research Quarterly*. 2013;48(4):333-48.
29. Muthen LK, Muthen BO. How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling*. 2002;9(4):599-620.
30. Swain AJ. Analysis of parametric structures for variance matrices. [Unpublished doctoral dissertation]. In press 1975.
31. Glenn CR, Klonsky ED. Emotion dysregulation as a core feature of borderline personality disorder. *Journal of Personality Disorders*. 2009;23(1):20-8.
32. Fulton AM, Murphy KR, Anderson SL. Increasing adolescent mothers' knowledge of child development: an intervention program. *Adolescence*. 1991;26(101):73-81.
33. Crouch JL, Behl LE. Relationships among parental beliefs in corporal punishment, reported stress, and physical child abuse potential. *Child Abuse & Neglect*. 2001;25(3):413-9.
34. Cross TP, Casanueva C. Caseworker judgments and substantiation. *Child Maltreatment*. 2009;14(1):38-52.



*Figure 1.* Path model for direct and indirect associations of maternal early life maltreatment, depression in remission, and borderline personality disorder with maternal difficulties in emotion regulation, maternal child abuse potential, and child psychopathology. Bidirectional arrows indicate covariance between two variables and one-directional arrows a directional relationship. Covariation between ELM, BPD, and rMDD was an intended result of our recruitment strategy which aimed at including considerable numbers of mothers with either zero, one, two, or three risk factors. ELM=early life maltreatment (sum score of CECA interview main scales); MDD=major depressive disorder in remission (assessed with the M.I.N.I.); BPD=borderline personality disorder (assessed with the IPDE); emotion regulation difficulties assessed with the DERS; abuse potential assessed with the German version of the CAPI (EBSK); child psychopathology measured with the TRF. \*\*\*  $p < .001$  \*\* $p < .01$  \* $p < .05$ .



*Figure 2.* Standardized path coefficients for tested paths of the final model.  $n=114$ . Only significant paths are displayed. Controlled for maternal and child age, gender of child, mother's years of education and mother's acute axis I disorders. Bidirectional arrows indicate covariance between two variables and one-directional arrows a directional relationship. Covariation between ELM, BPD, and rMDD was an intended result of our recruitment strategy which aimed at including considerable numbers of mothers with either zero, one, two, or three risk factors. ELM=early life maltreatment; MDD=major depressive disorder in remission; BPD=borderline personality disorder. \*\*\*  $p<.001$  \*\* $p<.01$  \* $p<.05$ .

Table 1

*Demographic and Clinical Characteristics*

<b>Mothers</b>	<b>Sample (N=114) M (SD)/ %</b>
Age in years	39.0 (6.1)
Years of education	17.2 (3.6)
Partnership status	
- married/in a relationship with the father of the child	50.9 %
- married/in a relationship with partner that is not the father of the child	13.2 %
- single, separated from partner/husband, divorced, or widowed	36.0 %
Nationality (German)	90.4 %
Mothers with a history of moderate/severe ELM	56.1 %
Sexual abuse	31.6 %
Physical abuse	56.3 %
Emotional abuse	29.7 %
Neglect	28.1 %
Parental antipathy	62.5 %
Mothers with diagnosis of rMDD	62.6 %
Age at onset (years)	27.21 (9.41)
Number of episodes	2.35 (1.54)
Depression Score (HAMD)	2.77 (2.17)
Any psychiatric hospitalization	45.1%
History of moderate/severe ELM	67.6 %
Additional diagnosis of BPD	19.7 %
Other current diagnosis (see below)	29.6 %
Mothers with diagnosis of BPD	16.7 %
Age at onset (years)	27.94 (7.74)
Self-harming behavior within last three months	31.6 %
Any psychiatric hospitalization	78.9%
History of moderate/severe ELM	84.2 %
Additional diagnosis of rMDD	73.7 %

---

Other current diagnosis (see below)	42.1 %
Other current diagnoses (additional to rMDD and/or BPD)	19.3 %
- Dysthymia	4.4 %
- Panic Disorder	2.6 %
- Obsessive Compulsive Disorder	0.9 %
- Social Phobia	3.5 %
- Post-Traumatic Stress Disorder	1.8 %
- Alcohol Abuse	0.9 %
- Eating Disorders	1.8 %
- Generalized Anxiety Disorder	2.6 %
Emotion regulation difficulties	89.9 (21.4)
Child abuse potential	180.1 (41.1)
<b>Children</b>	<b><i>M (SD) / %</i></b>
Age in years	8.0 (1.8)
IQ	104.9 (13.1)
Sex (Girls)	58.8 %
Mean TRF Score (Psychopathology)	49.7 (9.8)

---

*Notes.* *M*=Mean; *SD*=standard deviation; ELM=early life maltreatment; rMDD=major depressive disorder in remission; HAMD=Hamilton Depression Scale; BPD=Borderline Personality Disorder; HAMD=Hamilton Rating Scale of Depression; DERS=Difficulties in emotion regulation scale; CAPI=Child abuse potential inventory; TRF=Teacher Report Form; IQ=intelligence quotient.

Table 2

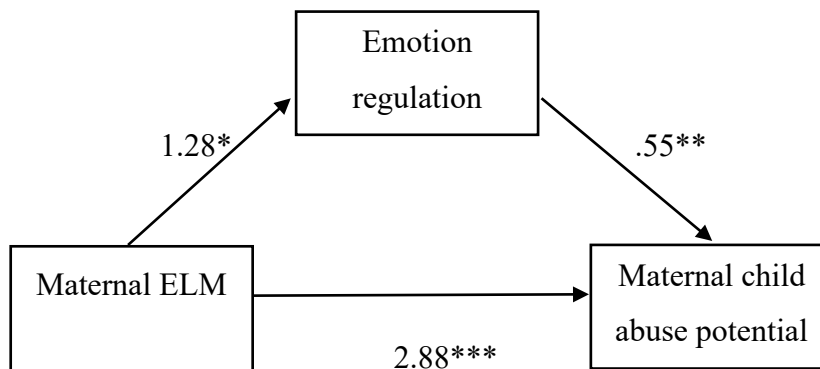
*Intercorrelations among key study variables and demographic variables*

	1	2	3	4	5	6
1. History of ELM	1					
2. rMDD	.252*** <sup>a</sup>	1				
3. BPD	.225* <sup>a</sup>	.105 <sup>b</sup>	1			
4. Emotion regulation difficulties	.262*** <sup>c</sup>	.348*** <sup>a</sup>	.452*** <sup>a</sup>	1		
5. Abuse potential	.364*** <sup>c</sup>	.321*** <sup>a</sup>	.306*** <sup>a</sup>	.382*** <sup>c</sup>	1	
6. Child psychopathology	.234* <sup>c</sup>	.066 <sup>a</sup>	.230* <sup>a</sup>	.081 <sup>c</sup>	.349*** <sup>c</sup>	1
7. Age of child	-.039 <sup>c</sup>	.044 <sup>a</sup>	.045 <sup>a</sup>	.020 <sup>c</sup>	.072 <sup>c</sup>	.113 <sup>c</sup>
8. Gender of child	.034 <sup>a</sup>	.047 <sup>b</sup>	-.104 <sup>b</sup>	-.086 <sup>a</sup>	-.094 <sup>a</sup>	-.094 <sup>a</sup>
9. Age of mother	-.039 <sup>c</sup>	-.048 <sup>a</sup>	-.280*** <sup>a</sup>	-.163 <sup>c</sup>	-.110 <sup>c</sup>	-.132 <sup>c</sup>
10. Mother's years of education	-.144 <sup>c</sup>	-.152 <sup>a</sup>	-.242*** <sup>a</sup>	-.079 <sup>c</sup>	-.203* <sup>c</sup>	-.188* <sup>c</sup>

*Notes.*  $n=114$ . ELM=early life maltreatment. rMDD=major depressive disorder in remission. BPD=Borderline Personality Disorder. <sup>a</sup>Point-biserial correlation coefficient. <sup>b</sup>Phi coefficient. <sup>c</sup>Pearson's  $r$  correlation coefficients.

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

## Supplementary Material



*Figure S1.* Mediation model for the effect of maternal ELM on abuse potential partially mediated by emotion regulation difficulties.  $n=114$ . Reported are unstandardized regression coefficients. Indirect effects ( $b=.70$ ) of maternal ELM on abuse potential significant with 95% confidence interval [.14; 1.61] entirely above zero. Controlled for age of mother and child, gender of child, mother's years of education, and presence of acute DSM IV axis I disorders. \* $p<.05$  \*\* $p<.01$  \*\*\* $p<.001$ .

Table S1.

*Association of child abuse potential with different aspects of emotion regulation*

Scales	Child abuse potential
Nonacceptance of emotional responses	.236*
Difficulty engaging in goal-directed behavior	.176 <sup>†</sup>
Impulse control difficulties	.175 <sup>†</sup>
Lack of emotional awareness	.402***
Limited access to emotion regulation strategies	.273**
Lack of emotional clarity	.397***
Total score	.382***

*Note.*  $n=114$ . Reported are Pearson's  $r$  correlation coefficients. <sup>†</sup> $p<.10$  \* $p<.05$  \*\* $p<.01$  \*\*\* $p<.001$ .



### 7.1.3 Paper III

#### Alterations of Empathy in Mothers with History of Early Life Maltreatment, Depression and Borderline Personality Disorder and their Effects on Child Psychopathology

Katja Dittrich<sup>1</sup>, Felix BERPohl<sup>2</sup>, Dorothea Kluczniok<sup>2</sup>, Catherine Hindi Attar<sup>2</sup>, Charlotte Jaite<sup>1</sup>, Anna Fuchs<sup>3</sup>, Corinne Neukel<sup>4</sup>, Sabine C. Herpertz<sup>4</sup>, Romuald Brunner<sup>3</sup>, Sibylle Maria Winter<sup>1</sup>, Ulrike Lehmkuhl<sup>1</sup>, Stefan Roepke<sup>5</sup>, Michael Kaess<sup>6</sup>, Christine Heim<sup>7,8</sup>, Katja Boedeker<sup>1</sup>

<sup>1</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Campus Virchow-Klinikum, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Berlin, Germany

<sup>2</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Campus Charité Mitte, Department of Psychiatry and Psychotherapy, Berlin, Germany

<sup>3</sup> University Hospital Heidelberg, Centre for Psychosocial Medicine, Department of Child and Adolescent Psychiatry, Heidelberg, Germany

<sup>4</sup> University Hospital Heidelberg, Centre for Psychosocial Medicine, General Psychiatry, Heidelberg, Germany

<sup>5</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Campus Benjamin Franklin, Department of Psychiatry and Psychotherapy, Berlin, Germany

<sup>6</sup> University Hospital of Child and Adolescent Psychiatry and Psychotherapy, University of Bern, Bern, Switzerland

<sup>7</sup> Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health (BIH), Institute of Medical Psychology, Berlin, Germany

<sup>8</sup> Pennsylvania State University, College of Health and Human Development, Department of Biobehavioral Health, Pennsylvania, USA

Correspondence concerning this article should be addressed to Katja Dittrich, Charité – Universitätsmedizin Berlin, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, Augustenburger Platz 1, 13353 Berlin, Germany, 0049 30 450 666 227, [katja.dittrich@charite.de](mailto:katja.dittrich@charite.de).

*Acknowledgements:*

This work was supported by the German Federal Ministry of Education and Research (BMBF) [Grant number: 01KR1207C] and the German Research Foundation (DFG) [Grant numbers: BE2611/2-1; LE560/5-1; RO3935/1-1; HE2426/5-1]. We would like to thank all the women and children who participated in our study.

*Declaration of Interest:*

There is no conflict of interests, financial or otherwise, to declare.

Reprinted with permission. This is an accepted manuscript of the following article:

Dittrich, K. et al. (2019). Alterations of empathy in mothers with a history of early life maltreatment, depression, and borderline personality disorder and their effects on child psychopathology. *Psychological Medicine*, 1–9.

This version is free to view and download for personal use only. Not for re-distribution, re-sale or use in derivative works. © 2019 (Cambridge University Press). The final version is available at DOI: [10.1017/s0033291719001107](https://doi.org/10.1017/s0033291719001107)

### Abstract

*Background:* Early life maltreatment (ELM), borderline personality disorder (BPD) and major depressive disorder (MDD) have been associated with empathy deficits in different domains. Lack of maternal empathy has also been related to child behavioral problems. As ELM, BPD and MDD often co-occur, we aimed to identify dissociable effects on empathy due to these three factors. In addition, we aimed to investigate their indirect effects via empathy, on child psychopathology. *Methods:* We included 251 mothers with and without MDD (in remission), BPD and ELM and their children, aged 5 to 12. We used the Interpersonal Reactivity Index as a measure of empathy on four different dimensions (personal distress, empathic concern, perspective taking, and fantasy) and the Child Behavior Checklist as a measure of child psychopathology. *Results:* Having included all three factors (ELM, MDD, BPD) in one analysis, we found elevated personal distress in MDD and BPD, and lower levels of perspective-taking in BPD, but no effects from ELM on any empathy subscales. Furthermore, we found indirect effects from maternal BPD and MDD on child psychopathology, via maternal personal distress. *Conclusion:* The present study demonstrated dissociable effects of maternal ELM, MDD, and BPD on empathy. Elevated personal distress in mothers with BPD and MDD may lead to higher levels of child psychopathology.

*Keywords:* Empathy; Borderline Personality Disorder; Depressive Disorder; Mothers; Child

## Introduction

Broadly defined, empathy refers to an individual's reaction to observing another person's experiences (Davis 1983). For some authors the term "empathy" exclusively describes the ability to share the feelings of others; the ability to understand the mental states (including emotional states) on a cognitive level is then referred to as theory of mind (de Vignemont & Singer 2006; Preckel *et al.* 2018). The general consensus exists that when describing social functioning in reaction to interpersonal situations one should distinguish between a more cognitive reaction, including reasoning about other people's mental states, and a more affective reaction, including the sharing of affective states and feeling of concern for others (Davis 1983; Preckel *et al.* 2018). Taking into account the multi-dimensionality of the concept, Davis (1983) developed the Interpersonal Reactivity Index (IRI) that assesses four different dimensions of trait empathy or social functioning. Briefly, *personal distress* describes uncomfortable feelings when confronted with another's suffering and *empathic concern* describes compassion and concern for others. Both are considered rather affective empathic responses. *Perspective-taking*, a measure of cognitive empathy, touches on the understanding of other people's emotional states and *fantasy*, the tendency to imaginatively transpose oneself into fictitious characters. Impaired empathy has been found in certain mental disorders including major depressive disorder (MDD) (Schreiter *et al.* 2013) and borderline personality disorder (BPD) (Dziobek *et al.* 2011), and in individuals with an experience of early life maltreatment (ELM) (Parlar *et al.* 2014).

A number of studies have already addressed the effects of MDD on trait empathy (review by Schreiter *et al.* 2013). Investigations in which trait empathy is measured with the IRI in BPD, are scarcer and the findings are more inconsistent (review by Roepke *et al.* 2012). For individuals with ELM, the number of investigations is still limited and characterized by the use of diverse instruments. In general, the most consistent findings have been reported on the affective dimensions, in that the majority of studies found higher levels of personal distress in patients with MDD and BPD (Guttman & Laporte 2000; O'Connor *et al.* 2002; Wilbertz *et al.* 2010; Dziobek *et al.* 2011; Thoma *et al.* 2011; Derntl *et al.* 2012; New *et al.* 2012; Schneider *et al.* 2012; Schreiter *et al.* 2013), but no effects on empathic concern (Guttman & Laporte 2000; O'Connor *et al.* 2002; Wilbertz *et al.* 2010; Thoma *et al.* 2011; Derntl *et al.* 2012; New *et al.* 2012; Schneider *et al.* 2012; Schreiter *et al.* 2013). Similarly, Parlar *et al.* (2014) found higher levels of personal distress, but also lower levels of empathic concern in individuals with ELM who also suffered from PTSD. Results for cognitive empathy in MDD and BPD have

been mixed (Guttman & Laporte 2000; Dziobek *et al.* 2011), but a number of studies which applied the IRI, found lower levels of perspective-taking in depressed patients (Wilbertz *et al.* 2010; Cusi *et al.* 2011; Schreiter *et al.* 2013), BPD patients (Harari *et al.* 2010; New *et al.* 2012) and individuals with ELM-related PTSD (2014). While there seems to be a lack of studies addressing the isolated effects of a ELM on empathy assessed with the IRI, other investigations which used different measures, found similar impairments in cognitive (Locher *et al.* 2014; Nazarov *et al.* 2014) and affective empathy (Locher *et al.* 2014; Parlar *et al.* 2014). It should be noted that none of the studies mentioned above found significant effects on the fantasy dimension.

MDD and BPD show high comorbidity (Zanarini *et al.* 1998) and are common sequelae of ELM (Liotti *et al.* 2001; Plant *et al.* 2013; Li *et al.* 2016). Thus, the separate investigation of one of these three factors carries the risk of being confounded by one of the other two factors. While the mentioned studies investigated the effects of MDD and BPD separately and while the effects of ELM have not been investigated independently of PTSD so far, our study aims to extend this research by including all three risk factors in one study in order to identify their specific contribution to empathy. We included all four dimensions of empathy to gain a comprehensive picture of alterations when considering the co-occurrence of all three risk factors.

As deficits in maternal empathy have been related to child psychopathology and attachment problems (Grienenberger *et al.* 2005; Psychogiou *et al.* 2008), it might also be of interest to investigate indirect effects, via empathy, on the next generation. Psychogiou *et al.* (Psychogiou *et al.* 2008) used a modified version of the IRI to specifically assess maternal empathy towards her own child. They found positive associations between personal distress and child hyperactivity, conduct problems and emotional problems. Maternal empathy (collapsed score of perspective-taking and empathic concern) was negatively associated with higher child conduct problems.

As impaired empathy has been reported in individuals with ELM, MDD, and BPD, it might be an important aspect for explaining elevated levels of psychopathology in children of mothers with these conditions (Goodman & Rouse 2011; Eyden *et al.* 2016; Plant *et al.* 2017). So far, however, alterations in trait empathy have not specifically been addressed as a potential mechanism leading to child psychopathology in mothers with MDD, BPD, and ELM. It appears desirable to investigate the mediating role of different dimensions of trait empathy, to promote

a deeper understanding of the potential role of maternal empathy in the intergenerational transmission of abuse and psychopathology.

### **Aims of the Study**

The first aim of this study was to disentangle the effects of MDD, BPD, and ELM on empathy, by including all three factors in one study. Our second aim was to investigate whether alterations in maternal empathy would mediate the effects of maternal ELM, MDD, and BPD on child psychopathology.

## **Method**

### **Participants and Procedure**

This study was performed within the framework of the UBICA (Understanding and Breaking the Intergenerational Cycle of Abuse, [www.ubica.de](http://www.ubica.de)) multicenter project in Berlin and Heidelberg (Dittrich *et al.* 2018a, 2018b; Kluczniok *et al.* 2018). The present study included 251 mothers and their children aged between 5 and 12 years. BPD was diagnosed in 33 mothers and MDD in remission (rMDD) in 131 mothers. 142 mothers had experienced ELM before the age of 17 of at least moderate severity. However, in our analyses we used a dimensional score for ELM composed of the main scales (sexual, physical, and emotional abuse, neglect, and parental antipathy) of the Childhood Experience of Care and Abuse Interview (CECA, Bifulco *et al.* 1994). There was an intentional co-occurrence of two or all three risk factors in parts of our sample, consisting of mothers with/without ELM and/or rMDD and/or BPD (see Table 1 for detailed information).

Mothers with ELM, rMDD and BPD, as well as healthy mothers and their children were recruited by advertisement (poster and flyer) in psychotherapeutic, psychiatric, gynecological, and pediatric outpatient clinics. Mothers with MDD had to be in a remitted state to exclude the risk that the effects of acute depression would override the effects of BPD and ELM. Acute MDD symptoms might have caused bias in response behavior (Gartstein *et al.* 2009) and interfered with participation in the study. Thus, we chose to investigate mothers with MDD in remission, with depressive symptoms at a sub-clinical level rather than acute MDD, and only mothers with a Hamilton Depression Scale (Hamilton 1960) score of seven or less were

---

included. Mothers with BPD had to be non-suicidal and sufficiently stable (i.e., not hospitalized) to participate in the study.

The exclusion criteria for the mothers included a lifetime history of schizophrenia, neurological diseases, manic episodes, an acute depressive episode, and anxious-avoidant, or antisocial personality disorder as these conditions could potentially impair their participation in the study. Mothers with BPD or rMDD were allowed to have a comorbid current or lifetime DSM-IV axis I diagnosis (other than acute MDD); this was controlled for in our analyses. A further exclusion criterion was the taking of benzodiazepines within the last six months. Medication with other psychotropic drugs did not represent an exclusion criterion, as long as the dosage had been stable for at least two weeks prior to entering the study. The exclusion criteria for the child participants included a previous diagnosis of autistic disorder or intellectual disability. Because the aim of our project was to investigate the effect of maternal factors on child behavior, the mothers and children had to live together. The study was approved by the ethics committee of the Charité – Universitätsmedizin Berlin. Written informed consent was obtained from all the participants after the procedure had been fully explained.

## Measures

### *Empathy.*

We administered the German version (Paulus 2009) of the Interpersonal Reactivity Index (Davis 1980, IRI; 1983), a self-rating questionnaire which differentiates four dimensions of empathy (seven items each): *Perspective-taking* refers to the cognitive aspect of empathy, measuring the ability to spontaneously adopt another's point of view. *Fantasy* assesses a person's tendency to imaginatively transpose themselves into the actions and feelings of fictitious characters in movies, books, or plays. *Empathic concern* and *personal distress* both touch on emotional reactions to interpersonal situations. *Personal distress* assesses more "self-oriented" feelings such as discomfort, anxiety, unease in emotional and tense interpersonal situations while *empathic concern* measures more "other-oriented" reactions to others' misfortune, such as concern or sympathy. The German version of the IRI has shown good values in reliability, factorial validity and item analyses (Paulus 2009). German sex- and age-adjusted T-norm scores for each of the four dimensions were entered in our analyses.

**Maternal ELM, rMDD and BPD.**

The maternal history of depression (and other diagnoses of DSM-IV axis I disorders) was assessed using the Mini-International Neuropsychiatric Interview (M.I.N.I.; Lecrubier *et al.* 1997) which is a fully structured, diagnostic interview which has been reported to achieve good inter-rater reliability (Sheehan *et al.* 1997, 1998). The International Personality Disorder Examination (Mombour *et al.* 1996; Loranger *et al.* 1997), a structured clinical interview with an established reliability and validity, was administered to assess BPD and other personality disorders (antisocial and anxious-avoidant). The interviews were conducted by clinical psychologists (holding bachelor or master's degrees), following training by experienced users. For rMDD and BPD, a binary variable (yes/no) was entered in our analyses.

Maternal experiences of ELM were assessed using the Childhood Experience of Care and Abuse Interview (CECA; Bifulco *et al.* 1994; Kaess *et al.* 2011). This is a semi-structured, clinical interview which uses investigator-based ratings to collect retrospective accounts of adverse childhood experiences (up to an age of 17 years), such as sexual, physical, and emotional abuse, neglect, and parental antipathy. The data were rated according to manualized threshold examples and predetermined criteria, using a four-point scale of severity. We entered the sum score of the five main CECA dimensions into the analyses, with higher scores indicating higher severity.

**Child psychopathology.**

To assess child psychopathology, we used the Child Behavior Checklist (CBCL; Achenbach 1991; Arbeitsgruppe Deutsche Child Behavior Checklist 1998) which is a parental questionnaire about children's emotional and behavior problems. The German version of the instrument has shown good reliability and validity (Döpfner *et al.* 1994). The T-value norms of the total problem score were entered in our analyses. The total problem score including 118 items showed excellent internal consistency (Cronbach's  $\alpha = .95$ ). It has been demonstrated to correlate well with child psychiatric diagnoses in children, and thus to provide a valid indicator for mental health problems in children (Kasius *et al.* 1997; Jensen & Watanabe 1999). The high correlation between the internalizing and the externalizing scales on the CBCL in the present study ( $r = .62, p < .001$ ) indicates that the use of the total problem score did not result in undue aggregation of divergent information (Burt *et al.* 2005; Bödeker *et al.* 2018). However, to provide a more comprehensive picture of different aspects of child psychopathology, details on the results for the two main subscales (internalizing and externalizing behavior) and the more



differentiated subscales (e.g. withdrawn, somatic complaint, anxious/depressed) are reported in the supplementary material.

### **Data Analyses**

We first explored correlation coefficients between maternal characteristics (age, years of education, current relationship status, current DSM-IV axis I disorders) and the four IRI dimensions in order to identify possible confounding variables. If the correlation was significant ( $p < .05$ ), the respective variable was used as a covariate in regression analyses. Significant associations only emerged for presence of current axis I disorders and empathy (dimensions *personal distress* and *empathic concern*), which was therefore included as a covariate in all the regression analyses. The same procedure was applied for mediation analyses: any maternal (mentioned above) and child demographic characteristics (age, sex) which showed significant correlations with child psychopathology, were entered as covariates. Significant associations emerged for child's age, maternal relationship status and current axis I disorder. Thus, all mediation analyses were controlled for maternal axis I disorder, relationship status, child age, and the two maternal risk factors not included as the predictor in the respective analysis.

Using the severity of ELM, presence of rMDD, and BPD as predictors, we conducted four linear regression analyses for the four different empathy dimensions as an outcome. We used mediation analyses based on ordinary least squares regression according to Hayes (2013) to investigate the indirect effects of these maternal factors, via empathy, on child psychopathology. Percentile bootstrap confidence intervals (95 %) for the indirect effects (based on 10,000 bootstrap samples) entirely above or below zero were considered significant. The regression diagnostics did not reveal any signs of multicollinearity, violation of assumptions or influential outliers. Information on the mother's years of education was missing in two cases, as well as the CBCL in two cases and information on perspective-taking in three cases. All analyses were performed with IBM SPSS Statistics 24 for Windows (IBM, Armonk, NY, USA) with the *process* macro also being used for the mediation analyses (Hayes 2013).

### **Results**

To estimate the effects of the severity of ELM, the presence of rMDD, and the presence of BPD on empathy, we conducted linear regression analyses with all three predictors in one model (Table 2). All the regression analyses were controlled for maternal current axis I disorder.

The results showed that both BPD and rMDD were significantly associated with higher personal distress and BPD was significantly associated with lower perspective-taking. Other regression analyses were not statistically significant (Table 2).

Mediation analyses were only conducted for those dimensions of empathy which had shown significant associations with maternal ELM, rMDD, or BPD. In each analysis, we controlled for the two maternal risk factors that were not the predictors in the respective analysis (e.g. when estimating the indirect effect of BPD on child psychopathology, we controlled for ELM and rMDD) and for child's age, maternal relationship status, and the presence of maternal current axis I disorder.

The indirect effect of maternal BPD on child psychopathology through maternal personal distress, was significant (Figure 1a). Similarly, a significant, indirect effect from maternal rMDD on child psychopathology through maternal personal distress, was found (Figure 1b). The indirect effect of maternal BPD on child psychopathology through maternal perspective-taking was not significant ( $ab=0.15$ , 95% CI [-0.73, 1.27]). In the mediation model (as in the regression analysis), BPD predicted perspective-taking ( $a=-7.33$ ,  $p<.001$ ) but perspective-taking was not associated with child psychopathology ( $b=-0.02$ ,  $p=.729$ ).

All analyses were conducted with the CBCL total problem score as outcome. Similar findings were obtained when the two subscales (internalizing and externalizing behavior) and the more differentiated subscales (e.g. withdrawn, somatic complaint, anxious/depressed) were considered separately (see supplementary material).

## Discussion

We examined the effects of rMDD, BPD, and the severity of ELM on different facets of empathy and the indirect effects of maternal rMDD, BPD and severity of ELM on child psychopathology through maternal empathy. By including all three risk factors in one analysis, we disentangled their specific effects on empathy. Having investigated the psychological mechanism underlying the effects of ELM, MDD, and BPD on child psychopathology by addressing the mediating role of empathy, the main findings of our study are: BPD and rMDD predicted higher personal distress and BPD also predicted lower perspective-taking. The severity of ELM did not have an effect on empathy when rMDD and BPD were controlled for. We found a significant indirect effect of maternal BPD on child psychopathology via maternal

personal distress while controlling for rMDD and ELM. Similarly, a significant indirect effect from rMDD was found on child psychopathology via personal distress while controlling for BPD and ELM. While the majority of studies to date have focused solely on acute depression or acute depressive symptoms, to the best of our knowledge, this is the first study to investigate empathy in individuals with depression in remission. Our results for elevated personal distress in women with rMDD, are in line with previous research on acute depression (O'Connor *et al.* 2002; Wilbertz *et al.* 2010; Thoma *et al.* 2011; Derntl *et al.* 2012; Schneider *et al.* 2012; Schreiter *et al.* 2013), but extend these findings by showing that these disturbances could possibly persist even after remission. Our findings of BPD as a predictor of higher personal distress and lower perspective-taking is also in accordance with previous results (Guttman & Laporte 2000; Dziobek *et al.* 2011; New *et al.* 2012). However, we combined all three conditions, ELM, BPD, and MDD, in one study in order to take into account the close association between these conditions.

MDD is often characterized by an attentional focus on the self as part of a dysfunctional, self-regulatory cycle in which patients ruminate and lack the ability to disengage from unattainable goals (Mor *et al.* 2010). During empathic processes, such as when watching someone in a stressful situation, this attentional self-focus may cause depressed individuals to imagine how they would react themselves in such a situation, rather than focusing on the other's reaction (Schreiter *et al.* 2013). It is also conceivable that depressed patients show a blurred self-other distinction, which in certain situations may lead to emotional contagion, so that the other person's emotion, with which one resonates, might even be mistaken for one's own emotion (Singer & Klimecki 2014). Individuals with BPD show a different pattern of difficulties in controlling their attention: They show a focus on current distress and signals of threat and anger (Baer *et al.* 2012), as well as emotional hyperreactivity with respect to interpersonal situations (Sauer *et al.* 2014). In the unfortunate combination with difficulties in emotional regulation which is often shown by patients with BPD in particular but also those with rMDD (Dittrich *et al.* 2018a), personal distress levels may rise. This is relevant because personal distress may lead to social impairments and interpersonal problems due to unfavorable reactions, such as stress, withdrawal and non-social behavior, to these emotional situations (Schreiter *et al.* 2013; Singer & Klimecki 2014).

These social impairments might be especially important in the close relationship between mother and child. Our study indicates that elevated personal distress seems to mediate the effects of BPD and rMDD on child psychopathology. A link between maternal personal

distress (measured using the IRI) and child emotional and behavioral problems has been reported before (Psychogiou *et al.* 2008). However, we provide first indications for an intergenerational, indirect effect leading from maternal BPD and rMDD via maternal personal distress to child psychopathology. Mothers with high personal distress might perceive their child's negative emotions as aversive and stressful, which might limit their flexibility for reacting to the child's distress and even lead to withdrawal and non-comforting, or aggressive reactions. Another explanation could lie in children's emotional development, which is normally facilitated by a maternal scaffolding of emotional expressions and modulation (Cole *et al.* 2018). When mothers show intense emotional reactions to their child's emotional expressions, the child may experience less dyadic co-regulation of emotions which might impair the acquisition of valuable emotional regulation strategies.

While personal distress relates to a more "self-oriented" aspect of affective empathy, empathic concern describes the "other-oriented" reaction to others' misfortune, sometimes also referred to as compassion (Singer & Klimecki 2014). In accordance with previous research (Thoma *et al.* 2011; Derntl *et al.* 2012; New *et al.* 2012), no effects from rMDD and BPD on empathic concern, emerged in our study. It is conceivable that individuals with rMDD and BPD can feel compassion towards others while experiencing high personal distress at the same time. However, future studies might explore whether high personal distress could cause people to refrain from actual helping behavior, as self-report instruments on empathy only measure compassionate feelings towards others but not the capacity to act upon them (Schreiter *et al.* 2013). Of interest, Wingenfeld *et al.* (2018) found that only after psychosocial stress induction borderline patients showed significantly lower empathic concern, measured in a behavioral task, than the control group.

Interestingly, lower levels of perspective-taking emerged for women with BPD but not rMDD. Impaired capacity to reflect upon the mental states of others has been argued to be a key feature of BPD and the main cause of interpersonal problems in these patients (Fonagy & Bateman 2008). Accordingly, most previous studies on cognitive empathy or perspective-taking in BPD found lower scores for these patients in trait and state (behavioral) measures (Harari *et al.* 2010; Dziobek *et al.* 2011; New *et al.* 2012). While other authors have reported lower levels of perspective-taking in acutely depressed patients (Wilbertz *et al.* 2010; Cusi *et al.* 2011; Schreiter *et al.* 2013), no significant effects emerged in our study of patients with MDD in remission. Perspective-taking describes the cognitive ability to draw inferences about other people's intentions, thoughts and beliefs, also referred to as the theory of mind (Singer &

---

Klimecki 2014). Longitudinal studies have shown significant improvements in theory of mind tasks for MDD patients after remission (review by Berezcz *et al.* 2016). However, mild forms of social cognitive deficits still appear to persist, even in a remitted state (Ladegaard *et al.* 2015). While these studies assessed state (behavioral) theory of mind measures, we applied a trait measure of cognitive empathy, which also reflects a subjective impression of the participant. It seems conceivable that patients with MDD in remission estimate their own current performance similarly to healthy controls, given their experience of former periods of acute depression that may have implied more severe, social-cognitive impairments.

In contrast to our findings on personal distress, we did not find that lower perspective-taking mediated the effects of BPD on child psychopathology. This result contradicts the findings of Psychogiou *et al.* (2008), who reported negative associations between maternal empathy and child conduct problems. However, as Psychogiou *et al.* assessed a community sample and collapsed two scales into one, the results are hardly comparable. Notably, in their study, personal distress similarly seemed to play a more important role for child psychopathology than perspective-taking, as personal distress showed significant correlations with more child behavior scales. One might question why the two aspects of empathy show different impacts on child psychopathology: While both scales have been related to deficits in social competence, heightened personal distress has also been related to emotional vulnerability and fearfulness (Davis 1983). Thus, as low perspective-taking represents a lack of certain cognitive skills which might otherwise be compensated, personal distress can lead to stressful emotional states followed by aversive reactions or withdrawal from the child, which in turn may negatively affect the close emotional bond between mother and child.

Finally, when controlling for BPD and MDD, we did not find effects from ELM on any of the empathy dimensions studied here. Other studies investigated specific effects of PTSD related to childhood trauma and reported effects on cognitive and affective empathy (Nazarov *et al.* 2014; Parlar *et al.* 2014). Parlar *et al.* (2014) for example, reported lower levels of empathic concern and perspective-taking and higher levels of personal distress, using the IRI, in individuals with PTSD related to ELM. However, as they did not study the effects of ELM on empathy independently of PTSD, results are hard to compare. We controlled for mental disorders to estimate the isolated effect of ELM and have concluded that trait empathy deficits in adults with ELM seem to be provoked mainly by common sequelae such as MDD or BPD. Further research replicating this finding with state empathy tasks would be desirable.

## Limitations

Several limitations of the present study may be considered. First, we used self-report measures of empathy, which require some level of self-reflection from the participants, instead of behavioral tasks. The two approaches might produce different results. For example, Schreier et al. (2013) in their review, showed that impairments in cognitive empathy in MDD were more often observed when using objective rather than subjective measures. However, behavioral tasks are usually a state measure while the IRI instead captures the trait aspects of empathy, which might also explain the divergent results. Future studies would ideally incorporate both. Also, other factors than psychiatric disorder that have not been considered in this study could contribute to empathy in mothers. Second, we only focused on mothers; it would appear desirable to investigate this issue also in fathers as they could be an equally important attachment figure for the child. Third, the total effects of our mediation model were not significant. While this was considered a prerequisite of mediation analyses in traditional approaches, more contemporary and more statistically powerful methods of mediation testing have disproven this assumption (Hayes 2009). Fourth, in our study, the proportion of mothers with borderline personality disorder was lower than the proportion of mothers with depression or a history of maltreatment. Fifth, Banzhaf et al. (Banzhaf *et al.* 2018) found that perspective-taking deficits in MDD could be attributed to comorbid alexithymia, which we did not assess in our study. Sixth, recruitment by advertisement might have caused a selection bias of participants in our study. Seventh, we included children at elementary school age. It would be interesting to investigate whether the observed effects can already be found in younger children. Finally, as this is a cross-sectional study, no conclusions can be drawn about causal direction. Although the onset of the maternal risk factors lay in the past, the assessment of maternal empathy and child psychopathology was carried out at the same time-point. Therefore, the causal direction underlying the association between empathy and offspring psychopathology could not be established unambiguously. Also, a disposition towards high personal distress could function as a vulnerability factor for certain mental disorders and severe child behavioral problems could possibly impact on maternal well-being. Longitudinal research designs would be needed to identify causal directions or reveal possible, bi-directional relationships in this context.

We conclude that empathy impairments in mothers with rMDD and BPD may pose a risk for child psychopathology. Elevated personal distress in mothers with BPD and MDD but not lower perspective-taking in BPD was found to lead to higher levels of psychopathology in

their children and may thus be an important aspect for explaining intergenerational effects in maternal psychopathology. In our study, ELM did not affect empathy when potentially co-occurring sequelae like MDD and BPD were taken into account. Intervention programs which address the attentional focus in empathic processes and promote emotion regulation, in order to lower personal distress in mothers diagnosed with BPD or MDD, may have a positive influence on the next generation.

---

## References

- Achenbach TM** (1991). *Manual for the child behavior checklist/4-18 and 1991 profile*. Burlington VT. Dept. of Psychiatry, University of Vermont.
- Arbeitsgruppe Deutsche Child Behavior Checklist** (1998). *Elternfragebogen über das Verhalten von Kindern und Jugendlichen; deutsche Bearbeitung der Child Behavior Checklist (CBCL/4-18). Einführung und Anleitung zur Handauswertung mit deutschen Normen, bearbeitet von M. Döpfner, J. Plück, S. Bölte, K. Lenz, P. M. Arbeitsgruppe Kinder-, Jugend- und Familiendiagnostik (KJFD)*: Cologne (Germany).
- Baer RA, Peters JR, Eisenlohr-Moul TA, Geiger PJ, Sauer SE** (2012). Emotion-related cognitive processes in borderline personality disorder: A review of the empirical literature. *Clinical Psychology Review* **32**, 359–369.
- Banzhaf C, Hoffmann F, Kanske P, Fan Y, Walter H, Spengler S, Schreiter S, Singer T, Bermpohl F** (2018). Interacting and dissociable effects of alexithymia and depression on empathy. *Psychiatry Research* **in press**
- Berez H, Tényi T, Herold R** (2016). Theory of Mind in Depressive Disorders: A Review of the Literature. *Psychopathology* **49**, 125–134.
- Bifulco A, Brown GW, Harris TO** (1994). Childhood experience of care and abuse (CECA): A retrospective interview measure. . Blackwell Publishing Ltd *Journal of Child Psychology and Psychiatry and Allied Disciplines* **35**, 1419–1435.
- Bödeker K, Fuchs A, Führer D, Kluczniok D, Dittrich K, Reichl C, Reck C, Kaess M, Hindi Attar C, Möhler E, Neukel C, Bierbaum A-L, Zietlow A-L, Jaite C, Lehmkuhl U, Winter SM, Herpertz S, Brunner R, Bermpohl F, Resch F** (2018). Impact of Maternal Early Life Maltreatment and Maternal History of Depression on Child Psychopathology: Mediating Role of Maternal Sensitivity? *Child Psychiatry & Human Development*
- Burt KB, Van Dulmen MHM, Carlivati J, Egeland B, Sroufe LA, Forman DR, Appleyard K, Carlson EA** (2005). Mediating links between maternal depression and offspring psychopathology: The importance of independent data. *Journal of Child Psychology and Psychiatry and Allied Disciplines*
- Cole PM, Michel MK, Teti LO** (2018). The development of emotion regulation and dysregulation: A clinical perspective. . Wiley/Blackwell (10.1111) *Monographs of the Society for Research in Child Development* **59**, 73–102.
- Cusi AM, MacQueen GM, Spreng RN, McKinnon MC** (2011). Altered empathic responding in major depressive disorder: Relation to symptom severity, illness burden, and psychosocial outcome. *Psychiatry Research* **188**, 231–236.



- Davis MH** (1980). A Multidimensional Approach to Individual Differences in Empathy. *JSAS Catalog of Selected Documents in Psychology* **10**, 85.
- Davis MH** (1983). A Multidimensional Approach to Individual Differences in Empathy. *Journal of Personality and Social Psychology* **44**, 113–126.
- Derntl B, Seidel EM, Schneider F, Habel U** (2012). How specific are emotional deficits? A comparison of empathic abilities in schizophrenia, bipolar and depressed patients. . Elsevier *Schizophrenia Research* **142**, 58–64.
- Dittrich K, Bodeker K, Kluczniok D, Jaite C, Hindi Attar C, Führer D, Herpertz SC, Brunner R, Winter SM, Heinz A, Roepke S, Heim C, Bempohl F** (2018a). Child abuse potential in mothers with early life maltreatment, borderline personality disorder, and depression. *British Journal of Psychiatry* **213**, 412–418.
- Dittrich K, Fuchs A, Bempohl F, Meyer J, Führer D, Reichl C, Reck C, Kluczniok D, Kaess M, Hindi Attar C, Möhler E, Bierbaum AL, Zietlow AL, Jaite C, Winter SM, Herpertz SC, Brunner R, Bödeker K, Resch F** (2018b). Effects of maternal history of depression and early life maltreatment on children’s health-related quality of life. *Journal of Affective Disorders* **225**, 280–288.
- Döpfner M, Schmeck K, Berner W, Lehmkuhl G, Poustka F** (1994). [Reliability and factorial validity of the Child Behavior Checklist: an analysis of a clinical sample and a field sample]. *Zeitschrift für Kinder- und Jugendpsychiatrie* **22**, 189–205.
- Dziobek I, Preißler S, Grozdanovic Z, Heuser I, Heekeren HR, Roepke S** (2011). Neuronal correlates of altered empathy and social cognition in borderline personality disorder. *NeuroImage* **57**, 539–548.
- Eyden J, Winsper C, Wolke D, Broome MR, MacCallum F** (2016). A systematic review of the parenting and outcomes experienced by offspring of mothers with borderline personality pathology: Potential mechanisms and clinical implications. *Clinical Psychology Review* **47**, 85–105.
- Fonagy P, Bateman A** (2008). The Development of Borderline Personality Disorder—A Mentalizing Model. . Guilford Publications Inc. *Journal of Personality Disorders* **22**, 4–21.
- Gartstein MA, Bridgett DJ, Dishion TJ, Kaufman NK** (2009). Depressed Mood and Maternal Report of Child Behavior Problems: Another Look at the Depression–Distortion Hypothesis. *Journal of applied developmental psychology* **30**, 149–160.
- Goodman S, Rouse M** (2011). Maternal depression and child psychopathology: a meta-analytic review. ... *psychology review* **14**, 1–27.
- Grienenberger J, Kelly K, Slade A** (2005). Maternal reflective functioning, mother-infant

affective communication, and infant attachment: Exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment and Human Development* **7**, 299–311.

**Guttman HA, Laporte L** (2000). Empathy in families of women with borderline personality disorder, anorexia nervosa, and a control group. . Allan Memorial Institute, McGill University Health Centre, Montreal, Quebec, Canada. *Family Process* **39**, 345–358.

**Hamilton M** (1960). A rating scale for depression. *Journal of neurology, neurosurgery, and psychiatry* **23**, 56–62.

**Harari H, Shamay-Tsoory S, Ravid M, Levkovitz Y** (2010). Double dissociation between cognitive and affective empathy in borderline personality disorder. *Psychiatry Research* **175**, 277–279.

**Hayes AF** (2009). Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium. . Routledge *Communication Monographs* **76**, 408–420.

**Hayes AF** (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. The Guilford Press: New York, N.Y.

**Jensen PS, Watanabe H** (1999). Sherlock Holmes and child psychopathology assessment approaches: The case of the false-positive. *Journal of the American Academy of Child and Adolescent Psychiatry*

**Kaess M, Parzer P, Mattern M, Resch F, Bifulco A, Brunner R** (2011). [Childhood Experiences of Care and Abuse (CECA) - validation of the German version of the questionnaire and interview, and results of an investigation of correlations between adverse childhood experiences and suicidal behaviour]. . Sektion Storungen der Persönlichkeitsentwicklung, Klinik für Kinder- und Jugendpsychiatrie am Psychosozialen Zentrum des Universitätsklinikums Heidelberg. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie* **39**, 243–252.

**Kasius MC, Ferdinand RF, Van den Berg H, Verhulst FC** (1997). Associations between different diagnostic approaches for child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry and Allied Disciplines*

**Kluczniok D, Boedeker K, Hindi Attar C, Jaite C, Bierbaum AL, Fuehrer D, Paetz L, Dittrich K, Herpertz SC, Brunner R, Winter S, Heinz A, Roepke S, Heim C, BERPohl F** (2018). Emotional availability in mothers with borderline personality disorder and mothers with remitted major depression is differently associated with psychopathology among school-aged children. *Journal of Affective Disorders* **231**, 63–73.

**Ladegaard N, Videbech P, Lysaker PH, Larsen ER** (2015). The course of social cognitive

and metacognitive ability in depression: Deficit are only partially normalized after full remission of first episode major depression. . Wiley/Blackwell (10.1111) *British Journal of Clinical Psychology* **55**, 269–286.

**Lecrubier Y, Sheehan D V., Weiller E, Amorim P, Bonora I, Sheehan KH, Janavs J, Dunbar GC** (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry* **12**, 224–231.

**Li M, D’Arcy C, Meng X** (2016). Maltreatment in childhood substantially increases the risk of adult depression and anxiety in prospective cohort studies: systematic review, meta-analysis, and proportional attributable fractions. . Cambridge University Press *Psychological Medicine* **46**, 717–730.

**Liotti G, Pasquini P, Cirrincione R** (2001). Predictive factors for borderline personality disorder: patients’ early traumatic experiences and losses suffered by the attachment figure. . Wiley/Blackwell (10.1111) *Acta Psychiatrica Scandinavica* **102**, 282–289.

**Locher SC, Barenblatt L, Fourie MM, Stein DJ, Gobodo-Madikizela P** (2014). Empathy and childhood maltreatment: a mixed-methods investigation. . Department of Psychology, University of Cape Town, Cape Town, South Africa. *Annals of clinical psychiatry : official journal of the American Academy of Clinical Psychiatrists* **26**, 97–110.

**Loranger AW, Janca A, Sartorius N** (1997). *Assessment and Diagnosis of Personality Disorders: the ICD-10 International Personality Disorder Examination (IPDE)*. Cambridge University Press: Cambridge, U.K. LB - UBICA; Measures.

**Mombour W, Zaudig M, Berger P, Gutierrez K, Berner W, Berger K, von Cranach M, Gighuber O, von Bose M** (1996). *IPDE: International Personality Disorder Examination*. Huber: Bern, Switzerland.

**Mor N, Doane LD, Adam EK, Mineka S, Zinbarg RE, Griffith JW, Craske MG, Waters A, Nazarian M** (2010). Within-person variations in self-focused attention and negative affect in depression and anxiety: A diary study. . Routledge *Cognition and Emotion* **24**, 48–62.

**Nazarov A, Frewen P, Parlar M, Oremus C, Macqueen G, Mckinnon M, Lanius R** (2014). Theory of mind performance in women with posttraumatic stress disorder related to childhood abuse. . Department of Psychiatry and Behavioral Neurosciences, McMaster University, Hamilton, Ontario, Canada; Mood Disorders Program, St. Joseph’s Healthcare, Hamilton, Ontario, Canada. *Acta Psychiatrica Scandinavica* **129**, 193–201.

**New AS, aan het Rot M, Ripoll LH, Perez-Rodriguez MM, Lazarus S, Zipursky E, Weinstein SR, Koenigsberg HW, Hazlett EA, Goodman M, Siever LJ** (2012). Empathy

and alexithymia in borderline personality disorder: clinical and laboratory measures. . James J. Peters Veterans Affairs Medical Center, New York, USA. antonia.new@mssm.edu *J Pers Disord* **26**, 660–675.

**O'Connor LE, Berry JW, Weiss J, Gilbert P** (2002). Guilt, fear, submission, and empathy in depression. *Journal of affective disorders* **71**, 19–27.

**Parlar M, Frewen P, Nazarov A, Oremus C, MacQueen G, Lanius R, McKinnon MC** (2014). Alterations in empathic responding among women with posttraumatic stress disorder associated with childhood trauma. *Brain and Behavior* **4**, 381–389.

**Paulus C** (2009). [*The Saarbrueck Personality Questionnaire on Empathy: Psychometric evaluation of the German version of the Interpersonal Reactivity Index*].

<http://psydok.sulb.uni-saarland.de/volltexte/2009/2363/>. Universität des Saarlandes: Saarbrücken, Germany.

**Plant DT, Barker ED, Waters CS, Pawlby S, Pariante CM** (2013). Intergenerational transmission of maltreatment and psychopathology: The role of antenatal depression. *Psychological Medicine* **43**, 519–528.

**Plant DT, Pawlby S, Pariante CM, Jones FW** (2017). When one childhood meets another – maternal childhood trauma and offspring child psychopathology: A systematic review. . England *Clinical Child Psychology and Psychiatry*, 135910451774218.

**Preckel K, Kanske P, Singer T** (2018). On the interaction of social affect and cognition : empathy , compassion and theory of mind. . Elsevier Ltd *Current Opinion in Behavioral Sciences* **19**, 1–6.

**Psychogiou L, Daley D, Thompson MJ, Sonuga-Barke EJS** (2008). Parenting empathy: Associations with dimensions of parent and child psychopathology. *British Journal of Developmental Psychology* **26**, 221–232.

**Roepke S, Vater A, Preißler S, Heekeren HR, Dziobek I** (2012). *Social cognition in borderline personality disorder*. *Frontiers in Neuroscience* **6**, 195.

**Sauer C, Arens EA, Stopsack M, Spitzer C, Barnow S** (2014). Emotional hyper-reactivity in borderline personality disorder is related to trauma and interpersonal themes. *Psychiatry Research* **220**, 468–476.

**Schneider D, Regenbogen C, Kellermann T, Finkelmeyer A, Kohn N, Derntl B, Schneider F, Habel U** (2012). Empathic behavioral and physiological responses to dynamic stimuli in depression. *Psychiatry Research* **200**, 294–305.

**Schreiter S, Pijnenborg GHM, Aan Het Rot M** (2013). Empathy in adults with clinical or subclinical depressive symptoms. *Journal of Affective Disorders* **150**, 1–16.

- Sheehan D V., Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC** (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry* **59**, 22–33.
- Sheehan D V., Lecrubier Y, Sheehan KH, Janavs J, Weiller E, Keskiner A, Schinka J, Knapp E, Sheehan MF, Dunbar GC** (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry* **12**, 232–241.
- Singer T, Klimecki OM** (2014). Empathy and compassion. *Current Biology* **24**, R875–R878.
- Thoma P, Zalewski I, von Reventlow HG, Norra C, Juckel G, Daum I** (2011). Cognitive and affective empathy in depression linked to executive control. *Psychiatry Research* **189**, 373–378.
- de Vignemont F, Singer T** (2006). The empathic brain: how, when and why? *Trends in Cognitive Sciences* **10**, 435–441.
- Wilbertz G, Brakemeier E-L, Zobel I, Haerter M, Schramm E** (2010). Exploring preoperational features in chronic depression. *Journal of Affective Disorders* **124**, 262–269.
- Wingenfeld K, Duesenberg M, Fleischer J, Roepke S, Dziobek I, Otte C, Wolf OT** (2018). Psychosocial stress differentially affects emotional empathy in women with borderline personality disorder and healthy controls. *Acta Psychiatrica Scandinavica* **137**, 206–215.
- Zanarini MC, Frankenburg FR, Dubo ED, Sickel AE, Trikha A, Levin A, Reynolds V** (1998). Axis I comorbidity of borderline personality disorder. . American Psychiatric Publishing *American Journal of Psychiatry* **155**, 1733–1739.

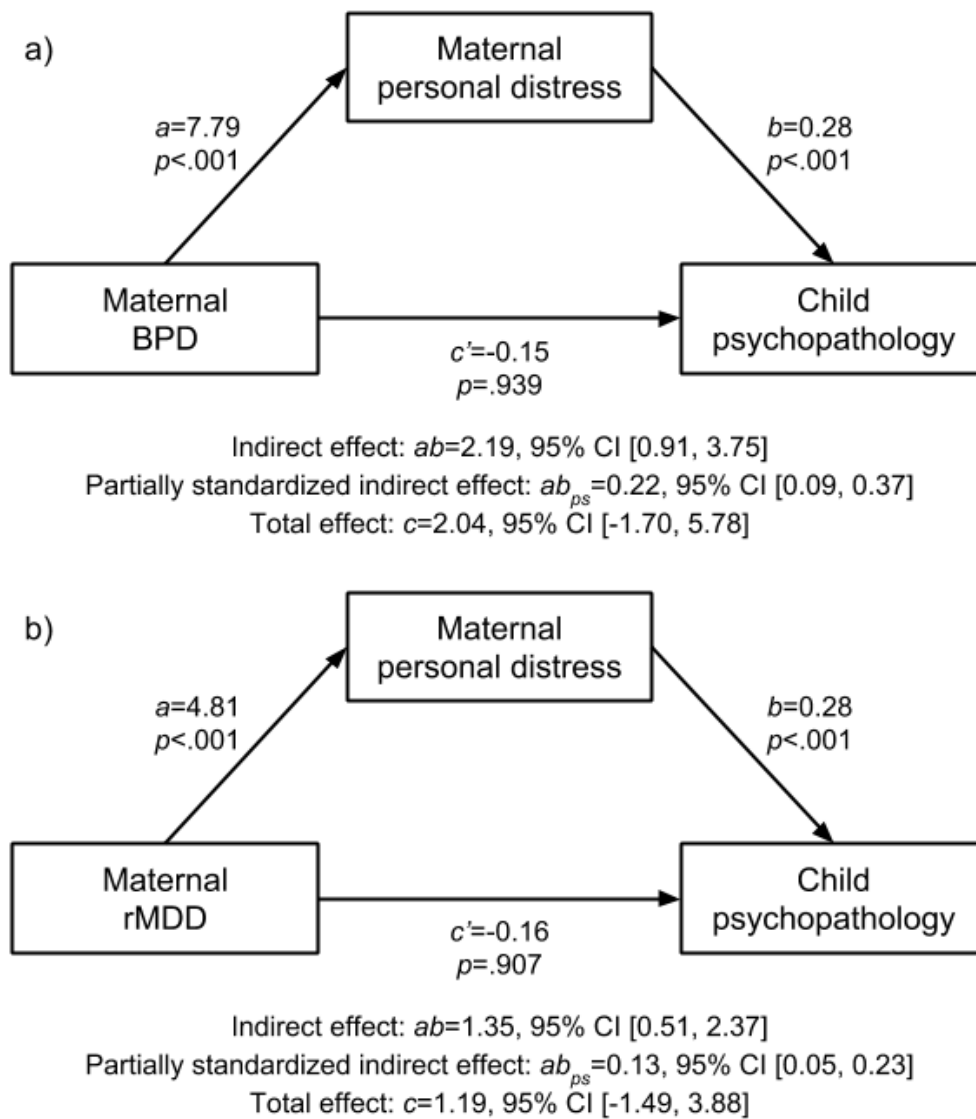


Figure 1. Mediation analyses with maternal personal distress as mediator and a) maternal borderline personality disorder (BPD) and b) maternal depression in remission (rMDD) as predictors and child psychopathology as outcome. Both indirect effects are significant as confidence intervals (CI) exclude zero.  $N=249$ .

Table 1  
*Demographic and clinical Characteristics*

<b>Mothers</b>	<b><i>M (SD)/ %</i></b>
Age in years	38.84 (5.80)
Years of education	16.84 (3.63)
Partnership status	
- married/in a relationship with the father of the child	57.4
- married/in a relationship with partner that is not the father of the child	13.1
- single, separated from partner/husband, divorced, or widowed	29.6
Nationality (German)	91.2
Mothers with moderate/severe ELM	56.6
Sexual abuse	45.8
Physical abuse	66.9
Emotional abuse	24.0
Neglect	31.7
Parental antipathy	61.2
Mothers with diagnosis of rMDD	52.2
Age at onset (years)	26.94 (8.90)
Number of episodes	2.47 (2.13)
Depression Score (HAMD)	2.82 (2.41)
Any psychiatric hospitalization	35.1
Moderate/severe ELM	71.7
Additional diagnosis of BPD	19.1
Other current diagnosis (see below)	26.0
Mothers with diagnosis of BPD	13.1
Age at onset/first diagnosis (years)	26.64 (7.25)
Self-harming behavior within last three months	39.1
Any psychiatric hospitalization	66.7
Moderate/severe ELM	81.8
Additional diagnosis of rMDD	75.8

---

Other current diagnosis (see below)	42.4
Other current diagnoses (additional to rMDD and/or BPD)	13.9
- Dysthymia	2.8
- Panic Disorder	6.8
- Agoraphobia without panic	2.0
- Obsessive Compulsive Disorder	0.4
- Social Phobia	1.6
- Post-Traumatic Stress Disorder	1.6
- Alcohol Abuse	1.6
- Eating Disorders	0.8
- Generalized Anxiety Disorder	3.2
Empathic concern (IRI)	48.73 (9.80)
Perspective-taking (IRI)	46.07 (10.64)
Personal distress (IRI)	46.99 (9.79)
Fantasy (IRI)	46.73 (9.67)

---

### Children

---

Age in years	8.06 (1.64)
Sex (female)	53.4
Psychopathology (CBCL)	55.58 (10.04)

---

*Notes.*  $N=251$ .  $M$ =Mean;  $SD$ =standard deviation; ELM=early life maltreatment; rMDD=major depressive disorder in remission; BPD=Borderline Personality Disorder; HAMD=Hamilton Rating Scale of Depression; IRI=Interpersonal Reactivity Index (norm scores); CBCL=Child Behavior Checklist (norm scores).

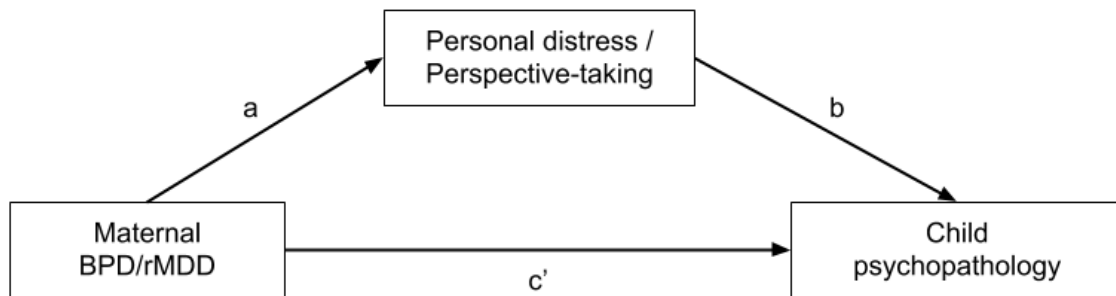


Table 2  
*Effects of early life maltreatment, depression and borderline personality disorder on dimensions of empathy*

	Empathic concern		Perspective-taking		Personal distress		Fantasy	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
<b>Step 1</b> – covariates <sup>a</sup>	.025	.013	.007	.191	.052	<.001	.010	.108
<b>Step 2</b>	.024	.101	.076	<.001	.090	<.001	.023	.125
ELM		-.093		-.098		-.051		-.121
rMDD		.101		-.097		.195		.072
BPD		-.102		-.222		.250		.116
Total $R^2$	0.049		.083		.141		.033	

*Note.*  $N=251$  (Perspective-taking  $N=248$ ). <sup>a</sup> only presence of any current DSM IV axis I disorders was included as a covariate (no other demographic characteristics showed significant association with the outcome variables). ELM=early life maltreatment (CECA sum score). rMDD=major depressive disorder in remission. BPD=borderline personality disorder.

## Supplementary Material



*Figure S1.* Overview of mediation analyses with maternal personal distress and perspective-taking as mediators and maternal borderline personality disorder (BPD) and maternal depression in remission (rMDD) as predictors and child psychopathology (main sub-scales internalizing and externalizing behavior and the eight more differentiated subscales of the CBCL) as outcome. See Table S1 and S2 for results.

Table S1

*Indirect effects from maternal rMDD and BPD to child internalizing and externalizing behavior problems mediated by maternal personal distress and perspective taking*

	<i>a</i>	<i>b</i>	<i>c'</i>	Indirect effect <i>ab</i> [CI]
<b>Effects of BPD via PD</b>				
Internalizing behavior	7.73***	0.35***	-0.67 <sup>ns</sup>	<b>2.69 [1.17, 4.59]</b>
Externalizing behavior	7.90***	0.17*	0.68 <sup>ns</sup>	<b>1.35 [0.32, 2.61]</b>
<b>Effects of rMDD via PD</b>				
Internalizing	4.70***	0.35***	-1.54 <sup>ns</sup>	<b>1.63 [0.62, 2.86]</b>
Externalizing	4.69***	0.17*	1.13 <sup>ns</sup>	<b>0.80 [0.16, 1.62]</b>
<b>Effects of BPD via PT</b>				
Internalizing behavior	-7.34***	0.01 <sup>ns</sup>	2.19 <sup>ns</sup>	-0.07 [-1.02, 1.04]
Externalizing behavior	-7.29***	0.01 <sup>ns</sup>	2.19 <sup>ns</sup>	-0.08 [-1.01, 1.05]

*Note.*  $N=245-248$ . BPD=Borderline Personality Disorder. rMDD=Major Depressive Disorder in remission. PD=personal distress. PT=perspective taking. ns=not significant. \*\*\*  $p<.001$  \*  $p<.05$ . Significant indirect effects are highlighted in bold. Paths are shown in Figure S1.

Table S2

*Indirect effects from maternal rMDD and BPD to child behavior problems (sub-scales of the CBCL) mediated by maternal personal distress and perspective taking*

	<i>a</i>	<i>b</i>	<i>c'</i>	Indirect effect <i>ab</i> [CI]
<b>Effects of BPD via PD</b>				
Withdrawn	7.90***	0.18***	1.87 <sup>ns</sup>	<b>1.39 [0.48, 2.55]</b>
Somatic complaints	7.60***	0.26***	-2.00 <sup>ns</sup>	<b>1.95 [0.70, 3.60]</b>
Anxious/Depressed	7.90***	0.23***	-0.32 <sup>ns</sup>	<b>1.79 [0.75, 3.17]</b>
Social Problems	7.80***	0.14**	1.13 <sup>ns</sup>	<b>1.09 [0.26, 2.08]</b>
Thought problems (Schizoid/compulsive)	7.80***	0.15**	-1.56 <sup>ns</sup>	<b>1.20 [0.34, 2.30]</b>
Attention problems	7.80***	0.15**	1.97 <sup>ns</sup>	<b>1.20 [0.33, 2.23]</b>
Delinquent behavior	7.75***	0.04 <sup>ns</sup>	2.05 <sup>ns</sup>	0.30 [-0.39, 0.94]
Aggressive behavior	7.90***	0.12*	1.37 <sup>ns</sup>	<b>0.95 [0.17, 1.88]</b>
<b>Effects of rMDD via PD</b>				
Withdrawn	4.69***	0.18***	-1.59 <sup>ns</sup>	<b>0.82 [0.24, 1.62]</b>
Somatic complaints	4.42***	0.26***	-1.46 <sup>ns</sup>	<b>1.14 [0.37, 2.00]</b>
Anxious/Depressed	4.69***	0.23***	-0.90 <sup>ns</sup>	<b>1.06 [0.37, 1.92]</b>
Social Problems	4.81***	0.14**	0.71 <sup>ns</sup>	<b>0.68 [0.15, 1.37]</b>
Thought problems (Schizoid/compulsive)	4.81***	0.15**	-0.66 <sup>ns</sup>	<b>0.74 [0.18, 1.48]</b>
Attention problems	4.81***	0.15**	-0.39 <sup>ns</sup>	<b>0.74 [0.19, 1.46]</b>
Delinquent behavior	4.98***	0.04 <sup>ns</sup>	0.90 <sup>ns</sup>	0.19 [-0.23, 0.69]
Aggressive behavior	4.69***	0.12*	0.94 <sup>ns</sup>	<b>0.56 [0.08, 1.19]</b>
<b>Effects of BPD via PT</b>				
Withdrawn	-7.29***	-0.02 <sup>ns</sup>	3.26*	0.11 [-0.66, 1.03]

---

Somatic complaints	-7.36***	0.04 <sup>ns</sup>	0.19 <sup>ns</sup>	-0.32 [-1.35, 0.66]
Anxious/Depressed	-7.29***	0.04 <sup>ns</sup>	1.89 <sup>ns</sup>	-0.29 [-1.22, 0.64]
Social Problems	-7.33***	0.01 <sup>ns</sup>	2.36 <sup>ns</sup>	-0.07 [-0.83, 0.74]
Thought problems (Schizoid/compulsive)	-7.33***	0.00 <sup>ns</sup>	-0.20 <sup>ns</sup>	-0.01 [-0.69, 0.86]
Attention problems	-7.33***	0.02 <sup>ns</sup>	3.31*	-0.16 [-1.10, 0.69]
Delinquent behavior	-7.28***	-0.02 <sup>ns</sup>	2.30 <sup>ns</sup>	0.13 [-0.54, 0.97]
Aggressive behavior	-7.29***	0.03 <sup>ns</sup>	2.60 <sup>ns</sup>	-0.23 [-1.07, 0.67]

---

*Note.*  $N=243-247$ . CBCL=Child Behavior Checklist. BPD=Borderline Personality Disorder. rMDD=Major Depressive Disorder in remission. PD=personal distress. PT=perspective taking. <sup>ns</sup>=not significant. \*\*\*  $p<.001$  \*\*  $p<.01$  \*  $p<.05$ . Significant indirect effects are highlighted in bold. Paths are shown in Figure S1.

## **7.2 Contributions to Conferences (related to this Dissertation)**

### **7.2.1 Oral Presentations**

Dittrich K, BERPPOHL F, KLUCZNIOK D, HINDI ATTAR C, JAITE C, FUCHS A, NEUKEL C, HERPERTZ SC, BRUNNER R, WINTER SM, ROEPKE S, KAESS M, HEIM C, BOEDEKER K. Alterations of empathy in mothers with history of early life maltreatment, depression and borderline personality disorder and their intergenerational effects on child psychopathology. 18th International Congress of European Society for Child and Adolescent Psychiatry: Vienna, Austria, June 30-July 2, 2019.

Dittrich K, Boedeker K, Fuchs A, Kluczniok D, Zietlow AL, Fuehrer D, Hindi Attar C, Moehler E, Winter, S, BERPPOHL F, Brunner R. Intergenerational effects of maternal history of abuse and depression on mother-child interaction and child well-being. 17th International Congress of European Society for Child and Adolescent Psychiatry: Geneva, Switzerland, July 9-11, 2017.

Dittrich K, Boedeker K, Fuchs A, Kluczniok D, Zietlow AL, Fuehrer D, Hindi Attar C, Moehler E, Winter SM, BERPPOHL F, Brunner R. Intergenerationale Effekte belastender Kindheitserlebnisse und mütterlicher Depression auf das Verhalten von Müttern und Kindern. 35. Kongress der Deutschen Gesellschaft für Kinder- und Jugendpsychiatrie, Psychosomatik und Psychotherapie: Ulm, Germany, March 22-25, 2017.

Dittrich K, Kluczniok D, Fuehrer D, Hindi Attar C, Jaite C, Bierbaum AL, Heim C, Roepke S, Brunner R, BERPPOHL F, Boedeker K. Der Einfluss von mütterlicher Borderline-Störung und Depression auf die kindliche Lebensqualität und mögliche Mediatoren. Kongress Deutsche Gesellschaft für Psychiatrie, Psychotherapie und Nervenheilkunde: Berlin, Germany, November 23-26, 2016

Dittrich K, Boedeker K, Kluczniok D, Hindi Attar C, Jaite C, Fuehrer D, Roepke S, Heim C, Herpertz S, Brunner R, BERPPOHL F. Transgenerationale Effekte von elterlicher Emotionsregulation und Misshandlungspotenzial bei Müttern mit Borderline-Störung, Depression und Misshandlungserfahrung. Kongress Deutsche Gesellschaft für Psychiatrie, Psychotherapie und Nervenheilkunde: Berlin, Germany, November 23-26, 2016.

### 7.2.2 Poster Presentations

Dittrich K, Fuchs A, Boedeker K, Meyer J, Jaite C, Kluczniok D, Fuehrer D, Hindi Attar C, Bierbaum AL, Bempohl F, Winter S, Herpertz S, Moehler E, Kaess M, Brunner R, Resch F. Transgenerationale Effekte: Kindliche Lebensqualität bei mütterlicher Depression und Misshandlungserfahrung. 50. Kongress der Deutschen Gesellschaft für Psychologie: Leipzig, Germany, September 18-22, 2016.

Dittrich K, Boedeker K, Fuchs A, Kluczniok D, Fuehrer D, Zietlow AL, Hindi Attar C, Jaite C, Herpertz, SC, Moehler E, Brunner R, Winter S, Bempohl F, Resch F. Effects of Maternal History of Depression and Childhood Abuse on Child Well-being. 5th German Health Research Meeting on Behavioral Disorders Related to Violence, Neglect, Maltreatment, and Abuse in Childhood and Adolescence: Mannheim, Germany, September 12-13, 2016.

Dittrich K, Fuchs A, Boedeker K, Meyer J, Jaite C, Kluczniok D, Fuehrer D, Hindi Attar C, Bierbaum AL, Bempohl F, Winter S, Herpertz S, Moehler E, Kaess M, Brunner R, Resch F. Transgenerationale Übertragung: Kindliche Lebensqualität bei elterlicher Traumatisierung. Forschungstagung der DGKJP: Frankfurt, Germany, February 18-19, 2016.





## Acknowledgments

My deepest gratitude goes to my supervisors Prof. Dr. Felix Bempohl and Dr. Katja Bödeker, who showed me their full support throughout the years of my work on this dissertation. Their valuable insights, helpful advice, and endless feedback at every stage of this dissertation have taught me a tremendous amount about being a scientist and have always made me think about the clinical relevance of our research. I am grateful to Prof. Dr. Fydrich for his support and advice and for reviewing my dissertation. Thank you for taking me on as your PhD student. I thank my entire promotion committee for their participation and for reviewing my dissertation.

Further, I would like to thank the entire team of the UBICA project for giving me the opportunity to be part of his great research group. I am very happy to have met every single person on the team. I am also deeply grateful to all mothers and children who participated in our research and made this work possible.

Special thanks also go to a number of other people, friends and colleagues – too many to mention – who have supported me throughout this time with statistics, writing, and relaxation advice, proofreading, coffee breaks and highly valuable after-work “meetings”.



**Eidesstattliche Erklärung**

Hiermit erkläre ich, die Dissertation selbstständig und nur unter Verwendung der angegebenen Hilfen und Hilfsmittel angefertigt zu haben. Ich habe mich anderwärts nicht um einen Doktorgrad beworben und besitze keinen entsprechenden Doktorgrad. Ich erkläre, dass ich die Dissertation oder Teile davon nicht bereits bei einer anderen wissenschaftlichen Einrichtung eingereicht habe und dass sie dort weder angenommen noch abgelehnt wurde. Ich erkläre die Kenntnisnahme der dem Verfahren zugrundeliegenden Promotionsordnung der Lebenswissenschaftlichen Fakultät der Humboldt-Universität zu Berlin vom 5. März 2015. Weiterhin erkläre ich, dass keine Zusammenarbeit mit gewerblichen Promotionsbearbeiterinnen/Promotionsberatern stattgefunden hat und dass die Grundsätze der Humboldt-Universität zu Berlin zur Sicherung guter wissenschaftlicher Praxis eingehalten wurden.

Berlin, den 11.10.2019

Katja Dittrich