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Longitudinal Transmission Pathways of Borderline Personality Disorder Symptoms: From Mother to Child?

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Hans Jürgen Grabe^b Sven Barnow^a^aDepartment of Clinical Psychology and Psychotherapy, Ruprecht-Karls-University Heidelberg, Heidelberg, and^bDepartment of Psychiatry and Psychotherapy, University of Greifswald, Greifswald, Germany**Key Words**

Borderline personality disorder · Familial transmission pathways · Parenting · Mother-child disagreement

Abstract

Background: There is evidence that the borderline symptomatology of the mother longitudinally predicts the number of borderline criteria met by the children. However, possible underlying mechanisms have rarely been examined. In line with transactional models of borderline personality disorder (BPD), we analyzed a broad concept of maladaptive mother-child interactions of mothers with BPD symptoms towards their children, including insensitive parenting and mother-child discrepancies, in reporting the child's psychopathological behavior. **Sampling/Methods:** The sample was drawn from the population-based Greifswald Family Study and consisted of 295 children and their biological mothers. Both were examined at two points in time, first when the children were about 15 years old (T_0) and again 5 years later (T_1), using path analyses. **Results:** Maladaptive mother-child interactions (especially an overprotective and rejecting parenting style and high discrepancies regarding internalizing problems) mediate the longitudinal transmission of borderline symptoms from mother to child. Furthermore, our data revealed that this result is consistent for various youth symp-

toms which are associated with BPD such as impulsivity or dissociation. **Conclusion:** The data of the current study imply that the transmission of borderline symptoms from mother to child is mediated by maladaptive mother-child interactions. For this reason early and professional support may be useful to prevent these children from developing severe psychopathology.

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Introduction

Borderline personality disorder (BPD) is marked by instabilities in emotion regulation, self-destructive behaviors and unstable interpersonal relationships. There is evidence that the diagnosis as well as symptoms of BPD on a subthreshold level are accumulating in families [1, 2]. For example, in a study of our group, we found that maternal BPD symptoms predict the number of criteria met by their offspring about 5 years later [3]. However, possible underlying mechanisms have rarely been examined. Besides genetic influences [4], a maladaptive familial environment could mediate the association of

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BPD symptoms between parents and their offspring [5, 6], as transactional models of BPD propose [for review, see 7].

In line with that, a dysfunctional parenting style seems to be an important factor for the development of BPD. For example, it was found that low parental affection as well as aversive parental behavior (e.g. harsh punishment) are connected to an elevated risk for offspring BPD [8]. Further studies reported highly conflictual, overinvolved and/or uninvolved, rejecting, and inconsistent relationships between mothers and children who developed BPD [9–11]. In addition, several studies found impaired parenting skills in mothers with BPD [12]. In a former study, we found the offspring to perceive their borderline mothers as overprotective [13]. Furthermore, it has been reported that mothers with BPD are less structuring and less sensitive in their interaction and that they show a disrupted affective communication with their infants [14–16].

This lack of sensitivity of mothers with BPD (symptoms) could be associated with a discrepancy between mother and child in reporting the child's psychopathology. Although information from mothers as well as from their offspring might be biased, resulting disagreements can be assumed to have clinical validity in themselves. For example, De Los Reyes et al. [17] pointed out that 'a mother's lack of access to information on their child's whereabouts and associations ... may have significant implications for the development of childhood psychopathology and for reports of other aspects of the mother-child relationship (e.g. negative parenting)'. As a consequence, information from parents and their children is often measured and thereupon aggregated into one discrepancy score, which reflects the extent of disagreement [18, 19].

Ferdinand et al. [18] were among the first who addressed the issue of why rating discrepancies between parents and their children occur. They held that these discrepancies are due to several underlying mechanisms. Firstly, there might be different definitions of problems, in terms of parents seeing (or exaggerating) problems that the child denies or does not recognize. Secondly, discrepancy effects might occur because of the unawareness of the parents of their offspring's problems. Concerning the parents, this might be explained by lack of interest, or incompetence in recognizing their children's troubles. Regarding the offspring, this could be due to withdrawal as well as refusing to seek parental help. Independent from the reasons why disagreement eventuates, it is likely that more discrepancies imply more difficulties between par-

ents and children as well as more maladaptive parent-child interactions.

In line with this, it was found that families with many conflicts or high amounts of stress demonstrate more discrepancies [19, 20] concerning the child's internalizing and externalizing problems. In addition, they found that low parental acceptance of the child as well as parental dysfunction is related to a higher discrepancy score. Furthermore, studies have shown that the level of depression and anxiety of the mother is related to more disagreement in the ratings [21, 22]. Moreover, discrepancy scores predict poor outcome such as drug use, deliberate self-harm, and behavioral or emotional problems of the child [18]. To the best of our knowledge, no study has examined these discrepancies with regard to BPD families.

Therefore, the goal of this study was to test longitudinally and in a community-based sample if maladaptive mother-child interactions (conceptualized by an insensitive parenting style and discrepancies in the perception of psychopathological problems of the offspring) mediate the relationship between maternal borderline symptomatology and BPD symptoms of the offspring about 5 years later (see fig. 1).

Methods

Participants

Current examinations are based on a sample which was drawn from the population-based Greifswald Family Study [23, 24], a subpopulation of the Study of Health in Pomerania, Germany [25]. A sample of 290 families consisting of 381 adolescents and their parents was examined at T_0 and reinvestigated about 5 years later (T_1 , $n = 334$ adolescents; more detailed information regarding the sampling is available from previous articles [13, 23]). Concerning the present study, 19 families (39 offspring) had to be excluded due to missing data in key variables. A final sample of 230 families including their 295 children remained for examination (see also table 1).

Assessments at T_0

In order to examine maternal BPD symptoms, the self-rating part of the German version of the Structured Clinical Interview for DSM-III-R (SCID-II) [26] was used. A criterion was regarded as fulfilled when at least one item for a corresponding criterion was affirmed. Internal consistency for the BPD subscale was found to be good [27].

To assess the perceived insensitive habitual parenting style of the mothers, adolescents completed the EMBU (Swedish acronym for 'own memories concerning upbringing') [28]. This self-report questionnaire consists of three scales (rejection, emotional warmth and overprotection). The questions have to be answered using a 4-point Likert-type scale. The EMBU has demonstrated adequate validity and reliability [29].

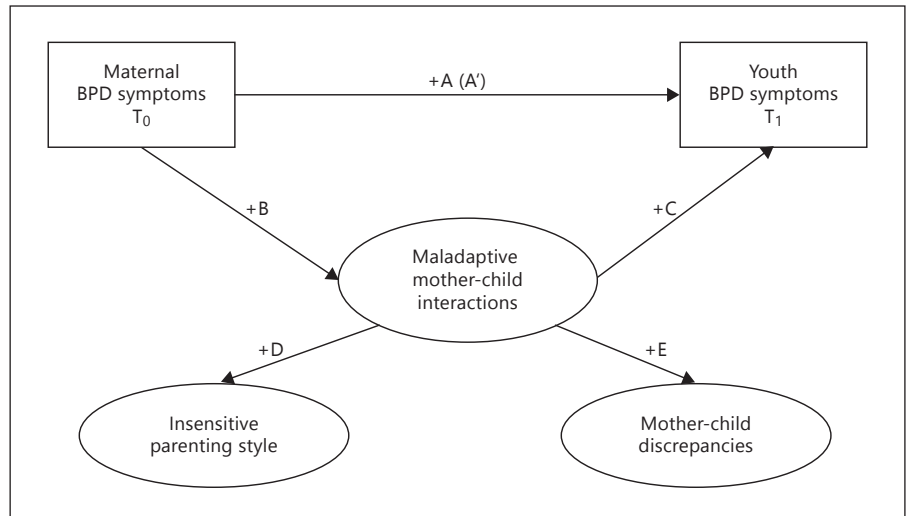


Fig. 1. Hypothetical path model concerning the longitudinal transmission of BPD symptoms. Expected directions of the associations between the variables: ‘+’ stands for an expected positive association, A = direct path without mediation, and A’ = direct path with mediation.

In order to evaluate discrepancies in reporting the psychopathological behavior of the child, the primary caregiver (the mother in each case) was asked to fill out the Child Behavior Checklist (CBCL) [30], while the offspring answered the corresponding Youth Self Report (YSR) [30]. CBCL as well as YSR are self-administered checklists using a 3-point scale regarding the internalizing (i.e. depression, anxiety and somatic complaints) and externalizing (i.e. delinquent and aggressive behavior) psychopathology of the child. Internal consistencies, reliability and validity of the YSR and the CBCL are satisfactory [30]. Both questionnaires consist of 112 items whereby the 96 congruent items in CBCL and YSR were used to calculate the discrepancy scores. To obtain discrepancy scores which reflect disagreement between mother and child, CBCL scores were subtracted from YSR scores separately for internalizing and externalizing disorders [31]. These discrepancy scores were used for further analyses.

Assessments at T₁

BPD symptoms of the adolescents/young adults were examined using the German version of the SCID-II interview for DSM-IV [32].

Data Analysis

To test the associations between the relevant variables we conducted correlation coefficients with SPSS 18. In the next step, path analyses (using the robust maximum likelihood SEM procedure with AMOS 18 controlled for the offspring’s gender) were used to evaluate the longitudinal relationship between maternal and youth borderline symptomatology as well as the underlying mechanisms. The indirect path was tested using bootstrap techniques. Maladaptive mother-child interactions were conceptualized as a latent variable examined by the two aspects of perceived insensitive maternal parenting style and mother-child discrepancies in reporting the psychopathology of the child. Various indices were used to assess the goodness of fit of the model: χ^2 in relation to the degrees of freedom (CMIN/DF), the general fit index (GFI), the nonnormed fit index (NNFI) and the root mean square error of approximation (RMSEA). Suggested ratios for these indi-

Table 1. Means and standard deviations for the variables of interest ($n_{\text{offspring}} = 295$, $n_{\text{mothers}} = 230$)

Demographics	
Age of mothers T ₀	39.87±4.45
Age of offspring T ₀	15.02±2.19
Age of offspring T ₁	19.37±2.20
gender of offspring (female)	54.9%
BPD symptoms (SCID-II)	
Mothers T ₀	2.30±1.75
Offspring T ₁	0.52±1.46
Discrepancy between mother and child (CBCL/YSR)	
Internalizing	0.31±0.19
Externalizing	0.32±0.19
Insensitive maternal parenting style (EMBU)	
Rejection	1.67±0.38
Emotional warmth	2.81±0.57
Overprotection	2.15±0.44

Self-rating part of DSM-III-R (mothers) and interview of the structured clinical interview for DSM-IV (offspring) were used.

ces vary between researchers, but for the current study a CMIN/DF below 2.5, a GFI and NNFI close to 1, and an RMSEA below 0.08 was considered evidence of an acceptably fitting model.

Results

Means and standard deviations concerning maternal and youth BPD symptomatology, discrepancy between mother and child, perceived insensitive maternal parenting style as well as the age and gender of the offspring are presented in table 1. Regarding discrepancies in report-

Table 2. Pearson correlation coefficients for age, gender, BPD symptomatology and maladaptive mother-child interaction

	Offspring demographics T ₀ age	BPD symptoms		Maladaptive mother-child interactions T ₀				
		mother T ₀	offspring T ₁	mother-child discrepancy		insensitive maternal parenting style		
				internalizing	externalizing	rejection	emotional warmth	over-protection
Offspring demographics T ₀								
Gender	-0.09	-0.14*	-0.16**	-0.10	0.06	-0.09	-0.05	0.01
Age		0.08	0.05	0.04	0.14*	0.15**	0.00	0.18**
BPD symptoms								
Mother T ₀			0.17**	0.15**	0.03	0.12*	-0.03	0.14*
Offspring T ₁				0.26**	0.18**	0.22**	-0.02	0.22**
Maladaptive mother-child interactions								
Mother-child discrepancy								
Internalizing					0.54**	0.23**	-0.22**	0.18**
Externalizing						0.30**	-0.18**	0.26**
Insensitive maternal parenting style								
Rejection							-0.32**	0.44**
Emotional Warmth								0.05

Gender: female = 0, male = 1. * $p \leq 0.05$; ** $p \leq 0.01$.

ing internalizing and externalizing symptoms of the child, the means were positive, which implies that in our study mothers reported fewer problems than their children on average.

Table 2 shows the correlations between the above-mentioned variables. Maternal BPD symptoms were positively related to the offspring's borderline symptoms, discrepancy score on internalizing problems, perceived maternal rejection and overprotection. The same variables, plus externalizing problems, were positively related to the offspring's BPD symptoms. Neither maternal nor youth BPD symptoms correlated with emotional warmth.

In the next step, we tested our hypothetical mediation model concerning the familial transmission of borderline symptomatology with path analyses. The data revealed a perfect mediation as direct effect between maternal and youth BPD symptoms was no longer significant, whereas the indirect path became significant as positive relation was found between maternal borderline symptomatology and maladaptive mother-child interactions as well as youth BPD symptoms. The model had an acceptable fit and reproduced the data well ($\chi^2 = 37.48$, $p = 0.002$, $CMIN/DF = 2.34$, $GFI = 0.970$, $NNFI = 0.878$ and $RMSEA = 0.068$). The included variables explained about 19% of the variance. Regarding the segmentation of maladaptive mother-child interactions into the two aspects

of insensitive maternal parenting style and mother-child discrepancies in reporting a child's psychopathology, both variables loaded on the latent variable of maladaptive mother-child interactions and their path coefficients were comparable in size (see fig. 2) The exclusion of one of the segments decreased the model fit significantly (data not shown).

The correlation showed that emotional warmth and mother-child discrepancies on externalizing symptoms did not correlate with maternal BPD symptoms. For this reason, we excluded these aspects from the model. The exclusion of these aspects yielded a very good model fit with path coefficients: $A^2 = -0.01$ (n.s.), $B = 0.31$ ($p < 0.01$) and $C = 0.52$ ($p < 0.01$), which was significantly better than the other models ($p < 0.001$). Additionally, this adapted model revealed the lowest association between maternal and youth borderline symptoms, as well as the highest mediation of maladaptive mother-child interactions (indirect path: 0.13, CI: 0.07–0.32, $p < 0.001$); the variance explained increased to 28%.

Analogous results were found for various aspects associated with BPD (impulsivity, alexithymia, self-esteem, dissociation and suicidal behavior: see online suppl. material; for all online suppl. material, see www.karger.com/doi/10.1159/000345857). To account for family membership we reanalyzed all data with 1 child per family and the results remained the same (data not shown).

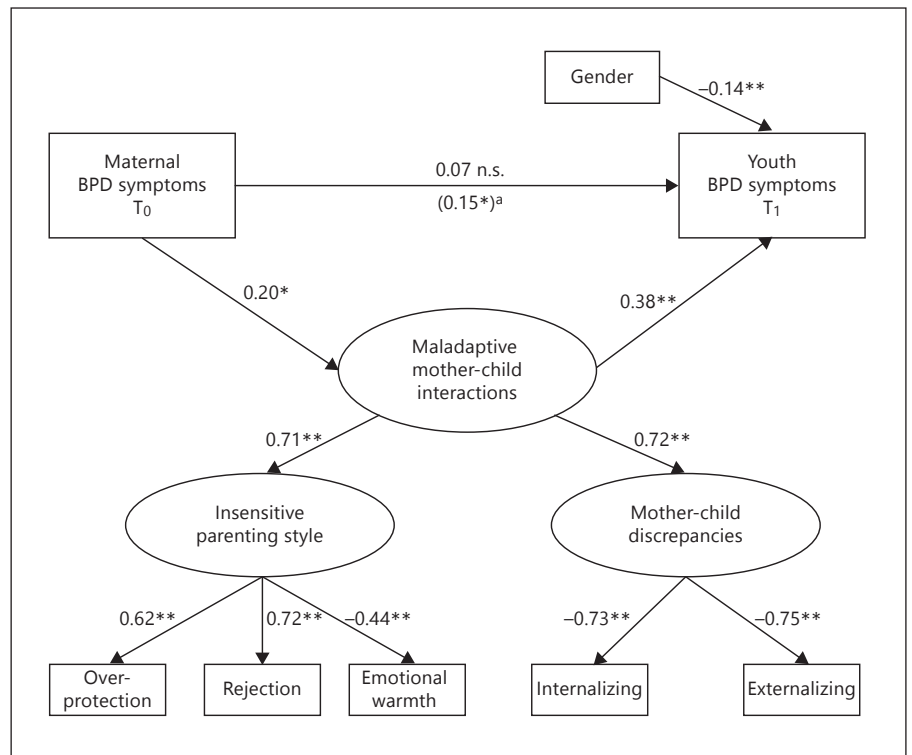


Fig. 2. Results of the path analyses of the hypothetical model. $\chi^2 = 37.48$, $p = 0.002$, CMIN/DF = 2.34, GFI = 0.970, NNFI = 0.878 and RMSEA = 0.068. * $p \leq 0.05$; ** $p \leq 0.01$; n.s. = not significant; indirect path: 0.08 (CI: 0.06–0.22), $p = 0.031$: ^a = path coefficient of the relation between maternal and youth BPD symptoms without the mediation.

Discussion

The goal of the current study was to examine the longitudinal transmission of borderline symptoms from mother to child by maladaptive mother-child interactions as a possible mediator. First of all, maternal borderline symptoms predicted the offspring's BPD symptoms with a small-to-medium effect size. Even though there is evidence of a familial coaggregation of BPD, there were no studies that investigated familiarity of BPD dimensionally in a community sample [for review, see 33]. In contrast to better investigated inpatient or outpatient groups – with expected larger effect sizes – our approach reduces the generalizability of the results less. However, there is a great need for prospective studies in this research field.

With reference to the first aspect of maladaptive mother-child interactions, namely insensitive maternal parenting style, our data revealed that rejection and overprotection are the decisive components with regard to borderline symptoms. This indicates that within the transmission of BPD symptoms, insensitive parenting might be based on children's perception of being simultaneously rejected and overprotected by their mothers. Alternations between those two styles make it impossi-

ble for the offspring to predict the behavior of their mothers.

With regard to mother-child discrepancies in reporting a child's psychopathology, our findings point to a mediating role of mother-child disagreements within the transmission of borderline symptoms. In detail, our data revealed that the disagreement gets worse with increasing maternal BPD symptoms, which implies a heightened risk for the offspring of suffering from borderline symptoms later on. Noteworthy, Hooley and Hoffman [34] found that adult BPD patients whose families scored higher on emotional overinvolvement had better clinical outcomes. Taking these findings together, BPD individuals may react differently depending on their phases of life.

Interestingly, we found this positive correlation between maternal BPD symptomatology and discrepancies on internalizing but not externalizing problems. An explanation for this difference might be that internal problems are more difficult to observe, so that borderline symptomatology impairs the mother's ability to recognize these problems. Taking this into account, our analyses showed that perceived insensitive maternal parenting style, as well as mother-child discrepancies, form parts of the latent construct of maladaptive mother-child interactions.

As hypothesized, maladaptive mother-child interaction mediated the transmission of borderline symptoms from mother to child, with significant indirect effects and an increase of explained variation to 19% in the hypothetical and 28% in the adapted model. These findings underline the importance of dysfunctional mother-child interactions for the development of BPD symptoms. In particular, Bateman and Fonagy [35], relying on their mentalization-based understanding of BPD, point out that these failures of parental responsiveness could cause inability to mentalize as well as produce an unstable sense of self. This theory is underpinned by many studies [36] and could present the mechanism for the association between the maladaptive mother-child interaction and the development of severe psychopathology, especially BPD. Therefore, our findings indicate that early professional intervention in the form of joint mother-child therapies may be useful. As this therapeutic approach has rarely been evaluated so far [37, 38], future research should appraise the efficiency systematically.

Besides all of these findings and possible conclusions, there are several limitations to the current study. To obtain maternal BPD symptomatology we used dimensional data utilizing DSM-III-R criteria. However, BPD criteria did not change substantially since then except for the addition of psychotic as a ninth criterion [39]. Furthermore, self-rating data were not shown to be less valid than interviews [40], and it was found that fulfilling even just a few BPD criteria led to impairment [41, 42]. Moreover, we measured BPD symptoms with the SCID-II questionnaire. Although a criteria evaluation revealed acceptable validity and adequate evidence of a relation to personality dimensions and functional impairments [43], future studies should include more detailed disorder-specific instruments and dimensional models of personality structure (as considered within the DSM5 proposals).

Due to the young age of the offspring sample at baseline, we could not predict changes in borderline pathology. Therefore, further studies should investigate mother-child interactions and their relation to the development of psychopathological problems (especially borderline features).

To date, we only asked the primary caregiver to complete the CBCL [30]. As this was the mother in each case, we could not evaluate father-child discrepancies in reporting the child's psychopathology. As another limitation, we have to point out that the causality between perceived insensitive maternal parenting style and mother-child discrepancies and possible variations in the influence of those two aspects cannot be clarified within this study.

Nonetheless, the current study also has various strengths. First, we enlarged the informative value of the results on the basis of the methodological quality of our investigation. By using a longitudinal design in a community-based sample with directly obtained dimensional data we enhanced the generalizability of the results and presented the first findings measured over two points in time regarding this topic.

Second, we developed an explicit model with which we were able to examine the impact of maladaptive mother-child interactions on the child. To the best of our knowledge, this is the first study that assessed insensitive parenting as well as mother-child discrepancies in reporting a child's psychopathology. Thus, the current study expands previous results by using self-ratings as well as multiple informant ratings within a discrepancy score. According to scientific as well as clinical experience, multiple informants are necessary to assess children's psychopathology in a valid way and to get a more complete diagnostic picture of the child [18, 19, 44].

Conclusion

We found a mediating role of maladaptive mother-child interactions within the familial transmission of BPD symptoms. Furthermore, this mediation was consistent for particular symptoms associated with BPD.

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