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RESEARCH

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Linking internalizing and externalizing problems to warmth and negativity in observed dyadic parent–offspring communication

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Abstract

Objective: This study examined the relative associations of mothers'/fathers' and offspring's internalizing and externalizing problems with parent-to-offspring and offspring-to-parent warmth and negativity.

Background: Psychological conditions of family members may be related to intrafamilial social interactions. Particularly, internalizing and externalizing problems may affect the quality of parent–offspring communication.

Method: In this study, fathers (N = 94), mothers (N = 125) and their offspring (N = 224, age range$_{offspring}$ = 7.5–65.5 years) from 137 nuclear families participated in a behavioral conflict interaction task during which expressed warmth and negativity were observed. Associations between parents' and offspring's psychological problems (of the past 6 months) and parent-to-offspring and offspring-to-parent communication were

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tested simultaneously using structural equation models separated for fathers and mothers. Based on prior findings in the study sample, our analyses were controlled for history of childhood abuse.
Results: Offspring's internalizing problems were related to *less negativity* toward their father, whereas offspring's externalizing problems were related to *more negativity* toward their father and to receiving *less warmth* from their mother. Father's externalizing problems were linked to *more negativity* toward offspring. No associations were found between maternal and paternal internalizing problems and dyadic parent–offspring interactions, nor for maternal externalizing problems.
Conclusion: Findings support that psychological conditions of one family member have an impact on their social interactions within the family.
Implications: Supporting families with interventions to improve parent–offspring interactions and (early) treatment of externalizing problems is recommended.

KEYWORDS
dyadic conflict interaction task, externalizing problems, family communication, internalizing problems, parent–offspring interactions

INTRODUCTION

The quality of parent–offspring interactions has been identified as an important factor contributing to offspring's emotional, psychological, and behavioral development (e.g., Bowlby, 1969; Steinberg, 2001). Warm and sensitive interactions between parents and their offspring foster a secure internal working model for a person's interaction with others (Bretherton et al., 1990; Kochanska et al., 2019), whereas poor parent–offspring relationship quality, characterized by negativity and lack of warmth, increases difficulties with interpersonal relations in general and can have negative consequences for offspring's mental health (Pinquart, 2017; Rokita et al., 2018; Seiffge-Krenke et al., 2010). The parent–offspring relationship is one of the most long-lasting emotional connections, in a lifetime, up to (late) adulthood, and remains important for mental well-being across the life span (Oliveira et al., 2020; van Wel et al., 2000).

Families can be seen as a complex social system in which parents and their offspring are continuously interacting and influencing one another (Minuchin, 1985). According to the family systems theory of human behavior, this means that mental states and conditions of one family member do not only reside in the individual, but may also have an impact on their social interactions within the family (Bowen, 1966). As such, internalizing and externalizing problems of fathers, mothers, and their offspring may influence the quality of parent–offspring interactions. To more fully understand the intergenerational associations and transmission of psychological problems, we examined fathers', mothers', and offspring's psychological problems and the association with observed dyadic parent–offspring communication. Thus, the four research directions focused on (a) parental psychological problems and parent-to-offspring behavior, (b) parental problems and offspring-to-parent behavior, (c) offspring problems and parent-to-offspring behavior, and (d) offspring problems and offspring-to-parent behavior, including mothers and fathers and examining internalizing and externalizing problems.

Parents' psychological problems and parent-to-offspring communication

The impact of parental internalizing problems (i.e., withdrawal, depression, anxiety, and somatic complaints) on parent–offspring interactions has been frequently described (e.g., Lovejoy et al., 2000; Wilson & Durbin, 2010): Depression of fathers and mothers has been associated with lower quality of parent–offspring interactions (Kudinova et al., 2019; Nelson et al., 2021). For instance, maternal depression has been related to more negativity in interactions toward one's own children (Browne et al., 2016; Dietz et al., 2008). Less is known about the associations between parental externalizing problems (i.e., rule-breaking, aggressive, and intrusive behaviors) and parent–offspring interactions. Only one study has shown that maternal inattention and impulsivity were associated with negative parenting practices, namely inconsistent discipline and lower involvement after controlling for maternal depression and child behavioral problems (M. Chen & Johnston, 2007). Also, parental anger and hyperreactivity were identified as risk factors of child maltreatment (Stith et al., 2009). However, to the best of our knowledge, the links between fathers' and mothers' externalizing problems and expressed warmth and negativity have not been investigated yet.

Parents' psychological problems and offspring-to-parent communication

Parenting and parent–offspring communication are often defined by parental behavior and communication from parents toward their offspring. However, according to the transactional model of human development, the parent–offspring relationship is viewed as a continuous process of reciprocal influences between the parent and their child (Sameroff, 2009): Besides *parent-to-offspring* communication, parent–offspring interactions also consist of *offspring-to-parent* communication (Kuczynski & Mol, 2015). To our knowledge only one study has examined the association between parental psychological problems and offspring-to-parent communication (Milan & Carlone, 2018). Here it was found that dyads in which mothers had high levels of PTSD symptoms (and daughters with low levels of PTSD symptoms), daughters showed especially warm, positive relational behaviors. To date, studies on father's symptomatology and offspring-to-parent problems are lacking. Thus, we aimed to explore the associations between internalizing and externalizing problems of fathers and mothers and offspring-to-parent communication.

Offspring's psychological problems and parent-to-offspring communication

As mentioned above, ample research has shown that the quality of parent–offspring interactions is an important factor in child psychological development (e.g., Baumrind, 1991; Pinquart, 2017). Associations of child and adolescent psychological problems and parental rearing behaviors are known to have reciprocal effects (e.g., Serbin et al., 2015). That is, above the influence of parental behaviors on offspring's mental well-being, offspring's psychological problems might also *elicit* certain parenting behavior. So, in addition to parent psychological problems, in this study we also focused on the associations of offspring's psychological problems with the quality of parent–offspring interactions. Previous research has shown that offspring's internalizing and externalizing problems are associated with observed increased negativity and decreased positivity during family communication. It was previously found that parents expressed more negativity (e.g., criticism) toward their offspring with ADHD as compared to their non-ADHD siblings (Cartwright et al., 2011). Adolescents' depressive symptoms were related to more negative parental affective behaviors (Sheeber et al., 2009; Yap et al., 2010) and less positive communication (Milan & Carlone, 2018). That is, in families with a depressed

adolescent, anger was expressed more often by parents and adolescents as compared to families of an adolescent without depression (Bodner et al., 2018). Similarly, mothers of anxious children were more negative toward their children during the interactions than mothers of children without anxiety (Gar & Hudson, 2008). Although ample research has shown that parents' and offspring psychopathology are both associated with the quality of parent–offspring communication in children and adolescents (e.g., Wilson & Durbin, 2010; Yap et al., 2010), older or even adult offspring are relatively less investigated in this context. Therefore, we have investigated the concurrent associations between parent and offspring psychological problems and dyadic parent–offspring interactions in a sample of offspring aged 7.5–65.5 years and their fathers and mothers.

Offspring's psychological problems and offspring-to-parent communication

So far, psychological problems in relation to offspring's communication toward their parents (as opposed to parents' communication toward their offspring) have mainly been studied in adolescents (Dietz et al., 2008; Milan & Carlone, 2018; Nelson et al., 2017). It was found that depressive symptoms and PTSD symptoms in adolescent young women were concurrently associated with negative communication from adolescents toward their mother (Milan & Carlone, 2018). Also, depressed adolescents expressed fewer positive behaviors toward their parent during observed interactions as compared to their nondepressed peers (Dietz et al., 2008; Nelson et al., 2017). Yet, in adult offspring, the associations of psychological problems and offspring to parent communication remained rather unaddressed, even though the parent–offspring relationship continues to be important across the life span (Oliveira et al., 2020; van Wel et al. 2000). As psychological problems of one family member may have an impact on their social interactions within the whole family (Bowen, 1966), we aim to contribute to the existing literature by elucidating whether internalizing and externalizing problems from child, adolescent, and adult offspring are associated with expressed warmth and negativity to their fathers and mothers.

Fathers and mothers

The importance of the parental role from both fathers and mothers in the child's development is widely acknowledged in the literature nowadays (Bakermans-Kranenburg et al., 2019; Day & Padilla-Walker, 2009; Lamb & Lewis, 2013). Yet, the majority of studies on the associations of psychological problems and parent–offspring communication focuses on mothers with their child and/or adolescent offspring (Gar & Hudson, 2008; Milan & Carlone, 2018), whereas research on associations between psychological problems and fathers' interactions with their offspring is relatively scarce. Results from our sample showed that within a family, the correlation between fathers' and mothers' communication style was .10, suggesting that mothers and fathers communicate differently with the same child (Buisman et al., 2021). Thus, investigating offspring interacting with both parents is of importance to elucidate the associations of psychological problems with parent–offspring communication in fathers and mothers. This will be pursued in the present study.

Current study

As part of the 3G Parenting Study—a family study on the intergenerational transmission of parenting styles, stress, and emotion regulation—94 fathers and 125 mothers and their offspring

spanning a wide age range ($N_{offspring}$ = 224, 7.5–65.5 years) participated in the current study. We aimed to examine the relative associations of mothers'/fathers' and offspring's internalizing and externalizing problems (in the past 6 months) with parent-to-offspring and offspring-to-parent warmth and negativity. Measures of family communication were based on social interactions of fathers and mothers with (multiple) offspring as observed in the conflict Family Interaction Task (a Revealed Differences Task; Strodtbeck, 1951). Only one study has been found that covers both psychological problems of parent and offspring simultaneously in the association with parent-to-offspring *and* offspring-to-parent communication (Milan & Carlone, 2018). Apart from the three aforementioned studies (Kudinova et al., 2019; Milan & Carlone, 2018; Nelson et al., 2021), no recent observational studies (<5 years) linking psychological problems to parent–offspring behavioral interactions were found. Yet, no research covers internalizing *and* externalizing problems and the two directions of communication, parent-to-offspring and offspring-to-parent, in fathers *and* mothers in one study, which were all addressed in the current investigation. This research is further unique in that it tries to cover a wide age range. Thus, core research questions were the following:

1. Are father's and offspring's internalizing and externalizing problems linked to father's and offspring's expressed warmth and negativity?
2. Are mother's and offspring's internalizing and externalizing problems linked to mother's and offspring's expressed warmth and negativity?

Given the scarcity of studies including fathers, we will explore the associations of father's and offspring internalizing and externalizing problems with father-to-offspring (FtO) and offspring-to-father (OtF) warmth and negativity during interactions. Thus, we do not formulate a hypothesis for any of the father–offspring interactions. Likewise, we do not have a hypothesis for the combination of mother's problems and OtM, given the exploratory nature of the topic. Based on the abovementioned literature (e.g., Cartwright et al., 2011; M. Chen & Johnston, 2007; Lovejoy et al., 2000; Milan & Carlone, 2018; Wilson & Durbin, 2010), it is expected that mothers' internalizing and externalizing problems are associated with less warmth and more negativity in mother-to-offspring (MtO) communication. Similarly, we hypothesize that offspring internalizing and externalizing problems are related to less warmth and more negativity in offspring-to-mother (OtM) and in MtO communication.

Previous findings from the same sample as the current study showed that parents' history of abuse was associated with less expressed warmth and more expressed negativity in the interaction with their child (Buisman et al., 2019). Also, it is well investigated that experienced childhood abuse is related to the development of psychological problems (Danese & Widom, 2020). To elucidate associations of psychological problems and parent–offspring interactions, over and above the effects of experienced childhood abuse, we included experienced abuse in our analyses as a covariate.

METHOD

Recruitment and procedure

The current study sample was part of the 3G Parenting Study on the intergenerational transmission of parenting styles, stress, and emotion regulation (see also, e.g., Buisman et al., 2019; Buisman et al., 2020). Participants were recruited via the Netherlands Study of Depression and Anxiety (NESDA; Penninx et al., 2008) and two other studies that included the assessment of caregiving experiences (Joosen et al., 2013; Scherpenzeel, 2011). From these studies, individuals who agreed to be contacted for participation in future studies and who had at least one child of

7.5 years or older were invited. We included only participants who reported any maltreatment during childhood to increase the ability to detect intergenerational transmission of child maltreatment. Thus, participants with a history of childhood maltreatment were oversampled.

A total of 395 individuals from 63 families gave consent and participated in the study. Data collection was conducted between March 2013 and May 2016. Nuclear families visited the laboratory at the Leiden University Medical Centre. Participants with offspring were invited to visit the laboratory twice—once with their family of origin (parents and siblings) and once with their partner and offspring. A laboratory visit took approximately 7 hours and involved questionnaires, computer tasks, family interaction tasks, and collection of saliva and hair samples (e.g., Pittner et al., 2020). Informed consent was obtained from all participants. For underage children, both parents signed for consent. Ethical approval was obtained from the Medical Ethics Committee of the Leiden University Medical Centre (reference number: P11.134).

Participants

The current study therefore consisted of 224 offspring aged between 7.5–65.5 years (average age 25.7; 58% female), and their parents ($N_{mothers} = 125$, $N_{fathers} = 94$) from 137 nuclear families. On average, mothers were 53.3 years (range: 29.4–88.4 years) and fathers were 52.2 years (range 26.6–82.3 years). Participants were families living the Netherlands and were mainly White (97%). In total, 25% held a college or university degree, 66% held an advanced secondary school or vocational school diploma, 7% had completed or were still in elementary school or a short track of secondary school, and 2% of the participants did not report their education.

In total, 185 mother–offspring dyads and 140 father–offspring dyads completed the Family Interaction Task. Of all families, 135 offspring participated with two parents, 64 offspring participated with their mother only, and 25 offspring participated with their father only. Approximately half of the mothers ($n = 74$) and more than half of the fathers ($n = 54$) completed the interaction task with two or more (up to seven) of their offspring, with one child at a time. Out of all participants ($N = 395$), 57 persons (16%) participated both as parent and as offspring in the conflict family interaction task. Most families participated with two children (63.4%), 28.1% of the families participated with one child (5.4%), four families participated with three children, and one family participated with seven children (3.1%).

Measures

Dyadic parent–offspring interactions

The Family Interaction Task (FIT) in this study concerned a Revealed Difference Task in which dyads of one parent and one of their children were asked to discuss and try to reach consensus on a topic they disagreed on (Strodtbeck, 1951). Participants selected topics they had been arguing about most often during the past month from a list. They could also add a topic that was not listed. A research assistant selected the two topics that participants felt most strongly about, preferably topics that were reported by both parent and offspring.

Mothers predominantly discussed family issues (e.g., amount of time spent together, 14%), child's behavior or behavioral rules (e.g., table manners and bedtime, 14%), housekeeping (e.g., cleaning, 14%), and lifestyle (e.g., alcohol or drug use, 13%) with their offspring. Fathers predominantly discussed child's behavior or behavioral rules (20.3%), followed by lifestyle (12%), housekeeping (10%), money-related issues (10%), and family issues (9%). A full overview of frequencies of the discussed topics during the FIT of mothers and fathers can be found in Table S1 of the supplementary materials. The interactions were videotaped, and there were no

other people in the room during the task. The videotaped dyadic parent–offspring interactions were coded by one or two of four coders with The Supportive Behavior Task Coding Manual, Version 1.1 (see also Buisman et al., 2019, for a more detailed description). Warmth and negativity of fathers, mothers, and offspring during the task were rated on a 9-point Likert scale. Warmth reflects the extent to which a person demonstrates warmth toward the other—that they care about the other, value, and genuinely like the other. This includes verbal expressions (e.g., verbally empathizing) and nonverbal expressions (e.g., facial expressions, touching, and body postures). The scale ranged from (1) *no signs of warmth* (i.e., "You can't tell if the person likes or cares about the other") to (9) *clear signs of warmth* (i.e., "The participants' overall behavior gives a warm feeling to the interaction").

Negativity captures the level and persistence of tension, hostility, dissension, or antagonism directed at the conversational partner. Examples of negativity are stonewalling, negative statements of the other, eye rolling, loud sighing, interrupting the other, and negative teasing (sarcasm). Negativity was rated on a 9-point rating scale ranging from (1) *demonstrations of negativity are absent* to (9) *the person is very negative* (i.e., "The negativity endures throughout the discussion and is disruptive to the interaction"). Interrater reliability between all pairs of observers was adequate to good (intraclass correlations coefficients were between .71–.82 for warmth and .66–.78 for negativity, see also Buisman et al., 2021). Negativity scores from the FIT were highly skewed to the left, therefore we log-transformed scores and then multiplied by 10 to scale up the variance.

Internalizing and externalizing problems

Internalizing and externalizing problems were assessed with age group–specific questionnaires, assessing similar problems for all ages. The Child Behavioral Checklist (CBCL), Youth Self Report (YSR), and Adult Self Report (ASR) are part of the Achenbach System of Empirically Based Assessment (ASEBA) taxonomy and consist of items to assess adaptive functioning and problems (Achenbach & Rescorla, 2000, 2001, 2003). The scales Withdrawn, Somatic Complaints, and Anxious/Depressed are combined into the internalizing dimension of psychopathology and the scales Aggressive and Rule-Breaking Behaviors constitute the externalizing dimension. Sum scores on internalizing and externalizing dimensions of each questionnaire were calculated.

Child Behavioral Checklist (CBCL)

Fathers and mothers of children aged 7–11 years ($N = 46$) rated their child's behavioral and emotional problems on 112 items using a 3-point scale (0 = *not true*, 1 = *somewhat true*, 2 = *very true*). If both parents participated, means of mother and father report were calculated. Internal consistencies for internalizing (mother report $\alpha = .88$, father report $\alpha = .87$) and externalizing problems (mother report $\alpha = .86$, father report $\alpha = .90$) were excellent.

Youth Self Report (YSR)

In the YSR, adolescents aged 12–17 years ($N = 43$) rate 112 items on a 3-point scale (0 = *not true*, 1 = *somewhat true*, 2 = *very true*). Cronbach's alpha in the current sample was .90 for internalizing problems and .82 for externalizing problems, indicating excellent internal consistency.

Adult Self Report (ASR)

In the ASR, adults (≥18 years) rate 120 items on a 3-point scale (0 = *not true*, 1 = *somewhat true*, 2 = *very true*). Cronbach's alpha of the ASR internalizing problems was .91 and was .84 for externalizing problems, indicating excellent internal consistency. We used z values of the

continuous sum scores per instrument in the analyses. Outliers in mother and offspring internalizing problems and offspring externalizing problems were winsorized, that is, the difference between the two next highest values was added to the next highest value with standardized value <3.29 to approach a normal distribution (Tabachnick et al., 2007).

Covariates

Demographic information

Offspring's age and sex were included as covariates as well as household socioeconomic status (SES). To assess household SES, participants of 18 years and older were asked about household income and highest completed education. Yearly household income was measured on a 7-point scale ranging from (1) *less than €15,000* to (7) *more than €65,000*. Most participants rated their level of education on a 7-point scale. Due to changes in the Dutch educational system, some offspring rated education on a 10-point scale. Both education scales were rescaled to a 4-point scale. A composite household SES score was calculated by averaging the standardized household income and standardized completed educational level. If data of two partners living in the same household were available, their scores were averaged for the household SES score. Children living with their parents shared their parents' household SES score.

History of experienced childhood abuse

To examine the effects of psychological problems over and above the effects of experienced childhood abuse (CA; Buisman et al., 2021; Buisman et al., 2019), self-reported CA was included in our final model. Childhood maltreatment was measured using adapted versions of the self-reported Parent–Child Conflict Tactics Scales (CTSPC; Straus et al., 1998) supplemented with items from the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998). Fathers, mothers, and offspring reported the extent to which they had a history of experienced emotional and physical abuse, and physical and emotional neglect before the age of 18 years. Offspring aged 12–18 years and living with their parents at the time of the study indicated whether they had experienced maltreatment within the last year and/or in the years before. Here, we used the overall abuse score, averaging the emotional and physical abuse scales. Participants reported separately on experienced abuse by their father and mother. Scale scores comprised the highest score for father or mother. The emotional abuse scale consisted of five items (e.g., "Shouted, yelled, or screamed at me"). The internal consistency of the emotional abuse scale was good ($\alpha_{mother} = .81$, $\alpha_{father} = .74$). The physical abuse scale consisted of 13 items, including corporal punishment (five items, e.g., "Being spanked on the hand, arm or leg with a bare hand"), severe assault (four items, e.g., "Being hit with a fist or kicked hard"), and very severe assault (four items, e.g., "Being burned or scalded"). Internal consistency of the physical abuse scale was excellent ($\alpha_{mother} = .91$, $\alpha_{father} = .91$). All items were answered on a 5-point Likert scale (1 = *never* to 5 = *almost always*). The emotional and physical abuse scales correlated $r = .57$; $p < .001$.

Analyses

Missing data

From the total number of fathers ($N = 94$) and mothers ($N = 124$) that were eligible for the FIT, data on the FIT and ASR from 85 fathers and 114 mothers with in total 224 of their offspring were available. Some information from the FIT was missing due to technical problems (22 dyads) or because parents and offspring could not attend at the same day (10 dyads). Little's missing completely at random (MCAR) test showed that data were not missing completely at random ($\chi^2 = 239.01$, $df = 198$, $p = .025$). Participating mothers were younger ($t = 2.07$,

$df = 122$, $p = .041$) as compared to nonparticipating mothers and came from households with a lower SES ($t = 2.39$, $df = 122$, $p = .018$), but they did not differ on experienced CA, internalizing problems, and externalizing problems. Participating fathers did not differ from nonparticipating fathers. Full information maximum likelihood (FIML) was used to estimate missing information on the outcome variables.

Descriptive analyses

As a first step, we described means and standard deviations of all study variables and compared group differences between fathers and mothers with an independent sample t test. Correlations between study variables were assessed using robust Spearman correlations, because negativity scores from the FIT were highly skewed to the left, even after log transformation. Next, we assessed resemblance of psychological problems and FIT measures among sibling offspring and among parent couples by calculating the intraclass correlation coefficient (ICC; between-family variance/total family variance; Shoukri et al., 2013). ICCs were computed within lme4 (package version 1.1–21; Bates et al., 2014). ICCs ≥.3 indicate high family resemblance (Scherbaum & Ferreter, 2009), ICCs <.3 were considered moderate, and values <.15 were considered low (Bliese, 2000; James, 1982). In a previous study on the same sample, we found that, when warmth and negativity from fathers and mothers were aggregated to parent-to-offspring and offspring-to-parent communication, the resemblance of communication from one parent to offspring siblings was high (ICC = .41) and the resemblance of communication from offspring siblings to one parent was low (ICC = .08; Buisman et al., 2021).

Main analyses

Structural equation modeling (SEM) with the lavaan (package version 0.6–3; Rosseel, 2012) in R version 3.5.1 was used to test the associations between psychological problems of father, mother, and offspring and the observed warmth and negativity in FtO, OtF, MtO, and OtM communication. Demographic variables of offspring's age, gender, and household SES were included in the first model to control for confounding effects. Mother–offspring dyads and father–offspring dyads did the task separately. So, despite interrelatedness of fathers and mothers from the same family, separate analyses for fathers and mothers were carried out due to already complex models. Moreover, analyzing fathers and mothers separately allows for insights into father–offspring interactions, where there is a dearth of knowledge as compared to mother–offspring interactions.

Experienced CA of parents and offspring was associated with negative communication from parents to offspring and offspring to parents in the current sample (Buisman et al., 2021; Buisman et al., 2019) and given that experienced CA and psychological problems are known to correlate (Danese & Widom, 2020), we controlled in our main analyses for potential confounding effects of CA experiences of parents and offspring. All nonsignificant demographic control variables (i.e., offspring's gender and household SES) were removed from the analysis to keep the main models parsimonious.

For all models, estimates and standard errors of the individual paths in the model are described. A maximum likelihood estimation with robust (Huber-White) standard errors (MLR) was used to estimate the model parameters as the negativity scores from the FIT were highly skewed (Rosseel, 2012). Given the nested family structure of the data, multilevel modeling (ML-SEM) would be the appropriate method to control for interrelatedness among family members. However, listwise deletion for cases with missing data is currently used for ML-SEM in the lavaan package. To retain as much data as possible in order to contribute to the statistical power of our models, we did not use ML-SEM. To control for dependency of FIT observations within nuclear families, robust standard errors were calculated with the lavaan.survey.fiml package and reported; see Buisman et al. (2019) for a similar approach.

Assessment of fit will be based on the comparative fit index (CFI) and the root-mean-square error of approximation (RMSEA). Acceptable and excellent model fit is indicated by CFI

values greater than .90 and .95, respectively, and by RMSEA values smaller than .10 and .06, respectively (F. F. Chen, 2007; Cheung & Rensvold, 2002). Chi-square statistics and standardized root-mean-square residual (SRMR) are reported for descriptive purpose. All p values less than .05 were considered statistically significant.

RESULTS

Descriptive analyses

Sample characteristics

Descriptive characteristics of offspring, mothers, and fathers can be found in Table 1. The mean levels of internalizing and externalizing problems were above the clinical cutoff (T score > 63; Achenbach et al., 2003) in all three groups (i.e., mothers, fathers, and children). Mothers expressed higher levels of warmth as compared to fathers, $t(329) = 2.22$, $p = .027$, and offspring displayed higher levels of negativity to their mothers as compared to fathers, $t(329) = -2.21$, $p = .028$. Mothers reported more internalizing problems than fathers, $t(197) = 2.17$, $p = .031$). Parental age, externalizing symptom levels, experienced childhood abuse, levels of negativity to child, and positivity to parent did not differ across fathers and mothers. Spearman correlations between all study variables can be found in Table S2 of the supplementary materials.

Family resemblance of psychological problems and FIT outcomes

ICCs revealed that there was moderate resemblance of internalizing problems (ICC = .15) and high resemblance of externalizing problems (ICC = .33) among sibling offspring. Furthermore, there was no sibling resemblance of OtM and OtF negativity (ICCs = .00), indicating that

TABLE 1 Descriptive characteristics

	Offspring	Mothers	Fathers	Mothers vs. fathers	
	M (*SD*) / % (*N*)	*M* (*SD*)	*M* (*SD*)	*t*	*p*
Age *M* (*SD*)	25.65 (14.15)	52.87 (13.01)	53.18 (12.86)	−0.17	.866
Female, % (*N*)	58 (130)				
Household SES *M* (*SD*)	.19 (.66)				
Experienced childhood abuse *M* (*SD*)	1.53 (0.46)	1.69 (.66)	1.66 (.49)	0.46	.647
ASR internalizing *M* (*SD*)	53.31 (9.64)	54.39 (9.15)	51.45 (9.86)	2.17	.031*
ASR externalizing *M* (*SD*)	45.12 (7.32)	42.96 (5.38)	44.45 (6.02)	−1.84	.068
YSR internalizing *M* (*SD*)	40.26 (7.94)				
YSR externalizing *M* (*SD*)	38.49 (5.53)				
CBCL internalizing *M* (*SD*)	36.21 (4.73)				
CBCL externalizing *M* (*SD*)	39.78 (5.10				
Warmth to child *M* (*SD*)		5.61 (1.81)	5.14 (1.76)	2.22	.027*
Negativity to child *M* (*SD*)		2.18 (1.57)	2.19 (1.48)	−0.02	.987
Warmth from child *M* (*SD*)		4.74 (1.88)	4.71 (1.71)	−0.11	.916
Negativity from child *M* (*SD*)		2.59 (1.98)	2.14 (1.73)	−2.21	.028*

Note. ASR = Adult Self Report (ASR); CBCL = Child Behavioral Checklist; SES = socioeconomic status; YSR = Youth Self Report.
*Correlation is significant at the .05 level (two-tailed).

brothers and sisters were not similar in levels of negativity in the communication toward the same parent. OtF and OtM warmth yielded ICCs of .14 and .40, respectively, meaning that siblings were moderately concordant in warmth toward their father and highly concordant in warmth toward their mother.

Previous findings showed that resemblance of parent-to-offspring communications among offspring siblings was moderate (Buisman et al., 2021). Here, when looking separately at mothers' and fathers' warmth and negativity, we found that mothers were highly concordant toward multiple offspring in their warmth and negativity (ICC MtO warmth = .55; ICC MtO negativity = .47). Similarly, fathers were also highly concordant in warmth (ICC FtO = .33) and negativity (ICC FtO = .46) toward their children. Resemblance of warmth and negativity toward offspring in parent couples was low (ICC warmth = .13 and ICC negativity = .08). Offspring, however, were highly concordant in warmth (ICC = .38) and moderately concordant in negativity (ICC = 0.27) toward their parents.

Main analyses

Internalizing and externalizing problems and father–offspring interactions

First, we tested the hypothesized structural model of father and offspring internalizing and externalizing problems and father–offspring communication during the FIT (both FtO and OtF) controlled for household SES, offspring's age, and offspring's sex. This model exhibited an acceptable fit, indicating it described the data sufficiently, $\chi^2 = 18.02$, $df = 12$, $p = .115$, CFI = .984, RMSEA = .047, SRMR = .029). Of all associations between the covariates and FIT outcomes, household SES and age were significantly associated with FtO negativity: Fathers from families characterized by higher SES displayed more negativity toward their offspring ($\beta = .12$, adj. $SE = 0.07$, $p = .001$) and fathers of older offspring displayed less negativity ($\beta = -.14$, adj. $SE = 0.01$, $p = .001$). Older offspring displayed less negativity toward their father ($\beta = -.23$, adj. $SE = 0.02$, $p < .001$). Other covariates were not associated to any of the FIT outcomes in the model (all p values >.06). All model and parameter estimates can be found in Table S3 of the supplementary materials.

In our main father–offspring model, experienced CA of father and offspring were included in the model. In the father–offspring model including experienced CA, household SES and offspring's age were nonsignificant and were therefore removed due to the already complex model, $\chi^2 = 6.94$, $df = 8$, $p = .543$, CFI = 1.00, RMSEA = .000, SRMR = .030). The model showed that offspring's internalizing problems ($\beta = -.20$, adj. $SE = 0.10$, $p = .027$) were related to less OtF negativity, whereas offspring's externalizing problems were related to more OtF negativity ($\beta = .25$, adj. $SE = 0.13$, $p = .012$). Father's externalizing problems ($\beta = .17$, adj. $SE = 0.06$, $p = .049$) and father's experienced CA ($\beta = .17$, adj. $SE = 0.07$, $p = .004$) were associated with elevated FtO negativity. Father's experienced CA ($\beta = -.15$, adj. $SE = 0.04$, $p = .005$) was also associated with less FtO warmth. Results from this model are displayed in Table 2 and Figure 1.

Internalizing and externalizing problems and mother–offspring interactions

Similar to father–offspring models, we first tested the hypothesized structural model of mother and offspring internalizing and externalizing problems and mother–offspring communication (both MtO and OtM) controlled for household SES, offspring's age, and offspring's sex. The model exhibited an adequate fit, $\chi^2 = 17.32$, $df = 12$, $p = .138$, CFI = .99, RMSEA = .044, SRMR = .026). Of all relations between the covariates and FIT outcomes, offspring's age was

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TABLE 2 Internalizing and externalizing problems and fathers-offspring interactions

	Father to offspring warmth			Father to offspring negativity			Offspring to father warmth			Offspring to father negativity		
	Beta	**Adj. *SE***	***p***	**Beta**	**Adj. *SE***	***p***	**Beta**	**Adj. *SE***	***p***	**Beta**	**Adj. *SE***	***p***
Intercept	2.93	0.03	<.001***	1.51	0.04	<.001***	2.75	0.03	<.001***	1.25	0.05	<.001***
Internalizing problems father	−0.09	0.03	.347	−0.03	0.05	.773	−0.07	0.04	.489	0.01	0.05	.845
Externalizing problems father	0.04	0.04	.677	0.17	0.06	.049*	0.01	0.04	.939	0.09	0.06	.264
Internalizing problems offspring	0.01	0.04	.886	−0.13	0.07	.384	0.11	0.07	.972	−0.20	0.10	.027*
Externalizing problems offspring	−0.09	0.06	.310	0.16	0.10	.066	−0.16	0.07	.115	0.25	0.130	.012*
Experienced CA father	−0.15	0.04	.005**	0.17	0.07	.005**						
Experienced CA offspring							0.05	0.08	.384	0.08	0.15	.154

Note. CA = childhood abuse.
*Correlation is significant at the .05 level (two-tailed).
**Correlation is significant at the .01 level (two-tailed).
***Correlation is significant at the .001 level (two-tailed).

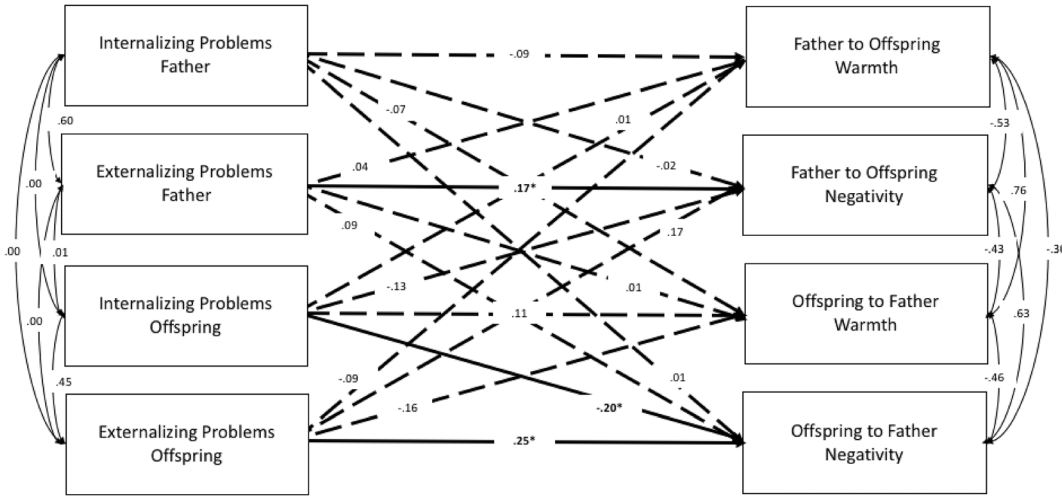

FIGURE 1 Associations father model: Father-to-offspring (FtO) and offspring-to-father (OtF) warmth and negativity

Note. This model was controlled for father and offspring experienced childhood abuse. Double-ended arrows = estimated covariance; solid single-ended arrows = significant associations ($p < .05$); dotted single-ended arrows = nonsignificant associations.

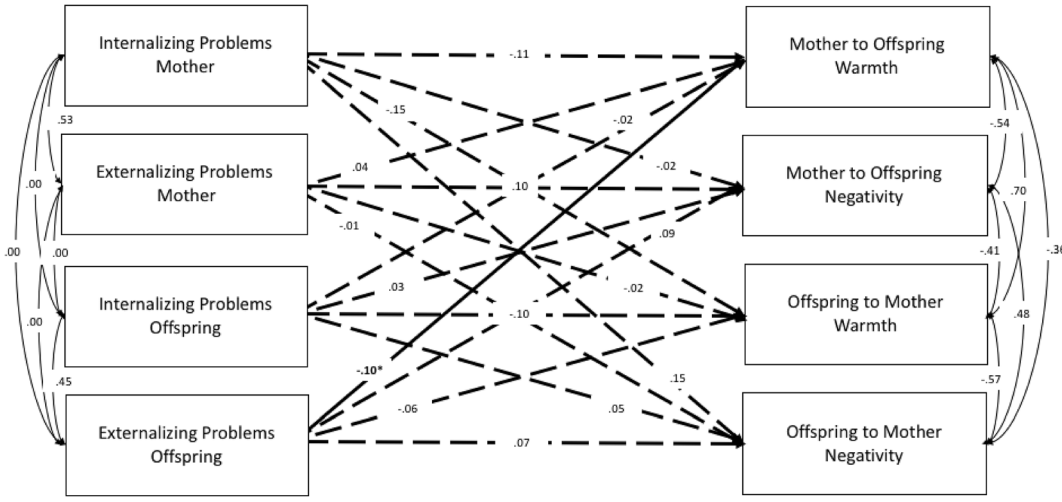

FIGURE 2 Associations mother model: Mother-to-offspring (MtO) and offspring-to-mother (OtM) warmth and negativity

Note. This model was controlled for mother and offspring experienced childhood abuse and offspring's age. Double-ended arrows = estimated covariance; solid single-ended arrows = significant associations ($p < .05$); dotted single-ended arrows = nonsignificant associations.

positively associated with expressed warmth (β = .12, adj. $SE = 0.11$, $p = .022$) and inversely related with negativity (β = −.17, adj. $SE = 0.29$, $p = .029$). That is, older offspring displayed more warmth and less negativity toward their mother. None of the other covariates included in the model were significant (all p values >.09). All model and parameter statistics can be found in Table S4 of the supplementary materials.

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TABLE 3 Internalizing and externalizing problems and mother–offspring interactions

	Mother to offspring warmth			Mother to offspring negativity			Offspring to mother warmth			Offspring to mother negativity		
	Beta	**Adj. *SE***	***p***	**Beta**	**Adj. *SE***	***p***	**Beta**	**Adj. *SE***	***p***	**Beta**	**Adj. *SE***	***p***
Intercept	3.11	0.02	<.001***	1.4	0.04	<.001***	2.53	0.03	<.001***	1.30	0.04	<.001***
Internalizing problems mother	−0.11	0.04	.294	−0.02	0.08	.883	−0.15	0.05	.162	0.15	0.07	.111
Externalizing problems mother	0.04	0.04	.665	0.10	0.07	.306	−0.02	0.05	.866	−0.01	0.07	.955
Internalizing problems offspring	−0.02	0.03	.620	0.03	0.06	.643	−0.10	0.05	.154	0.05	0.10	.523
Externalizing problems offspring	−0.10	0.03	.042*	0.09	0.08	.203	−0.06	0.05	.337	0.07	0.09	.294
Age offspring							0.09	0.06	.001**	−0.17	0.26	.019*
Experienced CA mother	−0.09	0.03	.120	0.10	0.070	.174						
Experienced CA offspring							0.04	0.08	.469	−0.01	0.22	.958

Note. CA = childhood abuse.
*Correlation is significant at the .05 level (two-tailed).
**Correlation is significant at the .01 level (two-tailed).
***Correlation is significant at the .001 level (two-tailed).

In the main mother–offspring model, in which experienced CA scores were taken into account (all nonsignificant demographic covariates were removed; $\chi^2 = 11.70$, $df = 14$, $p = .631$, CFI = 1.00, RMSEA = .000, SRMR = .026) offspring's externalizing problems were associated with less MtO warmth ($\beta = -.10$, adj. $SE = 0.03$, $p = .042$), see Figure 2. All other links of psychological problems and experienced CA with mother–offspring communication were nonsignificant (all p values >.15), see Table 3.

In post hoc sensitivity analyses (see supplementary materials), we tested whether the associations differed across age groups for fathers and mothers (offspring's age ≤ 18 years versus >18 years), which was not the case.

DISCUSSION

In the current study we have examined the associations between fathers', mothers', and offspring's internalizing and externalizing problems (in the last 6 months) and their expressed warmth and negativity during dyadic parent–offspring interactions. We found that offspring's internalizing problems related to *less negativity* toward their father, whereas offspring's externalizing problems were related to *more negativity* toward their father and receiving *less warmth* from their mother. Externalizing problems from father were associated with *more negativity* expressed toward their offspring. In contrast to our expectations, mother's externalizing and internalizing problems were not associated with expressed warmth and negativity toward her offspring.

Externalizing problems and increased negativity during father–offspring interactions

Our main finding was that paternal externalizing problems relate to increased expressed negativity to his child, and offspring's externalizing problems relate to increased negativity to their father, above and beyond the significant effect of father's experienced abuse. Fathers' expressed negativity during communication, such as hostility and (verbal) aggression, might set an example for their child and reinforces and normalizes aversive and externalizing behaviors of the child and, in turn, increases offspring's negativity during communications toward their father. This transactional process could be indicative of the intergenerational transmission of psychological problems (Harold et al., 2011).

Within the framework of the social development model (SDM; Catalano & Hawkins, 1996), externalizing problems can be understood as socially learned behaviors. Behavioral researchers have postulated that offspring learn and mirror their externalizing behaviors from their parents, but also that genetic factors contribute to the development of externalizing problems (Catalano & Hawkins, 1996; Plomin et al., 2016). Our study adds to the literature (e.g., Bailey et al., 2009; Thornberry et al., 2003) by elucidating the link between offspring's externalizing problems and increased expressed negativity toward their father, in addition to the association of fathers' externalizing problems and negative parenting behaviors. Parental communication toward the child plays a role in intergenerational transmission of externalizing problems from parents to offspring (Bailey et al., 2009). Longitudinal studies with a prospective design including twins and their parents could verify the mechanism underlying the transactional processes and potential intergenerational transmission of externalizing problems.

The association of externalizing problems and increased expressed negativity has been found here for fathers, but not for mothers. This aligns with earlier findings on the transmission of antisocial and externalizing behavior specifically from fathers to offspring with parenting as an explaining factor (Thornberry et al., 2003). Discrepancy between fathers' and mothers'

intergenerational continuity of externalizing behaviors was attributed to differences in prevalence and severity of externalizing problems between males and females, with males showing more externalizing problems than females (Moffitt & Caspi, 2001; Rutter et al., 2003). In our study, however, mothers and fathers did not differ in their mean levels of externalizing problems. An alternative explanation for the differences in findings between fathers and mothers could be that fathers' externalizing problems result in more overt behaviors, such as expressing their hostility and (verbal) aggression (i.e., more negativity), compared to mothers' externalizing behaviors. Consequently, these negative expressions can be observed in the interaction with their child. Mothers' externalizing problems might be more covert and, for example, entail "not following the rules," "lack of feeling guilty after doing something wrong," or "sudden change in mood/feelings" (Achenbach & Rescorla, 2003, p. 5), which can be less easily observed in terms of negativity in the interaction with their child.

Externalizing problems and reduced maternal warmth during parent–offspring interactions

Offspring's externalizing problems were related to less warmth from mothers. No associations of externalizing problems and negativity during the mother–offspring interactions were found. This is in line with findings from a (longitudinal) study on mother–adolescent dyads: Problem behavior of the child was related to reduced levels of positive parenting practices of mothers, but not to an increase of negative parenting practices (Serbin et al., 2015). Offspring's externalizing behaviors might provoke annoyance and dissatisfaction in one's interaction partner, which in turn could result in receiving less warmth and patience during communication (Rothenberg et al., 2020). Externalizing behaviors of a child and reduced positive parenting are known to have a reciprocal relationship and amplify each other over time (Serbin et al., 2015). This self-perpetuating process is also referred to as the "coercive" or "vicious cycle" (Sameroff & Mackenzie, 2003). However, it could also be argued that offspring with externalizing problems might need more restrictive parenting, including setting clear boundaries and rules, which might come with a more directive communication style during the mother–offspring interactions and could have been rated as less warm. It should be noted, though, that it is not clear yet whether reduced maternal warmth (and increased boundary setting) is beneficial in terms of reducing offspring's externalizing problems in the long term or whether these problems aggravate over time.

To break the vicious cycle, (early) treatment of offspring's externalizing problems is recommended. Moreover, it was previously shown that children from mothers who demonstrated significantly more positive parenting behaviors have fewer externalizing problems (Boeldt et al., 2012; Eisenberg et al., 2005). Therefore, families might benefit from interventions to improve the parent–offspring dynamics. One example of an evidence-based intervention to promote positive parenting is Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) training, which has been shown to be effective in promoting positive parenting and reducing externalizing problems of the child (Juffer et al., 2017).

Lack of associations between parental psychological problems and parent–offspring interactions

In the present study, parents' psychological problems were unrelated to offspring's expressed warmth and negativity during the interactions when offspring's psychological problems were taken into account. Our results contrast the previous finding that maternal PTSD resulted in an increase of expressed warmth of daughters (Milan & Carlone, 2018). Remarkably, also no

associations of maternal and paternal internalizing problems nor maternal externalizing problems and their own expressions of warmth and negativity were found. This was somewhat in contrast with previous literature (Browne et al., 2016; M. Chen & Johnston, 2007; Dietz et al., 2008; Milan & Carlone, 2018), which shows that mothers' depressive symptoms and maternal inattention and impulsivity were linked to increased negativity and less positivity in communication.

Our study differed from earlier research on some methodological aspects: First, we investigated the full spectrum of internalizing (i.e., depressive, anxious, and somatic complaints) and externalizing problems (i.e., intrusive, aggressive, and rule-breaking behaviors) in association to expressed warmth and negativity, whereas earlier studies focused on specific parental mental conditions or behaviors, for example depression (Lovejoy et al., 2000; Wilson & Durbin, 2010). Second, prior work on the effects of parental psychological problems on parenting practices focused on self-reports of their parenting behaviors in contrast to our observational design (e.g., M. Chen & Johnson, 2007). This might contribute to stronger associations between these variables as a person's problems might color their view on the family communication (negativity bias; Platt et al., 2017). Third, even though our results did not give any indication of multicollinearity, internalizing *and* externalizing problems were significantly correlated ($r = .52–.58$). These three aspects might partly explain the lack of associations between parental problems and their expressed warmth and negativity in our study. Moreover, the low to moderate factor loadings and low percentage of explained variance in our analytical models could indicate that other factors, such as the content of the conversation, parental personality traits, or temperament may contribute additionally to the levels of expressed warmth and negativity within families.

Psychological problems and the role of CA and parent–offspring interactions

In the present 3G Parenting Study sample, parents' experienced CA is related to poorer parent-to-offspring communication (Buisman et al., 2019). In the current study, we therefore controlled our analyses for self-reported CA experiences. The findings from our main model indicate that mothers' and offspring's self-reported CA were not significantly associated with MtO communication, nor was offspring's self-reported CA associated with OtF communication. However, the significant bivariate correlations between predictors (i.e., self-reported experienced CA and increased psychological problems; $r = .18–.31$), as found in the present study, might indicate that CA has a reciprocal suppressing effect (Lancaster, 1999). Because of the correlations between self-reported CA and internalizing and externalizing problems, adding self-reported CA to the model increased the strength of the association between psychological problems and parent–offspring communication.

Another way of understanding this phenomenon is in terms of mediation. A history of abuse is related to an increased risk of internalizing and externalizing psychological problems (Danese & Widom, 2020). As such, psychological problems, specifically externalizing problems, could mediate the association between experienced abuse on the one hand and less expressed warmth and more expressed negativity in parent–offspring interactions on the other hand. Future studies with prospective designs could shed light on the potential mediating effects of psychological problems in the relation between parents' and offspring's CA and parent–offspring interactions and whether effects differ across father–offspring and mother–offspring interactions.

Strengths, limitations, and future studies

One strength of this study is the observational design including mothers and fathers with—when available—multiple of their offspring. Observational techniques to assess parent–offspring

interactions have the advantage to rule out self-report bias, for example, influences of participants' mood, expectancies, and social desirability tendencies (Smith, 2011). Also, observations allow the rater to mark and rate subtle affective and behavioral aspects of parenting behavior that are presumably not captured by self-reports based on questionnaire measures, such as mother's emotional flexibility or responsiveness (Kluczniok et al., 2016; van Dijk et al., 2017). Second, investigating parents' and offspring's psychological problems concurrently—instead of testing parent problems and offspring problems in isolation—enabled us to draw conclusions on the effects of offspring problems in the context of parental problems, and vice versa. Third, including offspring-to-parent communication in addition to parent-to-offspring communication in our analyses provides a more representative image of the complex and interdependent family interactions. Last, the sample including child, adolescent, *and* adult offspring of all ages allowed us to draw conclusions on the associations of psychological problems and family communication across the life span: Associations of psychological problems and family communication were independent of offspring's age.

The findings of this study should also be interpreted in the context of some limitations. First, because of the cross-sectional study design no firm statement on the direction of effects can be made. Here, participants reported retrospectively on their internalizing and externalizing problems during the past 6 months, prior to the interaction task. Therefore, negativity in family communication was "predicted" by father and offspring externalizing problems in our models.

It should be noted that associations of psychological problems and parent–offspring interactions might be bidirectional (e.g., Serbin et al., 2015). Future studies with a prospective (intervention) design could elucidate this. Moreover, in longitudinal studies we can test whether negative family communication acts as a mediating or moderating factor in the relation between parent and offspring psychopathologies (Elgar et al., 2007; Steele & McKinney, 2019).

Second, expressed negativity was highly skewed to the left in our study, which means that parents did not display much negativity toward their children, although participants with a history of childhood maltreatment were oversampled. The skewness could be due to the observational setting, in which participants might behave in a more socially desirable way and express less negativity. Although observations of parent–offspring interactions reflect natural behavior relatively well (Gardner, 2000), we acknowledge that family communication might be different in a natural setting, such as in the home environment when family members are not being observed.

Third, the qualities of communication (warmth and negativity) were coded separately and independently for each person in the interaction. Each person received two scores based on the level of warmth and negativity he or she showed toward their interaction partner. In addition, a more dynamic and transactional approach, such as the space grids method, may capture systemic interactions at a microlevel; for example, elucidate the extent to which a person is flexible (vs. rigid) in their behavior in reaction to actions of their partner (Meinecke et al., 2019).

Fourth, 56 persons (15%) participated as both a parent and a child which causes some dependency in the data. We aimed to obviate this by using the robust estimator. Lastly, it should be noted that that study sample mainly consists of families who identify racially as White and reported elevated mental health symptoms. Also, mothers participating in the FIT were younger as compared to nonparticipating mothers. Younger mothers might be more committed to participate as they might expect some possible short-term benefit in their relationship. These three aspects might limit the generalizability of our findings across populations (e.g., across different cultural backgrounds and older mothers).

Conclusion and implications

In this study, we have shown that offspring externalizing problems were related to receiving *less* warmth from their mother and expressing *more* negativity toward their father, whereas offspring's

internalizing problems were related to *less* expressed negativity toward their father. Father's (but not mother's) externalizing problems were associated with negativity expressed to their child. These findings contribute to the existing literature by demonstrating these associations, separately for mother–offspring and father–offspring dyads, across a wide age range (offspring's age 7.5–65.5 years). It should be noted that fathers', mothers', and offspring's mean levels of internalizing and externalizing problems in our sample were above the clinical cutoff (*T* scores between 79–83; Achenbach & Rescorla, 2003), suggesting that our sample includes (clinically) vulnerable families. We highlight the importance of focusing on both mothers and fathers in understanding the associations between psychological problems and parent–offspring interactions in future research. Until now, most research on parent–offspring interactions is related children being under 18. The results from the present study show continued effects into adulthood.

Our findings support that psychological conditions of one family member have an impact on their social interactions within the family (Bowen, 1966). As such we promote early treatment of psychological problems of one family member, which might have a positive effect on the dyadic parent–offspring interactions. As a consequence, and in line with the family systems theory (Bowen, 1966), the family might benefit as a whole. Also, supporting families to improve their interpersonal relationships and family communication by offering them educational programs, such as Curious Minds, VIPP-SD, or Triple P – Positive Parenting Program, has been shown effective, especially in families where child's externalizing problems are at play (Juffer et al., 2017; Sanders et al., 2000; Spruijt et al., 2020). To that end, we promote early intervention and a systemic approach—including mothers, fathers, and offspring—in clinical and future research when targeting within-family communication and mental health.

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