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Prospective association of parental and child internalizing symptoms: Mediation of parenting practices and irritability

Short title: ASSOCIATION OF PARENTAL AND CHILD INTERNALIZING SYMPTOMS

Fátima Valencia[1,2]

Eva Penelo[1,3]

Núria de la Osa[1,4]

J. Blas Navarro[1,3]

Lourdes Ezpeleta[1,4]

[1]Unitat d'Epidemiologia i de Diagnòstic en Psicopatologia del Desenvolupament (2017 SGR33). Universitat Autònoma de Barcelona. Bellaterra (Barcelona), Spain.

[2]Instituto de Psiquiatría y Salud Mental Marañón. Hospital General Universitario Gregorio Marañón. Madrid, Spain.

[3]Departament de Psicobiologia i Metodologia de les Ciències de la Salut. Universitat Autònoma de Barcelona. Bellaterra (Barcelona), Spain.

[4]Departament de Psicologia Clínica i de la Salut. Universitat Autònoma de Barcelona. Bellaterra (Barcelona), Spain.

Corresponding author: Dr Fatima Valencia. Departament de Psicologia Clínica i de la Salut. Edifici B. Universitat Autònoma de Barcelona. 08193 Bellaterra (Barcelona). Spain. Phone: (34) 935 812 883. E-mail: Fatima-valencia@hotmail.es

Abstract

Maternal internalizing symptoms have been linked with child internalizing symptoms, but paternal internalizing difficulties have received little attention. Our aims were to prospectively analyze the simultaneous effect of maternal and paternal internalizing symptoms on child internalizing difficulties, examining gender differences, and to verify the mediating effect of parenting practices and child irritability. The sample included 470 families assessed at child ages 3, 6, 8 and 11. Multi-group Structural Equation Modeling was performed with Mplus8.2. Complete equivalence was found between boys and girls for all paths. Maternal internalizing symptoms at age 3 had an indirect effect on child internalizing symptoms at age 11, via irritability at age 8. Paternal internalizing symptoms at age 3 were not associated with any of the variables under study. Maternal internalizing symptoms and child irritability are targets for intervention in order to prevent child internalizing difficulties.

Keywords: Internalizing symptoms, Irritability, Parental psychopathology, Parenting, Prevention.

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Conflict of interest

The authors declare that they have no conflict of interest.

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Data availability statement

The data that support the findings of this study are available on reasonable request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Prospective association of parental and child internalizing symptoms: Mediation of parenting practices and irritability

The internalizing spectrum is an empirically-derived cluster of symptoms including mood, anxiety and somatic complaints (Achenbach & Rescorla, 2001). A recently published survey showed that internalizing difficulties are the most prevalent disorders in children and young people (Sadler et al., 2018). These symptoms tend to persist and increase over time (Bufferd et al., 2012; Côté et al., 2009) and predict future mood disorders (Roza et al., 2003). Therefore, prevention of risk factors involved at an early stage is critical.

In terms of risk factors, a myriad of studies have consistently demonstrated an association between maternal and offspring internalizing symptoms in both children (Barker et al., 2011; Weeks et al., 2014) and adolescents (Havewala et al., 2019; Zalewski et al., 2017). The study of paternal psychopathology, however, has been neglected (Wilson & Durbin, 2010). Despite the fact that previous research has suggested a larger impact of maternal mental health difficulties on child psychopathology (Connell & Goodman, 2002), there is evidence of the significant effect of paternal internalizing symptoms on both child internalizing and externalizing difficulties (Bögels & Perotti, 2011; Kane & Garber, 2004; Ramchandani & Psychogiou, 2009). Some investigations have found a similar impact of maternal and paternal depression in terms of parenting dysfunction (Wilson & Durbin, 2010) and child outcomes (Kane & Garber, 2004; Ramchandani & Psychogiou, 2009). Moreover, research has demonstrated that psychopathology in both parents predicts greater levels of

offspring psychopathology (Rasing et al., 2015). Therefore, paternal internalizing symptoms should also be considered when analyzing risk factors for children internalizing difficulties.

Some authors have noted the importance of conducting gender-specific research regarding the familial transmission of psychopathology (Connell & Goodman, 2002). Andreas et al. (2018) have shown stronger concurrent associations between the same-gender parent (in comparison with the opposite-gender parent) and child internalizing difficulties. Ramchandani and Psychogiou (2009) reviewed a number of studies suggesting higher risk of emotional and behavioral difficulties for boys in the context of paternal psychopathology. Murdock et al. (2018) demonstrated a direct relationship between maternal negative affect and child depressive symptoms, but only an indirect association between paternal and child depressive symptoms, which was mediated by punitive parenting. It would appear that maternal symptoms impact directly on both girls and boys (Andreas et al., 2018; Watson et al., 2012), whereas fathers' symptoms have an indirect effect (Murdock et al., 2018) and a stronger influence on boys' difficulties (Ramchandani & Psychogiou, 2009).

Parenting practices have been postulated as a potential mechanism involved in familial transmission of internalizing problems (Laskey & Cartwright-Hatton, 2009; Wilson & Durbin, 2010). Positive parenting includes behaviors like praise, spending time with the child or being affectionate; inconsistent parenting involves a lack of consistency when using consequences for negative behavior and changing discipline strategies depending on parental mood; punitive parenting includes physical punishment and screaming at the child when misbehaving (de la Osa et al., 2014). Child internalizing symptoms have been linked with harsh parenting, lack of parental warmth, over-involvement, harsh control, less autonomy granting, low levels of monitoring and authoritarian parenting (Laskey & Cartwright-Hatton, 2009; Pinquart, 2017; Yap et al., 2014). Parenting practices has been seen to mediate the relationship between parental depression and child internalizing symptoms, including the

following variables: psychological aggression (Kuckertz et al., 2018), harsh parenting (Laskey & Cartwright-Hatton, 2009), father-child conflict (Kane & Garber, 2004; Nath et al., 2016), maternal rejection (Zalewski et al., 2017) and a fewer number of positive behaviors in the interaction between mother and child (Foster et al., 2008). Moreover, a relationship between depression and inconsistent parenting has been observed (Dette-Hagenmeyer & Reichle, 2014; Zalewski et al., 2017). There is evidence suggesting a similar effect of maternal and paternal positive and harsh parenting in terms of child internalizing symptoms (van der Sluis et al., 2015).

The associations between parental psychopathology, parenting practices and child irritability have been stressed by previous researchers, demonstrating bidirectional relationships (Lengua & Kovacs, 2005; Wiggins et al., 2014). Irritability can be defined as 'an excessive reactivity to negative emotional stimuli that has an affective component, anger, and a behavioral component, aggression' (Leibenluft & Stoddard, 2013, p. 1473). It is present across multiple disorders and it has been a focus of much research in recent years (Vidal-Ribas et al., 2016). Multiple studies have demonstrated prospective and concurrent associations with internalizing symptoms (Ezpeleta, Penelo, de la Osa, Navarro, & Trepat, 2019; Leadbeater & Homel, 2015; Stringaris & Goodman, 2009). In terms of its etiological underpinnings, it is acknowledged as moderately heritable and therefore physiologically based (Lengua & Kovacs, 2005; Vidal-Ribas et al., 2016). However, it has been demonstrated that levels of child irritability can be prospectively predicted by parental (especially maternal) internalizing symptoms during the early years of life (Dougherty et al., 2013; Whelan et al., 2015; Wiggins et al., 2014) and negative and inconsistent parenting practices (Lengua & Kovacs, 2005), even after controlling for the effect of genetics (Oliver, 2015). Whelan et al. (2015) showed a significant prospective path from maternal depressive symptoms to child irritability and adolescent depression.

The present study builds on the existing literature in several ways. Firstly, few studies have analyzed simultaneously the prospective effects of both parents' internalizing difficulties on child internalizing symptoms and investigations exploring gender-specific associations are scarce. Secondly, the underlying factors explaining the relationship between parental and child internalizing symptoms have not been thoroughly studied. Previous investigations have mainly focused on the link between either parental and child psychopathology, parenting practices and child difficulties or parental psychopathology and parenting practices (Kuckertz et al., 2018), but they have rarely analyzed four-factor associations. To our knowledge, no published studies have explored the mediating effect of child irritability in the relationship between parental internalizing difficulties, parenting practices and child internalizing symptoms.

This study aimed to evaluate a prospective model from ages 3 to 11 of the influence of maternal and paternal internalizing symptoms on their children's internalizing difficulties, analyzing the mediating effect on this relationship of parenting practices and irritability. The objectives are two-fold: a) to examine the influence of parental internalizing symptoms, parenting practices and irritability on the prospective development of child internalizing symptoms, as well as the equivalence of these associations across child gender, and b) to examine the mediating role of parenting strategies and irritability on the relationship between parental and child internalizing symptoms. Based on previous studies mentioned above, we expected this model to show equivalent paths across gender except for the path between paternal and child internalizing symptoms, hypothesizing a significant effect for boys but not for girls. The hypothesized model is presented in Figure 1.

Methods

Participants

The sample was taken from a longitudinal study of risk factors for the development of psychopathology in early childhood (Ezpeleta et al., 2014). Participants were followed up annually from age 3 to age 11. A double phase design was used to select study participants. A random sample of 2,283 families with 3-year-old children attending 54 schools in Barcelona (N = 13,578) were initially invited to take part. A total of 1,341 (58.7%) families agreed to participate in the study and 63 were excluded for not speaking Spanish and/or for the presence of neurodevelopmental disorders in children. Children were screened for behavioral problems, which was the main outcome of the project, using the parental report on the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). Four supplementary questions were added from the Oppositional Defiant Disorder (ODD) criteria of DSM-IV (often deliberately annoys others; often blames others for his/her mistakes or bad behavior; is easily offended by things others say; is often angry and resentful). Those participants rated with a raw score of 4 or above on the conduct problems scale (90^{th} percentile) or scoring 2 (*certainly true*) on any of the DSM-IV ODD symptoms were invited to participate (n = 522, 42%). In addition, 30% (n = 255) of families with a negative screening score (below the aforementioned cut-off criteria) were randomly selected to be included. The final sample at baseline (age 3) included 622 children (417 cases screening positively and 205 screening negatively on conduct problems) with a mean age of 3.76 (SD = 0.32). There were 312 females (50.2%) and 554 children identified as Caucasian (89.1%).

The sample for this study included 470 children and their parents with available information in the endogenous variable YSR (child internalizing symptoms) assessed at the follow-up at age 11 (retention rate was 75.6%). For the purpose of the study, the assessments at age 3, 6, 8 and 11 were used. At age 3, 97.7% families provided information regarding parental internalizing symptoms; at age 6, 77.5% families reported on parental practices; and at age 8, 68.8% families completed the irritability variables. 90.9% of the total data values

were available and therefore the model was estimated with the Full Information Maximum Likelihood (FIML) approach (Graham, 2009). The sample included 245 females (52.1%). In terms of ethnicity, 92.6% identified as Caucasian, 3.4% as Hispanic and the remaining 4.0% belonged to other ethnic groups. Regarding Socioeconomic Status (SES), assessed with the Hollingshead´s Index of Social Position (Hollingshead, 1957), there were 38.6% in the high-SES category, 45.5% of families in the medium to medium-high SES category, and 15.9% were low to medium-low SES families. There were no differences between participants and non-participants in terms of gender [$\chi^2(1) = 1.566$, $p = .211$], ethnicity [$\chi^2(5) = 10.771$, $p = .056$], maternal [$t(589) = 0.923$, $p = .250$] and paternal [$t(559) = 0.923$, $p = .356$] internalizing symptoms, positive parenting [$t(476) = –0.508$, $p = .611$] and child irritability [$t(429) = –0.725$, $p = .469$]. Those without information on the outcome of study were more likely to belong to the low to medium-low SES category [$\chi^2(2) = 10.180$, $p = .006$] and to use more inconsistent [$t(476) = 2.961$, $p = .003$] and punitive [$t(476) = 2.947$, $p = .003$] parenting.

Measures

Parental internalizing symptoms

They were assessed with the *Adult Self-Report (ASR)* (Achenbach & Rescorla, 2003). This instrument includes 126 items evaluating psychopathology in adults aged 18-59 in the past 6 months. Response categories included 0 (*no true*), 1 (*somewhat true*) and 2 (*very true or often true*). For the purpose of the study we used the internalizing score, which is the sum of the empirical scales anxious/depressed, withdrawn/depressed and somatic complaints (39 items). Both parents (460 mothers and 440 fathers) completed this questionnaire separately when their children were aged 3. Parental mental health in the early years of life has been recognized as a critical variable associated with child development (Lyons-Ruth et al., 2000). The internal consistency for the internalizing scale in this sample was ordinal $\alpha_o = .95$ for maternal and ordinal $\alpha_o = .94$ for paternal reports.

Parenting practices

The Spanish adaptation of the *Alabama Parenting Questionnaire for preschoolers (APQ-Pr)* (de la Osa et al., 2014) was used to measure parental practices. This questionnaire includes 24 items rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*) organized in three factors: positive, inconsistent and punitive parenting. Parental report was obtained when children were aged 6 (335 maternal reports, 53 paternal reports and 94 reports from both parents), enquiring about strategies typically used. At this age, children enter primary school and parenting practices will be critical to help children regulate themselves in and out of the classroom (Montes et al., 2012). Internal consistency was calculated with ordinal alpha because most of the response options had null frequencies, especially those reflecting negative parenting. The values for positive parenting, inconsistent parenting and punitive parenting scores were ordinal $\alpha_o = .85$, ordinal $\alpha_o = .72$ and ordinal $\alpha_o = .73$, respectively.

Child irritability

Following Stringaris and Goodman (2009), the irritability dimension of ODD comprised three items (loses temper, touchy-annoyed, angry-resentful). The item loses temper was taken from the SDQ for parents and the other two items were assessed with the supplementary questions added to the SDQ to asses DSM-5 ODD criteria dimensionally in our study. Each question included three response categories: 0 (*no true*), 1 (*somewhat true*) and 2 (*certainly true*). Parents rated the presence of symptoms over the past six months. The sum of responses on these three items was used to obtain the score on the measure regarding irritability. Parents completed this questionnaire when their children were aged 8 (249 maternal reports, 36 paternal reports and 109 reports from both parents). Irritability was assessed at this time point because it has been seen as normative in toddlers and preschoolers, but tends to decrease during school age (Wiggins et al., 2014). Ordinal alpha was $\alpha_o = .86$ in the sample.

Child internalizing symptoms

The *Youth Self-Report (YSR)* (Achenbach & Rescorla, 2001) was administered to children at age 11 to assess behavioral and emotional problems in the past 6 months. Internalizing symptoms are highly prevalent during adolescence and therefore early adolescence is a key stage for prevention (Hughes & Gullone, 2008). This instrument includes 112 items with three response categories: 0 (*no true*), 1 (*somewhat/sometimes true*) and 2 (*very true/often true*). The score on the internalizing subscale (including anxious/depressed, withdrawn/depressed and somatic complaints) (31 items) was taken as the outcome measure of the study. Ordinal alpha was $\alpha_o = .89$ in the sample.

Conduct problems

They were assessed with the conduct problems scale of the SDQ (Goodman, 1997). Parents assessed the presence of conduct problems over the past six months when children were age 3. There were three response categories: 0 (*no true*), 1 (*somewhat true*) and 2 (*certainly true*). Ordinal alpha was $\alpha_o = .67$ in the sample.

Procedure

The study was approved by the ethics review committee of the principal investigator's institution. Schools were asked permission to carry out the study and families who had been recruited and met inclusion criteria provided written consent to participate. Families were contacted by telephone and interviewed at the school for each annual assessment. Questionnaires were completed at home by either the mother, the father or both parents by consensus and returned the day of the personal interview. The study has been performed in accordance with the 1964 Helsinki Declaration.

Statistical Analysis

The statistical analyses were performed with Mplus8.2. Due to the double-phase design, sample weights were used to correct for the unequal probabilities of selection. A weighted

variable assigned each child the reciprocal of their probability of selection in the second phase of sampling, allowing the generalization of findings to the general population.

Multi-group Structural Equation Modeling (SEM) was conducted using the Robust Maximum Likelihood (MLR) method of estimation. This method is robust to non-normality and estimates missing data using the FIML approach (Enders & Bandalos, 2001; Graham, 2009). The model was adjusted by SES and conduct problems scores at age 3, which were included as covariates.

We tested invariance of paths across gender by comparing an unconstrained model with all the parameters freely estimated with another model in which all parameters were constrained to be equivalent across gender. Invariance was examined with the scaled chi-square difference (Bryant & Satorra, 2012) for nested models (α level set at .05).

We evaluated goodness-of-fit using the χ^2, p value, the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis index (TLI) and Standardized Mean Square Residual (SMSR). A fit was considered adequate when chi-square test was non-significant ($p > .05$), CFI and TLI were above .90 (acceptable) or .95 (excellent) and RMSEA below .08 (acceptable) or .06 (excellent) and SMSR was under .08 (Hu & Bentler, 1999; Kline, 2010).

In this multiple-path mediational model, we tested for indirect effects even though the direct or the total effect of the first factor on the outcome was not statistically significant (Hayes, 2013), using the product-of-coefficients test (as cited by Taylor, MacKinnon, & Tein, 2008). The authors have proposed that the mediation analysis can be more powerful than the simple regression conducted between independent and dependent variables, and that there might be a suppression effect between mediated and direct effects, or between the signs of the two mediational paths.

Results

Table 1 shows the means, standard deviations and inter-correlations between the variables included in the study. Child internalizing symptoms at age 11 were significantly correlated with maternal internalizing symptoms when their children were age 3 and irritability at age 8 for boys, and with punitive parenting at age 6 and irritability at age 8 for girls.

Invariance Across Gender

The baseline multi-group model (configural model) yielded good fit [χ^2 (1) = 0.463, p = .496; CFI = 1.000, TLI = 1.000, RMSEA = .000 (90% CI .000-.151), SMSR = .005]. When parameters were fixed to be equal across gender, chi-square test showed non-significant differences between the unconstrained and the constrained model [$\Delta\chi^2$ (16) = 20.030, p = .219]. Invariance across gender was also tested for each path individually. Although one path was found non-equivalent between girls and boys, in the final model such path was non-statistically significant in both genders (detail upon request). Given that complete equivalence across gender was demonstrated and the full constrained model showed excellent fit [χ^2 (17) = 20.250, p = .262; CFI = .981, TLI = .933, RMSEA = .029 (90% CI .000-.069), SMSR = .033], the model was rerun with the whole sample with a one-group approach. The standardized parameters for the final model are presented in Figure 2.

Direct Effects

The following direct paths were statistically significant (Figure 2): maternal internalizing symptoms at age 3 were associated with positive parenting, inconsistent parenting and punitive parenting at age 6 and also with irritability at age 8; punitive parenting at age 6 was associated with irritability at age 8 and irritability at age 8 was associated with child internalizing symptoms at age 11. On the other hand, the direct effect from maternal internalizing symptoms to child internalizing difficulties was not significant.

Indirect Effects

The only statistically significant effect was the indirect effect of maternal internalizing symptoms on child internalizing difficulties, via irritability. Increased maternal internalizing symptoms were associated with increased irritability and this in turn was linked with higher levels of child internalizing difficulties.

Paternal internalizing symptoms were not directly or indirectly associated with the variables studied.

Discussion

The current study analyzed the prospective effects of parental internalizing symptoms on child internalizing difficulties, examining the mediating effect of parenting practices and irritability. Complete equivalence across gender was found, showing that the variables of the study did not have a differential impact depending on child gender. Maternal and paternal internalizing symptoms were not directly associated with those of their offspring (boys and girls). Irritability showed a significant mediating effect between maternal and child internalizing symptoms. Despite the fact that a chain of positive and significant direct effects between maternal internalizing symptoms, punitive parenting, irritability and child internalizing symptoms was observed, the total indirect effect involved was statistically null, indicating no mediation. Paternal internalizing symptoms were not associated with any of the variables of the study.

Regarding the full equivalence found across gender, the direct path between paternal and offspring internalizing symptoms was neither significant for boys nor for girls, thus disconfirming our hypotheses and contrary to previous research (Ramchandani & Psychogiou, 2009). In line with our findings, Andreas et al. (2018) demonstrated no significant prospective effect of paternal internalizing symptoms and no differences between their longitudinal

association with girls' and boys' difficulties. Our result might reflect the differential parental roles in both girls' and boys' upbringing, with mothers being the primary caregiver for both genders (Wiggins et al., 2014).

There was a significant indirect effect between maternal internalizing symptoms, irritability and child internalizing symptoms, although the strength of the association was weak. According to attachment theory, the ability to regulate emotions can be predicted by parental sensitivity (van IJzendoorn et al., 1995). Maternal internalizing symptoms might have a negative impact in terms of availability and responsiveness, thus increasing the chance of developing insecure attachment and dysregulated emotion (Maughan et al., 2007). This potential underlying mechanism could be explored in future studies. Moreover, Foster et al. (2008) demonstrated less helping behaviors from depressed mothers in a problem-solving task, possibly leading to more difficulties for children in terms of coping with daily difficulties. Consistent with the literature, there was an association between irritability and the internalizing spectrum. It has been suggested that irritability might interfere with occupational and social adjustment and lead to less support and more self-criticism and depressive symptoms (Leadbeater & Homel, 2015; Rudolph & Clark, 2001).

As aforementioned, and even though the effect of the three-path mediational model including punitive parenting and irritability as mediators was not significant, the micromediational chain maternal internalizing symptoms - punitive parenting - irritability - child internalizing symptoms included three single direct significant paths. According to previous studies, mothers presenting internalizing difficulties might be more likely to engage in negative parenting style (Kuckertz et al., 2018; Zalewski et al., 2017), possibly in relation to difficulties regulating the expression of negative emotions like anger (Shay & Knutson, 2008). Physically punitive discipline has been previously associated with future emotion

dysregulation, given that this type of strategies arouse the child in anger and fear and interfere with regulatory skills (Colman et al., 2006).

Maternal symptoms were also associated with less positive and more inconsistent parenting, as reported by previous studies (Kuckertz et al., 2018; Zalewski et al., 2017). Contrary to our hypothesis, a longer mediational chain including maternal symptoms, positive/inconsistent parenting, irritability and child internalizing symptoms was not significant. Several explanations might account for these findings. Firstly, self-report measures of parenting practices have been seen to include biases in terms of the interpretation of items and social desirability responses (Morsbach & Prinz, 2006). Alternatively, it might be that only a punitive style (including physical punishment and yelling in the APQ-Pr) has a long-term impact on child emotion regulation skills. Studies showing a mediating effect of parenting in the relationship between maternal and child internalizing symptoms are either cross-sectional or have shorter follow-up periods (Murdock et al., 2018; Zalewski et al., 2017). Internalizing difficulties were assessed in preadolescence, when the social world starts having a more prominent role in the emotional wellbeing, beyond family relationships (Ross et al., 2010). As in our study, previous investigations have generally reported small effect sizes regarding parenting practices associations (Kane & Garber, 2004; Kuckertz et al., 2018; Wilson & Durbin, 2010), suggesting that other variables need to be considered.

In this 8-year prospective study, findings did not support a direct effect of maternal or paternal internalizing symptoms on preadolescent internalizing difficulties. Studies with shorter follow-ups have demonstrated a significant effect of maternal symptoms (Kuckertz et al., 2018; Zalewski et al., 2017) and the effect of past maternal psychopathology on parenting appears to be mediated by the concurrent mood state (Foster et al., 2008). Maternal internalizing symptoms at age 3 might have an indirect effect on preadolescents, via its impact on other variables like irritability.

Contrary to our expectations and to previous literature (Wilson & Durbin, 2010), the findings yielded non-significant associations between fathers' and offspring internalizing symptoms, as well as with the other variables of study. Our findings are, however, consistent with other investigations showing a higher effect of maternal psychopathology on child's mood (Connell & Goodman, 2002). These results might be explained by the fact that mothers continue to be primary caregivers (Wiggins et al., 2014) and by the separate roles that parents have during child upbringing: mothers tend to be more involved in emotion regulation and shared affect, whereas fathers are focused on play and physical activation (Paquette & Dumont, 2013). The former might have a more prominent role in relation to internalizing symptoms. In this line, harsh parenting has been linked with emotion regulation difficulties when performed by mothers and with child aggression in the case of fathers (Chang et al., 2003). It is also important to bear in mind that parenting practices were largely reported by mothers, whose report and parenting style might differ from those of the father. Finally, men tend to report less internalizing symptoms than women (Seidler et al., 2016), thus introducing a potential assessment bias.

The study included a large and representative sample of school-aged children followed up prospectively during eight years and resulting in a high retention rate (75.6%). Moreover, variables were assessed at different developmental stages, from preschool to preadolescence, providing information about the impact of parental internalizing symptoms throughout child development. While most studies have analyzed the effects of maternal internalizing difficulties, separate measures of maternal and paternal internalizing symptoms were simultaneously examined. A multi-group model was conducted, allowing the examination of gender differences and the equivalence of the model by gender was tested. The main limitations lie in the fact that variables (except for child internalizing symptoms) were assessed through parental report, thus leading to potential measurement biases as mentioned

above. Previous studies, however, have found a significant correlation between self-report and observation measures of parenting practices (Duncan et al., 2015; Hawes & Dadds, 2006). The predominance of maternal report on parenting practices and child irritability might have been an obstacle to find significant associations between paternal symptoms and other variables under study (in Spain fathers are increasingly involved in their child's care, but mothers are often the main caregivers). However, mean scores on maternal and paternal report on parenting practices and irritability were compared and only the scores on positive parenting yielded significant differences ($p < .008$). Significant effects might have been obscured by greater homogeneity of psychopathology and a potential floor effect, considering that mean scores in the ASR and the YSR were low (as expected in a community sample).

Despite the limitations, the findings of the present study highlight the importance of parenting, irritability and emotion regulation in order to prevent internalizing symptoms and have a number of implications for prevention and intervention with these symptoms in preadolescence. Therapeutic programs aimed at improving parental skills rarely include help for parents' internalizing symptoms, which are often underlying maladaptive parenting practices (Shay & Knutson, 2008). An improvement in maternal symptoms has been associated to a decrease in child psychopathology (Gunlicks & Weissman, 2008). Cost-effective programs aimed at parents with internalizing symptoms should be developed, including strategies to cope with their own difficult emotions or anxiety when interacting with their children. Child irritability and emotion regulation skills should be a target for intervention, especially in the offspring of maternal internalizing symptoms. A wider implementation of anger management interventions (Sukhodolsky et al., 2016) might result in better coping skills and contribute to the prevention of internalizing difficulties. Most interventions are implemented when children are already presenting with symptoms. Agents involved in child development (e.g. general pediatricians, teachers) should be trained to

recognize signs of parental internalizing symptoms, punitive style or child irritability and refer to specialized mental health services when needed.

Future studies could replicate these findings using observational measures of parenting and assessing parental psychopathology by means of a diagnostic interview, thus controlling for potential bias of parental report. More research is needed to ascertain as to why maternal and paternal difficulties have a differential effect on child internalizing symptoms. The role of fathers in child's upbringing and emotional development should be studied in more depth, disentangling whether it has a direct effect on their offspring or it is mediated by their influence on mothers, as suggested by previous investigations (Gutierrez-Galve et al., 2015).

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Table 1. Descriptive statistics (means and standard deviations) and inter-correlations (N = 470)

Measure (minimum-maximum)	*M* (*SD*)		Pearson´s correlations						
	Females	Males	1	2	3	4	5	6	7
Age 3									
1. ASR-maternal internalizing symp. (0-78)	9.6 (7.2)	9.9 (7.5)		.44*	−.23*	.06	.23*	.25*	.18*
2. ASR-paternal internalizing symp. (0-78)	8.2 (6.5)	8.8 (6.3)	.29*		.06	.02	.14	.14	.05
Age 6									
3. APQ-Pr-positive parenting (0-60)	40.6 (4.1)	41.4 (4.0)	−.14*	−.05		−.16*	−.20*	.01	−.07
4. APQ-Pr-inconsistent parenting (0-35)	6.7 (3.3)	6.5 (3.2)	.23*	−.02	−.35*		.31*	.07	−.06
5. APQ-Pr-punitive parenting (0-25)	3.1 (1.8)	3.4 (1.9)	.13	.13	−.27*	.36*		.22*	.06
Age 8									
6. SDQ-irritability (0-6)	1.5 (1.3)	1.3 (1.3)	.27*	.17*	−.11	.21*	.33*		.16*
Age 11									
7. YSR-child internalizing symp. (0-62)	10.9 (6.1)	9.3 (5.4)	.05	.12	−.05	.10	.19*	.22*	

Note. For Pearson´s correlations, values for females are in the lower-left triangle and values for males are in the upper-right triangle; * $p < .05$.

Table 2. Standardized indirect effects

X variable	Y variable	Mediator/s	Standardized parameter	*p*-value
Maternal internalizing symptoms	Child internalizing symptoms			
		Positive parenting	.01	.346
		Inconsistent parenting	–.01	.623
		Punitive parenting	.01	.396
		Irritability	.04	**.015**
		Positive parenting; Irritability	.00	.422
		Inconsistent parenting; Irritability	.00	.409
		Punitive parenting; Irritability	.01	.137

In bold: statistically significant effects.

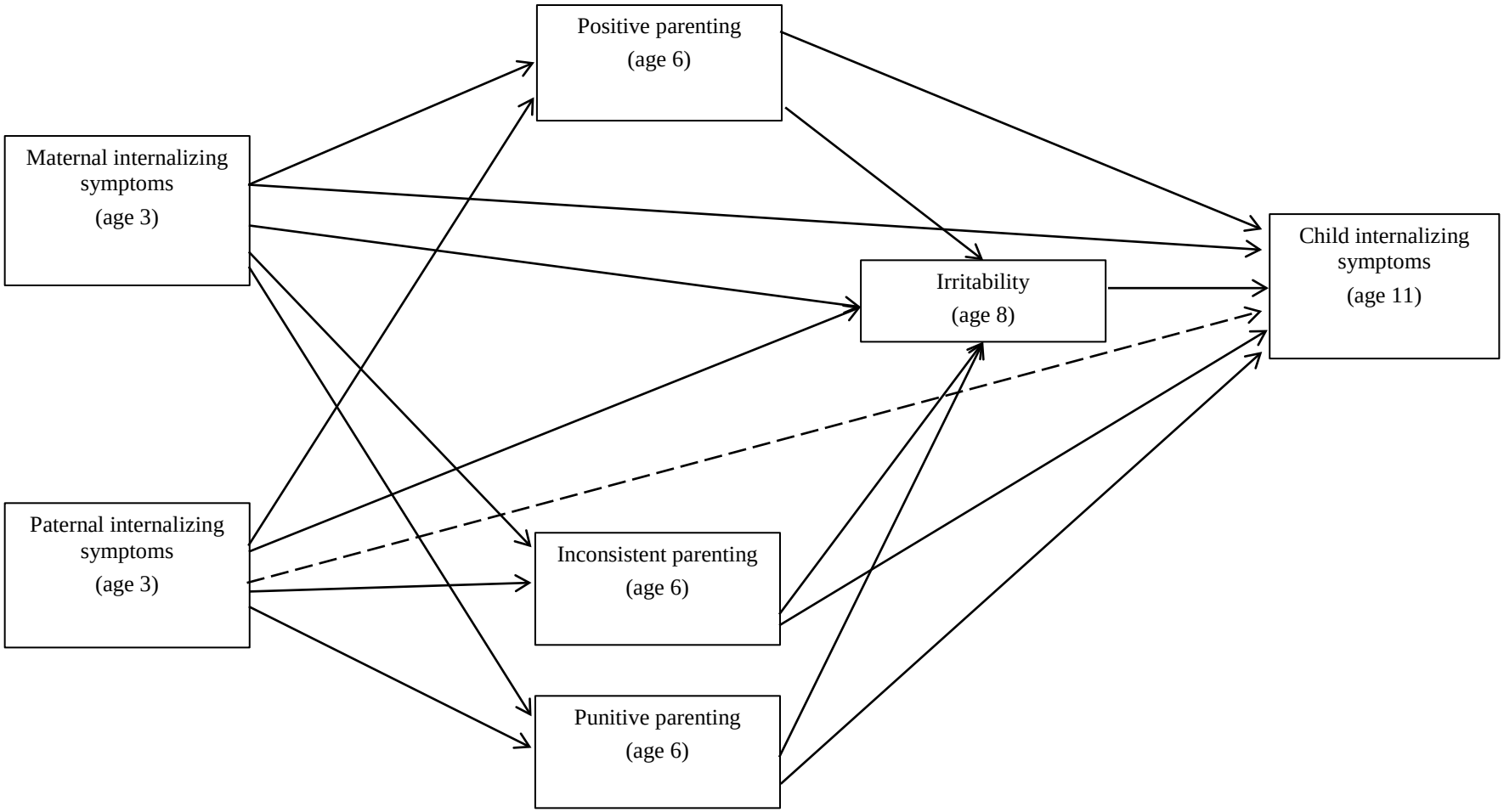

Figure 1. Hypothesized path model for child internalizing symptoms. The discontinued-line indicates a path hypothesized only for boys.

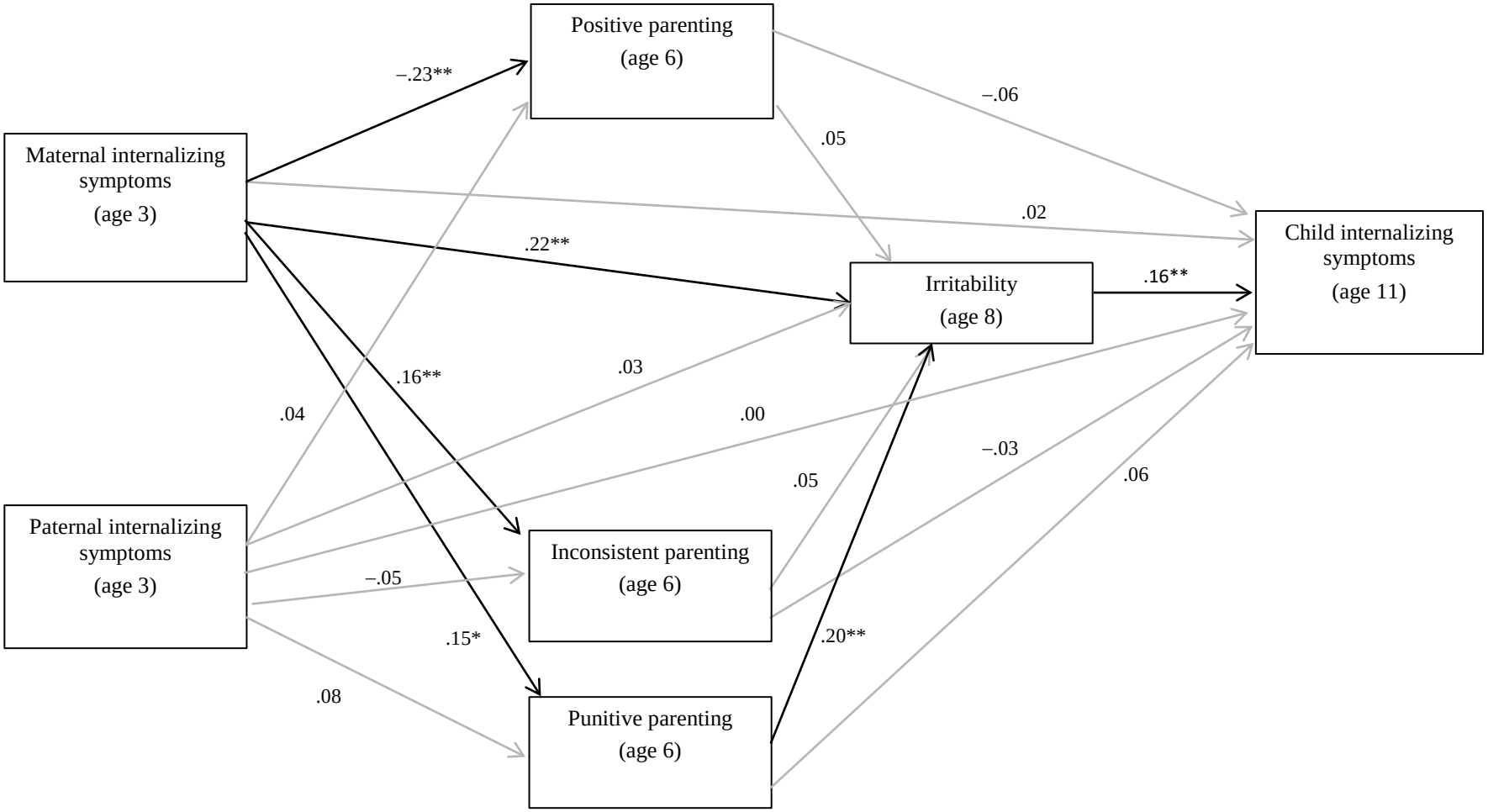

Figure 2. Final one-group model for the whole sample including standardized path coefficients (SES and conduct problems scores at age 3 included as covariates are not shown). Note: *$p < .05$, **$p < .01$. The black lines indicate significant effects and the grey lines non-significant associations.