

Parenting practices as mediating variables between parents' psychopathology and oppositional defiant disorder in preschoolers

Esther Trepát, Roser Granero and Lourdes Ezpeleta
Universitat Autònoma de Barcelona

Abstract

Background: Oppositional defiant disorder (ODD) is very frequent in preschoolers. The severity and the long-term negative outcomes make the understanding of this disorder a priority. The goal in this study was to assess the mediating role of parenting practices in the relationship between parents' psychopathology and ODD in preschoolers. **Method:** A community sample of 622 children was assessed longitudinally at age 3 and age 5. Parents reported on children's psychopathology through a diagnostic interview, and on their own psychological state and parenting style through questionnaires. **Results:** At ages 3 and 5, corporal punishment mediated the relationships between mothers' anxiety-depression and ODD (in girls), between mothers' aggressive behavior and ODD (in boys), and between parents' rule-breaking and ODD both in boys and girls. For both sexes, there was a direct association between mothers' aggressive behavior score and ODD. The association between fathers' psychopathology and ODD was not mediated by the fathers' parenting practices. Fathers' anxiety-depression and aggressive behavior scores were directly associated with ODD. **Conclusions:** Parents' psychopathology must be explored and, in families where such psychopathology is a relevant variable, parenting practices must be addressed with a view to the prevention and treatment of children's ODD in the preschool years.

Keywords: Oppositional defiant disorder, parental psychopathology, parenting, preschoolers.

Resumen

Las prácticas educativas de los padres como variables mediadoras entre la psicopatología parental y el trastorno negativista desafiante en preescolares. Antecedentes: la frecuencia del trastorno negativista desafiante (TND) y las consecuencias negativas a largo plazo hacen que la comprensión de este trastorno sea una prioridad. El objetivo de este estudio fue evaluar el papel mediador de determinadas prácticas educativas en la relación entre la psicopatología de los padres y el TND de los hijos. **Método:** una muestra comunitaria de 622 niños se evaluó longitudinalmente a los 3 y 5 años. **Resultados:** a los 3 y 5 años el castigo corporal medió la relación entre la ansiedad - depresión de la madre y TND (en las niñas), entre el comportamiento agresivo de la madre y TND (en los niños) y entre la ruptura de normas de las madres y TND en ambos sexos. Existe una asociación directa entre la puntuación de la conducta agresiva de la madre y el TND. El estilo educativo del padre no medió la asociación entre la psicopatología del padre y TND. Ansiedad - depresión y comportamiento agresivo del padre se asoció directamente con TND. **Conclusiones:** se debe explorar la psicopatología parental en familias de niños con TND y considerar las prácticas educativas como variables relevantes para la prevención y el tratamiento del TND.

Palabras clave: Trastorno Negativista Desafiante, psicopatología parental, crianza, preescolares.

Oppositional defiant disorder (ODD) is very frequent in preschoolers, the prevalence of this disorder being in the range 6.6% to 13.4% (Bufferd, Dougherty, & Carlson, 2011; Ezpeleta, de la Osa, & Doménech, 2014), with no sex differences being found as regards its prevalence in this age group. The severity and variety of conditions comorbid with ODD (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004), its persistence over time (Copeland, Shanahan, Costello, & Angold, 2009) and the long-term negative outcomes associated with it (delinquency, substance abuse, etc.) (Silver, Measelle, Armstrong, & Essex, 2010) make the understanding and prevention of this disorder a high priority.

Previous studies have shown that the clinical condition of ODD in boys and in girls presents differences in symptomatology, severity, associated impairment and comorbidity (Trepát & Ezpeleta, 2011), which must all be taken into account in investigation of this disorder.

ODD is understood to result from the interaction of the child's individual characteristics (e.g., a temperament characterized by negative emotionality) and the characteristics of the context. Contextual risk factors for ODD have been related to parental psychopathology, marital discord, disorganized families and parenting style characterized by practices such as corporal punishment and inconsistent discipline.

Regarding parental psychopathology, major depression (Goodman, Rouse, Connell, Broth, Hall, & Heyward, 2011), hostility (Nordahl, Wells, Olsson, & Bjerkeset, 2010), a history of antisocial behavior (Davies, Sturge-Apple, Cicchetti, Manning, & Vonhold, 2012), substance abuse (Nordahl, Wells, Olsson, & Bjerkeset, 2010; West & Newman, 2003) and Attention Deficit

Hyperactivity Disorder (ADHD) (Goldstein, Harvey, Friedman-Weieneth, Courteny, Tellert, & Sippel, 2007) have been associated with ODD in the child. It has been hypothesized that mental health problems in the parents influence other mediating variables, such as quality of attachment, quality of the relationship with the child, quality of the care provided or parenting style.

Currently, there is a broad consensus about Maccoby and Martin's (1983) proposal of a theoretical model of parenting styles, in which the dimensions of demandingness, operationalized with measures of severity and parental firmness (Steinberg, 2005), and responsiveness, operationalized with measures of affection and acceptance (Steinberg, 2005), are theoretically orthogonal (Darling & Steinberg, 1993). The result of the combination of these two dimensions is four types of parenting style: Authoritative (high levels of acceptance / involvement and strictness-imposition), Indulgent (high levels of acceptance / but low levels of involvement strictness-imposition), Authoritarian (low levels of acceptance / involvement and high levels of strictness-imposition) and Neglectful (low levels of acceptance / involvement and strictness-imposition) (Maccoby & Martin, 1983). Recent studies indicate that the impact of different parenting styles in psychosocial adjustment may vary depending on cultural differences (García & Grace, 2014; Musito & García, 2004).

In the context of different parenting styles, practices such as harsh punishment with frequent beatings or inconsistent discipline predict behavior problems both in children and adolescents (Loeber, Burke, & Pardini, 2009).

The difficult temperamental characteristics of the child make it more difficult for the parents to manage child's behavior and to apply adequate practices (Burke, Pardini, & Loeber, 2008). The effect of rearing style may differ between boys and girls, and is more closely linked to externalizing problems in boys. Leve, Kim and Pears (2005) reported that harsh discipline at age 5 predicted behavior problems 12 years later in boys; in girls, on the other hand, this association was found only in those who scored low in shyness or high in impulsivity.

Studies on the relationship between parental psychopathology, rearing style and ODD in preschoolers are scarce. Lavigne, Gouze, Hopkins, Bryant, and LeBailly (2012) examined the mediating variables in the association between parental depression and ODD in a community sample of children aged 4, and found that parenting style (high levels of hostility, low levels of support, and quality of scaffolding) and the child's temperament (including negative affect and sensory regulation) mediated this relation.

The study of these variables is complicated in view of two main difficulties. First, most studies do not focus on ODD per se, because they consider ODD in combination with conduct disorders or ADHD, so that the specific correlates of ODD are unclear (Greene, Bierderman, Zerwas, Monuteaux, Goring, & Faraone, 2002). And second, most research concentrates on the mother's psychopathology, with scant representation of the father's (Phares, López, Fields, Komboukos, & Duhig, 2005); moreover, when the father is included, it is common to combine the psychological data he provides with the data from the mothers, so that they become mixed up and it is impossible to know the relative contribution of each parent.

Therefore, more studies are needed on the mechanisms related to parental psychopathology, rearing style and ODD that overcome the limitations mentioned and focus on preschoolers – the age at which this disorder usually starts –, analyzing the relationships

longitudinally in the general population. The main purpose of the present study is to assess the extent to which parenting practices mediate the relation between parental psychopathology (either mother's or father's) and ODD. As a complementary measure, we assess the invariance of mediational models according to children's sex.

Method

Participants

Participants were part of a longitudinal study on ODD from age 3, carried out with a two-phase (also called double) sampling design (the research is detailed in Ezpeleta, de la Osa, & Doménech, 2014). Initially, 2283 children were invited to participate, randomly selected from the Barcelona (Spain) census of schools for the academic year 2009-10 and preschoolers 3 years-old. Fifty-four schools were represented, 25.9% of which were grant-assisted private and 74.1% public (state-funded). A total of 1341 families (58.7%) agreed to participate in the first-phase sampling. There were no sex differences ($p = .951$) between those who agreed to take part and those who did not, but participation was higher in the public schools than the private (semi-public) schools (44.4 vs. 35.7%; $p < .001$) and in families with higher socio-economic status (92.7% high-level vs. 39.5% low-level; $p < .001$).

The first-sampling phase included a screening tool to ensure the inclusion of children with possible psychopathological problems: the parent's version of the *Strengths and Difficulties Questionnaire (SDQ)* (Goodman, 1997). Four questions were added to cover all the DSM-IV diagnostic criteria for ODD. One hundred and thirty-five cases (10.6%) refused to participate in the second phase. These cases did not differ in sex ($p = .815$) or type of school ($p = .850$) from those who agreed to participate, but children who did agree to participate were from a higher socioeconomic status (86.2 vs. 73.6 %; $p = .007$). All the families with positive screening were invited to participate in the second phase and the follow-up, as well as 30% of the families with negative screening. The positive screening group included 417 children (206 boys; 49.4%) and the negative screening group, 205 children (105 boys; 51.2%). Children with intellectual disability or pervasive developmental disorder were excluded, as were those from families that did not speak Spanish, those whose primary caregivers were unable to provide reports, and those from families that were planning to move during the year following the beginning of the study (in total, 75 children were excluded). The final sample included 622 children and their parents (demographic data are shown in Table 1), who were included in the follow-up and assessed with the complete battery of measures.

Instruments

The *Diagnostic Interview for Children and Adolescents for Parents of Preschool Children (DICA-PPC)* (Reich & Ezpeleta, 2009) was used for the diagnosis of ODD, following the *Diagnostic and statistical manual of mental disorders-text revision (4th ed.)* (American Psychiatric Association, 2000) criteria. This instrument has shown good test-retest reliability and moderate convergence with other psychopathology measures (Ezpeleta, de la Osa, Granero, Doménech, & Reich, 2011). The interview was administered to parents when the children were aged 3 ($n = 622$)

Table 1
Demographic characteristics of the sample (N = 622)

Child			
Age (mean; SD)	3.8 (.33)	School (n; %)	
Sex (N; %)		Public	397 (63.8)
Male	311 (50.0)	Semi-public	225 (36.2)
Race/ethnicity (N; %)		Living with... Both biological parents	585 (94.7)
Non-Hispanic white	557 (89.5)	(n; %)	
Hispanic- American	46 (7.4)	Adoptive parents	7 (1.1)
Other	19 (3.1)	Reconstructed family	9 (1.5)
		One-parent family	30 (4.8)
Family socioeconomic status (N; %)		Born outside Spain (n; %)	
High	205 (33.0)	Child	19 (3.1)
Mean-high	280 (45.0)	Mother	88 (14.2)
Low	137 (22.0)	Father	94 (15.6)
Parents		Mother	Father
Age (mean; SD)		36.4 (4.7)	38.6 (5.8)
Education (N; %)			
College/university		340 (54.7)	279 (45.7)
High school/incomplete college		178 (28.6)	197 (32.2)
Middleschool/incomplete high school		92 (14.8)	122 (20.0)
Elementary school or less		12 (1.9)	13 (2.1)
Occupation (N; %)			
Major/minor professional/administration		279 (45.1)	273 (45.7)
Technician/Clerical/Skilled		200 (32.3)	237 (39.6)
Unskilled		140 (22.6)	88 (14.7)
Unemployed		112 (18.0)	46 (7.4)
Education unavailable for 11 parents			

and 5 (n = 574). No differences in sex (p = .238) or socioeconomic status (p = .068) were found associated with drop-out during the follow-up.

The *Alabama Parenting Questionnaire-Pr* (APQ-Pr; de la Osa, Granero, Penelo, Doménech, & Ezpeleta, 2013) is the Spanish version for parents of preschoolers of the *Alabama Parenting Questionnaire* (Frick, 1991). The APQ has been widely used to assess the behavior of parents of children with externalizing disorders. It has 42 items, clustered in 5 subscales: parental involvement, positive parenting, poor monitoring/supervision, inconsistent discipline and corporal punishment. It was answered by 570 mothers and 306 fathers of 3-year-old children. The Spanish version of the APQ, which was used in the same sample of our study, shows between moderate to very good internal consistency.

Adult Self-Report (ages 18-59 years) (ASR; Achenbach & Rescorla, 2003). This instrument assesses behavioral problems in adults aged 18 to 59. The Emotional And Behavioral Problems section includes 8 empirical syndromes that can be classified as internalizing problems (Anxious/Depressed, Withdrawn, Somatic Complaints and Thought problems) and externalizing problems (Attention problems, Aggressive behavior, Rule-breaking behavior, and Intrusive). Mothers (N = 570) and fathers (N = 306) answered the questionnaire when their children were aged 3. Internal consistency for mothers' reports ranged between .58

for the Intrusive scale and .92 for the total score, and for fathers' reports, it ranged between .54 for Rule-Breaking behavior and .93 for the total score.

Procedure

The study was approved by the ethics review committee of the author's institution. All 3-year-old preschoolers along with their families were invited to take part. The heads of the participating schools, as well as the children's parents, received a complete description of the study. Families were recruited at the schools and gave written consent. All parents of children from P3 (3 years-olds) in the participating schools were invited to answer the SDQ at home and return it to the schools. Families who agreed and met the screening criteria were contacted by phone and interviewers trained in the use of the DICA-PPC carried out the diagnostic interview with the parents at the school. Interviewers were blind to interviewees' screening group. All the interviews were recorded and supervised. On the same day as the interview, parents answered the APQ-Pr and ASR.

Data analysis

The mediational hypotheses were tested by means of Structural Equation Modeling (SEM) with STATA13 for Windows. Separate pathways were computed for the ASR/APQ-mother's and ASR/APQ-father's reports, and given the two-phase sampling, the *sampling weights procedure* was used, assigning to each participant a weight equal to the inverse probability of selection in the second phase of the design. Invariance of the structural parameters across children's sex was assessed through the group-level post-estimation procedure (*invariant test*). Overall goodness-of-fit statistics were assessed using the χ^2 test, the root mean square error of approximation (RMSEA), baseline comparison indexes (comparative fit index, CFI, and Tucker-Lewis index, TLI) and residual size (standardized mean square residual, SMSR). A fit was considered to be good if (Kline, 2010): a non-significant result (p > .05) was obtained for the χ^2 test, the RMSEA was under .08, the CFI-TI coefficients were above .90 and the SRMR was no higher than .08. The equation-level goodness-of-fit and effect sizes were also calculated via R² coefficients for each equation and for the global model (these coefficients measure the proportion of the variance explained by the indicator/s), multiple correlation (mc) and the Bentler-Raykov multiple correlation (mc²; Bentler & Raykov, 2000). The two last-mentioned coefficients indicate the relatedness of each dependent variable to the linear prediction of the model (in non-recursive models, mc² is computed to avoid the problem of obtaining inconsistent negative multiple correlations).

Results

Table 2 shows the Pearson correlations between the variables considered for the paths. The independent and mediating variables selected for the SEM were those with the strongest associations with ODD outcome (measured as the total number of symptoms in the diagnostic interview, labeled ODD-symptoms in this section). As the number of ASR scales (independent variables of the paths) was too high to permit a good level of fit, various shorter paths were tested previously, in a first step, so as to choose those with the

best fit (the scales selected were Anxious-Depressed, Aggressive Behavior and Rule-Breaking). For the APQ scales (mediating variables), Corporal Punishment and Inconsistent Discipline were selected for their strong relationships with ODD-symptoms.

Table 3 shows the results of the final structural equation models, and Figure 1 the path diagrams and standardized structural coefficients. The mothers' path yielded good fit: $\chi^2 = 5.75, p = .219$; RMSEA = .029, CFI = .992, TLI = .965 and SRMR = .018. Predictive ability for the overall pathway was also good ($R^2 = .156$). Assessment of invariance by children's sex yielded a significant result ($\chi^2 = 23.9, p = .047$), indicating that some structural coefficients were different for boys and girls (in the path diagram the different lines for each gender represent coefficients with non-invariance; separate results by sex are shown in Table 3). Corporal punishment mediated the relationships between mother's Anxiety-Depression and ODD-symptoms at ages 3 and 5 (for girls), between mother's Aggressive Behavior and ODD-symptoms at ages 3 and 5 (for boys), and between Rule-Breaking

and ODD-symptoms at ages 3 and 5 for both boys and girls. For both genders, there was a direct association between Aggressive Behavior score and ODD-symptoms. Parents' Rule-Breaking was associated with Inconsistent Parenting style, but the path did not continue to ODD-symptoms.

Fathers' path also yielded adequate goodness of fit, though it was poorer than that of the mothers: $\chi^2 = 8.51, p = .075$; RMSEA = .063, CFI = .940, TLI = .729 and SRMR = .030. Overall predictive capacity was also lower than for mothers ($R^2 = .088$). Assessment of invariance by children's sex yielded a non-significant result ($\chi^2 = 14.6, p = .405$), indicating that structural coefficients were statistically equal for boys and girls. The association between father's psychopathology and ODD-symptoms was not mediated by the father's rearing style. Father's Anxiety-Depression and Aggressive Behavior score was directly associated with ODD-symptoms. Parents' Rule-Breaking was associated with Inconsistent Parenting style, but the path did not continue to ODD-symptoms.

Table 2
Correlation matrix

Mothers (n = 570)		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
APQ-positive parenting	(1)	.70	.07	-.09	-.31	.25	.11	.03	.03	-.08	.00	-.12	-.16	-.10	-.05	-.14	-.02
APQ: involvement	(2)	–	.00	-.19	-.37	.18	.11	-.04	-.03	-.14	-.11	-.14	-.20	-.17	-.07	-.14	-.04
APQ: poor monitoring	(3)		–	.13	.16	.06	.01	.01	.07	.08	.06	.15	.05	.08	.05	.06	.13
APQ: corporal punishment	(4)			–	.13	-.03	-.05	.17	.21	.15	.20	.14	.12	.13	.10	.06	.09
APQ: inconsistent	(5)				–	-.15	-.13	.11	.05	.18	.22	.18	.18	.11	.14	.19	.16
APQ: norms	(6)					–	.33	-.01	-.04	-.13	-.10	-.16	-.22	-.15	-.09	-.22	-.01
APQ: autonomy	(7)						–	-.08	-.09	-.18	-.12	-.14	-.19	-.12	-.12	-.22	-.08
# ODD symptoms (age 3)	(8)							–	.41	.17	.18	.08	.10	.15	.15	.15	.05
# ODD symptoms (age 5)	(9)								–	.10	.12	.06	.10	.15	.06	.08	.02
ASR-Mother: anxious-depr.	(10)									–	.60	.38	.55	.55	.53	.67	.28
ASR-Mother: aggressive	(11)										–	.48	.39	.41	.44	.43	.45
ASR-Mother: rule-breaking	(12)											–	.32	.27	.38	.44	.47
ASR-Mother: withdrawn	(13)												–	.38	.42	.39	.09
ASR-Mother: somatic	(14)													–	.48	.49	.22
ASR-Mother: thought	(15)														–	.46	.32
ASR-Mother: attention	(16)															–	.29
ASR-Mother: intrusive	(17)																–
Fathers (n = 306)		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
APQ-positive parenting	(1)	.41	.19	-.02	-.08	.29	.12	.12	.05	.00	-.07	-.03	-.02	.00	-.03	-.10	-.02
APQ: involvement	(2)	–	.19	-.13	-.10	.25	.27	.01	.03	-.04	-.01	.00	-.03	-.03	-.10	-.11	.03
APQ: poor monitoring	(3)		–	.08	.19	.18	.04	.08	.12	.07	.10	.10	.02	.06	.09	.10	.09
APQ: corporal punishment	(4)			–	.17	.06	-.08	.10	.17	.07	.06	.10	.02	-.04	.03	-.03	.08
APQ: inconsistent	(5)				–	-.12	-.12	.07	.11	.16	.22	.18	.00	.10	.24	.17	.15
APQ: norms	(6)					–	.34	-.02	-.08	-.09	-.06	.00	-.08	-.08	-.03	-.14	-.08
APQ: autonomy	(7)						–	-.12	-.15	-.12	-.04	-.01	-.01	-.03	-.05	-.09	-.07
# ODD symptoms (age 3)	(8)							–	.36	.10	-.03	.05	.09	-.05	.03	.07	-.03
# ODD symptoms (age 5)	(9)								–	.13	.07	.17	-.02	-.03	.19	.15	.14
ASR-Father: anxious-depr.	(10)									–	.66	.39	.48	.51	.60	.65	.40
ASR-Father: aggressive	(11)										–	.47	.47	.45	.50	.47	.55
ASR-Father: rule-breaking	(12)											–	.27	.28	.45	.42	.54
ASR-Father: withdrawn	(13)												–	.25	.25	.41	.16
ASR-Father: somatic	(14)													–	.42	.41	.31
ASR-Father: thought	(15)														–	.38	.44
ASR-Father: attention	(16)															–	.30
ASR-Father: intrusive	(17)																–

Table 3
Structural equation modeling for mothers' reports

	Invariance (sex)		Structural equation model							
	χ^2	<i>p</i>	Coeff.	SE	<i>z</i>	<i>p</i>	95% CI (coeff.)	<i>R</i> ²	mc	mc ²
<i>Mothers' reports</i>										
APQ_Corporal								.072	.269	.072
ASR_Anxiety/depres.	6.05	.014	0.055 ^G	0.020	2.68	.007	0.015 0.095			
			-0.020 ^B	0.022	-0.089	.371	-0.065 0.024			
ASR_Aggressive	3.89	.049	0.018 ^G	0.026	0.67	.500	-0.034 0.069			
			0.093 ^B	0.028	3.37	.001	0.039 0.147			
ASR_Rules	1.69	.193	0.076	0.038	1.980	.047	0.001 0.151			
APQ_Inconsis								.060	.245	.060
ASR_Anxiety/depres.	0.58	.445	0.046	0.031	1.500	.133	-0.014 0.107			
ASR_Aggressive	0.95	.330	0.051	0.038	1.340	.182	-0.024 0.126			
ASR_Rules	3.51	.061	0.214	0.076	2.810	.005	0.065 0.364			
ODD (age 3)								.079	.281	.079
APQ_Corporal	0.44	.508	0.175	0.055	3.170	.002	0.067 0.282			
APQ_Inconsis	1.72	.190	0.052	0.027	1.880	.060	-0.002 0.106			
ASR_Anxiety/depres.	2.76	.097	0.037	0.019	1.890	.059	-0.001 0.075			
ASR_Aggressive	0.20	.652	0.059	0.024	2.420	.015	0.011 0.107			
ASR_Rules	1.58	.208	-0.078	0.048	-1.610	.107	-0.173 0.017			
ODD (age 5)								.201	.449	.201
APQ_Corporal	0.48	.488	0.134	0.047	2.860	.004	0.042 0.226			
APQ_Inconsis	0.87	.769	-0.027	0.023	-1.160	.247	-0.073 0.019			
ODD (age 3)	0.79	.375	0.388	0.037	10.460	<.001	0.315 0.460			
<i>Fathers' reports</i>										
APQ_Corporal								.016	.127	.016
ASR_Anxiety/depres.	0.35	.555	0.001	0.024	0.00	.998	-0.046 0.047			
ASR_Aggressive	4.78	.029	0.006	0.027	0.21	.830	-0.046 0.058			
ASR_Rules	0.59	.444	0.080	0.046	1.73	.084	-0.011 0.171			
APQ_Inconsis								.047	.217	.047
ASR_Anxiety/depres.	0.25	.617	-0.007	0.038	-0.18	.860	-0.082 0.068			
ASR_Aggressive	1.01	.314	0.060	0.043	1.41	.158	-0.023 0.144			
ASR_Rules	1.93	.165	0.163	0.075	2.18	.029	0.016 0.309			
ODD (age 3)								.054	.233	.054
APQ_Corporal	0.21	.650	0.183	0.083	2.20	.028	0.020 0.346			
APQ_Inconsis	0.29	.592	0.084	0.052	1.63	.102	-0.017 0.186			
ASR_Anxiety/depres.	0.02	.902	0.077	0.033	2.35	.019	0.013 0.142			
ASR_Aggressive	0.36	.551	-0.095	0.037	-2.58	.010	-0.167 -0.023			
ASR_Rules	3.44	.064	0.059	0.065	0.91	.362	-0.068 0.186			
ODD (age 5)								.159	.399	.159
APQ_Corporal	0.01	.979	0.083	0.073	1.14	.256	-0.060 0.227			
APQ_Inconsis	1.85	.174	0.025	0.045	0.56	.574	-0.062 0.112			
ODD (age 3)	0.17	.678	0.354	0.051	6.88	<.001	0.253 0.455			

mc: multiple correlation between dependent variable and its prediction. mc²: Bentler-Raykov squared mc-coefficient.
Coefficients differentiate by sex for significant invariance: ^Ggirls and ^Bboys

Discussion

The interest of this study resided in identifying the variables that mediate in the association between parental psychopathology and ODD in preschoolers from the general population. We found that mother's parenting style characterized by corporal or harsh punishment mediates the association between maternal psychopathology and ODD; father's psychopathology was directly related to ODD, with no mediation of rearing style.

Previous studies suggest that parenting style, conditioned by parental depression, facilitates the emergence of behavioral problems in children (Davies et al., 2012). Depressed mothers present more irritability, emotional arousal alteration and difficulties in emotional management, and tend to interpret their children's behavior with a negative attribution bias. All such aspects make depressed mothers' parenting style more inappropriate, reduce the quality of mother-child interaction and render the family environment more stressful (Goodman et al.,

2011), which, in turn, makes increased use of corporal punishment more probable (Lavehoy, Graczyk, O'Hare, & Neuman, 2000). Likewise, corporal punishment can provoke anger in the children

and this can bring about the typical oppositional and defiant behaviors, whereas perceiving their mothers as hostile can make children react with even more hostility. Consistent with previous

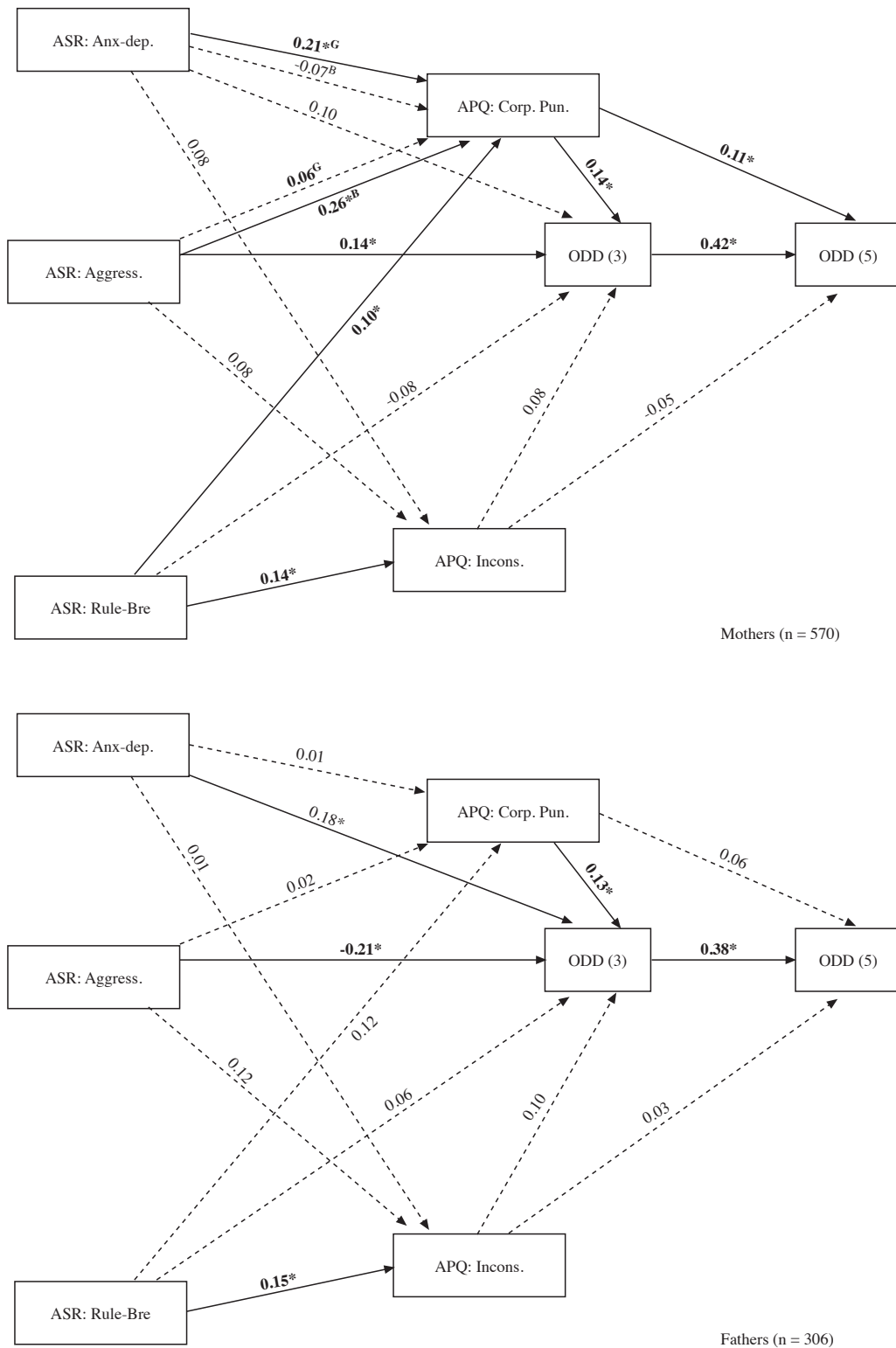


Figure 1. Structural Equation Model (standardized coefficients).
 * Bold and unbroken line: significant parameter.
 Coefficients differentiate by sex for significant invariance: ^Ggirls and ^Bboys

studies, in our sample of Spanish children, the use of punishment could be perceived by the children in this culture as intrusive and coercive (García & Grace, 2014; White & Schnurr, 2012), thereby increasing their behavioral problems rather than helping to control them.

Lately, literature highlights the importance of examining separately the contribution of mothers and fathers in the context of child psychopathology. Harper, Brown, Arias and Brody (2006), for example, pointed out the need of analyzing separately the effects of corporal punishment by mothers and fathers, as the impact of corporal punishment on the children may vary by sex of the parent who punishes. Also, Gershoff (2002) observes that mothers punish more than fathers. Xu, Tung and Dunaway (2000) propose that the greater frequency of corporal punishment by mothers may be attributable to the greater amount of time they spend with their children, given that women continue to be the primary caregivers even when they are also in paid employment. In this line, we contribute to determining the differential pathway of mothers' and fathers' psychological problems to ODD, which may be useful to plan different treatments for mothers and fathers with mental health problems.

The mediational path was different for boys and girls. Previous studies on sex differences and rearing styles have reported contradictory results (Tung, Li, & Lee, 2012). David and Lyons-Ruth (2005) found that girls responded with more approach than boys to mothers who threatened and punished, suggesting behavioral differences by sex at early ages in response to negative environmental stressors. Other studies, in contrast, found no such differences by sex (Browne, Oduyungbo, Thabane, Byrne, & Smart, 2010). More research is needed to ascertain whether parenting styles might affect boys and girls differently in the development of behavioral problems.

Our study also shows a direct association between parents' aggressive behavior and ODD. Aggressive behaviors are learnt by modeling, but they are also transmitted genetically, so that if the father presents aggressive behavior, there is a higher probability that his children will show defiant and aggressive behaviors (Davies et al., 2012).

The results of this study have several implications for the development and implementation of prevention and treatment programs for ODD. Given the mediating role of corporal punishment, one of the goals of ODD prevention programs should be to train mothers who present anxiety-depression and/or aggressive and antisocial behavior in parenting strategies that can serve as an appropriate alternative to the use of corporal punishment. Intervention programs focused on parents' training in behavior modification techniques have shown their efficacy in the context of ODD treatment (Webster-Stratton & Reid, 2010).

Another focus of ODD prevention programs should be parental psychopathology, which has been confirmed as a risk factor for the origin and maintenance of behavior problems in preschool children.

In conclusion, the results of this study on ODD in preschoolers support the mediating role of the parenting style characterized by the use of corporal punishment and the role of sex as an influential variable in the action mechanisms operating between parenting style, parental psychopathology and ODD. They also highlight the need to consider the psychopathology of mothers and fathers separately.

The present study has several strengths, including the sample size, its longitudinal approach, the separate study of mothers' and fathers' psychopathology, the analysis of sex differences, the specific study of ODD and the use of a semi-structured interview for diagnosis of the disorder. Nevertheless, it should be mentioned that, even if the fathers' sample is worthy of consideration, fewer fathers than mothers participated in our study.

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References

- Achenbach, T.M., & Rescorla, L.A. (2003). *Manual for the ASEBA Adult Forms and Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth and Families.
- American Psychiatric Association (2000). *DSM-IV-TR Diagnostic and Statistical Manual of Disorders* (4th ed). Washington, DC: Author.
- Bentler, P.M., & Raykov, T. (2000). On measures of explained variance in nonrecursive structural equation models. *Journal of Applied Psychology, 85*, 125-131.
- Browne, D.T., Oduyungbo, A., Thabane, L., Byrne, C., & Smart, L.A. (2010). Parenting by gender interactions in child psychopathology: Attempting to address inconsistencies with a Canadian national database. *Child and Adolescent Psychiatric Mental Health Journal, 4*, 1-13.
- Bufferd, S.J., Dougherty, L.R., Carlson, G.A., & Klein, D.N. (2011). Parent-reported mental health in preschoolers: Findings using a diagnostic interview. *Comprehensive Psychiatry, 52*, 359-369.
- Burke, J.D., Pardini, D.A., & Loeber, R. (2008). Reciprocal relationships between parenting behavior and disruptive psychopathology from childhood through adolescence. *Journal of Abnormal Child Psychology, 36*, 679-692.
- Copeland, W.E., Shanahan, L., Costello, E.J., & Angold, A. (2009). Childhood and adolescent psychiatric disorders as predictors of young adult disorders. *Archives of General Psychiatry, 66*(7), 764-772.
- Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin, 113*, 487-496.
- David, D.H., & Lyons-Ruth, K. (2005). Differential attachment responses of male and female infants to frightening maternal behavior: Tend and befriend versus fight or flight? *Infant Mental Health Journal, 21*, 1-18.
- Davies, P.T., Sturge-Apple, M.L., Cicchetti, D., Manning, L.G., & Vonhold, S.E. (2012). Pathways and processes of risk in associations among maternal antisocial personality symptoms, interparental aggression, and preschoolers' psychopathology. *Development and Psychopathology, 24*, 807-832.
- Ezpeleta, L., Osa, N.D.L., & Doménech, J.M. (2014). Prevalence of DSM-IV disorders, comorbidity and impairment in 3-year-old Spanish preschoolers. *Social Psychiatry and Psychiatric Epidemiology, 49*(1), 145-155.

- Ezpeleta, L., Osa, N.D.L., Granero, R., Doménech, J.M., & Reich, W. (2011). The diagnostic interview for children and adolescent for parents of preschool children. *Psychiatry Research*, *190*, 137-144.
- Frick, P.J. (1991). *The Alabama parenting questionnaire*. Unpublished rating scale, University of Alabama.
- García, F., & Gracia, E. (2014). The indulgent style and developmental outcomes in South European and Latin American countries. In H. Selin (Ed.), *Parenting across cultures: Childrearing, motherhood and fatherhood in non-Western cultures* (Vol. 7, pp. 419-433). Dordrecht, Netherlands: Springer.
- Gershoff, E.T. (2002). Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychological Bulletin*, *128*(4), 539-579.
- Goldstein, L.H., Harvey, E.A., Friedman-Weieneth, J.L., Courteny, P., Tellert, A., & Sippel, J.C. (2007). Examining subtypes of behavior problems among 3-year-old children, Part II: Investigating differences in parent psychopathology, couple conflict, and other family stressors. *Journal of Abnormal Child Psychology* *35*, 111-123.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology & Psychiatry*, *38*, 581-586.
- Goodman, K.E., Rouse, M.H., Connell, A.M., Broth, M.R., Hall, C.M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, *14*, 1-27.
- Greene, R.W., Biederman, J., Zerwas, S., Monuteaux, M.C., Goring, J.C., & Faraone, S.V. (2002). Psychiatric comorbidity, family dysfunction, and social impairment in referred youth with Oppositional Defiant Disorder. *American Journal of Psychiatry*, *159*, 1214-1224.
- Harper, F.W.K., Brown, A.M., Arias, I., & Brody, G. (2006). Corporal punishment and kids: How do parent support and gender influence child adjustment? *Journal of Family Violence*, *21*(3), 197-207.
- Kline, R.B. (2010). *Principles and practice of structural equation modeling* (3rd ed.). New York, New York: Guilford Press.
- Lavehoy, M.C., Graczyk, P.A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review*, *20*(5), 561-592.
- Lavigne, J.V., Gouze, K.R., Hopkins, J., Bryant, F.B., & LeBailly, S. (2012). A Multi-Domain Model of risk factors for ODD symptoms in a community sample of 4-year-olds. *Journal of Abnormal Psychology*, *40*, 741-757.
- Leve, L.D., Kim, H.K., & Pears, K.C. (2005). Childhood temperament and family environment as predictors of internalizing and externalizing trajectories from ages 5 to 17. *Journal of Abnormal Child Psychology*, *33*, 505-520.
- Loeber, R., Burke, J.D., & Pardini, D.A. (2009). Development and etiology of disruptive and delinquent behavior. *Annual Review of Clinical Psychology*, *5*, 291-310.
- Maccoby, E.E., & Martin, J.A. (1983). Socialization in the context of the family: Parent-child interaction. In P.H. Mussen (Ed.), *Handbook of child Psychology* (Vol. 4, pp. 1-101). New York: Wiley.
- Maughan, B., Rowe, R., Messer, J., Goodman, R., & Meltzer, H. (2004). Conduct disorder and oppositional defiant disorder in a national sample: Developmental epidemiology. *Journal of Child Psychology & Psychiatry*, *45*(3), 609-621.
- Musito, G., & García, J.F. (2004). Consecuencias de la socialización familiar en la cultura española. *Psicothema*, *16*, 288-293.
- Nordahl, H., Wells, A., Olsson, C., & Bjerkeset, O. (2010). Association between abnormal psychosocial situations in childhood, generalized anxiety disorder and oppositional defiant disorder. *Australian and New Zealand Journal of Psychiatry*, *44*, 852-858.
- Osa, N. de la, Granero, R., Penelo, E., Doménech, J.M., & Ezpeleta, L. (2014). Psychometric properties of the Alabama Parenting Questionnaire - Preschool revision (APQ-Pr) in 3 year-old Spanish preschoolers. *Journal of Child and Family Studies*, *23*, 776-784.
- Phares, V., López, E., Fields, S., Kamboukos, D., & Duhig, A.M. (2005). Are fathers involved in pediatric Psychology research and treatment? *Journal of Pediatric Psychology*, *30*(8), 631-643.
- Reich, W., & Ezpeleta, L. (2009). Diagnostic interview for children and adolescents - version for parents of preschoolers (3-7 years). Unpublished rating scale, Division of Child Psychiatry, Schools of Medicine, Washington University, St. Louis, MO, USA.
- Silver, R.B., Measelle, J.R., Armstrong J.M., & Essex, M.J. (2010). The impact of parents, child care providers, teachers, and peers on early externalizing trajectories. *Journal of School Psychology*, *48*, 555-583.
- Steinberg, L. (2005). Psychological control: Style or substance? In J.G. Smetana (Ed.), *New directions for child and adolescent development: Changes in parental authority during adolescence* (pp. 71-78). San Francisco: Jossey-Bass.
- Trepát, E., & Ezpeleta, L. (2011). Sex differences in Oppositional Defiant Disorder. *Psicothema*, *23*(4), 666-671.
- Tung, Y., Li, J.J., & Lee, S.S. (2012). Child sex moderates the association between negative parenting and childhood conduct problems. *Aggressive Behavior*, *38*, 239-251.
- Webster-Stratton, C., & Reid M.J. (2010). The incredible years parents, teachers, and children training series: A multifaceted treatment approach for young children with conducts disorders. In J.R. Weisz, & A.E. Kazdin (2010), *Evidence-Based Psychotherapies for Children and Adolescents*. Second Edition. NY: The Guilford Press.
- West, A.E., & Newman, D.L. (2003). Worried and blue. Mild parental anxiety and depression in relation to the development of young children's temperament and behavior problems. *Parenting: Science and Practice*, *3*, 133-154.
- White, J., & Schnurr, M.P. (2012). Developmental Psychology. In F.T.L. Leong, W.E. Pickren, M.M. Leach, & A.J. Marsella (Eds), *Internationalizing the psychology curriculum in the United States* (pp. 51-73). New York: Springer.
- Xu, X., Tung, Y., & Dunaway, R.C. (2000). Cultural, human, and social capital as determinants of corporal punishment: toward an integrated theoretical model. *Journal of Interpersonal Violence*, *15*, 603-630.