Prevalence, comorbidity, functioning and long-term effects of subthreshold Oppositional Defiant Disorder in a community sample of preschoolers

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Abstract

Aim: To study the prevalence of subthreshold Oppositional Defiant Disorder (ST ODD) - less than 4 symptoms, but nonetheless an impairing form of Oppositional Defiant Disorder (ODD) - its coexistence with other homotypic externalizing and heterotypical internalizing problems in children and associated impairment, as well as the long-term effect of this condition.
Methods: A population-based sample of 622 preschoolers (50.0% boys) was followed up from preschool to preadolescence. Parents were interviewed when the children were 3, 6 and 9 years old with the Diagnostic Interview for Preschoolers/Children and Adolescents versions following DSM-5 and the children's functioning was assessed by trained clinicians.
Results: ST ODD diagnosis is highly prevalent (19.4%-25.5%), highly comorbid [homo-(10.9%-18.4%) and heterotypical (5.8%-23.7%)], resulting in functional impairment across child development in a similar way for both genders. ST is also a risk factor condition that predicts the presence of psychological problems and impairment in childhood and preadolescence from preschool age.
Conclusion: A broader clinical assessment and intervention similar to that provided to full syndrome cases is needed for children presenting subthreshold forms of ODD.

Keywords: Dimensional, ODD, preschoolers, subthreshold

Introduction

Oppositional Defiant Disorder (ODD), a persistent pattern of hostile, negativistic, defiant and disobedient behaviour is among the most prevalent diagnoses in children and adolescent mental health settings (1)(2), presenting high concurrent and consecutive homo- and heterotypical comorbidity (3) and implying a high level of functional impairment (4). The current DSM-5 (5) diagnostic system is symptom-count based; for example, to meet the diagnostic criteria for ODD an individual must present four or more of eight symptoms associated with personal or environmental distress, or school-related or social impairment. Evidence suggest that within this categorical ODD there is a heterogeneity in the symptoms group, and different dimensions (6)with different comorbidity and predictive values have been found (7,8)(9).

The attempt to define psychopathology in terms of narrow diagnostic categories has been considered flawed by many authors (10) (11) (12) (13). This futility is reflected in common comorbidity, heterogeneity among diagnostic categories, the presence of diagnoses depending on the context or an informant, and age. In fact, the inclusion of impairment as diagnostic criteria in the DSM system is a step towards assuming that symptom counting only is not sufficient to identify problems. Mental disorders appear to be continuous – phenomenological and longitudinally– with subthreshold states (14). Diagnostic rules or cut-offs have often been arbitrarily set (15) and there is little evidence to support the 4 cut-off as distinctive from a different number of symptoms (13). One important consequence of this arbitrariness could be the neglect of children not fulfilling the threshold but nonetheless suffering inadequate functioning. Conditions with relevant psychiatric symptoms that do not meet the full criteria of a disorder according to the prevailing classification systems are receiving increased attention, including Attention Deficit and Hyperactivity Disorder (ADHD) (16)(17) (18), depression (16), anxiety, (19), disruptive behaviour disorders (18), bipolar

disorder, autism and psychotic disorders (14). Some studies have investigated comorbidity between subthreshold conditions (20), most of which examine whether a single subthreshold condition escalates into the full syndrome (FS) form of that disorder; equally important, though, is whether subthreshold conditions (ST) are likely to develop other FS disorders different from the ST one, and whether these associations are maintained after adjusting for comorbidity (21). In the particular case of ODD, longitudinal studies (22) (9) indicate that ODD diagnoses tend to predict internalizing problems.

Besides investigating the high prevalence and negative impact of ODD from an early age, as far as we know, none of the studies focuses specifically on ST ODD, and in fact some studies exclude ODD when investigating subthreshold CD (20). In this context, and aware of the importance of prevention considering the evidence for the possibility of escalation, we carried out a longitudinal study on ST ODD from preschool age to preadolescence.

The aims of this paper are to study the prevalence of ST ODD from preschool age to preadolescence, to establish the presence of comorbidity and to assess the functioning of children with ST ODD compared to both those with FS ODD and those without ODD symptomatology (Control Group; CG). For each measure, we investigated whether individuals classified as ST had a similar outcome profile to those who met the DSM-5 diagnosis, or whether they were more similar to the CG. We also examined the predictive value of presenting ST ODD at age 3 for FS ODD and other comorbidities and functioning at ages 6 and 9, and at age 6 for age 9. All the objectives were addressed considering the possibility of sex differences.

Method

Participants

The data used in this work are from a longitudinal study of behavioural problems in children followed since preschool. The research was launched with a two-phase design and an

initial random sample of 2,283 children selected from all the registered preschoolers (age 3) in Barcelona during the 2009-10 academic year. Children with intellectual disabilities or pervasive developmental disorders were excluded.

The proportion of participants in the first phase was 58.7% (N = 1,341 families) and no differences were found by sex (p = .95) on comparing participants and refusals. However, the proportion of refusals was statistically higher for families in low socioeconomic groups (p < .001). The screening for inclusion in the second phase was carried out with the parents' version of the Strengths and Difficulties Questionnaire for 3 and 4-year-olds (SDQ^{3-4}) (Goodman, 1997). In this second phase, all the children with a positive screening score for behavioural problems (n = 522) and a random sample of 30% of the children with a negative screening score (n = 235) were invited to continue. The final second-phase sample included 82.2% of the families invited to continue (N = 622 children, 416 with positive screening and 206 with negative screening); no statistical differences were found by sex (p = .820) or type of school (p = .850) on comparing participants and refusals in this second phase. The children's mean age was 3.8 (SD = 0.33), 311 were boys (50.0%) and 554 were white (89.1%). At the follow-up when the children were 6 years old, 511 (82.2%) participants remained (83.4% with positive screening and 79.9% with negative screening; p = .270), and 443 (71.2%) participated in the assessment at age 9 (70.4% with positive screening and 73.6% with negative screening; p = .369). In addition to the screening group at age 3, no differences were found at ages 6 and 9 between the remaining participants and those who dropped out by sex ($p \geq .331$), type of school ($p \geq .361$), and level of ODD symptoms ($p \geq .111$). Regarding socioeconomic status (SES) (23), more participants from low and medium-low SES families dropped out of the study at the 6- and 9-year-old follow-ups ($p \geq .043$). Table 1 shows the sociodemographic and clinical features of the sample at each follow-up.

Measures

Diagnostic Interview of Children and Adolescents for Parents of Preschool Children (DICA-PPC)/ Diagnostic Interview of Children and Adolescents for Parents (DICA-P). The DICA (24) is a semi-structured interview and a computerized instrument that generates diagnoses through computerized algorithms following the DSM-5 definitions. In semi-structured interviews, if after the question parents cannot give a precise answer or the answer is not clear enough to decide about the presence (*yes*) or absence (*no*) of a symptom, then interviewers are allowed to use clarification questions. Also interviewers completed the CGAS and CAFAS/PECFAS (see below) after a global consideration of all the answers of the parents in the interview. The first follow-up, at age 3, covered the whole life period, the following follow-ups covered the last year, that means the period in between the former and the present interview. Participants are asked if the problem or symptom "*was present at any time during the last year since we last interviewed you?*". Impairment is included in the definitions of the diagnoses. Information about impairment (how the symptoms/disorders affect the child's daily life at school, with the family and with peers), family burden (the consequences of the child's symptom/disorder within the family) and seeking professional help and treatment for the problem was obtained after the assessment for each disorder. After completing the questions corresponding to diagnostic criteria for each disorder, parents were asked "*how would you say these concrete problems we have just talked about, interfere in the family/school/friendship functioning or in the child discomfort"?* Subthreshold conditions are defined as cases that present less than 4 symptoms, which is the DSM-5 threshold criteria for ODD, but do indicate functional impairment in the impairment questions that ask about how the present symptoms as a whole, affect functioning. Diagnoses for ADHD, CD, major depression and anxiety/phobia were generated and counts of the number of symptoms were also obtained for ODD. For the present study, in addition to ODD, ADHD, generalized anxiety disorder, separation anxiety disorder, social anxiety and phobia were analysed. These

four anxiety disorder were analysed all together under the name of Any anxiety, considering it as present if at least one of the four was present. The interview presents good psychometric properties (25). Major depression or CD were not included due to the low prevalence.

The ***Strengths and Difficulties Questionnaire (SDQ$^{3\text{-}4}$)*** (Goodman, 2001) is a brief screening questionnaire on children's mental health completed by parents. It contains 25 items with three response options (*not true*, *somewhat true*, *certainly true*) related to emotional, conduct and hyperactivity symptoms, and peer problems. The conduct problems score was used as screening. Four ODD symptoms (deliberately annoys people, blames others, touchy, angry and resentful) were added to the list of questions for screening purposes.

The ***Children's Global Assessment Scale (CGAS)*** (26)(27) is a global measure of functional impairment rated by the interviewer after the diagnostic information from the diagnostic interview is recruited. Scale scores range from 1 (maximum impairment) to 100 (normal functioning) and scores above 70 indicate normal adaptation.

The ***Preschool and Early Childhood Functional Assessment Scale (PECFAS)*** and the ***Child and Adolescent Functioning Assessment Scale (CAFAS)*** (28). Both instruments determine the extent to which a subject's functioning is impaired in each of eight psychosocial areas. In this study, five scales were used (School, Home, Conduct, Humour and Emotions) as the prevalence of impairment due to autolysis, use of substances, cognition problems and bad functioning in the community was extremely low. Impairment in the humour scale was also too low to be analysed at ages 3 and 6. PECFAS was used for the follow-ups at ages 3 and 6 and CAFAS was used to assess the children at the 9-year-old follow-up. Both instruments include an area with many different examples of impaired functioning and the assessment is scored based on four levels of impairment (0 = *no or minimal impairment*; 10 = *mild impairment or distress*; 20 = *moderate impairment*; and 30 = *severe impairment*). CAFAS has

good psychometric properties in the Spanish population (29). In this study, we analysed the dichotomous classification [no impairment (0) versus minimal, mild to severe (10-30)].

Procedure

The project was approved by the ethics review committee of the authors' institution. The head teachers of the participating schools, as well as the children's parents, received a complete description of the study. The families were recruited at the schools and they gave written consent. All the parents of the children in P3 (aged 3) in participating schools were invited to answer the SDQ$^{3\text{-}4}$ at home and return it to the schools. The families who agreed and met the screening criteria were contacted by telephone and the parents were interviewed at the school. The interviewers were previously trained and were blind to the children's screening group. Before conducting the interviews, all the interviewers were required to demonstrate a minimum interrater agreement of $k \geq .80$ across all the symptoms for at least eight consecutive training interviews. Interrater agreement was revised at every follow-up for those interviewers remaining in the study.

After each interview, the interviewer completed the CGAS and PECFAS/CAFAS. All the measures described above, except for the SDQ used for screening purposes, were taken at 3, 6 and 9 years old.

Statistical Analysis

The statistical analyses were conducted with SPSS24, weighted by assigning sampling weights inversely proportional to the probability of participant selection. Confidence intervals for prevalence of ST were estimated using Wilson's method. Differences among groups (CG, ST ODD and FS ODD) regarding sex and SES were analysed using chi-square tests. Changes in proportions among the three groups over time were performed following (30), an extension of McNemar's test for paired nominal data with more than two categories. Last, differences among groups for impairment, comorbidity with ADHD, CD and any anxiety were analysed

both cross-sectionally and longitudinally with multiple linear and binary logistic regression models for quantitative (CGAS scores) and dichotomous measures (CAFAS/PECFAS and DSM-5 diagnoses), respectively. Additionally, polynomial contrasts were conducted considering the ordered nature of the groups (CG, ST ODD and FS ODD).

Results

The prevalence of ST ODD diagnoses at ages 3, 6 and 9 was 22.0% [95% CI: 18.9%, 25.4%], 19.4% [95% CI: 16.2%, 23.0%] and 25.5% [95% CI: 21.8%, 29.8%], respectively. No differences in prevalence between the sexes were found among children with ST in any of the three temporal assessments ($p \geq .689$). Regarding SES, no differences were found at age 6 and 9 ($p \geq .245$), whereas more medium-low and low SES children were shown to have ST or FS at age 3 [linear trend: $\chi^2(1) = 4.65$, $p = .031$]. Comparing the percentage of children in each diagnostic category (CG, ST ODD and FS ODD) through the follow-ups, no significant differences were found between ages 3 and 6 ($p = .061$) or between ages 3 and 9 ($p = .124$), whereas between ages 6 and 9 more children changed from CG to ST ODD than *vice versa* [$\chi^2(3) = 9.65$, $p = .022$].

No interaction was found between sex and diagnostic group on outcomes (comorbidity, functioning assessed with CGAS scores and PECFAS/CAFAS levels) in any of the three follow-ups, either cross-sectionally or longitudinally. The results of the outcome profile in Table 2 show concurrent associations between the FS ODD group condition and functioning and comorbidity. OR values related to comorbidity were generally higher for the comparison between the CG and the ST ODD groups than between the ST ODD and FS ODD groups for all the follow-ups (at 3, 6 and 9 years), indicating that the ST ODD group had more differences from the CG and more similarities with the FS ODD group. The only exception was heterotypical comorbidity (the presence of any anxiety) at age 3, which presented a

higher odds ratio [OR = 4.79; Wald (1) = 9.45, p = .002] for the FS ODD-ST ODD comparison than for the ST ODD-CG one (0.85), the latter not being statistically significant. Furthermore, apart from the presence of heterotypical comorbidity at ages 3 and 6, all the variables considered showed a lineal trend of greater comorbidity throughout the 3 groups (from CG to FS ODD). A quadratic trend was also found for some homo- and heterotypical comorbidity.

As regard functional impairment, only functioning at home at age 9 was higher for the FS ODD-ST ODD comparison [OR = 21.27; Wald(1) = 15.31, p < .005] than for the ST-CG [OR = 9.47; Wald(1) = 65.30, p < .005] one. All the variables included showed a linear trend of greater impairment in the same direction as comorbidity as regard the groups (CG-ST-FS). Also a quadratic trend for impairment in the areas of school, behaviour, humour and emotion was found. Specifically, several patterns were observed. The statistically significant quadratic trend in addition to the linear trend indicates that (a) for homotypic comorbidity at age 3 and impairment in most of the areas at age 9, levels are lower for CG and then percentages increase for ST ODD and flatten for FS ODD; (b) for heterotypical comorbidity at age 3, levels are lower for CG and ST ODD and then percentage increases for FS ODD; for the latter, a different pattern was observed at age 9, since only the quadratic trend was statistically significant, showing that the higher percentage was for ST ODD, despite it did not statistically differ from FS ODD. Lastly, (c) for total impairment (CGAS score, where higher scores indicate less impairment) at age 9 the decrease between CG and ST ODD is higher than between ST ODD and FS ODD.

Table 3 shows how ST ODD predicts comorbidity and functioning at ages 6 and 9; again, the presence of ST ODD at age 3 predicts global and specific impairment in most areas, as well as the presence of FS ODD both at 6 and 9. The presences of ST ODD at 6 follows the same pattern and also predicts comorbidity with ADHD. Moreover, OR values for the ST

ODD-CG comparison at age 3 were mostly statistically significant for the prediction at ages 6 and 9, whereas no differences were found between the FS ODD and ST ODD groups at age 3 in predicting outcomes at ages 6 and 9.

Discussion

Subthreshold ODD is highly prevalent along childhood with stable numbers of around 19-25%, with girls as much affected as boys. The condition is a risk for high homo- and heterotypical comorbidity both concurrently (mainly ADHD and anxiety) and longitudinally (ADHD). This pattern is consistent with that found in FS ODD studies (31). Also ST ODD condition it is as much a long-term predictor of meaningful impairment in several developmental areas as is FS ODD, suggesting that focusing on ST ODD could be relevant for preventive purposes.

The absence of sex differences regarding outcomes obtained for ST contrasts with the results of other studies (32), which have reported more comorbid internalizing disorders in girls for other gender-related problems, such as subthreshold ADHD. Nevertheless, our results are aligned with those obtained by (20), who found that the pattern of comorbidities of subthreshold psychiatry conditions was nearly identical for males and females. In any case, our results indicate the need to assess whether other full syndrome or subthreshold homo- and heterotypical problems are present when facing ST ODD. We consider as relevant the fact that ST ODD concurrently associates with externalizing problems (including FS ODD itself) at any age, also with higher rates of internalizing at age 9. Obviously, this could be related to the different dimensions reported by the literature on ODD (33) (8)(34)(9), which makes ODD a syndrome half-way in the internalized-externalized continuum (13) including negative affect, which is considered a transdiagnostic feature for many children psychopathological disorders. (10). Predictive association of ST ODD for heterotypical comorbidity was only found for ADHD. Other authors have found weak association between anxiety and ODD when

accounting for initial levels of internalizing symptoms, assuming little evidence for the unique contributions of ODD to the subsequent internalizing disorders. (9). Maybe the fact that our sample was from general population could also explain the lack of predictive association. The predictive value of subthreshold syndromes for heterotypical comorbidity has also been observed in adolescence by (18) (21), who studied problems other than ODD or included ODD as a disruptive behaviour. Cross-sectionally, compared to the CG, children with ST ODD exhibited major impairment, albeit less than children presenting FS ODD, in a pattern similar to that found by other authors (16) (17) studying ADHD. However, when it comes to predicting impairment and comorbidity, ST ODD and FS ODD behave in the same way; this is especially relevant to bear in mind when working with very young children whose symptomatology might at times be confusing. Sometimes ST conditions may be considered just “misbehave” or a parent-child relation problem that can be overcome without intervention, ignoring the overwhelming and burden daily situation that imply (35). Immediate intervention and future assessment should be indicated when ST is detected at early ages, as personal and environmental characteristics can enhance each other to worse the condition and influence treatment outcomes (36) (37).

Among the strengths of our research is the use of diagnoses generated with structured interviews and not with parent-rated questionnaires, in a large community sample followed from preschool to preadolescence. The study of a preschool sample is particularly interesting because psychiatric conditions with early-onset have been associated with greater impairment (20). As far as we know, this is the first study to consider ODD on its own and not mixed with other behavioural disorders. Among the limitations of our research is the fact that the participants who dropped out of the study at the age 3-year-old follow-up belonged to low SES families, which is also the social level most affected by ODD (38). Our study supports associations between ST ODD and negative outcomes, indicating the need to consider further

and more complete assessment and intervention for children presenting ST ODD in the same way as for children with FS, which would benefit both practice and research.

Conflict of interests. On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Table 1: Characteristics of the sample at each follow-up

Variable	Measure	Follow-up Age 3 (*N* = 622)	Age 6 (*N* = 511)	Age 9 (*N* = 443)
Demographics				
	Age (years), *M* (*SD*)	3.8 (0.33)	6.6 (0.35)	9.7 (0.35)
Sex	Females, *n* (%)	311 (50.0)	254 (49.7)	221 (49.9)
Socioeconomic status	High, *n* (%)	205 (33.0)	172 (33.6)	155 (35.0)
	Medium/medium-high, *n* (%)	280 (45.0)	239 (46.8)	209 (47.2)
	Medium-low/low, *n* (%)	137 (22.0)	100 (19.6)	79 (17.8)
Ethnicity	Caucasian, *n* (%)	554 (89.1)	465 (91.0)	407 (91.9)
	American Hispanic, *n* (%)	40 (6.4)	27 (5.3)	19 (4.3)
	Asian, *n* (%)	6 (1.0)	5 (1.0)	5 (1.1)
	Other, *n* (%)	22 (3.5)	14 (2.7)	12 (2.7)
Prevalence (DSM-5)*	ADHD, *n* (%)	29 (4.6)	40 (7.9)	48 (10.6)
	CD, *n* (%)	9 (1.5)	2 (0.4)	1 (0.3)
	MD, *n* (%)	1 (0.1)	2 (0.4)	8 (1.7)
	Any anxiety, *n* (%)	48 (7.7)	43 (8.6)	60 (13.3)
	ODD (full syndrome), *n* (%)	46 (7.3)	33 (6.6)	37 (8.2)
Comorbidity (DSM-5)*	ODD and ADHD, *n* (%)	29 (4.7)	40 (92.1)	47 (10.5)
	ODD and any anxiety, *n* (%)	48 (7.7)	43 (8.5)	60 (13.4)
Functioning	CGAS total score; *M* (*SD*)	78.7 (9.2)	76.5 (9.3)	69.7 (11.1)
	PECFAS/CAFAS School, *n* (% yes)	104 (16.7)	92 (18.2)	116 (25.8)
	PECFAS/CAFAS Home, *n* (% yes)	250 (40.3)	155 (30.6)	115 (25.6)
	PECFAS/CAFAS Behaviour, *n* (% yes)	111 (17.8)	65 (12.9)	103 (23.0)
	PECFAS/CAFAS Emotions, *n* (% yes)	163 (26.2)	74 (14.6)	108 (24.1)

* Weighted prevalence. Acronyms: ADHD: Attention Deficit and Hyperactivity Disorder; CD: Conduct Disorder; CAFAS: Children and Adolescents Functional Assessment Scale; CGAS: Children General Assessment Scale; MD: Mood Disorder; ODD: Oppositional Defiant Disorder; PECFAS: Preschool Children Functional Assessment Scale.

Table 2. Concurrent association of functioning and comorbidity with ST ODD

Response at age 3		**CG**	**At age 3 ST ODD**	**FS ODD**	Omnibus test F/χ^2 (*p*)	Comparisons: *B*/OR (*p*-value)* ST vs. CG	FS vs. ST	Polynomial contrasts* LT (*p*-value)	QT (*p*-value)
CGAS	Total score; *M* (*SD*)	82.1 (7.7)	73.0 (7.0)	66.9 (8.0)	145.2 (< .001)	−9.24 (< .001)	−6.43 (< .001)	< .001	.108
PECFAS	School (% yes)	10.3	29.2	41.3	44.0 (< .001)	3.66 (< .001)	1.71 (.132)	< .001	.132
	Home (% yes)	18.9	89.7	97.8	312.4 (< .001)	36.1 (< .001)	8.74 (.100)	< .001	.315
	Behaviour (% yes)	8.7	32.8	60.9	90.7 (< .001)	5.22 (< .001)	3.24 (.001)	< .001	.345
	Emotions (% yes)	22.6	32.1	44.4	12.0 (.002)	1.61 (.028)	1.68 (.137)	.002	.925
Comorbidity	ADHD (% yes)	1.6	10.9	15.6	29.8 (< .001)	7.76 (< .001)	1.61 (.334)	< .001	.046
	Any anxiety (% yes)	6.8	5.8	22.2	11.3 (.004)	0.85 (.696)	4.79 (.002)	< .001	.039
Response at age 6		**CG**	**At age 6 ST ODD**	**FS ODD**					
CGAS	Total score; *M* (*SD*)	79.8 (6.7)	70.2 (9.2)	60.8 (7.7)	160.6 (< .001)	−9.54 (< .001)	−9.67 (< .001)	< .001	.944
CAFAS	School (% yes)	13.1	30.6	39.4	24.3 (< .001)	2.89 (< .001)	1.54 (.297)	< .001	.283
	Home (% yes)	14.1	71.1	97.1	194.1 (< .001)	14.82 (< .001)	21.96 (.019)	< .001	.775
	Behaviour (% yes)	3.7	30.6	63.6	103.9 (< .001)	11.07 (< .001)	3.92 (.001)	< .001	.098
	Emotions (% yes)	9.6	22.4	48.5	34.7 (< .001)	2.71 (.001)	3.38 (.004)	< .001	.725
Comorbidity	ADHD (% yes)	3.5	17.3	29.4	34.1 (< .001)	5.68 (< .001)	1.97 (.147)	< .001	.138
	Any anxiety (% yes)	7.7	8.2	18.2	3.37 (.185)				
Response at age 9		**CG**	**At age 9 ST ODD**	**FS ODD**					
CGAS	Total score; *M* (*SD*)	74.3 (9.3)	62.3 (56.6)	56.6 (8.6)	122.4 (< .001)	−12.41 (< .001)	−5.33 (.002)	< .001	.002
CAFAS	School (% yes)	15.8	44.3	48.6	44.5 (< .001)	4.22 (< .001)	1.22 (.600)	< .001	.018
	Home (% yes)	8.7	47.4	94.6	162.5 (< .001)	9.47 (< .001)	21.27 (< .001)	< .001	.353
	Behaviour (% yes)	4.0	57.9	67.6	180.4 (< .001)	32.51 (< .001)	1.50 (.311)	< .001	< .001
	Humor	14.1	47.0	36.1	49.3 (< .001)	5.41 (< .001)	0.64 (.260)	.001	< .001
	Emotions (% yes)	14.1	46.5	35.1	47.4 (< .001)	5.29 (< .001)	0.61 (.212)	.002	< .001
Comorbidity	ADHD (% yes)	6.1	18.4	22.2	18.3 (< .001)	3.48 (< .001)	1.32 (.542)	.001	.147
	Any anxiety (% yes)	8.7	23.7	18.9	15.7 (< .001)	3.25 (< .001)	0.71 (.474)	.080	.019

* Comparisons and polynomial contrasts for omnibus test statistically significant ($p < .05$)

CG; Control Group; ST ODD: Subthreshold Oppositional Defiant Disorder; FS ODD: Full syndrome Oppositional Defiant Disorder; ADHD: Attention Deficit Hyperactivity Disorder

Table 3: Predictive association of ST with functioning, comorbidity and FS

Response at age 6		**CG**	**At age 3 ST ODD**	**FS ODD**	Omnibus test F/χ^2 (*p*)	Comparisons: *B*/OR (*p*-value)* ST vs. CG	FS vs. ST	Polynomial contrasts* LT (*p*-value)	QT (*p*-value)
CGAS	Total score; *M* (*SD*)	78.4 (8.5)	72.9 (10.1)	71.6 (8.9)	22.8 (< .001)	−5.36 (< .001)	−1.44 (.391)	< .001	.082
PECFAS	School (% yes)	16.0	21.1	31.4	5.4 (.067)				
	Home (% yes)	23.9	44.3	54.3	25.2 (< .001)	2.53 (< .001)	1.44 (.348)	< .001	.278
	Behaviour (% yes)	8.7	23.7	22.9	18.9 (< .001)	3.31 (< .001)	0.93 (.866)	.012	.042
	Emotions (% yes)	13.2	17.5	19.4	1.8 (.401)				
Comorbidity	ADHD (% yes)	6.2	11.3	14.3	5.5 (.065)				
	Any anxiety (% yes)	8.4	7.0	14.3	1.2 (.538)				
ODD	Full syndrome (%)	2.0	14.0	28.6	43.1 (< .001)	8.76 (< .001)	2.50 (.045)	< .001	.098
Response at age 9		**CG**	**At age 6 ST ODD**	**FS ODD**					
CGAS	Total score; *M* (*SD*)	72.1 (10.0)	65.0 (9.8)	57.3 (13.3)	39.6 (< .001)	−7.31 (< .001)	−7.59 (.001)	< .001	.925
CAFAS	School (% yes)	21.7	29.8	55.2	14.1 (.001)	1.56 (.103)	2.71 (.024)	< .001	.375
	Home (% yes)	17.6	42.9	79.3	60.0 (< .001)	3.57 (< .001)	4.99 (.002)	< .001	.606
	Behaviour (% yes)	13.5	42.9	65.5	59.1 (< .001)	4.75 (< .001)	2.73 (.026)	< .001	.367
	Humor	19.4	32.1	55.2	18.7 (< .001)	1.94 (.016)	2.54 (.034)	< .001	.658
	Emotions (% yes)	19.4	31.0	51.7	16.7 (< .001)	1.87 (.023)	2.42 (.045)	< .001	.679
Comorbidity	ADHD (% yes)	7.9	11.9	27.6	10.3 (.006)	1.62 (.217)	2.95 (.040)	.001	.460
	Any anxiety (% yes)	12.6	13.1	27.6	5.0 (.082)				
ODD	Full syndrome (%)	3.1	17.9	37.9	43.1 (< .001)	6.63 (< .001)	2.98 (.021)	< .001	.287
Response at age 9		**CG**	**At age 3 ST ODD**	**FS ODD**					
CGAS	Total score; *M* (*SD*)	72.0 (10.4)	64.9 (10.4)	62.7 (11.1)	25.4 (< .001)	−7.19 (< .001)	−2.61 (.240)	< .001	.123
CAFAS	School (% yes)	21.6	34.7	44.8	11.7 (.003)	1.92 (.011)	1.55 (.306)	.006	.716
	Home (% yes)	20.3	42.1	33.3	18.0 (< .001)	2.86 (< .001)	0.67 (.368)	.117	.014
	Behaviour (% yes)	17.0	35.8	50.0	24.6 (< .001)	2.73 (< .001)	1.73 (.195)	< .001	.438
	Humor	19.4	37.9	34.5	14.5 (.001)	2.52 (< .001)	0.88 (.776)	.052	.075
	Emotions (% yes)	19.1	36.8	34.5	14.1 (.001)	2.48 (< .001)	0.91 (.825)	.048	.089
Comorbidity	ADHD (% yes)	9.3	12.6	20.0	3.3 (.191)				
	Any anxiety (% yes)	12.7	13.7	17.2	0.7 (.707)				
ODD	Full syndrome (%)	4.6	15.8	23.3	18.0 (< .001)	3.88 (< .001)	1.53 (.414)	.001	.222

* Comparisons and polynomial contrasts for omnibus test statistically significant ($p < .05$)

CG; Control Group; ST ODD: Subthreshold Oppositional Defiant Disorder; FS ODD: Full syndrome Oppositional Defiant Disorder; ADHD: Attention Deficit Hyperactivity Disorder