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Oppositional Defiant Disorder Is Better Conceptualized as a Disorder of Emotional Regulation

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Abstract

Objective: It has been reported that Oppositional Defiant Disorder (ODD) can be differentiated into distinct subtypes associated with different outcomes in adulthood. We examined whether ODD is conceptually independent and coherent, and whether ODD and Conduct Disorder (CD) are expressions of the same core deficit. **Method:** The data come from a sample of 4,380 children for whom SNAP rating scales were available. Parallel analysis was performed on the eight-item ODD diagnostic items and on the SNAP-90 scale. These were factor analyzed and the components were correlated. **Results:** ODD has one underlying factor, whereas the parent-rated SNAP has nine underlying factors. ODD items grouped together with emotional lability and irritability items, which did not group with CD. Confirmatory factor analysis supported the separation of ODD and CD but not ODD and emotion dysregulation. **Conclusion:** The expanded ODD factor more likely captures a disorder of emotion regulation, rather than a disruptive behavior disorder. *(J. of Att. Dis. 2014; XX(X) 1-XX)*

Keywords

Oppositional Defiant Disorder, factor analysis, Conduct Disorder, emotion dysregulation

The regulation of emotions can be defined as the process by which individuals influence which emotions they have, when they have them, and how they experience and express them (Gross, 2007). Dysregulation can be defined as the lack of temper control, affective lability, and emotional overreaction (Reimherr et al., 2005). Deficient regulation of emotions is a pervasive and impairing component of many psychiatric disorders seen in childhood, presenting in unipolar and bipolar mood disorders, anxiety disorders, and behavior disorders including ADHD and Oppositional Defiant Disorder (ODD; Ambrosini, Bennett, & Elia, 2013; Burke, Loeber, Lahey, & Rathouz, 2005; Hinshaw, 2003; Leibenluft, Blair, Charney, & Pine, 2003; Stringaris, Cohen, Pine, & Leibenluft, 2009). There are indications that a shift in theoretical understanding is underway reflecting a greater emphasis on emotionality in childhood disruptive disorders. First is the addition of disruptive mood dysregulation disorder (DMDD) to *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-V*; American Psychiatric Association [APA], 2013), which is characterized by temper outbursts and persistent irritable mood between outbursts (APA, 2013). Second is the delineation of various dimensions (or subtypes) of ODD in the recent literature (Burke, 2012; Drabick & Gadow, 2012; Rowe, Costello, Angold, Copeland, & Maughan, 2010; Stringaris & Goodman, 2009; Whelan, Stringaris, Maughan, & Barker, 2013). Although the dimensions identified are not in perfect agreement, these can be classified broadly into affective (i.e., irritable, touchy, angry) and behavioral (i.e., defying adults, annoying, blaming) dimensions. We sought to examine whether these dimensions are truly distinct, with the objective of furthering our understanding of the role of regulating emotions in ODD.

Recently, the recognition of emotion regulation as an important facet of ODD has been gaining empirical support from factor analytic studies. Burke, Hipwell, and Loeber (2010) identified behavioral and affective components of ODD and reported that the behavioral component predicted CD, while the negative affect component predicted depression. Boys having the irritable-ODD subtype

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were more likely to present with anxiety and depression in adolescence or adulthood (Burke, 2012). A three-factor model was proposed by Stringaris and Goodman (2009) who reported that *irritable, headstrong*, and *hurtful* dimensions of ODD have differentiated longitudinal correlates. While *irritable* predicted later depression and anxiety, *headstrong* was most strongly associated with ADHD, and *hurtful* was associated with cold-bloodedness and callousness. Stringaris and colleagues confirmed that a three-factor solution for ODD better fits the data as compared with one- or two-factor solutions in a large Brazilian sample (Krieger et al., 2013). The factor analysis by Rowe and colleagues (2010) yielded two dimensions: *irritable* and *headstrong*. The *irritable* dimension predicted anxiety disorders at follow-up, whereas the *headstrong* dimension predicted Conduct Disorder (CD), substance abuse, and depression. Furthermore, it was shown that ODD-angry/irritable children (vis-à-vis ODD-noncompliant), operationalized with *DSM-V* criteria—are at greater risk of mood disorders (Drabick & Gadow, 2012). Collectively, these results show that the affective component of ODD is associated with significant psychopathology later in life and should be an important focus of treatment. This begs the question: Is dysregulated affect a mere component or the core deficit in ODD?

Replicating and interpreting the previously reported factor analytic studies are important for theoretical understanding to answer this question. The rationale behind factor analysis is that the correlation of items in a scale or subscale can be explained by the existence of a latent factor or dimension. What the latent factor is that underlies ODD—or whether ODD is that factor itself—has not been sufficiently examined. The question of how many factors to retain in factor analysis is often contentious, and the results could depend on whether exploratory (EFA) or confirmatory factor analysis (CFA) is used. We chose EFA for two reasons. First, the strong and divergent correlations of ODD (or its constituent dimensions) with other disorders raise the question whether ODD is conceptually independent and coherent. Second, the previously reported factor analytic results were inconsistent. Although models with different numbers of factors can be compared for fit through CFA, we reasoned that the theoretical justification for three factors (vis-à-vis one or two) is not sufficiently elaborated. EFA, as a preliminary step, would let the data speak for themselves without being constrained by theory.

Our specific research questions in this study are

1. Is ODD an independent factor or is it part of a larger construct?
2. How many factors does ODD consist of and what do they represent?
3. Does ODD (or its factors) correlate more strongly with affective or behavior problems?

Method

Sample

Data came from 9,931 responses to a web-administered SNAP-IV rating scale (Swanson, n.d.-b) managed by one of the authors (D.D.). The website (www.adhdratingscales.com) is an online resource that allows parents and teachers to complete the SNAP on behalf of children. Once completed, the scale is forwarded to a clinician of their choice, with the proviso that the anonymized data would also be used for research purposes. After duplicate persons and those with ages below 5 and above 17 were eliminated, a total of 4,380 SNAP scales were available for analysis of which about 70% were parent-rated and the rest were teacher-rated (see Figure 1). In removing duplicates, we chose to retain the parent-rated scores because these are more informative (Bussing et al., 2008).

Instrument

The SNAP-IV scale is a 90-item *DSM* (4th ed.; *DSM-IV*; APA, 1994)-based instrument that contains statements that are rated on a 4-point Likert-type scale ranging from 0 "Not at all" to 3 "Very much." Although the SNAP can be used to assess the presence of symptoms dichotomously (i.e., if these are present or absent), we decided to retain the Likert-type coding which is the recommended method (Swanson, n.d.-a) of scoring.

In contrast to the 30-item version of the SNAP, which only assesses ADHD and ODD, the 90-item version also assesses other *DSM-IV* disorders including conduct, mood, and anxiety disorders (Swanson, n.d.-a). Furthermore, the 90-item version contains items from the Conners' Index Questionnaire (Conners, 1998), which measures general childhood problems. We were particularly interested in whether emotion dysregulation (ED) items (e.g., 38, 39, 54, and others) would cluster with ODD after an EFA. We were also interested in whether the magnitude of ED's correlation with ODD differed from that of CD.

Data Analysis

We first compared demographic characteristics of our sample by SNAP version and by rater. Upper 5% cutoffs for ADHD-Inattentive, ADHD-Hyperactive/Impulsive, and ODD using SNAP scoring guidelines (Swanson, n.d.-a) were used to estimate prevalence rates. To examine whether ODD consists of more than one dimension, we performed Horn's parallel analysis (PA) on ODD items (Q#s 21-28) from the SNAP-90 and 5,000 random data sets with the same number of variables and records. We repeated the procedure for SNAP-30 data. Among the EFA criteria for factor retention, Horn's PA method is mathematically justified and recommended (Dinno, 2009). Conceptually, Horn's PA

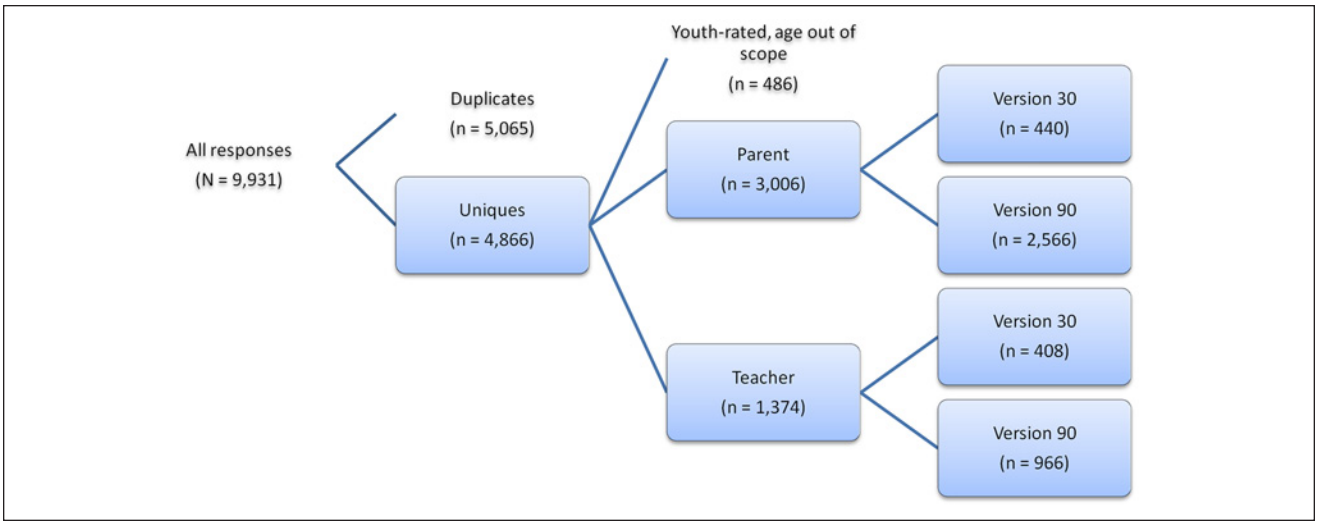

Figure 1. Breakdown of respondents.

calculates the eigenvalues from a data set of interest and compares their magnitude with those coming from *N* randomly generated data sets having the same number of records and variables. According to Horn (1965), even randomly generated data can produce eigenvalues greater than 1 due to sample bias. Hence, one should correct for this bias when making the decision regarding how many factors to extract. Accordingly, the retention rule is to keep extracting factors for as long as a given factor in the real data set accounts for more variance than a corresponding factor in random data (Hayton, Allen, & Scarpello, 2004).

To examine whether the current eight ODD diagnostic items (Q#s 21-28 in the SNAP) constitute a factor by themselves, we ran Horn's PA on the entire SNAP-90 scale. We then factor analyzed the entire scale, retaining the number of factors recommended by Horn's criterion using the principal components method of extraction. The results using the entire scale would then inform whether the ODD subscale is conceptually independent and coherent according to the following scenarios: *Scenario 1, Independent and Coherent*: This would be the case if the ODD diagnostic items loaded on a factor without (or with minimal) other items. *Scenario 2, Coherent but not Independent*: This would be the case if other items grouped with the ODD items in a factor. *Scenario 3, Not coherent*: This would be the case if the eight ODD items were distributed across different factors.

To determine whether ODD correlated more strongly with emotion regulation or behavior problems, we performed a CFA involving ODD, ED, and CD based on our EFA factor solution. We resorted to CFA because these constructs are latent instead of measured variables. Using our EFA results, we selected the items that loaded on each of these constructs and correlated the latent variables. CFA had the added benefit of validating (or disconfirming) the results reached through EFA. The logic of our CFA modeling was as follows. First, we loaded all the items from the three latent constructs in a single factor (Model 1). If the model fit is satisfactory (judged using root mean square error approximation [RMSEA], where a lower score is better), then a higher order construct of disruptive-emotional CD is warranted. This would support the view that ODD and CD are the same core disorder whose presentations vary by age. Next, we parceled out the CD items into a separate factor while retaining the unity of ODD and ED and compared goodness of fit between this model (Model 2) and Model 1. Finally, we grouped the items into the three latent factors (Model 3). The correlations between the factors in this third model would answer our third research question. All CFA models were fit using maximum likelihood estimation. Likelihood ratio tests were used to evaluate incremental increase in fit by adding extra factors.

The study received approval from the University of Saskatchewan ethics board.

Results

Children in our sample were about 9 years of age, and most were between kindergarten and Grade 5. Boys outnumbered girls 3 to 1. Parents were more likely to classify children as meeting the cutoffs for Inattentive (58%) and Hyperactive/Impulsive (48%) than teachers for whom the numbers were 25% and 32%, respectively. Parents and teachers classified about the same proportion (30%) as meeting the threshold for ODD (see Table 1).

PA of the eight-item ODD subscale in parent-rated SNAPs agreed with teacher-rated results in recommending the retention of only one component for ODD. Stated

Table 1. Characteristics of Our Sample.

	SNAP-90s		SNAP-30s	
	Parent-rated, *n* (%)	Teacher-rated, *n* (%)	Parent-rated, *n* (%)	Teacher-rated, *n* (%)
n	2,566	966	440	408
M age (*SD*)	9.50 (3.25)	9.26 (2.76)	9.96 (2.90)	9.44 (2.61)
Gender				
Female	757 (29.50)	225 (23.29)	104 (23.64)	84 (20.59)
Male	1,809 (70.50)	741 (76.71)	336 (76.36)	324 (79.41)
Grade level				
K-2	903 (35.19)	316 (32.71)	102 (23.18)	109 (26.72)
3-5	815 (31.76)	363 (37.58)	174 (39.55)	180 (44.12)
6-8	483 (18.82)	217 (22.46)	103 (23.41)	91 (22.30)
9-12	357 (13.91)	69 (7.14)	61 (13.86)	25 (6.13)
Missing	8 (0.31)	1 (0.10)	0 (0.00)	3 (0.74)
Mean ratings (*SD; n* and % meeting 5% cutoffs)				
ADHD-Inattentive				
M (*SD*)	1.85 (0.68)	1.93 (0.78)	1.69 (0.65)	1.65 (0.75)
Above threshold (%)[a]	1,547 (60.29)	283 (29.30)	210 (47.73)	66 (16.18)
ADHD-Hyperactive/Impulsive				
M (*SD*)	1.39 (0.82)	1.34 (0.92)	1.28 (0.75)	1.11 (0.81)
Above threshold (%)[a]	1,270 (49.49)	349 (36.13)	193 (43.86)	89 (21.81)
ODD				
M (*SD*)	1.38 (0.86)	0.93 (0.87)	1.26 (0.80)	0.83 (0.82)
Above threshold (%)[a]	818 (31.88)	318 (32.92)	113 (25.68)	98 (24.02)

Note. The figures are frequencies except for age and the scores for ADHD and ODD. ODD = Oppositional Defiant Disorder.
[a]Prevalence was calculated by dichotomizing the children according to the SNAP-IV scoring guidelines using the upper 5% threshold as a criterion.

differently, the ODD items in the SNAP are explained by a single underlying factor. As shown in Figure 2, after the first eigenvalue (magnitude of about 5) is extracted, the succeeding eigenvalues of the parent (left panel) and teacher (right panel) ratings are no larger than 1 and no better than those of random data.

The separate PAs of parent- and teacher-rated SNAP-90s reported an inconsistent number of extractable components. For parent-rated scales, nine components were recommended (adjusted ninth eigenvalue = 1.08) but only eight were recommended for teacher-rated scales (Adjusted ninth eigenvalue = 0.96). In view of the discrepancy, we restricted the factor analysis to parent ratings for the following reasons: (a) parent ratings outnumbered teacher ratings and (b) parent ratings are more informative than teacher ratings.

The EFA of SNAP-90 parent ratings revealed that the instrument consists of nine factors that represent ODD plus ED, ADHD-Hyperactive/Impulsive, ADHD-Inattentive, Conduct Problems, Mania, Depression, Tics/Obsessive-Compulsive Disorder (OCD), Lethargy, and Classroom Executive Function (see Table 2). The items loading with the eight ODD items were "quarrelsome," "hostile," "uncooperative," "acts smart," "changes mood drastically," "easily frustrated," "irritable," "excessive emotionality," "unstable relationships," and "angry outbursts." The items that loaded under CD were "teasing," "aggressive," "destructive with property," "deceitful," "rule violations," "rights violations," "impulsive aggression," and "fighting." It is noteworthy that none of these CD items cross-loaded with factor 1 (ODD + ED).

To test the correlation magnitudes of ODD, ED, and CD, we divided the first factor extracted in our EFA into ODD (#s 21-28) and ED, which was comprised of the rest of the factor 1 items (see Table 2). The three latent constructs had very good internal reliabilities: ODD (α = .94), ED (α = .91), and CD (α = .90). Model 1 under CFA had an RMSEA of 0.111, which reflects poor model fit. The following rule of thumb for interpretation is provided by Little (2013): >.10 = poor; .10 to .08ish = mediocre; .08 to .05ish = acceptable; .05 to .02ish = good; <.01 = great fit. Model 2, with CD and ODD + ED, had an RMSEA of .092 representing mediocre fit. Model 3, with the indicators loading onto three latent variables, had an identical RMSEA to Model 2 of 0.92. Importantly, Model 3 showed that the correlation of ODD and ED was very strong (r = .98), while that of ODD and CD was strong but somewhat weaker (r = .74). ED and CD were also correlated (r = .78). Because our three models were nested, improvements in model fit when specifying an added factor were also calculated. See Table 3 for details.

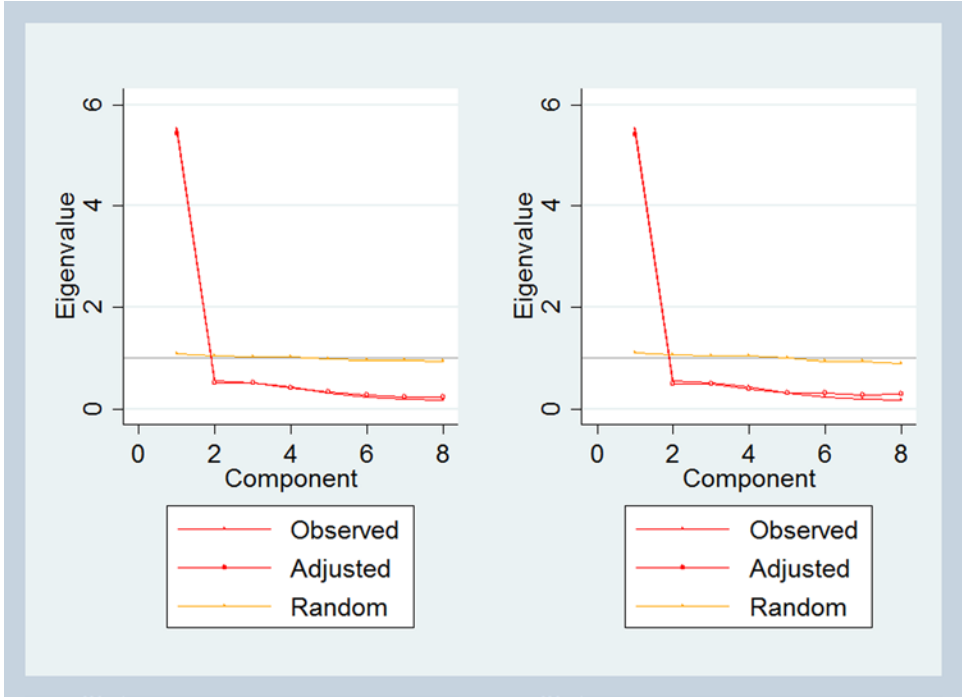

Figure 2. Graphs of parallel analysis of ODD items in parent (left) and teacher (right) ratings.
Note. ODD = Oppositional Defiant Disorder.

Discussion

We report three findings from this study. First, ODD is a unidimensional construct (i.e., sub-typing is not supported by our data). Second, ODD is not an independent construct; its diagnostic items load on a larger factor (ODD + ED) that represents ED and headstrong behavior. Third, CD is strongly correlated with both ODD and ED, but our results support the view that CD is separate from ODD.

The unidimensional finding is contrary to four other studies known to us. Burke and colleagues (2010) reported three underlying factors for ODD: oppositional behavior, negative affect, and antagonistic behavior, in a large sample of pre-adolescent girls. It is noteworthy that both their analysis and ours relied on PA as the basis for the number of factors to retain while reaching different conclusions. It is possible that their use of an all-girls sample might account for the different results, but this requires further study. The tri-dimensional ODD model of Stringaris and Goodman (2009) was based on a hypothesis that was formed *a priori* and was not the result of factor analysis. However, their latest result from a Brazilian sample (Krieger et al., 2013) confirmed the three-factor solution initially proposed. Rowe and colleagues (2010) performed EFA but did not describe the theoretical justification for irritable and headstrong ODD sub-factors other than an acceptable fit to the data. Interestingly, the authors reported that a three-factor model failed, "which may indicate that too many factors had been specified" (p. 9). An instrument such as the SNAP-90 that measures domains other than ODD allows for the possibility that ODD is part of a larger construct. Our findings support this latter interpretation. Nevertheless, our findings do not necessarily contradict the utility of sub-typing ODD. Characterizing ODD according to these subtypes—as if they were truly differentiated—is a valuable predictor of risk for mood and anxiety disorders later in life (Burke et al., 2010; Stringaris et al., 2009; Whelan et al., 2013). Clinically, our unidimensional result implies that children who present primarily with non-compliant or headstrong behavior should also be screened for intense and unstable emotions.

The poor fit of our single-factor CFA model contra-indicates against a unified ODD and CD construct. This outcome corroborates the EFA result in which none of the CD indicators cross-loaded onto ODD. It is consistent with the previous studies concluding that there is a meaningful distinction between these two diagnoses (Connor & Doerfler, 2008; Greene et al., 2002; Kuhne, Schachar, & Tannock, 1997). Theoretical and empirical work in this area is still fluid and a wide range of positions have been supported. There are currently three schools of thought regarding the overlap of ODD and CD, and these are compared and contrasted in a recent review (Lahey & Waldman, 2012).

Table 2. Factor loadings from an EFA of the SNAP-90 Parent scale (n=2,566).

Question number	ODD-expanded	ADHD-Hyperactive/Impulsive	ADHD-Inattentive	Mania	Depression	Tics/OCD	Conduct problems	Classroom executive function	Lethargy
1.				.75					
2.				.66					
3.				.48					
4.				.75					
5.				.77					
6.				.68					
7.				.67					
8.				.57					
9.				.76					
10.				.68					
11.		.74							
12.		.75							
13.		.83							
14.		.72							
15.		.88							
16.		.60							
17.		.56							
18.		.63							
19.		.57							
20.		.85							
21.	.88								
22.	.86								
23.	.83								
24.	.64								
25.	.68								
26.	.81								
27.	.89								
28.	.65								
29.	.85								
30.	.77								
31.		.50							
32.		.66							
33.									
34.	.74								
35.	.56								
36.		.81							
37.		.55							
38.	.72								
39.	.73								
40.							.42		
41.							.56		
42.							.68		
43.							.57		
44.							.63		
45.							.63		
46.							.63		
47.					.65				
48.					.77				
49.					.67				
50.					.82				
51.		.41							

(continued)

Table 2. (continued)

Question number	ODD-expanded	ADHD-Hyperactive/Impulsive	ADHD-Inattentive	Mania	Depression	Tics/OCD	Conduct problems	Classroom executive function	Lethargy
52.									.54
53.				.60					
54.	.74								
55.									
56.					.47				
57.									.55
58.	.41								
59.									
60.	.40								
61.						.64			
62.						.72			
63.						.66			
64.						.63			
65.						.48			
66.			.87						
67.			.67						
68.			.75						
69.									
70.			.51						
71.			.67						.47
72.			.87						
73.			.69						
74.			.84						
75.			.54	.42					
76.			.89						
77.									
78.	.56								
79.			.43						
80.							.49		
81.				.58				.49	
82.				.52				.57	
83.				.59				.52	
84.				.50				.42	
85.								.71	
86.								.67	
87.								.62	
88.								.63	
89.		.57						.52	
90.		.65						.51	

Note. For the purposes of CFA correlations, ODD consists of items 21-28; ED consists of items 29, 30, 34, 35, 38, 39, 54, 58, 60, and 78; CD consists of items 40-46 and 80. ODD = Oppositional Defiant Disorder; CFA = confirmatory factor analysis; ED = emotion dysregulation; CD = Conduct Disorder; OCD = Obsessive-Compulsive Disorder. Blank cells indicate loading below .40.

According to the reviewers, CD and ODD are independent but correlated forms of psychopathology—a conclusion that is consistent with our result.

Our second CFA model indicates that ODD and ED can be combined as a single factor because they correlate very strongly ($r = .98$). It might be argued that the superior fit of Model 3 as compared with Model 2 warrants a separation of ODD and ED. However, good CFA interpretation stipulates that when two factors correlate higher than .85, they are probably the same (Brown, 2006). This implies that ODD and ED probably tap into the same underlying construct representing headstrong behavior and emotionality.

Table 3. Comparison of Alternate Measurement Models of Oppositional Defiant Disorder from SNAP-IV Parent Ratings (n = 2,566).

	Model 1: All ODD, ED, and CD items under a general factor	Model 2: ODD and ED items in one factor and CD in another	Model 3: ODD, ED, and CD as separate factors
Absolute fit statistics			
χ^2	9,437.54	6,227.83	6,143.50
Degrees of freedom	275	274	272
RMSEA	.114 (poor)	.092 (mediocre)	.092 (mediocre)
Comparisons of fit	χ^2 difference	p of the difference	
Model 1 vs. Model 2	3,209.7	<.001	
Model 2 vs. Model 3	84.3	<.001	

Note. ODD = Oppositional Defiant Disorder; ED = emotion dysregulation; CD = Conduct Disorder; RMSEA = root mean square error approximation.

We propose that, because ODD is unidimensional and ED is statistically collinear with ODD, then ODD is better conceptualized as a disorder of emotion regulation, rather than as a behavior disorder. ED encompasses the original ODD criteria but also quick mood changes (#38), easy frustration (#38), irritability (#54), excessive emotionality (#58), and unstable relationships (#60). As none of these items loaded on the CD factor and because the ED and ODD latent variables correlated below .85, emotionality is likely more central to ODD than to CD. This conclusion is supported by Burke and colleagues who reported that ODD is a risk factor for future depression, while CD is an indirect risk factor only by first causing stressful events that subsequently lead to depression (Burke, Loeber, & Birmaher, 2002; Burke et al., 2005).

Our study is subject to several important limitations. First, we relied upon a singular questionnaire to assess ODD and various affective and behavioral disorders. Although the children in our sample were seen clinically by mental health practitioners who directed their parents/teachers to complete the SNAP online, we did not have access to clinical diagnoses. Second, the cross-sectional design of our study did not allow us to establish temporal precedence between symptom presentations of ODD, ED, and CD. Stronger evidence in the form of a longitudinal study would support our argument if it showed that ODD is accompanied by ED in children and if more of them developed subsequent mood disorders than was the case with CD or antisocial behavior. Third, although we propose that ODD is better conceptualized as ED, we have not in the current work devised a scale that optimally measures ODD-ED. It would be important in future work to prune away redundant items and design a scale that is short, reliable, and valid. Finally, factor analysis as a method reveals the logical clustering of items in a scale, not the categorization of individuals in real life. We have therefore not addressed whether ODD carves childhood disorders at the joints—only whether the items used to measure it do so. Our study is exploratory in nature and conclusions should be considered tentative.

In summary, current understanding and research of ODD is limited. ODD has historically been classified as a disruptive behavior disorder, with an emotion regulation component only recently being recognized. Our data suggest that disordered emotion regulation is not merely a component of ODD, but is the core deficit. Our findings indicate that current ODD criteria are coherent (unidimensional) but not independent and are likely better classified under a disorder of emotion regulation. This study indicates that ODD and DMDD may be conceptualized as occurring on the same continuum of disordered emotion regulation, with DMDD being of greater severity. Further research in this area is warranted.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr Quinn is a consultant for Eli-Lilly, Shire, Janssen, Purdue, and Highland Therapeutics. Dr Duncan is on the advisory boards and speaker bureaus of Shire, Janssen, and Purdue.

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References

Ambrosini, P. J., Bennett, D. S., & Elia, J. (2013). Attention deficit hyperactivity disorder characteristics: II. Clinical correlates of irritable mood. *Journal of Affective Disorders*, *145*, 70-76.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford.

Burke, J. D. (2012). An affective dimension within oppositional defiant disorder symptoms among boys: Personality and psychopathology outcomes into early adulthood. *Journal of Child Psychology and Psychiatry*, *53*, 1176-1183.

Burke, J. D., Hipwell, A. E., & Loeber, R. (2010). Dimensions of oppositional defiant disorder as predictors of depression and conduct disorder in preadolescent girls. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*, 484-492.

Burke, J. D., Loeber, R., & Birmaher, B. (2002). Oppositional defiant disorder and conduct disorder: A review of the past 10 years, part II. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*, 1275-1293.

Burke, J. D., Loeber, R., Lahey, B. B., & Rathouz, P. J. (2005). Developmental transitions among affective and behavioral disorders in adolescent boys. *Journal of Child Psychology and Psychiatry*, *46*, 1200-1210.

Bussing, R., Fernandez, M., Harwood, M., Hou, W., Garvan, C. W., Eyberg, S. M., & Swanson, J. M. (2008). Parent and teacher SNAP-IV ratings of attention deficit hyperactivity disorder symptoms: Psychometric properties and normative ratings from a school district sample. *Assessment*, *15*, 317-328.

Conners, C. K. (1998). Rating scales in attention-deficit/hyperactivity disorder: Use in assessment and treatment monitoring. *Journal of Clinical Psychiatry, 59*(Suppl. 7), 24-30.

Connor, D. F., & Doerfler, L. A. (2008). ADHD with comorbid oppositional defiant disorder or conduct disorder: Discrete or nondistinct disruptive behavior disorders? *Journal of Attention Disorders*, *12*, 126-134.

Dinno, A. (2009). Exploring the sensitivity of Horn's parallel analysis to the distributional form of random data. *Multivariate Behavioral Research*, *44*, 362-388.

Drabick, D. A., & Gadow, K. D. (2012). Deconstructing oppositional defiant disorder: Clinic-based evidence for an anger/irritability phenotype. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*, 384-393.

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. *The American Journal of Psychiatry*, *159*, 1214-1224.

Gross, J. J. (2007). *Handbook of emotion regulation*. New York, NY: Guilford.

Hayton, J. C., Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods*, *7*, 191-205.

Hinshaw, S. P. (2003). Impulsivity, emotion regulation, and developmental psychopathology: Specificity versus generality of linkages. *Annals of the New York Academy of Sciences*, *1008*, 149-159.

Horn, J. L. (1965). A rationale and test for the number of factors in factor-analysis. *Psychometrika*, *30*, 179-185.

Krieger, F. V., Polanczyk, V. G., Robert, G., Rohde, L. A., Graeff-Martins, A. S., Salum, G., . . .Stringaris, A. (2013). Dimensions of oppositionality in a Brazilian community sample: Testing the DSM-5 proposal and etiological links. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*, 389-400.

Kuhne, M., Schachar, R., & Tannock, R. (1997). Impact of comorbid oppositional or conduct problems on attention-deficit hyperactivity disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 1715-1725.

Lahey, B. B., & Waldman, I. D. (2012). Annual research review: Phenotypic and causal structure of conduct disorder in the broader context of prevalent forms of psychopathology. *Journal of Child Psychology and Psychiatry*, *53*, 536-557.

Leibenluft, E., Blair, R. J., Charney, D. S., & Pine, D. S. (2003). Irritability in pediatric mania and other childhood psychopathology. *Annals of the New York Academy of Sciences*, *1008*, 201-218.

Little, T. D. (2013). *Longitudinal structural equation modeling*. New York, NY: Guilford.

Reimherr, F. W., Marchant, B. K., Strong, R. E., Hedges, D. W., Adler, L., Spencer, T. J., . . .Soni, P. (2005). Emotional dysregulation in adult ADHD and response to atomoxetine. *Biological Psychiatry*, *58*, 125-131.

Rowe, R., Costello, E. J., Angold, A., Copeland, W. E., & Maughan, B. (2010). Developmental pathways in oppositional defiant disorder and conduct disorder. *Journal of Abnormal Psychology*, *119*, 726-738.

Stringaris, A., Cohen, P., Pine, D. S., & Leibenluft, E. (2009). Adult outcomes of youth irritability: A 20-year prospective community-based study. *The American Journal of Psychiatry*, *166*, 1048-1054.

Stringaris, A., & Goodman, R. (2009). Three dimensions of oppositionality in youth. *Journal of Child Psychology and Psychiatry*, *50*, 216-223.

Swanson, J. M. (n.d.-a). *Scoring Instructions for the SNAP-IV-C Rating Scale*. Retrieved from http://www.adhd.net/snap-iv-instructions.pdf

Swanson, J. M. (n.d.-b). *SNAP IV Teacher and Parent Rating Scale*. Retrieved from http://www.adhd.net/snap-iv-form.pdf

Whelan, Y. M., Stringaris, A., Maughan, B., & Barker, E. D. (2013). Developmental continuity of oppositional defiant disorder subdimensions at ages 8, 10, and 13 years and their distinct psychiatric outcomes at age 16 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*, 961-969.

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