Published in final edited form as:

Child Psychiatry Hum Dev. 2017 February ; 48(1): 32–39. doi:10.1007/s10578-016-0650-7.

Further Psychometric Evaluation of the Child Disgust Scale

Joshua M. Nadeau, Ph.D.^{1,2}, Alessandro S. De Nadai, M.A.^{1,3}, Megan Viar-Paxton, M.A.⁴,
Bunmi O. Olatunji, Ph.D.^{2,4}, David M. Jacobi, Ph.D.², Stephanie C. Eken, M.D.², Brian Kay,
M.S.², Bradley C. Riemann, Ph.D.², and Eric A. Storch, Ph.D.^{1,2,3,5,6,7}

¹Department of Pediatrics, University of South Florida

²Rogers Memorial Hospital

³Department of Psychology, University of South Florida

⁴Department of Psychology, Vanderbilt University

⁵Department of Health Policy and Management, University of South Florida

⁶Department of Psychiatry & Behavioral Neurosciences, University of South Florida

⁷All Children's Hospital – Johns Hopkins Medicine

Abstract

This study evaluated the psychometric properties of the Child Disgust Scale (CDS) among 457 youth (ages 8–17, $M=14.77\pm1.98$ years) initiating residential treatment for obsessive-compulsive disorder (OCD) and anxiety disorders. Confirmatory factor analysis supported a bifactor model with two distinct factors of Disgust Avoidance and Disgust Affect, in addition to an overall General Disgust factor. Strong internal consistency was observed for the CDS total and factor scores. In addition, CDS scores demonstrated generally modest and positive correlations with child-reported obsessive-compulsive and anxiety symptoms, weaker correlations with parent-reported anxiety and child-rated impairment, and non-significant correlations with parent-rated impairment. Findings suggest that the CDS displays strong psychometric properties and is developmentally appropriate for use in pediatric clinical populations with obsessive-compulsive and anxiety disorders.

Keywords

Child Disgust Scale; Disgust; Factor analysis; Validity; Reliability

Disgust is a basic and universal emotion often conceptualized as a defensive response to aversive stimuli [1]. Research has shown that the degree of disgust experienced varies between individuals [2]. Individual differences in the propensity to experience disgust in the presence of aversive stimuli has been defined as disgust sensitivity [3]. The construct is considered to be a stable (dispositional) personality trait with robust genetic influences [4, 5] that can be exacerbated by social transmission during childhood [1, 6]. Disgust sensitivity

has been associated with obsessive-compulsive disorder (OCD), most notably contamination obsessions and washing subtype compulsions [7, 8]. Further, disgust sensitivity has been correlated with symptoms of many anxiety-related disorders [9, 10], blood-injection-injury phobia (BII) [11, 12], posttraumatic stress disorder (PTSD) [13], and hypochondriasis [14].

To date, most research on disgust sensitivity and psychopathology has been among adult samples, with few data reported among pediatric populations. This is problematic, given research implicating disgust sensitivity in the development and maintenance of anxiety-related disorders [9, 10], the epidemiological data for which suggest an average age of onset as 11 years or earlier [15]. Consistent with adult research, the studies which have employed pediatric samples have shown associations between disgust sensitivity and symptoms of OCD, small animal phobia, social phobia, and disordered eating [16]. Further, Muris and colleagues [17] found evidence to suggest that priming of youth with disgust-related information specific to novel animals predicted subsequent elevations in child-reported fear of the animal(s) in question. This suggests that the experience of disgust may have a causal effect on the development of anxiety-related symptoms. The growing literature base suggesting associations between disgust sensitivity and anxiety symptoms in youth has created the need for a psychometrically sound measure for its assessment in children. Although more recent research has focused upon assessment of disgust sensitivity in youth, significant limitations in these efforts have been identified. For example, Muris et al. (18) developed an age-downward version of the Disgust Emotion Scale – the Disgust Emotion Scale for Children (DES-C). However, downwardly extending adult scales does not guarantee the ability to adequately account for developmental differences in the construct of disgust sensitivity among children. Additionally, studies of measures including the DES-C have used a restricted age range of children (typically 9–13 years), although anxiety disorders have been observed to develop in younger children. The Child Disgust Scale (CDS) [19] is a newly developed child-rated measure of disgust sensitivity characterized by endorsement of responses to disgust-eliciting stimuli. Ratings on the CDS assess a General Disgust factor and two constituent factors of Disgust Avoidance and Disgust Affect. When presented with disgust-eliciting stimuli, the Disgust Avoidance score reflects the likelihood of avoiding said stimuli, while the Disgust Affect score reflects the likelihood of experiencing an affective response.

To date only one psychometric investigation has been conducted on the CDS [19]. Internal consistency was .96 in a non-clinical sample of 1,500 school-children. Convergent and discriminant validity were supported in a non-clinical secondary sample of 50 school-age children, as the CDS scores demonstrated strong associations with measures of anxiety-related disorder symptoms and common fears, but no significant association with depressive symptoms. Although these data are encouraging, it is unclear if the proposed bifactor 2-factor structure of the CDS is generalizable to a clinical sample. Further, replication of assessment across populations is essential in evidence-based assessment in youth [20, 21]. Therefore, formal evaluation of the psychometric properties of the CDS in a clinical sample is critical.

The purpose of this study was to examine the psychometric properties of the CDS in a diverse clinical sample. We had three research questions. First, is the proposed CDS bifactor

structure supported in a sample of youth presenting for residential treatment of OCD and anxiety disorders? Given previous examination of the CDS [19], we hypothesized that the factor structure would support presence of a General Disgust factor as well as two discrete subfactors – one affect-based, the other delineating avoidance of disgust stimuli. Second, what is the internal consistency of the CDS Total and factor scores in this sample? Viar-Paxton et al. [19] found adequate internal consistency for overall disgust sensitivity, as well as for both subfactor scores (Disgust Avoidance, Disgust Affect). Therefore, we hypothesized that internal consistency would be comparable for the current sample. Third, to what extent do CDS scores correlate with measures of anxiety symptom severity and overall impairment in this sample? We hypothesized that CDS scores would correlate strongly with anxiety symptoms, given the findings of Viar-Paxton et al. [19], but not significantly with perceived impairment.

Method

Participants

Participants included 457 children and adolescents (ages 8–17, $M=14.77\pm1.98$ years; 53% female), who were seeking residential psychosocial treatment for OCD and/or anxiety disorders. Inclusion criteria included child age between 8–17 years and ability to independently read English. Potential participants were excluded from analysis if any administered measures were not completed. Table 1 below lists participant characteristics. All psychiatric diagnoses were made through clinical and/or diagnostic interviews with attending psychiatrist/psychologist upon admission to treatment facility.

Measures

Child Disgust Scale.—The CDS [19] is a 14-item child-rated measure of disgust sensitivity, with items scored on a 3-point scale ranging from 0–2. The CDS assesses an overall General Disgust factor and two subfactors (Disgust Avoidance, Disgust Affect). The Disgust Avoidance score is derived from the mean of 9 items (range=0–2); the Disgust Affect score is derived from the mean of 5 reverse-scored items (range=0–2). The sum of all 14 items constitutes a Total score, with higher scores corresponding to greater disgust sensitivity.

Children's Yale-Brown Obsessive Compulsive Scale – Self-Report (CY-BOCS-SR).—The CY-BOCS-SR [22] is a 10-item self-report measure of obsession and compulsion severity. Assessment is focused upon the week immediately prior to administration, with all items scored on a five-point Likert-type scale. The CY-BOCS-SR produces three scores: Obsession Severity; Compulsion Severity; and a summative Total Score. Like the clinician-rated version (Storch et al., 2004), the CY-BOCS-SR demonstrates good internal consistency, moderate inter-rater agreement, and acceptable convergent and divergent validity [23].

Screen for Child Anxiety Related Emotional Disorders – Child and Parent Versions (SCARED).—The SCARED [24] is a self-report measure used to screen youth for anxiety disorders. Both child- and parent-versions consist of 41 items. The specific

symptom domains assessed include panic/somatic, generalized anxiety, separation anxiety, social phobia, and school phobia. Items are rated using a 0–2 point rating scale (0=not true/hardly ever true, 1=sometime true, 2=true/often true). The SCARED demonstrates good internal consistency and discriminant validity [24].

Child Sheehan Disability Scale – Child and Parent Versions (CSDS-Parent/Child).—The CSDS-Parent [25] assesses the extent of impairment in social, academic, and family domains caused by a child’s psychiatric symptoms. Similarly, the CSDS-Child [25] assesses the child’s perception of impairment related to psychiatric symptoms across social, academic and family domains. The CSDS-Child and Parent versions demonstrate strong reliability and construct validity [25].

Procedures

Permission to conduct an archival review of clinical records was obtained by the institutional review boards at both the University of South Florida and Rogers Memorial Hospital. Data were collected as part of routine intake assessment administration among youth (and their parents) seeking residential psychiatric treatment for OCD and anxiety disorders.

Analytic Plan

Factor Structure.—To evaluate the factor structure of the CDS, a confirmatory factor analysis (CFA) was performed using the bifactor model of the CDS specified by Viar-Paxton et al. [19]. Because individual CDS items are ordinal in nature, the model was evaluated using WLSMV estimation in Mplus 7.31 [26]. Model fit was evaluated by using the χ^2 test for goodness-of-fit, the Comparative Fit Index (CFI) [27], the Root Mean Square Error of Approximation (RMSEA) [28], and the Standardized Root Mean Square Residual (SRMR) [29]. Because the χ^2 test for goodness-of-fit is often oversensitive [30], adequate model fit was determined by values of greater than .95 for the CFI, values of less than .06 for the RMSEA, and values of less than .06 for the SRMR [31]. We also reported total variance accounted for by the model and its subfactors as well as total common variance accounted for (i.e., of all model variance explained, how much of it was uniquely attributable to each factor). Multiple imputation was used to address missing data for the CFA (98.5% of data or greater was available for both items in all possible CDS item pairs). After considering the influences of number of imputations on precision of covariance estimates and statistical power [32], 100 imputations were used.

Internal Consistency.—To evaluate reliability, omega and omega hierarchical were computed, which are currently considered as more appropriate measures of reliability for bifactor models relative to older measures such as Cronbach’s alpha [33]. Omega reflects overall reliability and is analogous to Cronbach’s alpha, while omega hierarchical reflects the reliability of a factor after accounting for all other scale factors (i.e., General Disgust and/or subfactors). Omega and omega hierarchical were computed using the program “Omega” [34]. While widely accepted standards for omega hierarchical levels have not been established, omega hierarchical values should at minimum be greater than .50 in order to reflect adequate reliability [35].

Clinical Correlates.—Given that the CDS produces total and subscale scores, following precedent provided by Viar-Paxton et al. [19], Pearson correlations were used to evaluate clinical correlates of the CDS and its subscales, including OCD severity (self-reported CY-BOCS-SR total score and obsessions and compulsions subscales), overall anxiety (SCARED-C and SCARED-P), and overall impairment (CSDS-C and CSDS-P). Based on criteria presented by Cohen [36], Pearson correlations of 0.1, 0.3, and 0.5 represent small, medium, and large correlations, respectively. Full-information maximum likelihood estimation was used to address any missing data when evaluating clinical correlates (91% of data or greater was available for all possible pairs of clinical correlates).

Results

Descriptive Statistics.

Descriptive statistics are presented in Table 2, including mean ratings and skew/kurtosis statistics for each CDS item. All items were within the recommended range of ± 2 for skewness and kurtosis [37]. In terms of individual item responses, those questions for which more than 30% of the sample indicated high disgust included items 2 (eat popsicle licked by dog; 60.4%), 7 (touch sandwich with mold; 56.6%), 8 (eat soup with hair in it; 43.3%), 12 (use toilet with poop in it; 59.0%), 13 (share markers with someone who touched dead bird; 49.9%), 17 (drink after someone else from same container; 44.6%), and 18 (see someone vomit; 32.8%). In contrast, questions for which more than 30% of the sample indicated no disgust included items 4 (pick up worm in hand; 41.6%), 5 (sight of blood; 68.0%), 6 (touch raw meat when cooking; 48.9%), 11 (TV shows people's guts; 42.2%), 15 (see dead animal on road; 52.5%), and 16 (seeing blood in meat at store; 60.3%). Detailed descriptions of individual item prompts are provided in Table 3.

Factor Structure.

Overall model fit for the CDS bifactor model was adequate ($\chi^2(63)=128.58$, $p<.01$, CFI=.97, RMSEA=.05). Factor loadings for the CFA bifactor model of the CDS can be seen in Figure 1. Of note, all loadings were statistically significant except for the loading of item 18 on the Disgust Affect subfactor. Variance contributed by individual CDS items can be found in Table 3. For the entire scale, 47% of item variance was contributed to one of the study factors. The General Disgust factor explained 21% of the total variance, while 18% of total variance was explained by the Disgust Avoidance subfactor and 8% of total variance was explained by the Disgust Affect subfactor. The General Disgust factor explained 44% of the common variance, while 39% of common variance was explained by the Disgust Avoidance subfactor and 17% of common variance was explained by the Disgust Affect subfactor.

Internal Consistency.

After establishing the validity of the disgust construct in children, we evaluated how reliably the CDS measures this construct. Omega values for the General Disgust factor, Disgust Avoidance factor, and Disgust Affect factor were .90, .87, and .84, respectively. This reflects that all CDS scales displayed reliable scores. Omega hierarchical values for the General Disgust factor, Disgust Avoidance factor, and Disgust Affect factor were .52, .58, and .33, respectively.

Clinical Correlates.

Pearson correlations between CDS scores and clinical correlates can be found in Table 4. Medium-sized correlations were observed among OCD severity and both the CDS Total Score and CDS Disgust Avoidance Score, though the correlations with OCD severity were in the small-medium range for the CDS Disgust Affect subscale. Correlations among all CDS scales and child-reported anxiety on the SCARED-C were in the medium to medium-large range, though correlations among the CDS scales and parent-report on the SCARED-P were in the small-medium range. All CDS scores correlated in the small-medium range with child-rated disability on the CSDS-C, but correlations with parent-rated disability on the CSDS-P were statistically non-significant.

Discussion

This study sought to further investigate the psychometric properties of the CDS among a pediatric treatment-seeking population. With respect to individual item responses, the pattern of response approximated that of Viar-Paxton et al [19]. Disgust Avoidance mean score was 60% of the possible maximum, while Disgust Affect mean score was only 33.7% of the possible maximum. Overall, the bifactor model first reported for the CDS [19] fit well, reflecting validity for a model that has a General Disgust factor, with two unique subfactors – Disgust Avoidance and Disgust Affect. These factors also reliably measured their hypothesized constructs and showed evidence for unique measurement of their associated construct, as all three factors accounted for variance above and beyond that accounted for by the other factors. Although all factors showed such uniqueness, Disgust Avoidance accounted for more unique variance and exhibited a lower omega hierarchical value as compared to Disgust Affect. This differs somewhat from Viar-Paxton et al. [19]. It is possible that when using a clinical sample, the relative variance contributions may differ compared to a non-clinical counterpart, particularly when examining youth with obsessive-compulsive and/or anxious symptoms who exhibit avoidant behaviors.

With respect to clinical correlates, generally modest associations were observed between CDS scores and measures of anxiety and obsessive-compulsive symptoms, supporting the finding that disgust sensitivity is associated with anxiety symptoms. Interestingly, the strength of association with CDS scores was less strong for parent ratings as compared to child ratings, which may reflect method variance. Although associations were weak and/or non-significant between CDS scores and ratings of impairment (CSDS scores), the aforementioned difference in association strength between child and parent ratings resulted in weak but significant associations between CDS scores and child-rated impairment (parent ratings were non-significant), suggesting that disgust sensitivity may be a weaker predictor of functional impairment in youth with significant psychopathology.

Limitations

Study results should be interpreted in light of certain limitations. First, CDS scores were not examined as a function of diagnosis, nor was divergent validity examined. This limitation is a function of the clinical sample studied, wherein only those assays considered salient to treatment were administered. Future research should seek to incorporate measures to

examine divergent validity. Second, the current sample exhibited severe psychiatric symptoms; therefore, future research should seek to evaluate outpatient samples with more moderate symptom levels.

Summary

This study represents an important step in the investigation of psychometric properties for an instrument designed to assess disgust sensitivity among youth. Overall, the CDS displays good psychometric properties. When utilized among a pediatric residential treatment-seeking clinical population, the bifactor model originally proposed [19] fits well. However, when simultaneously considering all factors, the Disgust Affect subfactor accounted for less variance and was less reliable than the Disgust Avoidance subfactor. The CDS does predict some clinical correlates of interest, although the associations observed were modest. The associations of CDS scores with parent-reported measures were relatively low, this phenomenon is by no means unique to disgust sensitivity. It is possible that disgust does not affect overall symptom severity, and/or this may reflect shared method variance. More research is needed to determine how the Disgust Affect factor performs with outpatient clinical samples and to identify how parents might conceptualize child-rated disgust. Overall, our data indicate that the CDS is a measure with strong psychometric properties for use with pediatric treatment-seeking samples. This finding suggests that the CDS is an ideal tool for examining the contributions of disgust sensitivity to youth's experiences with anxiety disorders and OCD.

Acknowledgments

This research was supported by the National Institutes of Health under Ruth L. Kirschstein National Research Service Award F31 MH094095 to Alessandro De Nadai from the National Institute of Mental Health.

References

1. Rozin P, Haidt J, McCauley CR (2000) Disgust. In Lewis M, Haviland JM (Eds.), *Handbook of emotions* (637–653). New York: Guilford Press
2. Haidt J, McCauley C, Rozin P (1994) Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Pers Individ Dif* 16: 701–713
3. Olatunji BO, Sawchuk CN (2005) Disgust: Characteristic features, social implications, and clinical manifestations. *J Soc Clin Psychol* 24: 932–962
4. Olatunji BO, Rozin P, Haidt J, McCauley CR (2006) Further exploration of the role of disgust sensitivity in anxiety and related disorders. *Anxiety Stress Coping* 19: 331–334
5. Sherlock JM, Zietsch BP, Tybur JM, Jern P (in press). The quantitative genetics of disgust sensitivity. *Emotion*
6. Stevenson RJ, Oaten MJ, Case TI, Repacholi BM, Wagland P (2010) Children's response to adult disgust elicitors: Development and acquisition. *Dev Psychol* 46: 165–177 [PubMed: 20053015]
7. David B, Olatunji BO, Armstrong T, Ciesielski BG, Bondy CL, Broman-Fulks J (2009) Incremental specificity of disgust sensitivity in the prediction of obsessive-compulsive disorder symptoms: Cross-sectional and prospective approaches. *J Behav Ther Exp Psychiatry* 40: 533–543 [PubMed: 19683221]
8. McKay D, Moretz MW (2009) The intersection of disgust and contamination fear In Olatunji BO & McKay D (Eds.) *Disgust and its disorders: Theory, assessment, and treatment implications* (211–227). Washington, DC: American Psychological Association

9. Koch MD, O'Neill HK, Sawchuk CN, Connolly K (2002) Domain-specific and generalized disgust sensitivity in blood–injection–injury phobia: The application of behavioral approach/avoidance tasks. *J Anxiety Disord* 16: 511–527 [PubMed: 12396209]
10. Olatunji BO, Lohr JM, Smits JA, Sawchuk CN, Patten K (2009) Evaluative conditioning of fear and disgust in blood–injection–injury phobia: Specificity and impact of individual differences in disgust sensitivity. *J Anxiety Disord* 23: 153–159 [PubMed: 18650059]
11. Olatunji BO, Williams NL, Sawchuk CN, Lohr JM (2006) Disgust, anxiety, and fainting symptoms associated with blood–injection–injury fears: A structural model. *J Anxiety Disord* 20: 23–41 [PubMed: 16325112]
12. Page AC, Tan BJ (2009) Disgust and blood–injury–injection phobia In Olatunji BO & McKay D (Eds.), *Disgust and its disorders: Theory, assessment, and treatment implications* (191–209). Washington, DC: American Psychological Association
13. Engelhard IM, Olatunji BO, de Jong PJ (2011) Disgust and the development of posttraumatic stress among soldiers deployed to Afghanistan. *J Anxiety Disord* 25: 58–63 [PubMed: 20800428]
14. Davey GC, Bond N (2006) Using controlled comparisons in disgust psychopathology research: The case of disgust, hypochondriasis and health anxiety. *J Behav Ther Exp Psychiatry* 37: 4–15 [PubMed: 16253205]
15. Kessler RC, Ruscio AM, Shear K, Wittchen H-U (2009) Epidemiology of anxiety disorders In Antony MM & Stein B (Eds.), *Oxford Handbook of Anxiety and Related Disorders* (19–33). New York, NY: Oxford University Press.
16. Muris P, van der Heiden S, Rassin E (2008) Disgust sensitivity and psychopathological symptoms in non-clinical children. *J Behav Ther Exp Psychiatry* 39: 133–146. [PubMed: 17433251]
17. Muris P, Mayer B, Huijding J, & Konings T (2008). A dirty animal is a scary animal! Effects of disgust-related information on fear beliefs in children. *Behaviour research and therapy*, 46, 137–144. [PubMed: 17959140]
18. Muris P, Huijding J, Mayer B, Langkamp M, Reyhan E, & Olatunji B (2012). Assessment of disgust sensitivity in children with an age downward version of the Disgust Emotion Scale. *Behavior Therapy*, 43, 876–886. [PubMed: 23046788]
19. Viar-Paxton MA, Ebesutani C, Kim EH, Ollendick T, Young J, Olatunji BO (2015) Development and initial validation of the Child Disgust Scale. *Psychol Assess* 27: 1082–1096 [PubMed: 25844533]
20. Holmbeck GN, Devine KA (2009) Editorial: An author's checklist for measure development and validation manuscripts. *J Pediatr Psychol* 34: 691–696 [PubMed: 19487232]
21. Hunsley J, Mash EJ (2008) *A guide to assessment that work*. New York, NY: Oxford University Press.
22. Scahill L, Riddle MA, McSwiggin-Hardin M, Ort SI, King RA, Goodman WK, et al. (1997) Children's Yale–Brown Obsessive Compulsive Scale: Reliability and validity. *J Am Acad Child Adolesc Psychiatry* 36: 844–852 [PubMed: 9183141]
23. Storch EA, Murphy TK, Adkins JW, Lewin AB, Geffken GR, Johns NB, et al. (2006) The Children's Yale–Brown Obsessive–Compulsive Scale: Psychometric properties of child-and parent-report formats. *J Anxiety Disord* 20: 1055–1070 [PubMed: 16503111]
24. Birmaher B, Brent DA, Chiappetta L, Bridge J, Monga S, Baugher M (1999) Psychometric properties of the Screen for Child Anxiety Related Disorders: A replication study. *J Am Acad Child Adolesc Psychiatry* 38: 1230–36 [PubMed: 10517055]
25. Whiteside SP (2009) Adapting the Sheehan Disability Scale to assess child and parent impairment related to childhood anxiety disorders. *J Clin Child Adolesc Psychol* 38: 721–730 [PubMed: 20183656]
26. Muthén LK, Muthén BO (2012) *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
27. Bentler PM (1990) Comparative fit indexes in structural models. *Psychol Bull* 107: 238–246 [PubMed: 2320703]
28. Steiger JH (1990) Structural model evaluation and modification: An interval estimation. *Multivariate Behav Res* 25: 173–180 [PubMed: 26794479]
29. Bentler PM (1995) *Eqs for windows user's guide*. Multivariate Software, Encino, CA

30. Raykov T, Marcoulides G (2006) A first course in structural equation modeling. Lawrence Erlbaum Associates, Inc., Mahwah, NJ.
31. Hu LT, Bentler PM (1999) Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Modeling* 6: 1–55
32. Graham JW, Olchowski AE, Gilreath TD (2007) How many amputations are really needed? Some practical clarifications of multiple imputation theory. *Prev Sci* 8: 206–213 [PubMed: 17549635]
33. Brunner M, Nagy G, Wilhelm O (2012) A tutorial on hierarchically structured constructs. *J Pers* 80: 796–846 [PubMed: 22091867]
34. Watkins MW (2013) Omega [Computer software]. Phoenix, AZ: Ed & Psych Associates.
35. Reise SP, Bonifay WE, Haviland MG (2013) Scoring and modeling psychological measures in the presence of multidimensionality. *J Pers Assess* 95: 129–140 [PubMed: 23030794]
36. Cohen J (1988) *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
37. Cameron C (2004) Kurtosis In MS Lewis-Beck A Bryman TF Liao (Eds.), *The Sage encyclopedia of social science research methods*. Thousand Oaks, CA: Sage

Figure 1.
Bifactor Model Fit to the Child Disgust Scale

Table 1.**Participant Characteristics**

Age (years)	
Range	8–17
Mean (SD)	14.77 (1.98)
Gender (n, %)	
Male	213 (46.6)
Female	244 (53.4)
Ethnicity (n, %)	
White	417 (91.2)
Asian	17 (3.7)
Hispanic	13 (2.8)
Multiracial	5 (1.2)
Black	3 (0.7)
Indian	2 (0.4)
Primary psychiatric diagnosis (n, %)	
OCD	238 (52.1)
Depressive Disorders	97 (21.2)
Anxiety Disorders	79 (17.3)
Tic Disorders	13 (2.8)
ADHD	9 (2.0)
Eating Disorders	7 (1.5)
Substance Abuse/Dependence	1 (0.2)
Other Axis I Disorder (unspecified)	13 (2.8)

Table 2.

Descriptive statistics for CDS items

Item	<i>M</i> (SD)	Skewness	Kurtosis
CDS 2	1.45 (.75)	−0.95	−0.58
CDS 4	0.86 (.82)	0.27	−1.47
CDS 5 *	0.41 (.65)	1.33	0.53
CDS 6 *	0.74 (.81)	.50	−1.31
CDS 7	1.44 (.71)	−0.86	−0.56
CDS 8	1.25 (.75)	−0.44	−1.10
CDS 9 *	1.07 (.81)	−0.13	−1.45
CDS 10	1.02 (.72)	−0.03	−1.05
CDS 11	0.81 (.78)	0.35	−1.30
CDS 12	1.45 (.72)	−0.93	−0.51
CDS 13	1.30 (.78)	−0.58	−1.12
CDS 15 *	0.60 (.70)	0.74	−0.66
CDS 16 *	0.55 (.74)	0.95	−0.56
CDS 17	1.30 (.72)	−0.50	−0.93
CDS 18 *	1.10 (.74)	−0.16	−1.16

*
Item was reverse-scored.

Table 3.

Sources of Variance in the Child Disgust Scale Bifactor Model

Variable	General Disgust Variance	Disgust Avoidance Variance	Disgust Affect Variance	Total Variance
Item 2: If a dog licked my popsicle I would still eat it.	0.03	0.29		0.31
Item 4: I would pick up a worm with my hand.	0.25	0.17		0.42
Item 7: I would touch a sandwich with green mold on it.	0.19	0.38		0.57
Item 8: I would still eat my soup if I saw a hair in it.	0.07	0.27		0.34
Item 10: I would sit next to a sweaty kid at lunch.	0.13	0.30		0.43
Item 11: I would watch a TV show that showed people's guts.	0.24	0.11		0.36
Item 12: I would use the toilet even if there was poop still in it.	0.10	0.24		0.34
Item 13: I would share markers with someone that had touched a dead bird.	0.24	0.39		0.63
Item 17: I would still drink my juice box even if I saw another kid drink out of it.	0.11	0.43		0.53
Item 5: When I see blood I feel dizzy.	0.15		0.26	0.41
Item 6: I feel gross when I touch raw meat to help cook dinner.	0.34		0.14	0.47
Item 15: I feel sick if I see a dead animal on the side of the road.	0.33		0.22	0.55
Item 16: I don't like seeing the blood in meat at the grocery store.	0.33		0.48	0.80
Item 18: I feel sick if I see someone throw up.	0.38		0.03	0.40

Note. All items are numbered so that they match the item numbering from Vair-Paxton et al. (2015)

Table 4.

Clinical Correlates of the Child Disgust Scale Total Score and Subscale Scores

	CDS Total	CDS Disgust Avoidance	CDS Disgust Affect	Mean (SD)
CDS Total	-	-	-	14.05 (5.64)
CDS Disgust Avoidance	0.90 **	-	-	1.21 (0.46)
CDS Disgust Affect	0.71 **	0.34 **	-	0.67 (0.51)
CY-BOCS-SR Obsessions	0.31 **	0.30 **	0.21 **	9.38 (5.51)
CY-BOCS-SR Compulsions	0.27 **	0.28 **	0.15 **	8.89 (5.63)
CY-BOCS-SR Total	0.30 **	0.30 **	0.19 **	18.20 (10.59)
SCARED-C	0.39 **	0.31 **	0.37 **	35.05 (20.56)
SCARED-P	0.23 **	0.19 **	0.19 **	33.40 (16.78)
CSDS-C	0.25 **	0.20 **	0.22 **	17.86 (7.65)
CSDS-P	0.06	0.03	0.09	40.33 (8.57)

Note. CDS=Child Disgust Scale; CY-BOCS-SR=Children's Yale-Brown Obsessive Compulsive Scale; SCARED-C=Screen for Child Anxiety Related Emotional Disorders-Child Version; SCARED-P=Screen for Child Anxiety Related Emotional Disorders-Parent Version; CSDS-C= Child Sheehan Disability Scale-Child Version; CSDS-P=Child Sheehan Disability Scale-Parent Version

*
 $p < .05$;

**
 $p < .01$