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ORIGINAL ARTICLE

The Trichotillomania Scale for Children: Development and Validation

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Abstract Trichotillomania (TTM) is a chronic impulse control disorder characterized by repetitive hair-pulling resulting in alopecia. Although this condition is frequently observed in children and adolescents, research on pediatric TTM has been hampered by the absence of validated measures. The aim of the present study was to develop and test a new self-report measure of pediatric TTM, the *Trichotillomania Scale for Children* (TSC), a measure that can be completed by children and/or their parents. One hundred thirteen

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children meeting self-report criteria for TTM, and 132 parents, provided data over the internet. An additional 41 child–parent dyads from an outpatient clinic also provided data. Replicated principal components analysis, with elimination of poorly-loading items, yielded two components, which we labeled *Severity* (five items) and *Distress/Impairment* (seven items). The TSC total score and subscales showed adequate internal consistency and test-retest reliability. Parent–child agreement was good in the internet sample, but more modest in the clinic sample. Children's TSC scores correlated significantly with other measures of TTM severity, although some exceptions were noted. Parents' TSC scores correlated significantly with other measures of parent-rated TTM severity in the internet sample, but showed more attenuated relationships with child- and interviewer-rated TTM severity in the clinic sample. The present results suggest that the TSC may be a useful measure of TTM for child and adolescent samples, although additional clarification of convergent validity is needed.

Keywords Hair-pulling · Questionnaire · Impulse control disorders · Child disorders

Trichotillomania (TTM), a chronic impulse control disorder characterized by repetitive pulling out of one's own hair and resulting alopecia, appears to be more common in young people than was previously believed. Although early reports [1] described child and adolescent TTM as a very rare condition, more recent studies using epidemiological and student samples of older adolescents and young adults estimate the prevalence of clinically significant hairpulling to range between 1% and 3.5% [2–4]. The prevalence of TTM among younger children remains unknown.

Psychiatric comorbidity appears to be quite common among adults with TTM, particularly mood, anxiety, substance use, and personality disorders [5–8]. In children and adolescents, approximately one third to two thirds of TTM patients meet criteria for at least one comorbid Axis I disorder, with a preponderance of anxiety and internalizing disorders [9–11].

TTM appears to be associated with substantial impairment and reductions in quality of life. The majority of adult TTM patients report problems such as impaired social functioning, negative affect, interference with grooming behaviors, impaired recreational activity, work productivity, and physical illness or symptoms caused by pulling [12, 13]. Children and adolescents with TTM report spending an average 30–60 min per day pulling hair, and report experiencing significant distress about their symptoms [11].

Research on pediatric TTM has been hampered by the absence of validated measures for use with children and adolescents. A self-report measure, the Massachusetts General Hospital Hairpulling Scale (MGH-HPS) [14] has demonstrated good psychometric properties in adult samples [14, 15], although correlations with global clinician ratings are low [16]. Furthermore, the language in the MGH-HPS might not be appropriate for younger children, TTM severity is represented by a single score rather than by specific factors, and there is no means of assessing parents' perceptions of TTM severity. Clinician-rated scales such as the Psychiatric Institute Trichotillomania Scale [17] and the NIMH Trichotillomania Severity Scale [18] have shown poor internal consistency in small (N's = 22–28) adult samples [16, 19], perhaps due in part to the conceptual differences across the specific items. The lack of validated measures is of particular concern for clinical trials with pediatric samples. One trial [11] found that the NIMH Trichotillomania Severity Scale was sensitive to the effects of treatment; however, the poor internal consistency of that scale may render findings somewhat unstable.

The aim of the present study was to develop and test a new self-report measure of pediatric TTM, the *Trichotillomania Scale for Children* (TSC). Because of possible discrepancies between child- and parent-report of symptom severity [20–22], a child version (TSC-C) and parent version (TSC-P) were developed. It was predicted that the TSC-C and TSC-P would demonstrate adequate internal consistency, test-retest reliability, and convergent and divergent validity.

Method

Participants

Internet Sample

Data were collected as part of the Trichotillomania Impact Project for Children (TIP-C), the details of which are reported elsewhere [23]. Participants were children aged 10–17 who met self-reported modified diagnostic criteria for TTM and one of their parents or legal guardian. Modified diagnostic criteria required that the child (1) pulls his/her hair resulting in noticeable hair loss (both parent and child report); (2) "never/almost never" (0–10% of the time) pulls his/her hair because voices tell him/her to pull hair (both parent and child report); (3) "never/almost never" (0–10% of the time) pulls because he/she believes small bugs are crawling on him/her (child report); (4) has not always pulled as the result of physical causes (e.g., skin conditions, physical illness, or injury) or the use of medications, drugs, or alcohol (parent report); and (5) hair pulling results in at least "mild to moderate" impairment (a score of 3 or greater on a 9-point Likert scale) in day-to-day, social, interpersonal, or academic functioning (parent *or* child report).

Three hundred thirty six children and their parents participated in the TIP-C, and of these, 133 of the children met the modified diagnostic criteria for TTM. Only those participants who completed the TSC portion of the TIP-C ($n = 113$ children, $n = 132$ parents) are included in the current study. As shown in Table 1, this was a primarily female and Caucasian sample, with an average age of 14 years. Per parental report, 67.3% ($n = 76$) had previously been diagnosed with TTM and 37.2% ($n = 42$) had been diagnosed with another psychiatric disorder instead of or in addition to TTM. Thirty-nine children, or 34.8% of the sample, had never been formally diagnosed with any psychiatric condition, including TTM. The most common categories of diagnosed comorbid disorders according to parent report were anxiety disorder, mood disorder, and attention deficit-hyperactivity disorder (ADHD).

Clinic Sample

Forty-one child–parent dyads participated in the present study as part of an open trial and randomized controlled trial of CBT for pediatric TTM [11]. Data were included when either the child ($n = 38$) or parent ($n = 39$) completed the measure. Inclusion criteria were age 8–17, primary diagnosis of TTM as assessed using the Trichotillomania Diagnostic Interview (TDI) [24], and minimum symptom duration of 6 months. Exclusion criteria were a primary diagnosis other than TTM; current bipolar illness, developmental disorder, thought disorder; or current psychotherapy. As shown in Table 1, this sample was significantly younger than the internet sample, with a trend ($p = .06$) toward a greater

Table 1 Sample descriptions=

	Internet sample		Clinic sample			
	N (%)	*M* (SD)	*N* (%)	*M* (SD)	*p*	FET
Child age		14.38 (2.33)		12.58 (2.87)	3.88**	
Child female	81 (71.7%)		28 (73.7%)			1.00
Child White/Non-Hispanic	101 (89.4%)		29 (76.3%)			.06
Child Hispanic/Latino	6 (5.5%)		2 (5.3%)			
Child African-American	1 (0.9%)		6 (15.8%)			
Child multiracial	3 (2.7%)		0 (0.0%)			
Child anxiety disorder	26 (23.0%)		11 (28.9%)			.51
Child mood disorder	21 (18.6%)		3 (7.9%)			.20
Child ADHD	17 (15.0%)		NA			
Child tic disorder	6 (5.3%)		1 (2.6%)			.68
Child eating disorder	5 (3.8%)		NA			
Child disruptive behavior disorder	4 (3.5%)		4 (10.5%)			.11
Child Asperger's disorder	1 (0.9%)		NA			
Child PTSD	1 (0.9%)			0 (0.0%)		
Parent age		44.14 (6.75)		NA		

NA = Not Assessed, FET = Fisher's Exact Test, ** $p < 001$

proportion of minority participants. As is customary in TTM studies [25], criteria B and C (increasing and decreasing tension) of the *DSM-IV-TR* criteria for TTM were deemed optional, as these criteria have been found to exclude patients with clearly significant hair pulling [6, 8, 26]. Comorbid disorders were diagnosed for 36.8% ($n = 14$) of the sample using the Anxiety Disorders Interview Schedule for DSM-IV, Child Version (ADIS-C) [27], with the most common comorbid conditions anxiety disorders and disruptive behavior/externalizing disorders.

Measures

Trichotillomania Scale for Children

The first two authors (DFT and GJD), psychologists with extensive experience in the assessment of TTM, created the initial item pool for the Trichotillomania Scale for Children (TSC). Fifteen items were created to reflect three a priori domains of TTM psychopathology: severity, distress, and impairment (five items per domain). The items were also reviewed and modified by two additional psychologists with expertise in TTM. Items created for the severity scale assessed frequency of urges/pulling, duration of pulling episode, number of hairs pulled, and controllability of pulling. Distress scale items assessed emotional responses associated with pulling (e.g., guilt, embarrassment, sadness, self-reproach). Impairment items assessed interference with peer/family relationships, schoolwork, and grooming routines. Each item consisted of three or more sentences, reflecting varying levels of severity [e.g., (0) I did not pull any hair at all, (1) I pulled out between 1 and 10 hairs on most days, (2) I pulled out more than 10 hairs on most days]. Items were scaled from 0 to 2, with higher scores indicating more severe symptoms. In

cases where multiple answers were selected, the highest (i.e., most severe) selected value was scored. Once the initial item pool was completed a parallel parent version of the TSC was created by modifying the administration instructions.

Measures of TTM (Internet Sample)

Children rated [from 1 (mild) to 9 (severe)] the degree to which TTM interferes with their social life, ability to make friends or get closer to friends, and school or school work. Parents rated [from 1 (mild) to 9 (severe)] the degree to which TTM interferes with their child's social life, ability to form and maintain close relationships, ability to work, and academic life. They also provided a numeric rating (up to 10+) for the number of family vacations, social events, and days of school missed in the past 12 months due to TTM.

Measure of Comorbid Psychopathology (Internet Sample)

Children completed the Multidimensional Anxiety Scale for Children (MASC) [28], a self-report measure of anxiety symptoms. The MASC demonstrates excellent internal consistency and adequate convergent and divergent validity [28]. Parents completed a parallel version of this measure, the Parent Report on Child's Anxiety Symptoms (PROCAS) [28]. Items constituting the PROCAS are identical to MASC items except that nouns and pronouns are altered to match the parent's perspective (e.g., "My child…" rather than "I…"). March et al. [28] found that parent–child agreement ranged from $r = 0.18$ (father–child, MASC total score) to $r = 0.71$ (mother–child, Physical Symptom subscale). Subsequent research has demonstrated acceptable to very good internal consistency for parent-report of the Harm/Avoidance ($\alpha = 0.68$), Separation Anxiety ($\alpha = 0.72$), Physical Symptom ($\alpha = 0.81$), and Social Anxiety ($\alpha = 0.85$) subscales [29]. The Children's Depression Inventory (CDI) [30] was administered to assess self-reported depressive symptoms in the child sample. The CDI demonstrates strong internal consistency [30], acceptable test-retest reliability [31], and acceptable convergent validity [32].

Clinician Measures of TTM (Clinic Sample)

The *NIMH Trichotillomania Severity Scale* (NIMH-TSS) [18] is a semi-structured clinician-rated scale comprised of five items that assess time spent pulling in the past week, time spent pulling the previous day, resistance to pulling, distress, and interference. Resistance is rated on a scale ranging from 0 to 4, and the four other items are rated on a scale ranging from 0 to 5, with higher scores indicating greater symptom severity. The total severity score is calculated by summing the five items. The NIMH-TSS demonstrates adequate internal consistency, excellent inter-rater agreement, and adequate correlations with other TTM interviews, but shows poor correspondence with self-reported TTM severity and degree of alopecia [16]. Additional information about TTM severity was obtained using the *Psychiatric Institute Trichotillomania Scale* (PITS) [17], a clinician-rated measure that assesses various aspects of TTM severity. PITS items are scaled from 0 to 7, with higher scores indicating more severe symptoms. The PITS shows excellent inter-rater reliability but rather low internal consistency [16]. Therefore, emphasis was placed on item scores collected via the PITS rather than the total score. The items used for the present analyses were Severity, Impairment, and Distress.

Measures of Comorbid Psychopathology (Clinic Sample)

The MASC [28] was administered to children to assess self-reported anxiety symptoms. The CDI [30] was administered to children to assess self-reported depressive symptoms.

Procedure

Internet Sample

The TIP-C study was approved by the University of Wisconsin–Milwaukee's Institutional Review Board and the survey was linked to the website of the Trichotillomania Learning Center (TLC), a consumer organization, from May through July 2006. Participants were recruited through an e-mail distribution to TLC members. Respondents were informed that submission of the survey was an indication of consent to participate in research. The child's parent was asked to complete his/her section of the survey first then to leave the room and allow his/her child to complete the survey on his/her own unless the child specifically requested assistance with completing the survey.

Clinic Sample

Thirty-one participants were assessed at the University of Pennsylvania School of Medicine in Philadelphia, PA; 10 were assessed at the Institute of Living in Hartford, CT. Participants at the two sites did not differ in terms of age or TSC scores. There was, however, a significant sex difference between the two sites, with girls representing 100% of the IOL participants and only 61.2% of the University of Pennsylvania participants (Fisher's Exact Test = .012). Children were accompanied by at least one parent, and written assent (children) and consent (parents) were obtained. Assessments were completed as part of the pretreatment evaluation for a treatment-outcome study, which was approved by both the University of Pennsylvania and Hartford Hospital Institutional Review Boards [11]. Doctoral-level psychologists or postdoctoral fellows trained and supervised by a licensed psychologist completed diagnostic assessments and clinician-rated measures. A subsample of children ($n = 9$) and parents ($n = 5$) completed the TSC a second time at the beginning of the first therapy session to determine test-retest reliability. The mean intervening interval was 16.22 days (SD = 10.18) for children and 12.60 days (SD = 5.68) for parents.

Data Analysis

To examine whether the variability in TSC item scores could be explained by underlying factors, we used principal components analysis with oblimin rotation for the TSC-C in the internet sample. Number of components was determined by examining eigenvalues greater than 1.0, visual examination of the scree plot, and parallel analysis [33, 34] using Monte Carlo simulation software [35]. In parallel analysis, the pre-rotation eigenvalues are compared to those from a matrix of random values using the same N and number of variables; eigenvalues from the data set greater than those from the random matrix are retained. The factor structure was then replicated in the parent sample using the TSC-P.

Internal consistency of the TSC-C and TSC-P, as well as their subscales, was calculated using Cronbach's α. Test-retest reliability was examined in the clinic subsample using Pearson's *r*. Parent–child agreement was examined using Pearson's *r* as well as independent-samples *t*-tests. Convergent validity was examined using Pearson's *r*.

Results

Factor Structure

The KMO index of sampling adequacy for the TSC-C in the internet sample was .78, indicating that the correlation matrix was suitable for factor analysis [36]. The analysis yielded four components with eigenvalues greater than 1.0. Examination of the scree plot suggested that a solution with no more than three components was appropriate. Parallel analysis revealed that two eigenvalues from the present data set exceeded those from the simulation. Therefore, a 2-component solution was used (eigenvalues 4.58 and 2.12); these components accounted for 44.73% of the variance. The correlation between the two components was .35. Next, only those items that loaded ≥.40 on one component and ≤.30 on the other were retained. This resulted in the removal of three items, leaving two components which we labeled *Severity* (five items) and *Distress/Impairment* (seven items). Examinations of skewness and kurtosis indicated that both scales were approximately normally distributed. Item loadings are shown in Table 2. Each of the two subscales was scored by taking the mean of its responses; a total score was derived by summing the two subscale scores.

Table 2 Pattern matrix for the Trichotillomania Scale for Children (child and parent versions)=

	Child		Parent	
	Distress/ Impairment	Severity	Distress/ Impairment	Severity
Sad or depressed because of hair pulling or bald patches	**.848**	−.160	**.838**	−.047
Upset at self because of hair pulling or bald patches	**.843**	−.122	**.770**	−.105
Embarrassed about hair pulling or bald patches	**.808**	−.039	**.832**	.008
How has hair pulling affected the way child looks	**.750**	.022	**.667**	.090
How much longer did it take to get ready for school or go out because of bald patches	**.670**	−.035	**.671**	.028
How guilty about hair pulling	**.590**	.005	**.770**	−.033
Avoid activities because of hair pulling or bald patches	**.444**	.236	**.539**	.115
Frequency of hair pulling	−.048	**.829**	−.066	**.770**
How many hairs pulled out	−.138	**.807**	−.030	**.718**
Duration of hair pulling episodes	.021	**.724**	.073	**.612**
Frequency of urges to pull	−.017	**.699**	−.050	**.735**
Control over urges to pull	.149	**.452**	−.052	**.623**
Deleted items				
Teased by others because of hair pulling or bald spots	.331	.185	.198	.405
Hair pulling causes problems with family members	.329	.079	−.027	.440
Interference with school or chores	.257	.323	.182	.506

A similar analysis was conducted for the TSC-P. The KMO index of sampling adequacy was .829, indicating that the correlation matrix was suitable for factor analysis [36]. A 2-component solution yielded eigenvalues of 4.89 and 2.08, accounting for 46.44% of the variance. The correlation between the two components was .37. As shown in Table 2, loading patterns were similar to those obtained for the TSC-C.

Internal Consistency

The TSC-C and TSC-P showed adequate to good internal consistency (α) in the internet sample. For the TSC-C, Severity $\alpha = .76$, item-total correlations .36–.64; Distress/Impairment $\alpha = .84$, item-total correlations .43–.70; total score $\alpha = .83$, item-total correlations .38–.62. For the TSC-P, Severity $\alpha = .76$, item-total correlations .43–.60; Distress/Impairment $\alpha = .85$, item-total correlations .48–.74; total score $\alpha = .84$, item-total correlations .32–.70. Internal consistency was also adequate to good in the clinic sample: For the TSC-C, Severity $\alpha = .72$, item-total correlations .26–.69; Distress/Impairment $\alpha = .83$, item-total correlations .41–.66; total $\alpha = .82$, item-total correlations .28–.64. For the TSC-P, Severity $\alpha = .71$, item-total correlations .29–.64; Distress/Impairment $\alpha = .76$, item-total correlations .32–.66; total score $\alpha = .70$, item-total correlations .02–.59.

Test-retest Reliability

The TSC-C and TSC-P showed adequate test-retest reliability in the clinic sample. For the TSC-C, Severity $r = .81$, Distress/Impairment $r = .84$, total $r = .89$. For the TSC-P, Severity $r = .70$, Distress/Impairment $r = .97$, total $r = .90$.

Parent/Child Agreement

Table 3 shows Pearson correlations between TSC-C and TSC-P scores. Scale-specific correlations were adequate to high in the internet sample (Table 3, top), with the strongest

Table 3 Correlations between parent and child scores on the Trichotillomania Scale for Children=

		Child		
		Severity	Distress/Impairment	Total
Internet sample				
Parent	Severity	**.665****	.272**	.551**
	Distress/Impairment	.287**	**.802****	.698**
	Total	.557**	.711**	**.786****
Clinic sample				
Parent	Severity	**.363***	−.062	.170
	Distress/Impairment	.119	**.611****	.509
	Total	.291	.354*	**.426****

* $p < .05$. ** $p < .01$

correlation for Distress/Impairment. The correlation between the TSC-C and TSC-P total scores was high. Independent-samples *t*-tests did not indicate significant differences between children and parents on Severity ($t_{243} = 0.21$, $p = .83$), Distress/Impairment ($t_{244} = 0.26$, $p = .79$), or total score ($t_{243} = 0.29$, $p = .77$). Mean scores on the TSC-C were: Severity $M = 1.49$, SD = 0.39; Distress/Impairment $M = 1.20$, SD = 0.47; total $M = 2.70$, SD = 0.70. Scores on the TSC-P were: Severity $M = 1.48$, SD = 0.38; Distress/Impairment $M = 1.19$, SD = 0.52; total $M = 2.67$, SD = 0.75.

Scale-specific agreement was moderate but significant in the clinic sample (Table 3, bottom), with the strongest agreement again seen for Distress/Impairment. Independent-samples *t*-tests did not indicate significant differences between children and parents on Severity ($t_{73} = 0.38$, $p = .70$), Distress/Impairment ($t_{73} = -1.50$, $p = .14$), or total score ($t_{73} = -0.79$, $p = .43$). Mean (SD) scores on the TSC-C were: Severity 1.31 (0.42), Distress/Impairment 0.80 (0.47), total 2.11 (0.73). Mean (SD) scores on the TSC-P were: Severity 1.28 (0.38), Distress/Impairment 0.95 (0.43), total 2.23 (0.59).

Convergent Validity

Tables 4 and 5 show Pearson correlations between impairment ratings and scores on the TSC-C and TSC-P, respectively, in the internet (top) and clinic (bottom) samples. On the TSC-C, higher TTM Severity, Distress/Impairment, and total scores were associated with significantly greater self-reported interference with social functioning, making friends, and school work, as well as greater self-reported depression severity on the CDI.

Table 4 Correlations between Impairment ratings and scores on the Trichotillomania Scale for Children-Child Version (TSC-C)=

Variable	Rater	TSC-C scale		
		Severity	Distress/Impairment	Total
Internet sample				
Interferes with social life	Child	.306**	.618**	.585**
Interferes with making new friends or getting closer to friends	Child	.298**	.623**	.584**
Interferes with school or school work	Child	.334**	.362**	.428**
MASC total score	Child	.181	.366**	.345**
CDI total score	Child	.369**	.596**	.605**
Clinic sample				
CGI-S	Interviewer	.377*	.434**	.486**
NIMH-TSS	Interviewer	.352*	.311	.398*
PITS severity	Interviewer	.348*	−.032	.180
PITS interference	Interviewer	.055	.404*	.290
PITS distress	Interviewer	.197	.405*	.372*
MASC total score	Child	.334	.310	.388*
CDI total score	Child	.387*	.606**	.607**

Note: MASC = Multidimensional Anxiety Scale for Children, CDI = Children's Depression Inventory, CGI-S = Clinician's Global Impression-Severity, NIMH-TSS = NIMH Trichotillomania Severity Scale

* $p < .05$. ** $p < .01$

Table 5 Correlations between Impairment Ratings and Scores on the Trichotillomania Scale for Children-Parent Version (TSC-P)=

Variable	Rater	TSC-P scale		
		Severity	Distress/ Impairment	Total
Internet Sample				
Interferes with social life	Parent	.203*	.443**	.414**
Interferes with ability to form and maintain close relationships	Parent	.179*	.396**	.369**
Interferes with ability to work	Parent	.421*	.435*	.516**
Interferes with academic life	Parent	.079	.298**	.246*
How many events missed in past 12 mo.	Parent	.152	.548**	.466**
How many days of school missed in past 12 mo.	Parent	.141	.416**	.364**
PROCAS Total Score	Parent	.223*	.430**	.415**
Clinic sample				
CGI-S	Interviewer	.329	.236	.360*
NIMH-TSS	Interviewer	.178	.194	.256
PITS severity	Interviewer	.325*	−.061	.163
PITS interference	Interviewer	.122	.192	.218
PITS distress	Interviewer	.045	.338*	.275
MASC total score	Child	−.137	.040	−.054
CDI total score	Child	.131	.296	.299

Note: PROCAS = Parent Report on Child's Anxiety Symptoms, MASC = Multidimensional Anxiety Scale for Children, CDI = Children's Depression Inventory, CGI-S = Clinician's Global Impression-Severity, NIMH-TSS = NIMH Trichotillomania Severity Scale

* $p < .05$. ** $p < .01$

Distress/Impairment and total score, but not Severity, were significantly associated with greater self-reported anxiety on the MASC. On the TSC-P, higher TTM Severity, Distress/Impairment, and total scores were associated with significantly greater self-reported interference with social life, ability to form and maintain close relationships, ability to work, and anxiety as measured by the PROCAS. Distress/Impairment and total score, but not Severity, were associated with greater impairment in academic life, missing events, and school absence. Distress/Impairment was associated with more frequent school tardiness.

In the clinic sample, there were no additional parent ratings of impairment for examination of convergent validity. Therefore, TSC-P scales were compared to child and interviewer ratings. Scores on the TSC-C showed moderate but significant correlations with TTM severity as measured by the NIMH-TSS and CGI-S. The TSC-C subscales showed a specific relationship with PITS Severity, Interference, and Distress scores. TSC-C scores also correlated significantly with depression and anxiety as measured by the CDI and MASC. Scores on the TSC-P did not correspond as well to TTM severity on the NIMH-TSS, although the TSC-P total score was moderately and significantly correlated with TTM severity on the CGI-S and the TSC-P Severity and Distress/Impairment were significantly correlated with PITS Severity and Distress, respectively. TSC-P scores were not significantly related to child-reported distress on the CDI or MASC.

Discussion

To date, no valid measures of pediatric TTM have been developed. Even in adult samples, most measures such as the PITS and NIMH-TSS show substantial psychometric limitations [16, 19] and therefore the utility of these measures for evaluating TTM in children and adolescents is questionable. The most clearly reliable measure of adult TTM is the Massachusetts General Hospital Hairpulling Scale [14, 15]; however, even this measure shows poor correlations with global clinician ratings of TTM severity [16], and the language might not be appropriate for children. Development of reliable and valid measures of pediatric TTM, therefore, is critical for both clinical and research purposes. In the present study, the TSC-C and TSC-P showed a replicable factor structure and acceptable internal consistency and test-retest reliability, although the small sample size for the test-retest sample renders this result tentative.

The present results suggest that the TSC may be a useful measure of TTM for child and adolescent samples. One advantage of the measure is its ability to collect data from children and their parents separately. Children and parents frequently provide differing estimates of severity of child psychopathology [20–22], and therefore it is important to solicit separate reports on the child's TTM symptoms and associated impairment. In the internet sample, children and parents showed good agreement about TTM severity. However, parent–child agreement was weaker in the clinic sample, and this might reflect a limitation of the measure. The reasons for the difference are not clear, although the much smaller sample size for the clinic sample could have contributed. Children in the clinic sample were also two years younger on average than were those in the internet sample, with six children (16% of the sample) younger than age 10, the minimum age for the internet study. Results might be more reliable with older children and adolescents. Consistent with this notion, Keuthen et al. [37] found that adolescent hair-pullers showed better concordance with parents than did younger children on variables such as awareness of hair-pulling, interference with academic functioning, and anxiety. Finally, for reasons that are not clear, the clinic sample showed lower mean TSC scores than did the internet sample.

It is not entirely surprising that children and their parents would offer different perspectives on the child's TTM symptoms. Hair pulling is frequently performed covertly, and children often go to great lengths to conceal their pulling and resulting alopecia [11, 13, 38]. In such cases, parents might not have accurate information about the frequency and duration of pulling episodes. Conversely, many children (as well as adults) engage in "unfocused" pulling behaviors outside of awareness [e.g., 2, 8, 39], in which case pulling severity might be better estimated by an observer. Although distress is inherently subjective and presumably more easily detected by the child, impairment in many cases might be more obvious to the parent. We would suggest that a thorough assessment of pediatric TTM involve both child- and parent-report.

Another potential advantage of the TSC is its ability to assess both the severity of TTM and resulting distress and impairment. These two scales were replicated in children and parents, and show good internal consistency. Various aspects of TTM are not always strongly correlated, as suggested by the psychometric properties of measures such as the PITS, in which a single item is used for each of several facets of TTM including hair pulling frequency and duration, interference, distress, and alopecia severity. The PITS shows excellent inter-rater reliability but low internal consistency [16], suggesting that although the items are reliable, they do not interrelate strongly. Therefore, different dimensions of TTM are best considered separately, and degree of distress/Impairment cannot necessarily be inferred from severity of pulling or alopecia.

The convergent validity of the TSC is less clear. The TSC-C correlated somewhat more strongly with depression (as measured by the CDI) than it did with other measures of TTM severity (CGI-S, NIMH-TSS, PITS items). Thus, some of the variance in TSC-C scores might be attributable to negative affectivity. It bears mentioning again that the NIMH-TSS and PITS suffer from substantial psychometric limitations [16], and therefore it is not entirely surprising that correlations with the TSC would be attenuated. Another possible contributor is method variance: the TSC and CDI are both self-report instruments, whereas the CGI-S, NIMH-TSS, and PITS are all rated by interviewers. The TSC-P in general showed rather modest correlations against child- and interviewer-rated impairment. Interpretation of these findings is complicated somewhat by the use of different raters: as described above, parents' and children's' impressions of psychiatric impairment often differ, and method variance is a potential limitation. Nevertheless, additional research is needed to examine more carefully the extent to which the TSC-C and TSC-P correspond to other indices of TTM severity, distress, and impairment. Reassuringly, correlations tended to be particularly high for associations between the distress/Impairment subscale of the TSC-C and other scales of impairment, and between the TSC-C total score and other scales of severity.

Another critical question for clinical practice as well as clinical trials is the extent to which the TSC is sensitive to treatment outcome. The sole published treatment outcome study of pediatric TTM of which we are aware [11] used the NIMH-TSS and CGI-S, and found that both of these measures were sensitive to the effects of cognitive-behavioral therapy. Outcome research is needed to determine whether the TSC can be used in a similar fashion. If so, the TSC could be a useful addition to clinical research by allowing for more frequent self-report assessments of children and their parents.

It might be argued that the use of the internet for data collection is a limitation of the present study. The internet is increasingly being used for mental health research [40], and several studies indicate that web-based data collection results in greater sample diversity, generalizes across presentation formats, and findings are consistent with data collected using more traditional means [41]. Equivalence of internet and paper- and pencil measurement has been established in clinical disorders, including anxiety [42] and obsessive–compulsive disorder [43]. The present clinic and internet samples were reasonably similar in terms of basic demographics, and when similar measures were used (e.g., MASC), convergent scale validity was comparable across the two samples.

Summary

Trichotillomania (TTM) is a chronic impulse control disorder characterized by repetitive pulling out of one's own hair and resulting alopecia. TTM is associated with high rates of psychiatric comorbidity and functional impairment, indicating the need for additional research. However, such research has been hampered by the lack of psychometrically validated measures of TTM in children and adolescents. Although several TTM self-report and interviewer-rated scales exist, most either show poor psychometric properties in adults or use language that may not be appropriate for children and adolescents. The aim of the present study was to develop and test a new self-report measure of pediatric TTM, the *Trichotillomania Scale for Children* (TSC). A child version (TSC-C) and parent version (TSC-P) were developed. Initial psychometric analyses were conducted using a large internet-based sample of children with TTM ($n = 113$) and their parents ($n = 132$). As expected, rates of parent-reported psychiatric comorbidity were high. We also conducted

additional analyses in a sample of 41 child–parent dyads seeking outpatient treatment for pediatric TTM. As was the case with the internet sample, rates of diagnosed comorbid psychiatric disorders were high. The TSC was developed by psychologists experienced with pediatric TTM. From an initial pool of 15 items (scaled 0–2), principal components analysis in the internet sample of children revealed a 2-factor solution with 12 adequately-loading items. The two resulting subscales were labeled *Severity* and *Distress/Impairment*. The factor structure was replicated in the parent internet sample. The TSC-C and TSC-P showed adequate to good internal consistency in all samples. Test-retest reliability in the clinic sample was adequate. Parent–child agreement was adequate to high in the internet sample, but more modest in the clinic sample. In the internet sample, the TSC-C and TSC-P were significantly correlated with other ratings of TTM-related impairment, suggesting adequate convergent validity. In the clinic sample, the TSC-C and TSC-P showed more attenuated correlations with other measures; however, method variance (e.g., comparing parent, child, and interviewer measures) may have obscured the findings. The present results suggest that the TSC may be a useful measure of TTM for child and adolescent samples. Additional research is needed to examine more carefully the extent to which the TSC corresponds to other indices of TTM severity, distress, and impairment, and to determine the extent to which the TSC is sensitive to treatment outcome.

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Appendix

Name _____ **Date** _____

TRICHOTILLOMANIA SCALE FOR CHILDREN, CHILD VERSION (TSC-C)

These questions are about your hair pulling. There are no right or wrong answers. Each item is made up of three sentences. Your job is to pick the sentence that comes closest to describing how things have been for you in the past week. When you have picked the best sentence, put a check mark in the box next to it. If you can't decide which sentence is the best one, it's OK to check more than one. Try it now for practice:

How much do you like homework?
☐ (0) I do not like homework at all.
☐ (1) I like homework a little bit.
☐ (2) I like homework a lot.

Now the questions will be about hair pulling. When we talk about hair pulling, it doesn't have to be on your head—it could also include eyebrows, eyelashes, or anywhere else on your body. Remember, your job is to pick the sentence that best describes how your hair pulling has been in the last week.

Severity

1. On most days in the last week, how often did you feel like pulling your hair?
☐ (0) I did not feel like pulling my hair at all.
☐ (1) I felt like pulling my hair once in a while.
☐ (2) I felt like pulling my hair very often.

2. On most days in the last week, how often did you actually pull your hair? This question means how many times you had a period of pulling—not how many hairs you pulled.
☐ (0) I did not pull my hair at all.
☐ (1) I pulled my hair between 1 and 5 times a day.
☐ (2) I pulled my hair more than 5 times a day.

3. On most days in the last week, how much time did each period of hair pulling last?
☐ (0) I did not pull my hair at all.
☐ (1) A hair-pulling period lasted between 1 second and 5 minutes.
☐ (2) A hair-pulling period lasted more than 5 minutes.

4. On most days in the last week, how many hairs did you pull out?
☐ (0) I did not pull any hair at all.
☐ (1) I pulled out between 1 and 10 hairs on most days.
☐ (2) I pulled out more than 10 hairs on most days.

5. On most days in the last week, how much control did you have over urges to pull your hair? (You can check more than one thing if you want to).
☐ (0) I did not feel like pulling my hair at all.
☐ (0) I felt like pulling, but I never actually pulled my hair.
☐ (1) I could stop myself from pulling some of the time.
☐ (2) I could not stop myself from pulling at all, even when I really wanted to stop.
☐ (1) Some times I did not want to stop myself from pulling.
☐ (2) I did not want to stop myself from pulling at all.

Note to scorer: Score item 0-2 based on highest rating

For office use only: Sum (items 1-5) _____ ÷ 5 = _____ Severity score

Distress/Impairment

6. During the last week, how much longer did it take for you to get ready for school, or get ready to go out, because you had to hide bald patches?
☐ (0) I didn't have to hide any bald patches.
☐ (1) It took me a little longer to get ready than other kids, because I had to be careful about how I styled my hair or put on my makeup.
☐ (2) It took me a whole lot longer to get ready than other kids, because I had to be careful about how I styled my hair or put on my makeup.
☐ (2) I decided not to go somewhere this week, because it seemed like too much effort to style my hair or put on my makeup.

Note to scorer: Score item 0-2 based on highest rating

7. How much would you avoid the activities listed below because you were embarrassed about hair pulling or bald patches? (You can check more than one thing if you want to).

☐ (0) I would not avoid any of these activities because of hair pulling or bald patches.
☐ (1) I might not go swimming because I'd be embarrassed about bald patches.
☐ (2) I definitely would not go swimming because I'd be embarrassed about bald patches.
☐ (1) I might not go outside on a windy day because people might see my bald patches.
☐ (2) I definitely would not go outside on a windy day because people might see my bald patches.
☐ (1) I might not go outside on a sunny day because people might see my bald patches.
☐ (2) I definitely would not go outside on a sunny day because people might see my bald patches.
☐ (1) I might not go to a school dance or a party because people might see my bald patches.
☐ (2) I definitely would not go to a school dance or a party because people might see my bald patches.
☐ (1) I might not go on a field trip because people might see my bald patches.
☐ (2) I definitely would not go on a field trip because people might see my bald patches.
☐ (1) I might not hang out with friends or classmates because they might see my bald patches.
☐ (2) I definitely would not hang out with friends or classmates because they might see my bald patches.

Note to scorer: Score item 0-2 based on highest rating

8. During the last week, how do you think hair pulling has affected the way you look?

☐ (0) Hair pulling has not affected the way I look.
☐ (1) I don't look as good as I would if I didn't pull my hair.
☐ (2) Hair pulling has made me look really ugly.

9. During the last week, how guilty do you feel about hair pulling?

☐ (0) I did not feel guilty about hair pulling.
☐ (1) I felt a little guilty about hair pulling.
☐ (2) I felt extremely guilty about hair pulling.

10. During the last week, how embarrassed were you about hair pulling or bald patches?

☐ (0) I was not embarrassed at all about hair pulling or bald patches.
☐ (1) I was a little embarrassed about hair pulling or bald patches.
☐ (2) I was extremely embarrassed about hair pulling or bald patches.

11. During the last week, how upset at yourself did you get because of hair pulling or bald patches?

☐ (0) I did not get upset with myself at all because of hair pulling or bald patches.
☐ (1) I got a little upset with myself because of hair pulling or bald patches.
☐ (2) I got extremely upset with myself because of hair pulling or bald patches.

12. During the last week, how sad or depressed did you get because of hair pulling or bald patches?

☐ (0) I did not get sad or depressed at all because of hair pulling or bald patches.
☐ (1) I got a little sad or depressed because of hair pulling or bald patches.
☐ (2) I got extremely sad or depressed because of hair pulling or bald patches.

For office use only: Sum (items 6-12) _____ ÷ 7 = _____ Distress/Impairment score

Severity Score _____ + Distress/Impairment Score _____ = Total Score

Child's Name _____ **Date** _____

Parent's Name _____ **Relationship to Child** _____

TRICHOTILLOMANIA SCALE FOR CHILDREN, PARENT VERSION (TSC-P)

These questions are about your child's hair pulling. There are no right or wrong answers. Each item is made up of three sentences. Please pick the sentence that comes closest to describing how things have been for your child in the past week. When you have picked the best sentence, put a check mark in the box next to it. If you can't decide which sentence is the best one, it's OK to check more than one.

You may not know the exact answers to each question. For example, if your child pulls his/her hair only when alone, you might not know exactly how often this happens. If you don't know the exact answer, please give your best guess.

Severity

1. On most days in the last week, how often did your child express urges or desires to pull his/her hair?

☐ (0) My child did not feel like pulling his/her hair at all.
☐ (1) My child felt like pulling his/her hair once in a while.
☐ (2) My child felt like pulling his/her hair very often.

2. On most days in the last week, how often did your child actually pull his/her hair? This question means how many times your child had a period of pulling—not how many hairs he/she pulled.

☐ (0) My child did not pull his/her hair at all.
☐ (1) My child pulled his/her hair between 1 and 5 times a day.
☐ (2) My child pulled his/her hair more than 5 times a day.

3. On most days in the last week, how much time did each period of hair pulling last?

☐ (0) My child did not pull his/her hair at all.
☐ (1) A hair-pulling period lasted between 1 second and 5 minutes.
☐ (2) A hair-pulling period lasted more than 5 minutes.

4. On most days in the last week, how many hairs did your child pull out?

☐ (0) My child did not pull any hair at all.
☐ (1) My child pulled out between 1 and 10 hairs on most days.
☐ (2) My child pulled out more than 10 hairs on most days.

5. On most days in the last week, how much control did your child appear to have over urges to pull your hair? (You can check more than one thing if you want to).

☐ (0) My child did not feel like pulling his/her hair at all.
☐ (0) My child felt like pulling, but he/she never actually pulled his/her hair.
☐ (1) My child could stop him/herself from pulling some of the time.
☐ (2) My child could not stop him/herself from pulling at all, even when he/she really wanted to stop.
☐ (1) Some times my child did not want to stop him/herself from pulling.
☐ (2) My child did not want to stop him/herself from pulling at all.

Note to scorer: Score item 0-2 based on highest rating

For office use only: Sum (items 1-5) _____ ÷ 5 = _____ Severity score

Distress/Impairment

6. During the last week, how much longer did it take for your child to get ready for school, or get ready to go out, because he/she had to hide bald patches?

☐ (0) My child didn't have to hide any bald patches.
☐ (1) It took my child a little longer to get ready than other kids, because he/she had to be careful about how he/she styled his/her hair or put on makeup.
☐ (2) It took my child a whole lot longer to get ready than other kids, because he/she had to be careful about how he/she styled his/her hair or put on makeup.
☐ (2) My child decided not to go somewhere this week, because it seemed like too much effort to style his/her hair or put on makeup.

Note to scorer: Score item 0-2 based on highest rating

7. How much would your child avoid the activities listed below because he/she was embarrassed about hair pulling or bald patches? (You can check more than one thing if you want to).

☐ (0) My child would not avoid any of these activities because of hair pulling or bald patches.
☐ (1) My child might not go swimming because he/she would be embarrassed about bald patches.
☐ (2) My child definitely would not go swimming because he/she would be embarrassed about bald patches.
☐ (1) My child might not go outside on a windy day because people might see his/her bald patches.
☐ (2) My child definitely would not go outside on a windy day because people might see his/her bald patches.
☐ (1) My child might not go outside on a sunny day because people might see his/her bald patches.
☐ (2) My child definitely would not go outside on a sunny day because people might see his/her bald patches.
☐ (1) My child might not go to a school dance or a party because people might see his/her bald patches.
☐ (2) My child definitely would not go to a school dance or a party because people might see his/her bald patches.
☐ (1) My child might not go on a field trip because people might see his/her bald patches.
☐ (2) My child definitely would not go on a field trip because people might see his/her bald patches.
☐ (1) My child might not hang out with friends or classmates because they might see his/her bald patches.
☐ (2) My child definitely would not hang out with friends or classmates because they might see his/her bald patches.

Note to scorer: Score item 0-2 based on highest rating

8. During the last week, how does your child think hair pulling has affected the way he/she looks?

☐ (0) Hair pulling has not affected the way my child thinks he/she looks.
☐ (1) My child thinks he/she doesn't look as good as he/she would if he/she didn't pull his/her hair.
☐ (2) My child thinks that hair pulling has made him/her look really ugly.

9. During the last week, how guilty does your child feel about hair pulling?

☐ (0) My child did not feel guilty about hair pulling.
☐ (1) My child felt a little guilty about hair pulling.
☐ (2) My child felt extremely guilty about hair pulling.

10. During the last week, how embarrassed was your child about hair pulling or bald patches?

☐ (0) My child was not embarrassed at all about hair pulling or bald patches.
☐ (1) My child was a little embarrassed about hair pulling or bald patches.
☐ (2) My child was extremely embarrassed about hair pulling or bald patches.

11. During the last week, how upset at him/herself did your child get because of hair pulling or bald patches?

☐ (0) My child did not get upset with him/herself at all because of hair pulling or bald patches.
☐ (1) My child got a little upset with him/herself because of hair pulling or bald patches.
☐ (2) My child got extremely upset with him/herself because of hair pulling or bald patches.

12. During the last week, how sad or depressed did your child get because of hair pulling or bald patches?

☐ (0) My child did not get sad or depressed at all because of hair pulling or bald patches.
☐ (1) My child got a little sad or depressed because of hair pulling or bald patches.
☐ (2) My child got extremely sad or depressed because of hair pulling or bald patches.

For office use only: Sum (items 6-12) _____ ÷ 7 = _____ Distress/Impairment score

Severity Score _____ + Distress/Impairment Score _____ = Total Score

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