The Perceived Stress Scale for Children: A Pilot Study in a Sample of 153 Children

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Abstract: *Background*: The purpose of this study was to assess the utility and validity of an efficient screening tool intended for educators, clinicians and researchers who are interested in identifying perceived chronic stress and relations among home and school performance, behavior, and health in children.

Method: The *Perceived Stress Scale for Children* (PSS-C) was assessed on its ability to discriminate between children with known stress-related anxiety disorders from typically developing children without any identified stress-related conditions. The participants included 153 children from the northeastern United States (5-18 years) recruited via posted flyers, personal networks, and referral.

Results: The results suggested that the PSS-C is easy to administer, and effectively discriminates between children with and without known anxiety/stress disorders.

Conclusion: The PSS-C may be helpful for the early identification of children at risk for chronic anxiety/stress. This is important because chronic stress appears to result in increased vulnerability for poorer school outcomes and reduced home functional performance, as well as resulting in problems with overall health, mental health and body weight. An effective and efficient assessment for early identification of anxiety/stress in children assists in the development of appropriate responses.

Keywords: Assessments, children, stress, activity patterns, and health.

INTRODUCTION

Stress is part of life. Watching a scary movie, taking a test, asking for a first date, starting school, and meeting potential in-laws are all often associated with routine stress events that are short-term in duration. Daily life stress events such as these help us organize our behavior for effective outcomes. However, some events (a death, divorce, health problems, traumatic violence) have greater, longer lasting effects that can result in excessive worry or anxiety (National Institute of Mental Health, Fact Sheet on Stress available at: http://www.nimh.nih.gov/health/publications/stress/index.shtml). Chronic stress may become a burden that can result in a variety of negative physiological and emotional effects.

Stress affects both children and adults. The identification of stress that has become chronic is important, and can assist in developing appropriate responses, including interventions to develop coping strategies as well as clinical referrals when appropriate. However, there are limited options for early identification of chronic stress in children and adolescents.

Dr. C. Blair underscores, in a National Institute of Children's Health and Development (NICHD) press release [1], the importance of early identification of chronic stress in children: 'Research indicates that stress from a variety of sources—including crowded and chaotic home and classroom environments, for example, or problems with family or peers—impedes learning.' (p. 2).

This paper discusses the development of an easy to use and valid screening tool designed for use with youth from ages 5 to 18.

STRESS AND YOUTH: THE LITERATURE

Chronic Stress

Chronic stress is defined as stress that is enduring, and loaded with worry; in contrast, short-lived stress responding supports functional activity and is healthily adaptive [2]. While chronic stress has been strongly and negatively associated with health and performance across multidisciplinary research in adults [2-5], research on chronic stress effects in children has been less available. However, research that *has* focused primarily on children confirms similar associations in health and performance as found in adults. In adults, chronic dysregulation of cortisol levels related to stress has been shown to play a role in development of depression and depressive symptoms [6, 7]. Further, chronic stress in adults has been related to poorer cognitive performance [8] as well as constrained oocupational performance patterns [9]. Similarly, Blair

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and colleagues [10] found that some children experiencing chronic stress, due to poverty, show less well-organized stress hormone patterns that are associated with poorer cognitive performance. Other researchers [11] found that chronic environmental stress impacted school-related performance in children and, Maldonado and colleagues [12] also found that higher stress perception in 9-12 year olds was associated with lower cognitive performance, suggesting that chronic stress in children appears to negatively impact cognitive functioning, thus potentially reducing educational outcomes.

Assessing Stress

Associated with school-related academic performance, researchers and clinicians are also interested in measuring stress perception as it relates to children's physical and mental health, as well as daily activity participation. For example, Brown, Nobiling, Teufel, and Birch [13] studied the daily activity patterns and their relation to child stress perception based on a single question answered using hand-held devices. The researchers found that activity patterns were affected by both stress including the amount homework. Other researchers [14, 15] studied child stress perception and associations with activity, and health. Findings suggested that healthy children who are engaged in a lot of activity, especially ones that are sports and school-related, tended to have fewer colds/illnesses, and lower stress perception. Similarly, Arai and colleagues reported that active leisure activity was associated with lower stress perception and attenuated symptoms of stress associated with early trauma [16]. Other researchers explored whether children's eating patterns are affected by stress [17], similar to stress and weight control studies conducted in adults [18-20]. Their findings suggested that similar to adults, children whose eating behaviors are less driven by internal cues (e.g. eating only when hungry), are prone to eating excessive calories when feeling stressed.

Finally, chronic stress has been identified as a risk factor for anxiety and depressive disorders [21, 22]. While stress is defined as a response to a situation, or perception, in which one feels vulnerable, angry or nervous, anxiety is defined as a feeling of being fearful or apprehensive [5], and is more closely associated with chronic stress. Anxiety often stems from one or more real or imagined stressors, making chronic stress and anxiety intimately linked. Indeed, the relationship of perceived life stressors to negative thinking, anxiety and depression has been well documented in adolecents and adults [23, 24] and somewhat in children [21].

Clearly, there is an interest in assessing stress perception in children especially as it relates to school and home functional performance, overall health, body weight, and mental health. However, only two self-assessments targeting child stress perception were identified in the literature: 1) the Children's Stress Questionnaire – CSQ) recently developed by Byrne and colleagues [25], and 2) the Children Daily Stress Inventory (CDSI) [12]. Both appear well developed but lengthy, making research in this area more difficult to pursue. Indeed, the lack of an easy and efficient tool to capture stress perception may be in part why the research in this area is more limited than it is in adults. The CSQ is a 50-question tool in which children can select responses regarding how various life events affected them, using a 5-point Likert scale format, while the CDSI also contains 48-scaled questions about daily life stressors. Neither tool appeared available through open-access or purchase at the time this was written.

In contrast to the lengthy assessments noted above, one of the more robust tools available to measure stress perception in adults, the Perceived Stress Scale, is comprised of only 10 questions [26]. While also arguably tapping into a complex construct to measure (e.g. stress perception), this tool has been used widely in research for many years and is accepted as a pretty good snapshot of a person's stress perception at any one moment in time, across a wide age span and in a variety of languages [27-29].

No similar and efficient, easy to use screening measure for children could be identified through a review of the literature. The ability to screen children easily, early, and to potentially monitor their stress perceptions over time may be helpful for identifying those children who need further assessment as well as for targeting those who would benefit from intervention efforts aimed at ameliorating chronic stress effects. In addition to helping shape the delivery of various intervention approaches, regular monitoring over time of children's changing stress perceptions, among other attributes and characteristics, may also contribute to outcomes-based program evaluation.

PURPOSE OF THE STUDY

The purpose of this paper is to describe a screening tool for measuring perceived stress in children in an efficient, user-friendly format, as well as to present the

results of an initial study that looked at one aspect of the tool's construct validity, in being able to discriminate between children with known stress/ anxiety problems and those without. Data on the Perceived Stress Scale-Children (PSS-C) were gathered from a typical sample of well children without known anxiety, stress and/or depressive symptoms, and compared to results from children with known anxiety and stress-related disorders. The scale was designed to be used by individuals who work with youth and for whom a screener tool would be helpful and have widespread applicability.

The primary hypothesis of the study is that there would be a significant difference between scores obtained on the PSS-C from a typical sample of children with no known stress/anxiety problems and a clinical sample of children being treated for stress/ anxiety/depression. If confirmed, findings would suggest that the PSS-C could discriminate between the two populations of children, thus providing some evidence that the tool was valid as a simple, efficient, and effective screening tool for clinicians, educators, and others who work with children.

METHODS

Participants

Children, ages 5-18 years were invited to participate in the study through posted flyers, personal networks, and word-of-mouth referrals resulting in a convenience sample for the study. Flyers were posted in various locations around the university and community, and graduate students/faculty described the study to families within their personal networks. Several local day care centers and health care providers also told families about the study. Interested children were eligible to participate if they were healthy and did not have any identified or suspected anxiety or stress-related disorder. Children in the typical sample were given $5 in McDonald's gift certificates, with parent permission, to thank them for their time. Parents gave informed consent for the participation of their child. Assent was secured prior to beginning the assessment. The university's Institutional Review Board (IRB) for human subject participation approved the study.

The PSS-C was given to 153 children living in the northeastern United States between 2009-2011, 135 of who were typical developing children, based on parental report; none in the typical sample were identified with any developmental concerns or stress-related conditions and/or mental health concerns. In addition, 18 children who were identified and were currently being treated for anxiety disorders or other stress-related conditions (including depression) were asked to participate by three local mental health care providers, who were not researchers in the study but who administered the tool. Written consent of the parent or legal guardian, and child assent, were obtained through the treating mental health professional (i.e. pediatric psychiatrist or psychologist) and data were returned to the researcher with no personally identifying information included. Demographic characteristics of participants are in Table **1**.

Instruments

The development of the scale was grounded in the literature on children and adolescents and through discussion with colleagues with expertise in child development. Areas of concern included perceptions of feeling rushed or worried about not having enough time to do desired activity, perceptions of school performance, quality of friendships, relationships with parents, perceptions of conflict/anger and feeling happy, perception of having enough sleep, and perceptions of feeling loved. These areas are consistent with others describing constructs of childhood stress perception [12, 25, 30].

Table 1: Demographic Characteristics of Participants

	Age	Gender	Ethnicity
Total sample (N=153)	$\bar{X}$ = 9.4 years (SD= 3.04) Range = 5-18 years	48% males; 52% females	81% white; 19% African American, Latino/a; Asian
Typical sample (n= 135)	$\bar{X}$ = 9.13 years (SD= 3.1) Range = 5-18 years	45% males; 56% females	82% white; 18% African American, Latino/a; Asian
Clinical sample (n= 18)	$\bar{X}$ = 11.28 years (SD= 3.37) Range = 7-18 years	78% males; 22% females	73% white; 27% African American, Latino/a; Asian
Matched typical sample (n=18)	$\bar{X}$ = 11.52 years (SD= 3.7) Range = 8-18 years	53% males; 47% females	90% white; 10% African American, Latino/a; Asian

The goal of the scale is to provide a short, usable screening form for research or clinical use, with no more than 15 questions so that children would be able to answer quickly. Initially, sixteen questions emerged through discussion and the literature as contributing meaningfully to stress perception in children. These 16 questions were juried for face validity by a panel of 5 colleagues, all of who had expertise in child development. An initial question was used to teach younger children how to respond by asking them which response signified "a lot". Seven questions were developed with reverse wording and scoring in order to increase the likelihood of truthful responding. Each question was answered on a scale with 4 options ranging from never, a little, sometimes, and a lot. After wording revisions and deletion of questions believed to be redundant by the panel, 14 questions were pilot tested on approximately 20 children by graduate students participating in a research course with the author prior to using it in the study. Further re-phrasing of several questions was conducted in response to children's feedback, resulting in the final version with 14 questions, including the first one that is not scored. A higher value on the total of all 13 scored questions equated to higher stress perception (Questions 3, 6, 7, 10, 11, 13 and 14 are reversed scored). See Figure **1**.

Perceived Stress Scale (Children)

The following questions ask you about your feelings and thoughts during the last week. For each question you will be asked to circle the picture that best fits your answer.

Name: Date:

Age: Birthday: I am a: Boy Girl

1. Which one has a lot of something?

2. In the last week, how often did you feel rushed or hurried?

3. In the last week, how often did you have enough time to do what you wanted?

4. In the last week, how often did you feel worried about being too busy?

5. In the last week, how often did you feel worried about grades or school?

6. In the last week, how often did your mom and/or dad make you feel better?

7. In the last week, how often did your mom and/or dad make you feel loved?

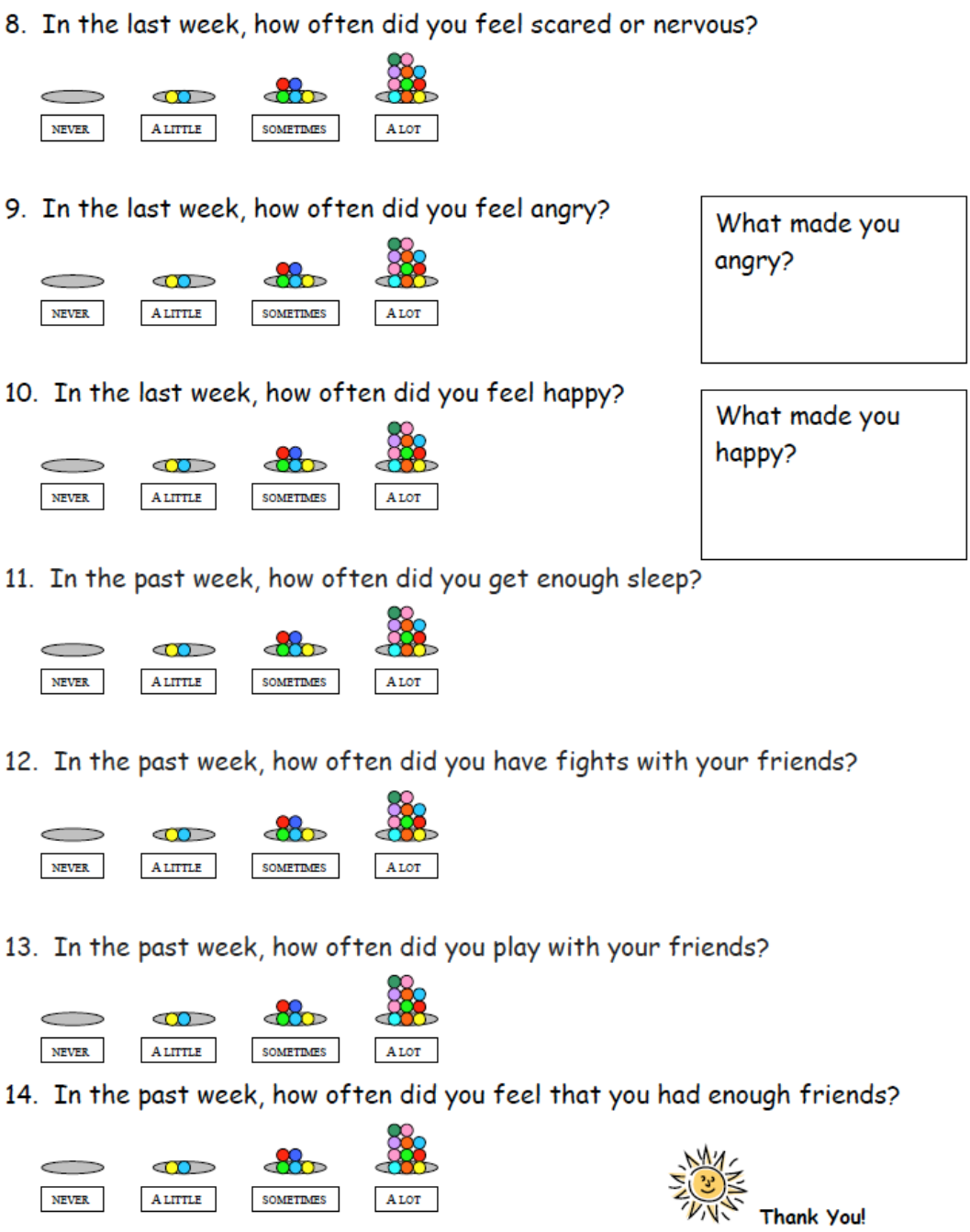

Figure 1: Children's perceived stress, occupational patterns, and health_Fall_2006 BPW.

Procedure

Participants were recruited for the study through flyers posted in areas where parents frequent (e.g. local childcare providers), personal networks and referrals. Graduate students in occupational therapy asked children to complete the perceived stress scale (PSS-C) independently; all assessments were completed either in the child's home or at daycare/preschool with adults present in the room but not assisting. Children were also asked whether they thought the scale was "easy" or "tricky/hard". Each PSS-C was scored and entered into a database by four graduate assistants not participating in administration of the questionnaires, but prepared for their portion of the study so as to ensure consistency in data collection and scoring. The mental health professionals providing clinical sample data were recruited through personal contact and agreed to participate by asking their clients

to participate with verbal consent by parent/guardian and verbal assent of the child. All responses from the clinical sample were anonymous; the three mental health professionals sent completed, unscored PSS-C forms as well as age, gender and diagnosis information for each study participant by mail to the researcher.

RESULTS

All analyses were completed using IBM-SPSS statistical software [31], with an established alpha of $p<0.05$ for group difference. The average time for a completed response across the entire sample was 3.5 minutes, (ranging from 2-5 minutes). Further, 98% of the typical children in the sample reported that the tool was "easy", validating our assumptions that children would be willing to complete the questionnaire. Anecdotally, a number of older teenagers described the tool as looking like it was designed for "younger kids", making the tool potentially less desirable for this age group.

Scores on the PSS-C for the entire sample (N=153) showed a wide range of distribution, with scores ranging from 1-31 (highest possible score is 39). The mean (11.73, SD 4.6), median (11) and mode (11) were consistent in values. The overall distribution shape was slightly skewed (*skewness* = 0.52). A stem and leaf plot showed that the skew was due to a slight tendency for scores in the lower value direction (i.e. lower stress perception) for the entire sample.

In order to address the hypothesis that differences would exist between the typical and clinical samples, independent *t* tests were run. The results showed significant differences between both groups on the PSS-C scores, $t = 3.23$ (151), $p = 0.002$.

The mean score on the PSS-C for the clinical group (n = 18) was 15.44 (SD 4.55), while the typical group (n = 135) mean was 11.24 (SD 5.25).

Significant age differences were found between both groups $t = 2.88$ (151) $p = 0.005$. The mean age for children in the clinical sample (n = 18) was 11.27 (SD 3.37), while the mean age within the typical sample (n = 135) was 9.13 (SD 3.1). This difference appeared due to an older group of children being seen for anxiety/stress disorders, perhaps suggesting that diagnosis and treatment occurs a bit later in childhood.

To assess whether PSS-C score differences remained between both groups while controlling for age and gender, a matched sample (n =18) was selected from the typical (control) group based on similar attributes. A comparison between the matched sample and the clinical sample characteristics showed no significant differences in age and gender although there was a trend (p= 0.07) for gender between both groups, with more males (78%) in the clinical sample (n=18) versus the typical matched sample (53%). Applying a paired *t*-test, the comparison of PSS-C scores in the matched pair analysis showed that significant score differences remained between the groups (t = 2.81 (34), $p<0.008$). The mean PSS-C score for the clinical sample (n=18) was 15.44 (SD 4.5), while the mean score for the typical matched group (n=19) was 11.68 (SD 3.5).

DISCUSSION/CONCLUSIONS

This research paper describes a screening tool developed to capture an indication of perceived stress in children. The importance of having an easy to use and efficient tool to which children can quickly respond extends researcher, teacher, and clinicians understanding of potential stress impacts on school and home performance, risks to physical and emotional health, as well as to impacts on body weight and daily activity patterns. As noted previously, there exists a small but diverse research literature that poses a variety of implications and interests for researching and appreciating stress perception in children. However, the potential implications of child stress perception on performance, health and activity patterns remain understudied. Indeed, Maldonado *et al.* [12] noted that there is surprisingly little systematic study on children's daily stress perception in typical life ---not including trauma--- that broadens our understanding of how chronic stress perception may have a broader impact on children's functional performance.

In part, the paucity of research described above may be due to very few practical tools available to assess stress perception in children. As noted earlier, only two self-assessments targeting child stress perception were identified in the literature, both of which are lengthy. In contrast, the PSS-C provides an easier and shorter alternative that could have multiple applications in stress screening, helping target at-risk children for lengthier assessment, research, and intervention planning and monitoring.

The results from the current study described in this paper suggest that the PSS-C is well accepted by children ages 5-18 years, can capture a snapshot of stress perception in children, and can discriminate

between children who have no known stress/anxiety disorder from those who do. The use of this tool by therapists, educators, and allied health professionals could promote research in various disciplines interested in including child stress perception as a variable, help shape interventions in school, home and community settings, and monitor child progress in intervention programs. Most importantly, the PSS-C may serve well as a screen for children whose results might warrant further and more extensive assessment.

Limitations

Several limitations exist, including a relatively small sample of both typical children and children diagnosed with anxiety/stress-related disorders all within the same geographic area and predominantly white. In addition, there was a wide age spread (5-18 years) of participants in the sample. Further study of the tool should include assessing responses across more diverse samples, and among age clusters. In addition, further analysis of the psychometric properties of the tool should be conducted, including test/re-test reliability.

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