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Toddler and Preschooler Behavior Scale: Preliminary Psychometric Evaluation of a New Scale

Casey A. Holtz, Brittany N. Barber, and Keyona M. Jarrett

Abstract: The purpose of this project was to develop a new behavior scale for parents with young children. The behavior scale is unique in that it is designed specifically for urban parents with young children. Children's Hospital of Wisconsin - Downtown Health Center was the primary source for participants, and other participants were selected from various schools, daycares, and child care facilities. The individuals were selected according to age, gender, ethnicity, and socioeconomic status. All three authors distributed the questionnaires to be self-administered by the participants. The participants completed the Eyberg Child Behavior Checklist and the Toddler and Preschooler Behavior Scale. With scores on both scales, concurrent validity between the two scales was investigated. Data will be used in the development of the Toddler and Preschooler Behavior Scale. Publications resulting from this study will be used to improve the identification of challenging behaviors in young children.

Behavior problems, such as frequent and clinically significant tantrums, noncompliance, and aggression towards peers, are prevalent in young children (Biglan, Mrazek, Carnine, & Flay, 2003). According to retrospective reports, young children with disruptive behaviors often have an onset in the preschool years (Keenan & Wakschlag, 2000). These challenging behaviors may be even more common in children coming from low-income, urban settings. Keenan and Wakschlag (2000) found that 75% of the clinic-referred preschoolers from low-income environments meet the diagnostic criteria for oppositional defiant disorder. Del'Homme, Sinclair, and Kasari (1994) found 23% of the 42 preschool children in their community sample (29% African American, 71% Hispanic; 95% government assistance; 63% males) to be at risk for behavior problems using a teacher report survey. Other studies support

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the finding that behavior problems in young children from low socioeconomic status backgrounds more likely range from 20%-33% (Feil, Walker, Severson, & Ball., 2000; Gross, Sambrook, & Fogg, 1999; Harden, Winslow, Kendziora, Shahinfar, & Rubin, 2000; Kaiser, Hancock, Cai, Foster, & Hester, 2000). These behaviors can have detrimental effects on the child and their family. Behavior problems have negative effects on parent-child interactions (Green & Doyle, 1999), social skills (Mendez, Fantuzzo, & Ciccetti, 2002), and academic achievement (Nielsen & McEvoy, 2004) later in life. Challenging behaviors may also be a precursor to more severe future behaviors including violence, aggression, and anti-social behaviors (Hofstra, Van Der Ende, & Verhulst, 2002). Due to the early development of challenging behaviors in many of today's youth, recent clinical focus has moved toward prevention and early intervention. Preliminary research shows that early treatment leads to a higher rate of positive results (Webster-Stratton & Reid, 2003).

One important caveat to early intervention is accurate identification of behavior problems in young children. Keenan and Wakschlag (2000) have found it necessary and suitable to diagnose young children (using developmental adaptations of the DSM-IV-TR; APA, 2000) with behavior problems (e.g., oppositional defiant and conduct disorder) as early as 1-1.5 years of age. In recent years, researchers and clinicians have stated the need for assessment measures validated for use with children in families with low SES, particularly children of minority status (Del'Homme, Sinclair, & Kasari, 1994; Qi & Kaiser, 2003). Current measures commonly used to assess severity of behavior problems have demonstrated reliability and validity for use with the general population but have not had adequate validation with low SES families. The Child Behavior Checklist (CBCL; Achenbach, 1991; 1992) is appropriate for children as young as one and a half years old, but has not been validated on urban, low socioeconomic status populations. Additionally, professionals consider the CBCL to be too cumbersome and time consuming to be used as a brief screening tool (Simonian, 2006). Similarly, The Behavioral Assessment System for Children, Second Edition (BASC-2; Reynolds, & Kamphaus, 2004) has been demonstrated to be reliable and valid with the general population (ages 2-22), but has yet to be used specifically with urban low SES populations. It may be a useful multidimensional approach to assessment, but it is too lengthy for use as a screening tool.

The measure used most commonly for screening purposes is the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999). The ECBI has strong empirical support concerning validity and reliability, but has a

few major flaws that may deem it less appropriate for very young children from low SES, urban populations. First, the authors did not stratify the ECBI by age or gender during standardization. That is problematic due to the wide range of behaviors in children ages 2-16 and the different presentation of some behaviors depending on gender. Children are scored on the same scale regardless of age (2-16) and gender. In addition, the ECBI is only designed for children ages 2-16. Many referrals to behavior clinics include children below the age of 2 (Keenan & Waksclag, 2000), and there are many different behaviors present when comparing one and two year old children. Therefore, this scale may not be useful for all young children who are referred to community clinics. Finally, although the ECBI is said to take approximately 10-15 minutes to administer, it can often take much longer due to the complexity of the scale (e.g., Likert scale 1-7; terminology used on the scale).

Considering the prevalence of behavior problems in low SES families, the importance of early identification of behavior problems and the current state of assessment tools for very young urban children, it is essential to develop and validate a scale specifically for very young children from urban low socio-economic status backgrounds. This study will include the development and standardization of a new screening tool for young children in urban populations. This scale will supplement the previously established measures by providing a unique, brief assessment of behavior that is specifically designed for urban families with very young children.

The purpose of this study is to improve the assessment process and the accuracy of diagnosis of behavior problems in very young urban children, which in turn will ensure that clinicians are correctly identifying the families who need early childhood mental health services. The authors hypothesize that a new screening tool (The Toddler and Preschooler Behavior Scale) developed for parents of young (0-5 years old), urban children will quickly and accurately measure the severity and pervasiveness of behavior problems in this population (as demonstrated by concurrent validity with the ECBI). The Toddler and Preschooler Behavior Scale (TPBS) will be more accurate and efficient at detecting behavior problems (as rated by parents) than the ECBI.

METHOD

Participants

The target group for this study includes parents/caregivers of young children (0-5 years old) from low socio-economic status (below poverty level) families residing in Milwaukee, WI. According to the 2006 American Community Survey (U.S. Census Bureau), 21.6% of Milwaukee families live under the poverty level. These families identified as 19% Caucasian, 65% African American, 14% Hispanic, 1.5% Asian and .5% other. Data collection will continue until race/ethnicity of participants closely match the city of Milwaukee statistics. There will be approximately 300-350 parents in the final sample. For proper analyses experts suggest that 100 cases are poor, 200 are fair, 300 are good, and 500 or more are very good (Comrey & Lee, 1992). In addition, a small sample size may be appropriate if structure coefficients and communalities are uniformly high (Kahn, 2006). Due to the specificity of the TPBS (behavior problems) communalities will likely be high. To be safe, 300 cases will be included in the sample in order to ensure proper factor analyses.

The evaluation of the scale is underway but not completed. To date, the authors have collected demographic, ECBI, and TPBS data for 78 participants. Participants were 78 parents who filled out the surveys about one of their children. Parents/caregivers were 83.3% female and ranged in age from 19-65 years old ($M = 30.5$). Parents' ethnicity was 85.9% African American, 6.4% Caucasian, 5.1% Latino/a, 1.3% Asian, and 1.3% other. Children were 51.3% male and ranged in age from .26-5.89 years old. Children's ethnicity was 83.3% African American, 7.7% Latino/a, 3.8% Caucasian, 1.3% Asian, and 3.8% other. The total number of children in each home ranged from 1-7 with the mean being 2.34. Parental education level ranged from completion of the 11th grade of high school to completion of two years post-bachelors degree with the mean being approximately 1.5 years past high school completed. Household income levels per year were as follows: 25.6% were less than \$10,000, 23.1% were between \$10,000-\$19,000, 20.5% were between \$20,000-\$29,000, 7.7% were between \$30,000-\$39,000, 10.3% were between \$40,000-\$49,000, 3.8% were between \$50,000-\$59,000, and 9.0% were above \$60,000.

Measures

The three measures used to collect information from parents of young children (0-5) in urban Milwaukee include the Toddler and Preschooler Behavior Scale (TPBS; Appendix A), the Eyberg Child Behavior Inventory (ECBI), and a demographic questionnaire.

The primary measure of interest is the Toddler and Preschooler Behavior Scale (TPBS). The TPBS items were developed based on an extensive review of current measures and a survey of common behaviors parents see in their young children. After the preliminary development, the first author asked a sample ($n = 20$) of professionals who work with young urban children (e.g., psychologists, teachers, nurses, speech pathologists, etc.) to rate each item on the scale based on its clarity and relevance to the population. Based on the results and comments, the author made changes and adjustments to the scale according to predetermined criteria (e.g., 80% of raters must consider the item as not relevant in order to remove it from the measure). The items were finalized and the measure was prepared to be given to parents. The measure used for preliminary analyses includes 43 items that are scored on a three point Likert-type scale ranging from almost *never* to *almost always*. The measure also asks parents to list a behavior that is problematic for their child and then rate its prevalence in different environments.

The Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) is a brief, 36 item measure used primarily to screen for conduct (behavioral) problems in children 2 to 16 years of age. Parents are asked to rate the intensity of their child's behavior on a scale of 1-7 from *never* to *always*. Parents are also asked to respond to whether the behavior is a problem for them. This measure takes approximately 10-15 minutes to administer. Eyberg & Pincus (1999) included 798 children (ages 2-16) in their sample which was reported to be representative of 1992 national census data (74% Caucasian, 19% African American, 3% Latino, 1% Asian, 1% American Indian, and 2% other). Internal consistency coefficients are .95 for the Intensity scale and .93 for the Problem scale. Test-retest reliabilities (3 weeks) are .86 for the Intensity scale and .88 for the Problem scale (Sattler & Hoge, 2006).

The demographic questionnaire requires the parents to write the child's date of birth (month, day, and year) and their own age. The remainder of the questionnaire is designed to gather information about the child's ethnicity and gender, along with parent gender, ethnicity, and education level. The parents are also asked to indicate number of children living in the home and household income. All items (except child's date of birth and parent age) are designed so the parent can simply check a box that fits their situation (e.g., Parent Gender: Male Female).

Procedure

The authors collected data at a number of sites (e.g., schools, daycares, hospitals) where they had access to the population of interest (i.e., parents of very young urban children). The primary sites included a pediatric clinic in downtown Milwaukee, a birth-to-three program in urban Milwaukee, and an inner-city public school in Milwaukee. All parents of 0-5 year old children were approached for the survey. Parents were asked to sign the informed consent form and had the opportunity to ask the author questions. Upon successful completion of the survey, each family received a five dollar gift certificate for a local grocer along with a children's book. Data collection sites were given large toy trucks (donated by a local children's center) for every 25 completed surveys.

Rationale for Preliminary Analyses

The main goal of the initial statistical analyses was to find out the degree to which the scores on the TPBS were predictive of the scores on the Eyberg Child Behavior Inventory. The first step in the statistical analysis involved recoding 13 of the 43 items on the TPBS. These items purport to measure developmentally positive behaviors and were recoded so that all of the items were being measured in the same direction (negative). The recoded items included: TPBS 2, 4, 5, 10, 13, 15, 19, 22, 23, 26, 31, 33, and 34 (refer to Appendix A). Following the first recode, all 43 items had to be recoded so that 1 = Almost Never, 2 = Sometimes, and 3 = Often. This recoding was done so that the items on the TPBS correspond with the Likert-type scale of the ECBI. Finally, the TPBS total score was calculated by summing the scores on all items.

The next part of the analyses was to score the responses on the ECBI. This included recoding all problem scale items so that 1 indicated that the behavior was a problem and 0 indicated that the behavior was not a problem. Next, two sums of scores were computed: one for the intensity scale and one for the problem behavior scale (a dichotomous variable). After calculating the sums, the cutoff scores provided by the Eyberg Child Behavior Inventory were used to determine whether each participant's child exhibited problem behaviors. According to ECBI cutoff scores, a score of 15 or greater on the problem behavior items is considered clinically significant and indicates the child's behaviors are considered a problem for the caregiver. For the intensity scale, a sum score of 131 or greater suggests that the sum of scores is clinically significant and the behaviors occur frequently.

In order to find out if the children who were classified as having problem behaviors on the TPBS also had problem behaviors according to the ECBI, SPSS was used to perform a Receiver Operating Characteristics (ROC) Curve Analysis. The ROC Curve represents a trade-off between the specificity (1-specificity on the x-axis) and sensitivity (on the y-axis; Dijkstra, Tiesinga, Plantinga, Veltman, and Dassen, 2004). The area under the curve in the ROC Curve Analysis in this case signifies that when a child who does not present with behavior problems receives a score of X and a child who does present with behavior problems receives a score of Y, then the area under the curve would be the probability that Y is greater than X (with greater scores indicating greater behavior problems). Criteria set by Dijkstra et al. (2004) indicates that areas under the curve from .50 to .70 indicate low test accuracy, from .70 to .90 indicate moderate test accuracy, and greater than .90 indicate high test accuracy.

Pearson Product Moment Correlation Coefficients were calculated between the total score on the TPBS and the sum of scores on the intensity scale and problem items to find out the degree to which the scores were related. This statistic was calculated to allow us to make some judgments about concurrent validity between our test, the TPBS, and the already established ECBI.

Last, Logistic Regression Analysis was used to hypothesize the cut-off score value for the TPBS that most accurately classifies children who have significant behavior problems based on their scores. This cut-off score will be used to identify children whose behaviors are problematic according to their scores on the ECBI.

RESULTS

Pearson Product Moment Correlation Coefficients were computed to assess concurrent validity between the TPBS and ECBI. The TPBS total score and the ECBI problem behavior score were found to have a moderate positive correlation ($r = .438, p < .001$), similarly, there was a strong positive correlation between the TPBS total score and the ECBI problem intensity score ($r = .703, p < .001$). These correlations suggest that there is a moderate to strong relationship between the TPBS and the ECBI.

A ROC curve analysis was completed to assess how well the TPBS was able to predict the scores on the ECBI. The total area under the curve predicted by the ROC curve analysis was .842, which indicates that the TPBS is moderately accurate at predicting the scores on the ECBI (Dijkstra et al., 2004). The analysis indicated that if certain items were excluded

from the TPBS (using a .475 cutoff), it may be able to better predict the scores on the ECBI. With TPBS items 4, 5, 20, 31, and 34 excluded, the area under the curve was estimated to be .867. This slightly improved the area under the curve, and suggests that the TPBS predicts the scores on the ECBI moderately well (Dijkstra et al., 2004). The ROC curve results indicate that if these items were excluded, the screening tool would be better at predicting the scores on the ECBI and consequently better at predicting whether children demonstrate significant behavior problems that warrant clinical attention.

Finally, a Logistic Regression analysis was completed in order to determine which cut-off score on the TPBS would best predict which children warrant clinical attention based on their scores on the ECBI. The classification and predictive probability scores of the logistic regression analysis were used to determine the cut-off score on the TPBS. In order to maximize both the total number of correctly classified children and the total proportion of correctly classified participants, an appropriate cut-off score on the TPBS was determined to be approximately 74. A cut-off score of 74 was determined by maximizing the number of total correctly classified children in this sample (85.9%) and by maximizing the sensitivity, or true positive outcomes (the proportion of children correctly classified; 75%). This means that for this sample any child who scored above a 74 on the TPBS should be recommended for further evaluation and treatment for significant behavioral problems. While this is not enough evidence to make the clinical judgment that 74 is the only appropriate cut-off score on the TPBS, it does provide a starting point for further analyses once more data is collected and the measure is revised.

FUTURE DIRECTIONS FOR THE EVALUATION OF THE TPBS

The authors will continue to explore the ROC curve analyses to establish which items on the TPBS best predict the ECBI. Upon determining which items are most predictive, authors will attempt to shorten the TPBS to as few as 10 or 15 items that still best predict the ECBI scores. This will allow us to use the TPBS as the short screening tool for young children's behavioral problems. In addition, regression analyses will be used to determine criterion validity. Corrected item total correlation will also be used as an index of discrimination to determine how much each item contributes to the shared variance.

Factor analyses will be used to determine the underlying constructs that may explain any covariation among the parent-rated behaviors. First, an

exploratory factor analysis (EFA) will be conducted. Principal-axis factoring (PAF) is the suggested method (Kahn, 2006) to analyze common variance among variables (e.g., behavior rating items). Parallel analysis (Horn, 1965) will then be used to generate eigenvalues (i.e., the amount of explained variance set on the same metric as the variables; Kahn, 2006) from a random set of data based on the sample examined in the study. These randomly generated eigenvalues will be plotted along with the eigenvalues generated for the sample data set. The factors with eigenvalues higher than the random eigenvalues will be retained (concluding that those items explain more variance than chance). Once the number of factors to extract and retain is decided, structure coefficients will be calculated to reflect the correlation between variables and factors. This will allow the author to interpret the factors based on the item content. Finally, in a future study the authors intend to conduct a confirmatory factor analysis (CFA) to confirm the results of the EFA results.

LIMITATIONS

The current study has several limitations. One limitation is the use of a convenience sample, which may result in an unrepresentative sample. The rationale for the use of convenience sampling in this study is due to the difficulty of gathering a random sample of low-income families with children aged five or younger. Another limitation is that one of the primary data collection sites is a pediatric clinic and it is possible that families surveyed in this setting may be more stressed and therefore may also report higher frequency of behavior problems. The authors intend to address this limitation as data collection continues by using statistical analyses to identify whether the sample from pediatric clinics is significantly different from samples collected at schools or community daycares. The reliance on parental report of childhood behaviors is also a limitation of the study. Many children between the ages of 0 and 5 have limited social interactions outside of their family (e.g. school, daycare), however, which resulted in a lack of other reliable informants about their behaviors. Therefore, the authors perceived parental report of the child's behaviors as the best method of measurement. Finally, the specific intention of the TPBS, to evaluate behavior problems in low SES families, will necessarily limit the measure's generalizability to other populations. It is important to consider these limitations both in the evaluation of the current results and in the future development of this measure.

CONCLUSIONS

For many years, researchers and clinicians have stated the need for assessment measures validated for use with children in families with low SES, particularly children of minority status (Del’Homme, Sinclair, & Kasari, 1994; Qi & Kaiser, 2003). Current measures commonly used to assess severity of behavior problems have demonstrated reliability and validity for use with the general population but have not had adequate validation with low SES families. Therefore, development of instruments designed to minimize cultural biases that are appropriate for accurate screening and diagnosis of behavior problems in young children from disadvantaged backgrounds is critical. This project is an important and necessary advancement in the field as it aims to develop a sound assessment instrument to identify significant challenging behaviors in very young children living in low SES, urban settings.

Current results suggest that the TPBS has an acceptable level of specificity and sensitivity along with a moderate to strong correlation with the already established ECBI. Additionally, the TPBS improves upon the ECBI because it was designed specifically for children ages 0-5 from low SES families and includes items that are developmentally appropriate for this age group. The ECBI was developed for children ages 2-16, and includes items that are developmentally appropriate for some age groups, but inappropriate for others. The scoring of the ECBI does not allow one to distinguish the developmental appropriateness of behaviors based on the child’s age. The TPBS also improves upon the currently established measure because it has been designed to include items that are relevant to ethnic minority families, as demonstrated by qualitative survey of parents where they indicated that the measure was applicable to their family and was easy to complete.

Considering the prevalence of behavior problems in young children from low SES families, accurate assessment and identification of early problems is important for both prevention and early intervention. The authors believe that the TPBS will be a more appropriate instrument to use with the population of interest. In the development of the ECBI, only 26% of the participants were non-White. This is not representative of low SES families (specifically from Milwaukee), which is comprised of 81% non-White individuals (U.S. Census Bureau, 2006). Therefore, the sample of the TPBS will be more representative of low SES families from an urban community.

In sum, through further development of the TPBS the authors intend to improve the accuracy of early diagnosis and ensure the correct identification of the children most in need of mental health services. The TPBS would also provide clinicians in urban settings with a valuable screening tool that they can use with confidence to assess behavior, track intervention outcomes, and use in further research with young children. With the use of the TPBS, early identification of problem behavior will hopefully lead to early intervention and improve the quality of life for both children and their parents.

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APPENDIX

Toddler and Preschooler Behavior Scale

Instructions: Listed below are common behaviors of toddlers and preschoolers. Think about your child's behavior over the past **two weeks**, and rate how often you observed each behavior. Circle **often** if it happens at least daily, circle **sometimes** if it happens weekly, and circle **almost never** if it rarely or never happens.

Your child.....**How Often Does the Behavior Occur?**

1. Hits others	Often	Sometimes	Almost Never
2. Eats with a spoon	Often	Sometimes	Almost Never
3. Throws things at others	Often	Sometimes	Almost Never
4. Is happy	Often	Sometimes	Almost Never
5. Listens to you	Often	Sometimes	Almost Never
6. Has temper tantrums	Often	Sometimes	Almost Never
7. Breaks things	Often	Sometimes	Almost Never
8. Is angry	Often	Sometimes	Almost Never
9. Hurts others	Often	Sometimes	Almost Never
10. Understands you	Often	Sometimes	Almost Never
11. Wakes up at night	Often	Sometimes	Almost Never
12. Gets into everything	Often	Sometimes	Almost Never
13. Does what you ask	Often	Sometimes	Almost Never
14. Jumps on furniture	Often	Sometimes	Almost Never
15. Plays well with others	Often	Sometimes	Almost Never
16. Hurts him/herself	Often	Sometimes	Almost Never
17. Has trouble sitting still	Often	Sometimes	Almost Never
18. Bites others	Often	Sometimes	Almost Never
19. Sleeps through the night	Often	Sometimes	Almost Never
20. Picks at his/her food	Often	Sometimes	Almost Never
21. Takes toys away from others	Often	Sometimes	Almost Never
22. Shares toys	Often	Sometimes	Almost Never
23. Listens to you	Often	Sometimes	Almost Never
24. Wears diapers/pull-ups	Often	Sometimes	Almost Never
25. Whines	Often	Sometimes	Almost Never
26. Helps others	Often	Sometimes	Almost Never

TODDLER AND PRESCHOOL BEHAVIOR SCALE

27. Bothers others	Often	Sometimes	Almost Never
28. Stays upset for a long time	Often	Sometimes	Almost Never
29. Sleeps with you	Often	Sometimes	Almost Never
30. Teases others	Often	Sometimes	Almost Never
31. Eats well	Often	Sometimes	Almost Never
32. Cries	Often	Sometimes	Almost Never
33. Cooperates in getting dressed	Often	Sometimes	Almost Never
34. Uses the toilet/potty chair	Often	Sometimes	Almost Never
35. Refuses to go to bed at night	Often	Sometimes	Almost Never
36. Clings to you	Often	Sometimes	Almost Never
37. Screams	Often	Sometimes	Almost Never
38. Sucks his/her thumb	Often	Sometimes	Almost Never
39. Uses a pacifier	Often	Sometimes	Almost Never
40. Scratches others	Often	Sometimes	Almost Never
41. Kicks others	Often	Sometimes	Almost Never
42. Wants a lot of attention	Often	Sometimes	Almost Never
43. Feels bad when hurts others	Often	Sometimes	Almost Never

Instructions: Which one of your child's behaviors causes you the most concern? Please write this one behavior on the line below.

Does this behavior....

Happen at home?	Y	N
Happen when shopping?	Y	N
Happen when visiting others?	Y	N
Happen more often than other children the same age?	Y	N
Hurt or injure your child?	Y	N
Hurt or injure others?	Y	N
Get noticed by relatives, friends or others?	Y	N

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Casey earned his BA in education from Martin Luther College, and his MA in school/child and adolescent counseling from Marquette University. He is currently in his second year in the Counseling Psychology Ph.D. program at Marquette University. His primary research interests include child development, and diagnosis and treatment of behavior disorders in youth from low socio-economic backgrounds. He intends to seek an academic position following completion of his program.

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Brittany is a second-year doctoral student in the Counseling and Educational Psychology Department at Marquette University. She is interested in the etiology and treatment of behavioral and emotional disorders in young children. She is also interested in the role of the family and culture in stress, coping, and well-being in multicultural individuals.

Keyona M. Jarrett

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