



Psychometric Evaluation of the Behavioral, Emotional, and Social Screener (BESS): Assessing Risk to Healthy Development in Early Childhood

Alayna Schreier, Grace S. Hubel, Mary Fran Flood, & David. J. Hansen
University of Nebraska-Lincoln



Introduction

Deficits in early social and emotional development have been identified as precursors to more significant mental health problems later in life and are a significant risk to a child's healthy development. Difficulties with emotional regulation and social skills may lead to the development of behavioral problems, which have been linked to mental health problems, peer relationship issues, and challenges to academic achievement (Eisenberg et al., 2000; Owens et al., 1999; Raver & Zigler, 1997). These long-term social and academic deficits further impede healthy development and are associated with both internalizing and externalizing disorders among children. Growing up in poverty is also a risk factor for young children, associated with exposure to substantial stressors, poor nutrition, and child maltreatment (Bender et al., 2011; Fantuzzo, McWayne, & Bulotsky, 2003). Low-income children enrolled in Early Head Start (EHS) and Head Start (HS) tend to be at higher risk for the development of social and emotional difficulties later in life (Lopez, Tarullo, Forness, & Boyce, 2000).

There are well established screening measures for young children, such as the Ages and Stages Questionnaire: Social Emotional (ASQ:SE; Squires, Bricker, & Twombly, 2002) and the Brief Infant Toddler Social Emotional Assessment (BITSEA; Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2004). However, the Head Start Performance Standards provide flexibility in the selection of screening instruments, requiring only the use of sound empirical procedures rather than informal methods (O'Brien, 2001). Agencies may choose to create their own screeners when they feel that available measures do not meet their specific needs.

The Behavioral, Emotional, and Social Screener (BESS) was developed in 2000 at the University of Nebraska-Lincoln to identify risk to healthy development among children enrolled in (EHS) and (HS). The paraprofessionals that provide direct services to families needed a brief but comprehensive measure that allowed them to complete multiple screenings over a short time frame for all enrolled children.

The BESS is comprised of three forms – Infant, Toddler, and Preschool – and screens for behavioral risk factors, environmental and parent/child interactional risk factors. The BESS also elicits qualitative concerns from the paraprofessionals who visit families' home weekly. A preliminary, exploratory psychometric analysis (Veed et al., 2006) examined internal consistency across all three measures, finding adequate internal consistency on the Toddler and Preschool forms. The Infant form did not demonstrate adequate internal consistency in this analysis. The current study expands on these analyses and examines the internal consistency reliability and additional psychometric properties of the BESS with a larger sample of families.

Method

Participants

The sample consisted of children ($n = 565$) in an EHS home-based program from two counties in southeastern Nebraska. The sample included 565 children and 372 caregivers. Age of children in this sample ranged from birth to five years. Refer to Table 1 for child and caregiver demographics.

Measures

Behavioral, Emotional, and Social Screener (BESS; Veed et al., 2006). The BESS is a rating scale used to identify risk for healthy development among children birth through five. There are three forms of the BESS, which include developmentally appropriate behavioral items. The Infant form is designed for children birth through 17 months and contains six behavioral items. The Toddler form is designed for children 18 through 36 months and contains ten behavioral items, as well as a subset of items from the CHAT to assess red flags for autism spectrum disorders (Baron-Cohen, Allen, & Gillberg, 1992). The Preschool form is designed for children age three to five and contains 11 behavioral items. The behavioral items are rated on a four-point Likert-type scale based on the frequency of the child's behavior: *never, sometimes, often, or almost always*. All three forms of the BESS also contain seven items addressing child maltreatment and environmental risk factors, rating their occurrence as *No, Concern/Unconfirmed, or Yes*. The paraprofessional working with the family is also asked to complete three additional questions pertaining to their observation of the parent/child interaction, rated on the same four-point Likert-type scale. The BESS takes 10-15 minutes to administer.

Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item self-report measure that identifies current depressive symptoms. 16 items are negatively worded, while four items indicate positive affect (Radloff, 1977) and require reverse scoring. The CES-D can be completed in both English and Spanish. For an unknown reason, the CES-D used in these archives had reworded the four reverse-scored items to be in the negative direction. The four reverse scored items on the Spanish form remained the same. Participants are asked to report how frequently they have experienced the described symptoms over the past week on a four-point Likert-type scale: 0 = rarely or none of the time (less than 1 day), 1 = some or a little of the time (1 to 2 days), 2 = occasionally or a moderate amount of time (3 to 4 days), and 3 = most or all of the time (5 to 7 days). The CES-D is summed with a range from 0 to 60. Raw scores greater than 16 indicate clinically significant risk for depression (Radloff, 1977).

Nebraska JUSTICE Records. The Nebraska JUSTICE system provides online access to public information available through Juvenile Court records. The Nebraska Department of Health and Human Services (DHHS) receives reports of possible incidents of child maltreatment, and agency workers determine whether risk is sufficient to file a case with the juvenile court system. A filed case is considered a substantiated instance of child maltreatment (Voices for Children of Nebraska, 2006). The current study used the same criteria as a larger study examining child maltreatment prevention and intervention. Occurrence of maltreatment was measured by the presence of a Juvenile Court case for maltreatment charges.

Table 1. Univariate Statistics for Demographic Information

Variable	Univariate Statistics			
<i>Child</i>				
Infant Age	$M = 52$	$SD = 47$	$N = 309$	
Toddler Age	$M = 2.13$	$SD = 39$	$N = 305$	
Preschool Age	$M = 3.32$	$SD = 24$	$N = 63$	
Gender	Male	261 (46.2%)		
	Female	230 (40.7%)		
Ethnicity	White	238 (42.1%)		
	Hispanic	92 (16.3%)		
	Black or African American	70 (12.4%)		
	Multiracial/Bi-racial	64 (11.3%)		
	Asian	16 (2.8%)		
	American Indian/Alaska Native	10 (1.8%)		
Primary Language	English	335 (57.5%)		
	Middle Eastern/South Asian	83 (14.7%)		
	Spanish	54 (9.6%)		
	East Asian	15 (2.7%)		
	African Languages	8 (1.4%)		
	European/Slavic Languages	6 (1.1%)		
	Other	1 (0.2%)		
<i>Parent</i>				
Gender	Male	7 (1.6%)		
	Female	365 (81.8)		
Ethnicity	White	222 (49.8%)		
	Hispanic	54 (12.1%)		
	Black or African American	55 (12.3%)		
	Multiracial/Bi-racial	12 (2.7%)		
	Asian	16 (3.6%)		
	American Indian/Alaska Native	10 (2.2%)		
Primary Language	English	240 (53.8%)		
	Middle Eastern/South Asian	64 (14.3%)		
	Spanish	43 (9.6%)		
	East Asian	12 (2.7%)		
	African Languages	8 (1.8%)		
	European/Slavic Languages	5 (1.1%)		
	Other	1 (0.2%)		
Highest Grade Completed	Less than high school degree	140 (31.4%)		
	High school diploma/GED	129 (28.9%)		
	Some college/Associates degree	81 (18.2%)		
	Bachelor's Degree	13 (2.9%)		
	Advanced Degree	3 (0.7%)		

Note: Percentages do not add up to 100% due to missing data.

Procedures

The BESS was administered by home visitation staff within 45 days of enrollment into EHS. Data were also collected at approximately one-year intervals for the duration of enrollment in both EHS and HS.

Psychometric analyses were conducted using archival data as part of a larger project looking at incidence of child maltreatment in EHS. Data were obtained from the records of EHS and HS, as well as records from a mental health consultation program providing services to the agency. For the purposes of this study, data were collected with children enrolled in EHS prior to age three. All analyses were conducted using the initial administration of each form of the BESS for each child. Thus, some children may have an initial infant form and an initial toddler form. For analyses including caregiver data (e.g., CES-D), only one child from each family was included in the analysis.

Results

Results indicate that the Infant BESS did not demonstrate adequate internal consistency across any of the three risk scales (Table 2). However, removal of one behavioral risk factor ("child has unusual difficulty sleeping") and a reduction in age range (birth through 9 months) led to improved internal consistency ($\alpha = .677$). The environmental risk scale demonstrated significant temporal stability, while the behavioral and parent/child interaction risk scales did not demonstrate significant stability (Table 2).

The Toddler BESS did not demonstrate adequate internal consistency across any of the three risk scales (Table 2). Both the behavioral and environmental risk scales demonstrated temporal stability, while the behavioral and parent/child interaction risk scales did not demonstrate significant stability (Table 2).

The Preschool BESS did demonstrate adequate internal consistency assessing both behavioral and environmental risk factors (Table 2). The behavioral risk scale demonstrated significant temporal stability, while the environmental and parent/child interaction risk scales did not demonstrate significant stability (Table 2).

The item assessing presence of parental mental health concerns was significantly correlated with scores on the CES-D above the clinical cutoff across all three forms (Table 3). Four items assessing exposure to child maltreatment were re-coded dichotomously and were significantly correlated with a substantiated instance of child maltreatment (Table 4).

Table 2. Internal Consistency and Test-Retest Reliability for the Behavioral, Emotional, and Social Screener (BESS)

Form	Number of Items	Number of Forms Completed	Cronbach's Alpha	Temporal Stability (n)
<i>Infant</i>				
Behavioral	6	285	.586	.063 (87)
Environmental	7	293	.326 ^a	.545** (87)
Parent/Child Interaction	3	283	.492	.028 (78)
<i>Toddler</i>				
Behavioral	10	280	.553	.666** (59)
Environmental	7	290	.578	.630** (62)
Parent/Child Interaction	3	297	.352	.012 (58)
<i>Preschool</i>				
Behavioral	11	58	.740	.508* (18)
Environmental	7	61	.630 ^b	.130 (18)
Parent/Child Interaction	3	56	.318	-.092 (15)

^a Child was sexually abused item was not endorsed on this measure.

^b Child has been neglected item was not endorsed on this measure.

* $p < .05$, ** $p < .001$

Table 3. Construct Validity of the BESS Parental Mental Health and Maltreatment Items with the CES-D and Justice Database

BESS Form	Correlation with CES-D (n)	Correlation with Justice (n)
Infant (0-17 Months)	.338** (237)	.204** (259)
Toddler (18-36 Months)	.336** (241)	.209** (260)
Preschool (36-60 Months)	.387* (57)	.359* (59)

* $p < .005$, ** $p < .001$

Discussion

Children enrolled in EHS and HS are exposed to a variety of factors that increase risk to overall healthy development. The aim of the current study was to evaluate a measure designed to screen for these risks and identify families in need of additional assessment, support, and intervention.

Results provide support for the reliability and validity of the Preschool BESS, indicating that it is adequately measuring behavioral and environmental risk to healthy development. While the results do not support the internal consistency of the Infant BESS and Toddler BESS, the behavioral subscale of the Infant BESS demonstrated reliability consistent with other infant screening measures. This reflects the difficulty inherent in identifying behavioral risk among infants who experience rapid behavior change over short periods of time. The environmental scales did not demonstrate adequate internal consistency, but were significantly correlated with related constructs such as parental depression and substantiated child maltreatment. Though the majority of items were infrequently endorsed, it is clinically relevant to screen for all aspects of environmental and family risk. Results of the parent/child interaction scale indicating inadequate internal consistency likely reflect the difficulty in assessing this dimension upon initial enrollment, before the paraprofessionals have observed substantial interactions between the parent and child. Findings related to temporal stability suggest that behavior may be more variable among infants and tends to be more stable over time for toddlers and preschool age children. The results demonstrate the difficulty of assessing the stability of risk factors within the context of an intervention program for young children.

The BESS was created because available screeners do not meet the specific needs of the population served by EHS and HS. Given the number of children enrolling in EHS and HS and the short time frame for screening completion, the BESS serves as a brief measure (10-15 minutes) that reduces the burden on paraprofessionals to complete numerous assessments in a short window of time with multiple children. Compared to other screeners, the BESS covers the full age range of children enrolled in EHS and HS (birth through five), so as to lessen the burden of learning and administering multiple measures as children progress through the program. The BESS also provides sufficient information pertaining to familial and environmental risk factors; comparable measures do not assess for these risk factors. The BESS is an interactive measure administered by the paraprofessionals, providing the ability to utilize their perspective in addition to parent report. Eliciting concerns from the staff who are in the home on a weekly basis reduces error that may arise from a solely self-report measure, and includes information that may have otherwise been excluded.

Results of this study demonstrate the need for further refinement and examination of the BESS. Revisions will address all areas with limited psychometric support, and may include reducing the age range of the infant form (birth through 9 months) and adapting items to better assess constructs relevant to risk for healthy development. Future research will further evaluate the use of the BESS within EHS and HS, in order to better inform assessment and intervention within at-risk families.