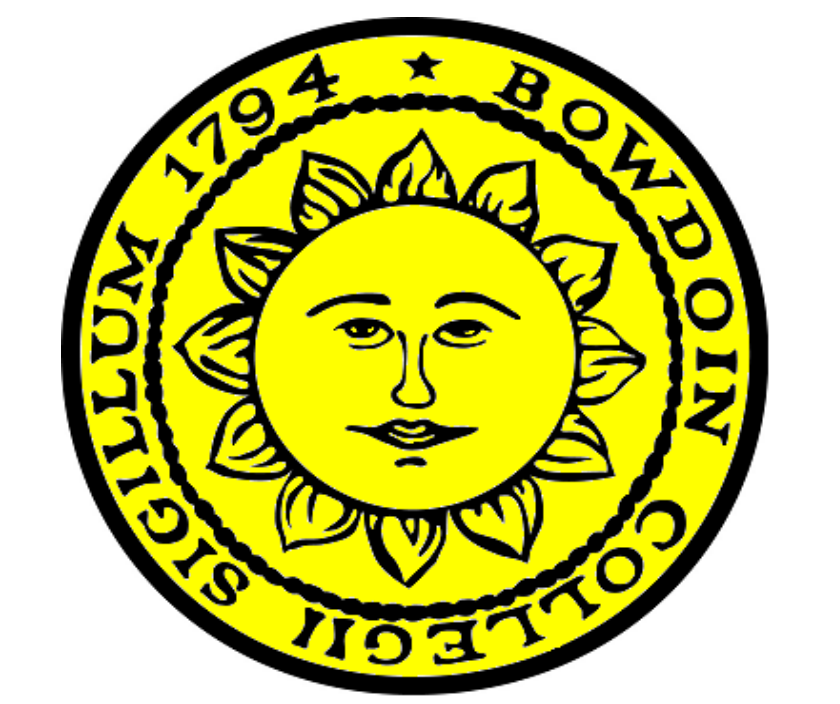


Development and Assessment of Short and Very Short Forms of the Early Childhood Behavior Questionnaire



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Samples

- Sample 1 (obtained by Bell)
 - N = 84
 - at age 24 months
- Sample 2 (obtained by Dixon)
 - N = 47
 - average age = 21.39 months
- Sample 3 (obtained by Braungart)
 - N = 110
 - average age = 20 months
- Sample 4 (obtained by Gartstein)
 - N = 85
 - average age 22.01 months
- Sample 5 (obtained by Putnam)
 - N = 98
 - at ages 18, 24, 30 and 36 months
- Sample 6 (obtained by Bridgett)
 - N = 64
 - at age 18 months

Scale Development Process

Short Form

Internal Consistency:

To create scales whose psychometric characteristics would generalize across samples, item-scale correlations were computed for each data set and averaged across data sets. Working scales containing the six items with the highest mean item-total correlations were then created, and Cronbach's alpha was calculated for all data sets. When alphas for any data set was < .65, item-total correlations were examined for these data sets to guide modifications. Items were removed from and added to the working scales until alphas for all data sets exceeded .65.

Content Validity:

Choosing scale items based solely on item-total correlations often leads to measurement of a narrow aspect of the construct (Loevinger, 1954). To avoid this, principal axis factoring was performed on each standard scale to determine subdimensions comprising each construct. For constructs with more than one dimension, items were removed from and added to the working scales until all dimensions were represented on the short form. In addition, the content of items was carefully considered, with similar items removed and replaced to maximize breadth.

Very Short Form:

Items chosen for inclusion on the short form were examined in terms of their relation to the three factors of the IBQ-R. Items demonstrating high correlations with their associated factor as well as low correlations with the other two factors, were considered for inclusion. To fully represent the content of the factors, one to three items from each of the 18 scales on the Standard and Short forms, excluding perceptual sensitivity, were retained for the Very Short Form scales. As in construction of the Short Form, items detracting from internal consistency were removed and replaced to achieve alpha > .65 in all data sets, and item content was taken into account to enhance validity.

Assessment

Scale	Alpha	Cross- Informant Agreement	Rank Order Stability			Short to Standard Corrected r
			6 m	12 m	18 m	
Act. Level Standard Short	.72 .69	.37 .15	.64 .59	.56 .49	.49 .50	.67
Attn. Focus Standard Short	.85 .76	.21 .19	.57 .53	.47 .43	.39 .37	.81
Att. Shifting Standard Short	.72 .69	.08 .11	.55 .58	.55 .58	.57 .54	.67
Cuddliness Standard Short	.90 .83	.35 .35	.57 .58	.50 .52	.56 .50	.87
Discomfort Standard Short	.79 .78	.50 .51	.72 .71	.65 .65	.63 .61	.74
Fear Standard Short	.77 .73	.44 .45	.67 .65	.58 .60	.55 .59	.73
Frustration Standard Short	.79 .73	.20 .26	.57 .52	.56 .46	.58 .59	.75
H.I.P. Standard Short	.82 .74	.25 .17	.66 .63	.63 .60	.49 .50	.74
Impulsivity Standard Short	.67 .65	.23 .26	.60 .49	.46 .48	.35 .38	.59
Inh. Control Standard Short	.88 .76	.47 .47	.62 .60	.62 .58	.59 .58	.82
L.I.P. Standard Short	.77 .75	.03 .05	.56 .48	.56 .44	.47 .31	.74
Motor Act. Standard Short	.76 .70	.18 .07	.74 .67	.73 .65	.58 .51	.72
Perc. Sens. Standard Short	.84 .73	.24 .24	.72 .68	.61 .59	.62 .58	.79
Pos. Antic. Standard Short	.85 .80	.23 .20	.53 .42	.44 .40	.07 .06	.79
Sadness Standard Short	.81 .73	.38 .38	.69 .68	.62 .60	.54 .55	.76
Shyness Standard Short	.87 .81	.48 .24	.55 .45	.42 .31	.34 .30	.82
Sociability Standard Short	.87 .74	.07 .15	.53 .59	.51 .55	.54 .34	.82
Soothability Standard Short	.80 .74	.22 .21	.58 .53	.55 .55	.50 .40	.76
Neg. Affect Standard Short Very Shrt		.37 .27 .70	.79 .77 .61	.78 .74 .60	.75 .73 .58	
Surgency Standard Short Very Shrt		.27 .19 .72	.71 .68 .67	.62 .62 .91	.45 .38 .47	
Eff. Control Standard Short Very Shrt		.32 .24 .72	.67 .66 .66	.65 .61 .57	.56 .54 .46	

Summary (see table for details)

Internal Consistency:

- Standard scales: **.80** (range = .67 to .90)
- Short Form scales: **.74** (range = .65 to .83)
- Very Short Form scales: **.71** (range = .70 to .72)

Criterion Validity:

- Average corrected standard-to-short correlations = **.76**
- Average standard-to-very short correlations = **.78**

Longitudinal Stability:

- Averaged over 3 six-month periods (18-24, 24-30, 30-36)
 - Standard scales: **.62** (range = .33 – .83)
 - Short Form scales: **.58** (range = .27 – .77)
 - Very Short Form scales: **.65** (range = .55 to .83)

Averaged over 2 twelve-month periods (18-30, 24-36)

- Standard scales: **.55** (range = .35 – .77)
- Short Form scales: **.53** (range = .31 – .71)
- Very Short Form scales: **.57** (range = .45 to .79)

Eighteen-month period (18-36)

- Standard scales: **.49** (range = .07 – .63)
- Short Form scales: **.46** (range = .06 – .61)
- Very Short Form scales: **.50** (range = .38 to .75)

Cross-Informant Agreement:

Average mother/father scale agreement:

- Standard: **.27**
- Short: **.25**
- Very Short: **.31**

Confirmatory Factor Analysis of Very Short Form Structure:

- TLI: .977
- CFI: .980
- RMSEA: .056 (CI=.052 -.059)

Discussion

This study documents the development and initial assessment of the Short and Very Short Forms of the Early Childhood Behavior Questionnaire. In the six samples the Short and Very Short Form scales achieved adequate internal consistency and criterion validity. In addition, the shortened measures were nearly as consistent across time and across raters as the standard scales.

These new measures give researchers flexibility in choosing an instrument for their specific needs. The Very Short form may be most useful for those whose primary research interests lie in other areas, but wish to efficiently assess broad dimensions of temperament. The Short form is appropriate for use by investigators who lack the time to administer the standard IBQ-R, but still desire the assessment of a wide variety of traits. In contrast to the standard form, which takes about 1 hour to complete, the Short and Very Short forms can be completed in 30 and 10 minutes, respectively.

The current study also informed theory regarding the structure of temperament. The 3-factor structure, which had emerged in prior analyses of the Standard and Short Forms, and was confirmed with the Very Short Form, is highly similar to empirically-driven models of temperament in toddlers, children, adolescents, and adults (Putnam, Ellis, and Rothbart, 2001).

In the current study, the short and very short scales were extracted from standard scale data, and analyses reported were conducted on these samples. Future studies using validation samples, including those for which these forms are directly administered, are needed to confirm these findings.

References

Loevinger, J. (1954). The attenuation paradox in test theory. *Psychological Bulletin*, 51, 493-504.

Putnam, S. P., Ellis, L. K., & Rothbart, M. K. (2001). The structure of temperament from infancy through adolescence. In A. Elias & A. Angleitner (Eds.), *Advances/proceedings in research on temperament* (pp. 165-182). CITY, Germany: Pabst Scientist.

Putnam, S. P., Gartstein, M.A. & Rothbart, M.K. (2006). Measurement of fine-grained aspects of toddler temperament: The Early Childhood Behavior Questionnaire. *Infant Behavior & Development*, 29(3), 386-401.

Putnam, S. P., & Rothbart, M. K. (2006). Development of Short and Very Short Forms of the Children's Behavior Questionnaire. *Journal of Personality Assessment*, 87(1), 103-113.

•The Standard, Short, and Very Short forms of the ECBQ can be downloaded upon request from <http://www.bowdoin.edu/~sputnam/rothbart-temperament-questionnaires/>

Abstract

Short (107 items) and Very Short (36 items) versions of the Early Childhood Behavior Questionnaire (ECBQ) were developed. Six samples of infants 18 to 36 months of age were used to construct 18 scales of 4 to 8 items for the Short Form. The Very Short Form measures three broad factors with scales of 12 items each. Both forms exhibited satisfactory internal consistency and cross-informant agreement for construction samples. Additionally, the Short Form approximated the factor structure and content breadth of the standard form.

Introduction

The Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein & Rothbart, 2006) is a widely used measure of early childhood temperament, as evident through its translation into 10 languages and requests for use in 400 research projects between 2006 and 2009. In its standard form, the ECBQ contains 201 items and takes about an hour to complete. This level of detail can prove exhaustive in research protocols that encompass, but are not limited to, early childhood temperament. Therefore, the current project was initiated to create and assess Short and Very Short forms of the ECBQ to diminish the demands on subjects in such studies, while enabling researchers to obtain valid and reliable data.

The ECBQ measures 18 discrete traits embedded within three higher-order factors: Negative Affect (Discomfort, Fear, Frustration, Motor Activation, Sadness, Perceptual Sensitivity, Shyness, Soothability), Surgency (Impulsivity, Activity Level, High Intensity Pleasure, Sociability, Positive Anticipation), and Effortful Control (Inhibitory Control, Attentional Shifting, Low Intensity Pleasure, Cuddliness, and Attentional Focusing). The current project sought to retain all 18 traits and 3 factors in the Short form, while only retaining measures of the 3 factors in the Very Short form.

The new forms were created using scores from a total of 485 infants, with both mothers and fathers reporting on 118 of these children at 18, 24, 30 and 36 months.

Temperament Scales and Definitions	
Activity Level/Energy	Level (rate and intensity) of gross motor activity, including rate and extent of locomotion.
Attentional Focusing	Sustained duration of orienting on an object of attention; resisting distraction.
Attentional Shifting	The ability to transfer attentional focus from one activity/task to another.
Cuddliness	Child's expression of enjoyment in and molding of the body to being held by a caregiver.
Discomfort	Amount of negative affect related to sensory qualities of stimulation, including intensity, rate or complexity of light, sound, or texture.
Fear	Negative affect, including unease, worry, or nervousness related to anticipated pain or distress and/or potentially threatening situations; startle to sudden events.
Frustration	Negative affect related to interruption of ongoing tasks or goal blocking.
High Intensity Pleasure	Pleasure or enjoyment related to situations involving high stimulus intensity, rate, complexity, novelty, and incongruity.
Impulsivity	Speed of response initiation.
Inhibitory Control	The capacity to stop, moderate, or refrain from a behavior under instruction.
Low Intensity Pleasure	Pleasure or enjoyment related to situations involving low stimulus intensity, rate, complexity, novelty, and incongruity.
Motor Activation	Repetitive small-motor movements; fidgeting.
Perceptual Sensitivity	Detection of slight, low intensity stimuli from the external environment.
Positive Anticipation	Excitement about expected pleasurable activities.
Sadness	Tearfulness or lowered mood related to exposure to personal suffering, disappointment, object loss, loss of approval, or response to other's suffering.
Shyness	Slow or inhibited approach and/or discomfort in social situations involving novelty or uncertainty.
Sociability	Seeking and taking pleasure in interactions with others.
Soothability	Rate of recovery from peak distress, excitement, or general arousal.