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Title: Validation of the Systematic Assessment of Book Reading

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Abstract

Background/Context
Measuring the quality of classroom-based interactive shared book reading within the early childhood classroom represents a specific dimension of teacher-child interactions that is of great interest to researchers and practitioners. This interest reflects decades of research demonstrating the benefit of reading to young children in both the home and the classroom (for reviews, see Bus, van IJzendoorn, & Pellegrini.,1995; Mol, Bus, & de Jong, 2009; National Early Literacy Panel [NELP], 2008). Despite this widespread interest and almost daily use of shared book reading in early childhood classrooms (Dickinson, De Temple, Hirschler, & Smith, 1992), to date there are very few standardized tools available for quantifying or describing young children's reading experiences. This presents a salient limitation to research, in particular, as it limits the comparison of findings across studies regarding what appear to be critical characteristics of shared book-reading sessions, including those qualities that most contribute to important child outcomes. To address these limitations, our study team has developed the Systematic Assessment of Book Reading, or SABR (Zucker, Pentimonti, Tambyraja, & Justice, 2017), an observational measure of teacher behaviors that support language and literacy development during shared book-reading sessions.

Purpose
The purpose of this validation study was to conduct a systematic investigation of the psychometric characteristics of the SABR. This work was completed in three phases detailed below: 1) SABR 1.0 transcript coding with a large item pool, 2) SABR 1.1 transcript coding with a reduced item pool, and 3) SABR 1.2 video coding with a further reduced item pool.

Analysis and Findings
SABR-1.0 Development and Initial Validation Phase. After an extensive literature review, we created 75 codes across many dimensions such as level of cognitive demand, content of utterance, form of utterance and child-level extratextual talk (i.e., talk above and beyond the actual reading of the text). We transcribed and coded 90 pre-k teachers' mid-year videotaped

shared-reading sessions of a trade book, *Rumble in the Jungle* (Andreae, 1996). Reliability and factor analyses were conducted to inform which items to retain in the next, more streamlined SABR 1.1 version (Pentimonti et al., 2017), removing items with low inter-rater agreement, low fit indices, or low rates of occurrence.

SABR-1.1 Long-Form Validation. In the second phase of work, a set of 50 retained items were used to code behaviors from 100 pre-k and kindergarten teachers' videotaped and transcribed Fall shared-reading sessions of a researcher-created book, *Kingdom of Friends* (Pentimonti & Zucker, 2015). See Tables 1-3 for codes, code definitions, and frequency counts for each code during the transcribed shared-reading sessions. Again, descriptive and factor analyses informed which items should be retained, revised, or removed (Pentimonti et al., 2018). We identified a 4-factor structure of the long-form: a) content of meaning-related talk, b) content of literacy-related talk, c) form of utterance, and d) child talk. Using multilevel modeling, we found that teachers' use of meaning-related talk was associated with gains in students' vocabulary scores. We also found that teachers' use of more sophisticated who-, what-, why-, and auxiliary-fronted questions (but not use of less sophisticated yes/no and closed questions) were associated with vocabulary gains (Pentimonti et al., 2018).

SABR-1.2 Short-Form Validation. Our third phase of work involved video coding (without transcription) of shared-book reading sessions of *Kingdom of Friends* (Pentimonti & Zucker, 2015) in 286 classrooms with 258 Fall observations, 40 at mid-year (a random subsample), and 252 in the Spring (*n*=550 total). Using the short-form designed for scalable, brisk coding, we coded the frequency of 17 behaviors (15 teacher, 2 child codes) that relied on explicitly defined behaviors and sets of keywords that indicated the presence of a behavior across 3 instructional domains and 1 form of utterance domain. These codes comprised the most parsimonious set of codes that were associated with child outcomes in Phase 1.1 and were able to be coded from videos with minimal pausing (Pentimonti et al., 2018; Deshmukh et al., 2018). Regarding psychometrics, factor analyses yielded a single factor with item loadings ranging between .41 and .86 (see Table 4). Inter-rater reliability were high, ranging from 95% to 99% agreement. Test-retest reliability revealed that the SABR narrative factor scores were strongly correlated (*r*=.75) at Fall and Spring. There was also a strong correlation *r*=.78 between SABR *Kingdom of Friends* text scores and teachers' own choice texts, observed in a subsample of 33 classrooms. We established convergent validity with moderate relations with the Early Language and Literacy Classroom Observation (ELLCO): Pre-K Tool (*r*s=.42 to .51, see Table 5). Criterion validity of the SABR-1.2 was investigated for a subsample of 877 students tested at baseline and follow-up. Findings revealed that teachers' SABR factor scores were associated with gains in students' vocabulary and print knowledge scores (see Table 6). Additionally, results revealed that teachers' use of what, why, how questions and recasts were associated with vocabulary gains, but not use of less sophisticated yes/no and turn taking questions. Finally, teachers' use of talk referencing book and print conventions was associated with gains in children's print knowledge skills.

Conclusion

Results of our validation study suggest the SABR is a reliable and valid tool that provides researchers with a standardized and freely available tool that can be used to document the types of shared-reading experiences children are exposed to in their early childhood classrooms. We have created two versions of the tool: 1) a long version with a more comprehensive set of codes

that requires transcription, and 2) a short version with a more parsimonious set of codes that requires video coding which allows for reduced coding time. The final products for the SABR tool include: (a) a SABR-1.1 long form that is disseminated at no cost online; (b) a SABR-1.2 short form that is also disseminated at no cost online; and (c) online reliability training materials available for free download and certification to use either the long form or short form.

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Table 1. *SABR 1.1 long-form/transcript code definitions and frequency counts (Note - T=Teacher, C=Child Codes)*

General Content Code Definitions	Example	Teacher Talk		Child Talk	
		M	*SD*	*M*	*SD*
Literacy-related: Utterances that address the topic of literacy predominantly	T: *What is the spine for?*	20.89	15.45	4.85	5.04
Meaning-related: Utterances that address the topic of comprehending the meaning of the text predominantly	T: *How do you think they feel?*	101.79	71.61	35.89	26.18
Behavior/Rules Reminder: Utterances that reference students' behavior or classroom rules/procedures	T: *Raise your hand if you know.* T: *Please don't yell out.*	16.47	25.00	1.91	3.27
Behavior/Attention Directing: Utterances that focus students' or teacher's attention on the book or non-instructional topics	T: *Let's look.* T: *Pay attention.*	26.77	27.04	2.46	3.69
Literacy-Related Modifier Codes					
Print Meaning: Utterances about the function of print as a meaningful symbol	T: *We have a new book to read today.*	2.88	3.26	0.53	1.05
Author/Illustrator: Utterances that name author/illustrator or discuss the role of the author/illustrator	T: *We don't have any books by this author.*	4.62	4.87	0.94	1.55
Book & Print Conventions: Utterances about book parts, book handling or rules and conventions of printed words	T: *I'm going to tell you what the title is.*	7.83	7.57	1.44	2.20
Letters: Utterances about letter names, letter sounds, alphabetical order or letter features	C: *You have a "T" in your name.*	0.33	0.81	0.12	0.44
Words: Utterances that identify whole words in print, includes rhyming and syllabication	T: *This says "best" and this says "friends."*	2.12	2.54	0.34	0.79
Writing: Utterances about how to write, invented spelling, and modeled writing	T: *That's the way your write in kindergarten.*	1.03	1.40	0.36	0.76
Meaning-Related Modifier Codes					
Character Reference: Utterances that refer to characters as proper nouns or questions that elicit a character's name	T: *Dad told her that Diego wants to help.* T: *And who was in charge all the time?*	9.61	9.28	1.81	2.18
Event Reference: Utterances that refer to overt character behaviors, physical objects, or explicitly stated text events	C: *She stepped on the castle!*	13.29	13.89	3.72	4.73
Cognition: Utterances that indicate cognition/thinking of character/self/others	T: *Do you think that might be the time-out chair?*	16.37	14.82	1.73	3.08
Feelings/Emotions: Utterances that contain emotion terms such as sad, happy, angry or other variations	T: *She was sad.*	11.17	8.50	4.30	4.60
Desires/Preferences: Utterances that involve naming or inferring desires, preferences, or other volition terms	T: *And what does he want to play with her?*	9.15	9.52	2.51	3.25
Judgments & Perspectives: Utterances that express opinions or attitudes; assertions about quality/merit	T: *They're not having a good time here at all.*	20.41	17.64	5.82	5.11
Causal Effects & Problem/Solution: Utterances that reference antecedents or consequences/effects of text events	T: *But we need to talk and work together so we can be happy.*	7.13	6.96	2.46	3.33
Predictions/Forecasts: Utterances include inferences on a forecasted causal chain or future text events	T: *You want to make a prediction for what the picture is?*	6.39	7.10	2.05	3.30
Define Word Meanings: Utterances that request or provide a word's definition or elaborates on word meaning	T: *Sulk away means go away kind of slow and sad.*	4.56	6.40	1.28	2.47
Acting Out & Pretend Play: Utterances that promote dramatization of the book or other pretend role play	T: *Can you make that kind of a face and pout?*	5.07	8.99	1.16	2.88
Making Connections: Linking the text to reader's personal experience or world knowledge	T: *That reminds me of the book Llama.*	11.00	10.89	3.44	4.77

Table 2. *Child talk in SABR 1.1 long-form/transcript code definitions and frequency counts*

Length of Child Utterance	Example	*M*	*SD*	Min	Max
Single Word Utterance: These child idea units include codeable words (not excluded content, such as yes/no utterances) and generally contain a single word.	C: *Sad.*	19.70	20.51	0.00	115.00
Multiword Utterance: These child idea units include two words or more.	C: '*Cause he didn't sit by her!*	31.85	22.40	0.00	121.00
Topic Control					
Child Control: Child-controlled conversation including spontaneous comments/questions or spontaneously repeating a word or phrase from the text.	C: *I can't see.*	18.81	16.59	0.00	103.00
Teacher Control: Teacher-controlled conversation for a given child utterance such as any conversations started by a teacher question or about a topic originally brought up by the teacher.	T: *The kingdom was what?* C: *In danger.*	32.71	26.43	0.00	146.00

Table 3. *Teacher form of question and response utterances in SABR 1.1 long-form/transcript code definitions and frequency counts*

Major Form of Teacher (T) Utterance	**Example**	*M*	*SD*	Min	Max
Question (Q): Interrogative sentence form – ending punctuation is a question mark. Requires a response from listener.	Question: *Did [their disagreement] get smaller or did it get bigger?*	57.69	36.74	0.00	186.00
T Modifiers: Teacher Question (TQ) Wording					
Wh- Questions: Who, what, when, where (but not Why) + interrogative sentence form	T Wh-Q: *What are they reading?*	22.68	18.44	0.00	86.00
Why Questions: Why + interrogative sentence form	T Why Q: *Why was Petunia sad?*	1.63	2.01	0.00	9.00
How Questions: How + interrogative sentence form	T How Q: *How do you think Petunia is feeling?*	2.50	3.24	0.00	15.00
Auxiliary-Fronted Questions: Auxiliary verb is the first word in question (Do…? Did…? Will…l? Can…? Have…? And all "to be" verbs)	T Aux-fronted Q: *Are they happy?*	15.00	13.02	0.00	72.00
Yes/No Questions Without Auxiliary Verb: Questions that can be answered with a yes/no response, but they do not have the auxiliary verb as the first word in question.	T Yes/No Q: *Right?*	13.23	11.62	0.00	69.00
Turn-taking Questions: Questions meant to give a child an opportunity or turn to speak.	T Turn-taking Q: *Brooke, yes?*	2.48	3.79	0.00	22.00
Cloze Prompt: Implicit prompt for child to fill in a final word/phrase as indicated by rising intonation	T: *The spine holds the…*	1.88	2.06	0.00	17.00
T Modifiers: Responses Required for TQ					
Open Question: Multi-word response required to provide a an acceptable response	T: *Why was Petunia sad?*	14.29	14.01	0.00	75.00
Closed Question: Single word response required to provide a an acceptable response	T: *Do you have friends?*	41.51	27.59	0.00	149.00
Real Question: Information-seeking questions presume the questioner does not have the information/answer.	T: *Did you like that book?*	24.11	18.44	0.00	95.00
Test Question: Known-information or test questions have a known correct answer. The purpose is to evaluate the child's response accuracy/recall/comprehension.	T: *What did Diego give Petunia?*	31.43	24.76	0.00	145.00
T Modifier: Responding to Child Talk					
Recast/Extend: Utterances that elaborate on child utterances by repeating, recasting, or expanding the topic in a way that uses at least one word from the child's previous utterance	T: *What does the author do?* Cs: *Write the words.* T: *The author writes the words.*	12.94	10.15	0.00	62.00

Table 4. *SABR-1.2 factor loadings*

SABR-1.2 item	Factor loading
Teacher recast	.86
Auxiliary fronted yes/no question	.69
Yes/no question	.46
Wh- question	.87
Why question	.62
How question	.57
Redirection/Reminders	.53
Book/Print conventions	.57
Letters/Words/Writing	.41
Character reference	.64
Cognition	.75
Feelings/Emotions	.75
Define/Elaborate on Vocabulary	.62
Act Out/Pretend	.52

Table 5. *SABR-1.2 factor score correlations with ELLCO items*

ELLCO item	Correlation with SABR factor score
Teachers understand role of extended conversations	.47
Instructional efforts to expand students' spoken vocabulary	.48
Instruction to promote students' word knowledge	.51
Teacher instructs students in comprehension strategies	.42
Teacher conducted an engaging reading and discussion	.45

Table 6. *SABR-1.2 factor score associations with gains in vocabulary and print knowledge scores*

SABR factor score	*b (SE(b))*	*t (sig)*
Intercept	3.29 (.28)	18.37 (<.01)
Vocabulary gain score (CELF expressive vocabulary subtest)	.48 (.18)	2.62 (<.01)

SABR factor score	*b (SE(b))*	*t (sig)*
Intercept	4.67 (.27)	17.13 (<.01)
Print knowledge gain score (TOPEL)	.76 (.28)	2.75 (<.01)