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[INTERNAL CONSISTENCY ANALYSIS OF FROG STREET
ASSESSMENT FOR BIRTH-PRE-KINDERGARTEN CHILDREN]

INTERNAL CONSISTENCY ANALYSIS
FROG STREET AIM ASSESSMENT
(ENGLISH)
FOR
Birth to Pre-K Children



A REPORT DEVELOPED
FOR
FROG STREET PRESS



Prepared by
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Executive Summary



The Frog Street AIM Birth-Prekindergarten (FSA B-Pre-K), is a curriculum-based assessment (CBA) scale, which has as its purpose of assessing children individually from birth to 5 years old. FSA B-Pre-K, created in 2018, is based on the curriculum from Frog Street Birth-Pre-kindergarten, a comprehensive, research-based program that integrates instruction across developmental domains and early learning disciplines. Though the FSA B-Pre-K is a CBA, it can be used independently of the Frog Street curriculum. FSA includes various B-Pre-K Skill Domains (Social Foundations, Language and Literacy, Cognition/ Mathematics, Cognition/ Science, Cognition/ Social Studies and Perceptual, Physical, and Motor Development) capturing 58 indicators of children's learning progression.

The Charge for the Research Team

The Frog Street Press Chief Executive Officer, Ron Chase, requested in Spring 2020, that the Center for Research & Development in Dual Language & Literacy Acquisition Research Team, a team of well-respected individuals, in the Department of Educational Psychology at Texas A&M University, complete an psychometric analysis of the Frog Street AIM Birth-Prekindergarten (FSA B-Pre-K) Assessment. The specific charge was that the internal consistency analysis was conducted for each domain with fifty-eight items. Additionally, the internal consistency analysis detailed the psychometrics property to the content analysis that the Research Team conducted for the same instrument in 2018. Mr. Chase' charge included developing a report of results and forthright recommendations for his team of curriculum/testing specialists related to the FSA.

The Research Team then focused on meeting the charge and offering a report that is thoughtful and meaningful for improvements of the FSA B-Pre-K Assessment. The Research Team hopes that the recommendations will ensure that the assessment is systematic, psychometrically appropriate, and well-aligned with the curriculum and standards for Head Start Early Learning Outcomes Framework.

To accomplish the charge, the Research Team agreed on the following framework for carrying out the work.

1. Review the structure of FSA B-Pre-K Assessment

2. Clean the student achievement data collected via FSA B-Pre-K assessment
3. Conduct internal consistency analysis on the cleaned data
4. Generate the psychometric report for FSA B-Pre-K assessment
5. Provide recommendations for FSA B-Pre-K assessment

Review of Sub-Assessments



FSA B-Pre-K Assessment includes 58 items nested in six subtests:

Cognition/Mathematics (CM), Cognition/Science (CS), Cognition/Social Science (CSS), Language & Literacy (LL), Social Foundations (SF), and Perceptual, Physical, and Motor Development (PPMD). Frog Street provided a total of 358,242 data entries at item level with student IDs for the Research Team to cluster the entries at the student level. Since different testees might receive different subtests or subtest combinations due to their age or other factors, the internal consistency analysis was conducted and reported at the subtest level.

The subtest **Cognition/Mathematics** consists of 12 items: rote counting, object counting, making sets, subitizing, comparing quantities, addition problems, subtraction problems, identifying, extending and creating patterns, identifying/comparing/measuring, two-dimensional shapes, three-dimensional shapes, and combining shapes. Thirty-four participants who were tested on all items in this subtest were included in the internal consistency analysis. The results indicated that the scale of the subtest **Cognition/Mathematics** has an

excellent level of internal consistency, as determined by Cronbach's alpha of 0.956 (George & Mallery, 2003).

The subtest **Cognition/Science** consists of 2 items: examining, describing, and classifying data, and conducting experiments and investigations. Sixty-two participants who were tested on both items in this subtest were included in the internal consistency analysis. The results indicated that the scale of the subtest **Cognition/Science** has a poor level of internal consistency, as determined by Cronbach's alpha of 0.522 (George & Mallery, 2003).

The subtest **Cognition/Social Science** consists of 2 items: rules at home and school and past, present, and future. Seventy-eight participants who were tested on both items in this subtest were included in the internal consistency analysis. The results indicated that the scale of the subtest **Cognition/Social Science** has an acceptable level of internal consistency, as determined by Cronbach's alpha of 0.765 (George & Mallery, 2003).

The subtest **Language & Literacy** consists of 19 items: listening/purposes and situations, speaking/purposes and situations, word meanings, word relationships, sentences, questions, prepositions, inflections, responds to questions about a text, retell a text, concepts of print, rhyming words, syllables/onsets and rimes/phonemes, initial/final/medial sounds, adding/deleting/substituting sounds, upper and lowercase letters, letter sounds, name recognition and writing, and writing to convey meaning. Twenty-five participants who were tested on all items in this subtest were included in the internal consistency analysis. The results indicated that the scale of the subtest

Language & Literacy has an excellent level of internal consistency, as determined by Cronbach's alpha of 0.966 (George & Mallery, 2003).

The subtest **Social Foundations** consists of 18 items: emotional identifications, response to distressed peer, separation from adults, seeking emotional support, conflict resolution strategies, identifying abilities, self-confidence, community, self-control strategies, persisting with tasks, following directions, information recall and connection, using logic, interest, planning, play/work with peers, social behaviors, and creativity and self-expression. Thirty-six participants who were tested on all items in this subtest were included in the internal consistency analysis. The results indicated that the scale of the subtest **Social Foundations** has an excellent level of internal consistency, as determined by Cronbach's alpha of 0.945 (George & Mallery, 2003).

Conclusions and Recommendations

Frog Street Assessment



Based on the available data and the results of internal consistency analysis, the Texas A&M University Research Team concludes that the Frog Street AIM Birth to Pre-Kindergarten Assessment has excellent internal consistency in the subtests: Cognition/Mathematics, Language & Literacy, and Social Foundations. The instrument achieved acceptable internal consistency in the subtest Cognition/Social Science, and poor internal consistency in the subtest Cognition/Science. These latter two subtests have only two items per subtest. Additionally, since no testees completed all items in the subtest, Perceptual, Physical, and Motor Development, no internal consistency was able to be determined in this report.

There are some general recommendations for the future psychometrics analysis:

1. Since the Assessment is observational in nature, it is recommended trained testers establish inter-rater reliability of the Assessment.
2. It is recommended that all the testers receive comprehensive and explicit training of the Assessment.

3. More specificity is needed for the rating range, such as the difference between three levels of Emerging, Progressing, and Ready for each level of each indicator.

4. It is recommended that Frog Street restructure and increase the number of items on the subtests of Cognition/Social Science and Cognition/Science to improve the internal consistency.

5. It is recommended that Frog Street administer all the items of the subtest, Perceptual, Physical, and Motor Development, on eligible students for future internal consistency analysis.

6. It is recommended that the Assessment provide a norming table for transferring the ratings (Emerging, Progressing, and Ready) into standard scores.

7. It is recommended that the cut-off point scores of FSA B-Pre-K Assessment should be established on empirical data.

8. It is recommended that the User Guide or Assessment Reference Manual include all test items and directions and potential responses for the teacher to improve reliability. Additionally, it is recommended that “how to” develop local norms be included in the Guide or Manual.

9. It is recommended that Frog Street collect more data for future internal consistency analysis by age group.

Reference

George, D., & Mallery, M. (2003). Using SPSS for Windows step by step: a simple guide and reference. Boston, MA: Allyn & Bacon.