
The Test of Phonological Awareness: A Critical Review

Analyse critique de l'épreuve de sensibilisation phonologique

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Key words: phonological awareness, phonemic awareness, linguistic awareness, early reading, assessment, screening

Abstract

Phonological awareness has been shown to be related to early reading acquisition. The purpose of this review is to critically examine the Test of Phonological Awareness (TOPA) (Torgesen & Bryant, 1994) in light of its rationale, with reference to the research on phonological awareness and its relationship to early reading skill and to phonological and language impairments. In the first section of the review, the rationale of the test is evaluated using evidence provided by the literature. In the second and third sections, the test is described and the technical data provided in the examiner's manual are evaluated using criteria for psychometric tests. In the concluding section of the review, the usefulness of the instrument is addressed.

Abrégé

On a prouvé que la sensibilisation phonologique était liée à l'apprentissage précoce de la lecture. L'analyse avait pour but de jeter un oeil critique sur l'épreuve de sensibilisation phonologique (TOPA) (Torgesen & Bryant, 1994) dans ce contexte, d'après les recherches entreprises sur la sensibilisation phonologique et les liens de cette dernière avec les aptitudes précoces à la lecture ainsi qu'avec les problèmes de phonologie et de langage. La première partie de l'analyse évalue la raison d'être du test à partir de preuves extraites de la documentation. La deuxième et la troisième décrivent l'épreuve et évaluent les données techniques qui apparaissent dans le manuel de l'examineur, selon les critères applicables aux épreuves psychométriques. Dans la conclusion, on se penche sur l'utilité de l'instrument à l'étude.

Traditionally, the aetiology of early reading problems has been regarded as primarily visual in nature. During the last 20 years however, a language basis for reading disability has been proposed. A burgeoning body of evidence now implicates difficulty with language processing as a contributing

factor in a majority of early reading disabilities. The interaction between phonological processing abilities and the acquisition of early reading skill has been studied in investigations of verbal short-term memory, retrieval of phonological information, production of complex phonological sequences, and phonological awareness (Catts & Kamhi, 1989). The latter area, phonological awareness (also termed phonemic awareness and linguistic awareness in the literature), is relevant to this review.

Phonological awareness is a part of the broader area of language knowledge termed metalinguistic awareness; that is, the ability of the listener to reflect upon the features of spoken language and manipulate them. This requires explicit knowledge of the structural elements of oral language, knowledge which is utilized in the acquisition of reading and writing skills (Ball, 1993).

Phonological Awareness and the Development of Early Reading Skill

Consistent research findings have established "a relationship between explicit awareness of the phonological structure of language and early reading development" (Catts & Kamhi, 1989, p. 1). In addition, some research has indicated that the ability to segment words into phonemes and the ability to read exist in a mutually reinforcing relationship (Just & Carpenter, 1987). The notion that children gain explicit awareness of the phonological structure of words as a consequence of reading instruction is supported by empirical evidence (e.g., Bradley & Bryant, 1991).

Results of phonological awareness testing of Kindergarten-level children have been found to predict later success in reading (Bradley & Bryant, 1983). Other research has demonstrated that training of preschool children enhances phonological awareness even outside the context of alphabetic instruction and has long-term effects on children's reading and spelling skills in Grades One and Two (Lundberg, Frost, & Petersen, 1988).

Phonological Awareness and Impairments of Phonology and Language

Research on the link between expressive phonological impairment and aspects of literacy development has produced mixed results. While some studies have indicated that children with phonological impairments demonstrate a greater number and range of errors in reading and spelling (e.g., Bird & Bishop, 1992; Clarke-Klein, 1991), others have found that these children do not experience undue difficulty in acquiring reading skills (e.g., Catts, 1993; Levi, Capozzi, Fabrizi, & Sechi, 1982).

Bird, Bishop, and Freeman (1995) have recently attributed discrepant findings to heterogeneity of populations studied. Controlling for differences in accompanying language difficulties and age, they determined that segmentation tasks were more difficult for phonologically impaired children. The authors concluded that children with expressive phonological impairments have a deficit in the ability to analyze subsyllabic units. Difficulty acquiring "the alphabetic principle" places these children at risk for reading problems.

Other studies have provided evidence that the language-impaired population performs poorly on tasks requiring phonological awareness. Because there is a high incidence of reading difficulty in language-impaired children, some researchers have hypothesized a fundamental link between their underdeveloped phonological awareness skills and their difficulty acquiring reading skills (Catts, 1991).

Experimental research to date has suggested a relationship between phonological awareness and early reading skills. The need for an easily administered instrument which effectively measures phonological awareness skills is clear. Whether the TOPA meets that need is addressed in this review.

Test Description

The TOPA is a brief test of young children's ability to isolate phonemes in orally presented words administered individually or in groups. The Kindergarten version "can be given any time during the kindergarten year, but the scale is likely to be most sensitive to individual differences during the second half of the year" (Torgesen & Bryant, 1994, p. 3). The Early Elementary version is designed for children in Grades One and Two. Each version assesses phonological awareness via two subtests. In the Kindergarten version, the child is required to identify a word which has an identical initial sound to a stimulus word, and to identify which of four stimulus words has a word-initial sound which is different from the others. The Early Elementary version requires a child to perform the same tasks using word-final sounds. The

test booklet, in which the child records responses, consists of visual stimuli representing items read aloud by the examiner. It is assumed that this visual support is an attempt to reduce the effect of auditory memory constraints.

Administration and Scoring

Each version of the instrument can be administered in 15 to 20 minutes. General and specific test administration procedures are outlined. Instructions to be read verbatim are provided for each subtest, as well as for a preliminary orientation section which is optionally administered. All test items are administered.

Scoring of items is dichotomous. Raw scores yield standard scores (i.e., *z*-scores, *T*-scores, *W*-scores, normal curve equivalents, or quotients) and percentile rank from tables found in the manual. The test is normed for children between the ages of 5 years 0 months to 8 years 11 months.

Evaluation

The recent publication of the TOPA is undoubtedly welcomed by speech-language pathologists and others who work in the area of phonological awareness, as norm-referenced tests of phonological awareness are scarce. While the test has a number of strengths, it also has some restrictive features.

A major limitation on the TOPA's use is that it does not allow for testing of children younger than Kindergarten age. Based on results of experimental research (e.g., Lundberg et al., 1988), a case could be made for identification and intervention during the preschool years to maximize long-term benefit to children with underdeveloped phonological awareness skills.

Norms

The examiner's manual presents a thorough description of normative procedures. The TOPA - Kindergarten and Early Elementary versions were normed on standardization samples of 857 and 3654 children respectively. A comparison of the standardization sample percentages with population percentages reveals that the sample approximates United States population demographics. As is almost a given among standardized tests, there is a mismatch between the normative sample and Canadian students. Unless it can be demonstrated that sample characteristics of race, ethnicity, geographic region, and gender are shared by local students, the interpretation of scores on the basis of established norms can be misleading (McCauley & Swisher, 1984).

Two difficulties with the norms are apparent. The first difficulty is that no information was presented on household income or on parental educational level and occupational status. This is a considerable oversight, particularly as the authors acknowledge that "the development of phonological awareness is heavily influenced by factors in the child's immediate family and school environment" (Torgesen & Bryant, 1994, p. 15).

The second difficulty is that the data on which norms for the Kindergarten version are based were collected in the spring of the Kindergarten year. If the test is administered at any other time of year, caution must be exercised in the interpretation of results. The recommended time of administration is the beginning of the second semester of Kindergarten, but it is unclear whether this coincides with the spring of the year in which normative data were gathered.

Reliability

The TOPA examiner's manual addresses reliability in terms of rationale equivalence reliability, test-retest reliability, and standard error of measurement.

Rationale equivalence reliability estimated internal consistency using coefficient alpha. Coefficients ranged by age group from .87 to .90. According to criteria presented by Gay (1992), these coefficients are adequate.

Test-retest reliability was determined for each version. The correlation coefficients obtained after adjustment for error associated with internal consistency were .94 (Kindergarten version) and .77 (Early Elementary version). The latter coefficient may be artificially low due to one or both of two factors mentioned by the authors: that the test-retest interval of eight weeks was inappropriately large, and that phonological awareness is affected by reading instruction. As it is unlikely that children taking the test a second time will recall responses given the first time, a shorter interval between test administrations is indicated.

The standard error of measurement for the quotient standard score ranges from 4.5 to 5.4 across versions and age groups. Given a standard error of measurement of 4.5 and a standard score of 101, there is 68% probability that the child's true score will fall between 96 and 106 (Torgesen & Bryant, 1994). Using Gay's (1992) criterion for a 25-item test, figures in this range represent a moderate standard error of measurement. Overall, data on reliability offer partial proof that the test measures with an acceptable level of consistency.

Validity

Three major types of validity are reported in the manual: content, criterion-related (concurrent and predictive), and construct validity.

Content validity is addressed by a detailed description of the TOPA construction, including item development and analysis. The authors describe the test as a measure of phonological sensitivity, a type of phonological awareness which requires recognition and identification of phonemes. Items on the TOPA measure knowledge of this skill; therefore, the TOPA's content validity is judged to be adequate. However, phonological awareness tasks vary in their complexity, some requiring only phonological sensitivity and others requiring the ability to manipulate phonological segments. Because the TOPA measures only the former, it measures a narrow aspect of phonological awareness, one which develops early in many children. While information gained from the test may be of use with Kindergarten-level children, it is less useful for early elementary children. Some children may obtain an acceptable score on the TOPA - Early Elementary despite difficulty with higher-level phonological awareness tasks such as segmenting, blending, and manipulating.

To establish direct evidence for concurrent validity, studies involving nonstandardized phonological awareness tests were undertaken. Correlations are not strong, with coefficients ranging from .42 to .66. As there is no other widely available standardized test which measures what the TOPA is purported to measure, these correlations must be regarded cautiously.

Data on the predictive validity of the TOPA are provided. Results from administration of the Kindergarten version produced a coefficient of .62 when correlated with results of the Word Analysis Subtest of the Woodcock Reading Mastery Test administered at the end of Grade One. When the Early Elementary version was administered to the same sample of children at the beginning of Grade One and correlated with reading skill at the end of the year, the correlation coefficient was .55. The authors claim that the TOPA can be used to identify Kindergarten children who are delayed in the development of phonological awareness. The stated premise is that training in phonological awareness will prepare these children for subsequent reading instruction. Therefore, predictive validity is essential to the usefulness of the TOPA. Further independent studies are needed to fully substantiate the claim that TOPA scores predict later reading performance.

Three different types of evidence for construct validity are presented in the manual. The first type of evidence demonstrates that the TOPA item types assess the same underlying trait as several other instruments which measure phonological awareness. The second type is experimental evidence that phonological awareness at early developmental levels predicts which children will learn the greatest amount from explicit awareness training. The third type of evidence derives from findings that global similarity or dissimilarity of test items did not affect item difficulty. As construct validity is the degree to which a test measures a hypothetical construct, demonstrating construct validity involves testing hypotheses related to the construct (Gay, 1992). The evidence presented by the authors appears to support the construct validity of the TOPA.

As the TOPA is a recently developed test and as a majority of the studies cited were conducted by the test authors, validity data must be considered preliminary. According to Gay (1992), validity is the most important characteristic of a test. Thus, there is a need for additional comprehensive and independent studies before the TOPA can be verified as valid for the purposes and groups for which it is intended.

Conclusion

The development of the TOPA is a step toward filling the gap in standardized testing materials for the measurement of phonological awareness. The test may be useful to teachers as a group screening tool to determine classroom levels of phonological sensitivity. It may also be useful to speech-language pathologists as a screening device to determine who may benefit from phonological awareness instruction in conjunction with speech and/or language intervention. Due to its small sampling of specific lower-level phonological skills, the TOPA must not be the sole determinant of eligibility for intervention. Rather, it can be part of a battery of tests which contributes to a profile of related strengths and needs.

Insufficient time has elapsed since publication of the TOPA to allow for longitudinal research on its effectiveness in identifying children who have phonological awareness deficits and who consequently may be at risk for reading disabilities. There also exists a more general need for continued research on the nature of phonological awareness. Further study of its precise characteristics, developmental stages, and effects on literacy outcome, will expand existing knowledge of language-based reading disabilities.

Test of Phonological Awareness

Authors: Joseph K. Torgesen and Brian R. Bryant (1994)

Cost: \$205.00

Publisher: PRO-ED, 8700 Shoal Creek Blvd., Austin, TX 78757

Canadian Distributor: Psycan Corporation, P.O. Box 290, Station V, Toronto, ON M6R 3A5 (1-800-263-3558)

Acknowledgements

The author gratefully acknowledges the two anonymous reviewers who provided comments on an earlier version of this article.

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TOPA Review

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Erratum

In the September 1995 issue (Vol. 19, No. 3) there were several errors in the article entitled "The Incidence of Professional Burnout Among Canadian Speech-Language Pathologists".

Data for New Brunswick were omitted in Table 1 as the authors had received no responses from that province; this should have been noted. The total of the Very Satisfied column should read 28 rather than 2. In Table 7, the results for NBO should read 28 rather than 38 under the 'somewhat effective' heading. In the section titled "Open-Ended Questions" on page 185, "communication" should be replaced by "community" in the name of the Department of Health and Community Services.

JSLPA apologizes for these errors.