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# Test Review: Comprehensive Test of Phonological Processing, Second Edition

Test Review: CTOPP-2

**Test Overview**

The Comprehensive Test of Phonological Processing–Second Edition, is a norm-referenced test that measures phonological processing skills related to reading for individuals aged 4 to 24 years (CTOPP-2; Wagner, Torgesen, Rashotte, & Pearson, 2013). Because phonological processing skills are essential for reading, the CTOPP-2 is a valuable tool to identify children who are at risk for future reading problems including reading disabilities (Wagner et al., 2013). The CTOPP-2 is an important assessment tool for school psychologists, speech and language pathologists, and other educational professionals in order to determine strengths and weaknesses in phonological processing skills and document progress (Wagner et al., 2013). Because the CTOPP-2 can be used to assess very young children, it serves as an important tool for planning and implementing early intervention programs. The structure of the CTOPP-2 was based on a theoretical model of phonological processing developed by Wagner and colleagues and comprised of phonological awareness, phonological memory, and rapid naming (Dickens, Meisinger, & Tarar, 2015).

**Test Summary**

The test contains 10 core and two supplemental subtests that are administered in the order that they appear. There are two versions of the test, one for 4-6 year olds and one for ages 7-24. The CTOPP-2 has five composites (M = 100, SD = 15), Phonological Awareness, Phonological Memory, Rapid Symbolic Naming, Rapid Non-Symbolic Naming and the Alternate Phonological Awareness composite. Administration of the measure takes approximately 30 minutes. All examinees begin at the first item and discontinue after 3 consecutive incorrect answers. Many of the tasks are unfamiliar or

novel tasks, things than an examinee has not had experience with previously. For that reason there is feedback given on the initial test items to ensure that the examinee has fully understood the tasks. The CTOPP-2 yields six types of normative scores: age equivalents, grade equivalents, percentile ranks, subtest scaled scores, composite indexes, and developmental scores. The subtest scaled scores have a mean of 10 and a standard deviation of 3. The composite score indexes have a mean of 100 and a standard deviation of 15 (Dickens, Meisinger, & Tarar, 2015). Statistically significant discrepancies are calculated at a .05 level of confidence (Wagner et al., 2013).

**Psychometric properties: Reliability**

The CTOPP was found to be a very reliable measure. Generally, a reliability coefficient of .80 or higher would be considered adequate, with values at and above .90 to be desirable. The average internal consistency coefficients presented for the CTOPP-2 were .80 for all subtests, except Nonword Repetition, with an average alpha of .77 (Dickens, Meisinger, & Tarar, 2015). The average alternate-form reliability coefficients were .85 for the timed subtests and exceeded .90 for the untimed composite scores. Test–retest correlations for the core subtests ranged from .75 to .92. The tests were administered to a representative sample of 144 children ages 4 to 18 years, divided into three age groups (4-6 years, 7-11 years, and 12-18 years). The time between testing varied from 1 to 2 weeks. The results showed that the mean and standard deviations were nearly identical with high test-retest reliability coefficients, which demonstrates stability in the scores over time (Dickens, Meisinger, & Tarar, 2015). The results of the Inter-rater reliability demonstrated that the scores correlated and all coefficients exceeded .90 (Wagner et al., 2013). The Content Stability assesses whether a test that is reliable for the

general population is equally reliable to subgroups within that population. The coefficient alphas of 126 coefficients of internal consistency were reported for seven subgroups (Wagner et al., 2013). The subgroups included: male, female, white, black/african American, Hispanic, two or more races, and learning disabled. The Alphas were consistently large, suggesting the CTOPP-2 is equally reliable for all subgroups (Wagner et al., 2013).

**Psychometric properties: Validity**

The content validity of a test assures that the questions and format of the test are well constructed and will therefore provide accurate results. Item analysis procedures were used to choose good items and reject unsatisfactory items during test construction (Wagner et al., 2013). When examining the criterion-prediction validity of the CTOPP-2, the subtests and composites of the CTOPP-2 were compared with the CTOPP and a variety of other tests assessing phonological processing which were reviewed across a total of 33 studies (Dickens, Meisinger, & Tarar, 2015). The results provide evidence that the CTOPP-2 has criterion-prediction validity when examined over time and in comparison to other measures. The construct validity findings demonstrated that phonological awareness and phonological memory are strongly correlated and the two forms of rapid naming are moderately correlated with both phonological awareness and phonological memory (Dickens, Meisinger, & Tarar, 2015). A confirmatory factor analysis was conducted to confirm the relationship of the CTOPP-2 subtests to the areas of phonological abilities being tested (Dickens, Meisinger, & Tarar, 2015).

**Standardization sample and norms**

The CTOPP-2 normative sample included 1,900 individuals from ages 4 to 24.

Most age groups included an adequate sample size of participants, with at least 200 participants in each. Demographics of the sample is representative of the US population based on the 2010 U.S. Census information. The sample characteristics were based on geographic region, gender, ethnicity, Hispanic status, exceptionality status, family income, and educational level of parents (Wagner et al., 2013).

## Critical Analysis

### Strengths

There are many reasons why this measure is often used as part of a psychoeducational assessment. There is substantial evidence demonstrating that the CTOPP-2 is an adequately valid measure with high reliability coefficients. The alternate-form reliability coefficients were very high as were the internal consistency coefficients, demonstrating stability of test scores over time and consistent performance on the individual composites. The CTOPP-2 has a large number of subtests (9 or 10 subtests of 30 or more items) providing an in-depth measure of phonological processing. The CTOPP-2 is suitable for use with preschoolers, which is an advantage because this information can be used for early intervention (Tennant, 2014). While it can be used to assess young children, it is also suitable for individuals up to age 24, which is not the case with most measures of phonological processing which are mainly for preschoolers. Other instruments measuring this skill are not as extensive as the CTOPP-2 and would not provide as detailed of a profile in order to determine strengths and weaknesses of a client with a suspected reading disorder.

### Weaknesses and Limitations

The CTOPP-2 is normed only with the American population and there are no Canadian norms available. “Floor effects” were noted on some of the subtests, particularly Segmenting Nonwords, which had the lowest internal consistency coefficient of .77, which is attributed to the difficulty of this task for young children (Tennant, 2014). Many of the items can be challenging as they are unfamiliar and the examiner needs training in order to accurately administer the measure. Another weakness to be noted is that the 18- to 24-year sample age group included too few participants, with only 115 participants for this large age range (Tennant, 2014). It was also noted that African American members of the sample group performed below average on areas of phonological awareness (Dickens, Meisinger, & Tarar, 2015). This brings into question if this measure can be generalized to all populations or if there are biases towards certain groups.

**Conclusion**

Overall, the CTOPP-2 is a very thorough and useful tool for assessing phonological processing. The test materials are well constructed, making the CTOPP-2 easy to administer, score, and interpret. Because of its large age-range and the depth and breadth with which it examines the skills involved in phonological processing, it is a very useful tool for school psychologists and others involved in program planning. The CTOPP-2 correlates well with other measures of phonological processing and beginning reading measures, and items were selected based on research and careful analyses (Tennant, 2014). The CTOPP-2 is also a valuable measure looking at response to intervention as well as for research purposes. In summary, the CTOPP-2 is an essential part of a psycho-educational assessment when a reading disability is suspected.

# References

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