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KAUFMAN-ABC INTELLIGENCE TEST

The Kaufman Assessment Battery for Children, Second Edition (KABC-II) is a measure of processing and cognitive ability for children and adolescents between the ages of 3 and 18 years. The KABC-II is a versatile instrument that can be used to assess for intellectual disability, learning disorders, developmental disabilities, more focal neurocognitive impairments, and intellectual giftedness, although it should be noted that the diagnosis of intellectual disability requires additional assessment of adaptive behavior. It can be administered as a complete measure of mental processing and general cognitive ability or more selectively to understand specific neuropsychological functioning. The following sections discuss the history, test structure and scoring, and validity of the KABC-II. According to the KABC-II manual, test user qualifications include the completion of a recognized graduate training program in psychology with specific coursework and supervision in the administration and interpretation of clinical assessment instruments, cognitive assessment, test and measurement theory, neuropsychology, and educational psychology.

Historical Background and Development

The K-ABC

The KABC-II is a conceptual and structural revision of the Kaufman Assessment Battery for Children (K-ABC) that took 5 years to complete. It evolved out of the pioneering work of Alan Kaufman, who served as the project manager for the revised version of the Wechsler Intelligence Scale for Children (WISC-R) in 1974 by the Psychological Corporation, where he worked directly with David Wechsler. In 1979, Kaufman authored *Intelligent Testing with the WISC-R*. , in which he introduced the concept of *intelligent testing*. and suggested that examiners apply theoretical knowledge and clinical judgment flexibly in order to provide meaning to the scores obtained from intelligence tests. In 1983, he co-authored the K-ABC with his wife Nadine while working as a professor at the University of Georgia. Interestingly, the K-ABC development team also included several of his doctoral students, some of whom went on to publish psychoeducational tests on their own.

The K-ABC was a revolutionary instrument at the time of its publication and was praised for its rigorous standardization procedures and sophisticated validity studies. Psychometric researchers often credit its technical validation with setting the standard for future tests. The K-ABC was also heavily influenced by the neuropsychological theories of A. R. Luria and Roger Sperry during its conceptualization and was the first test to integrate cognitive psychology into intelligence testing. In contrast to the popular Wechsler Scales, which primarily emphasized the measurement of general intelligence (*g*), the K-ABC test structure emphasized multiple cognitive components, including sequential and simultaneous processing. Because of the de-emphasis of *g* and the exclusive focus on elements of cognitive processing, it was suggested that the K-ABC was a more useful instrument for appraising the cognitive abilities of culturally and linguistically

diverse individuals, who were thought to be the subject of bias in traditional IQ tests. To support this notion, validity studies in the K-ABC technical manual provided evidence that the difference in scores between Black and White examinees was less than that often reported in more conventional measures such as the Wechsler Scales. Additionally, the K-ABC provided users with a global achievement scale, making it the first cognitive test developed to be a comprehensive psychoeducational measure. Accordingly, it became a popular instrument in learning disability evaluations conducted by school and educational psychologists as well as for clinicians seeking an alternative to the Wechsler and Stanford-Binet intelligence scales.

From the outset, the K-ABC generated tremendous controversy and was subjected to numerous research investigations. As an example, in 1984 a special issue of the *Journal of Special Education* was devoted entirely to the K-ABC. The majority of those inquiries focused on the validity of the K-ABC theoretical framework and its structural model. As an example, an independent confirmatory factor analysis conducted by Tim Keith and Stephen Dunbar in 1984 suggested that K-ABC measures were consistent with contemporary models of intellectual ability, including a higher-order general factor and that users should interpret the scores on the instrument with caution. Also in 1984, Arthur Jensen suggested that the diminished Black-White differences on the K-ABC were largely the result of statistical artifacts caused by the lower *g*-loadings on K-ABC measures. Nevertheless, the controversies engendered by the K-ABC remained largely unresolved when the process for its revision began in 1996.

The KABC-II

Published in 2004, the KABC-II was a major revision and restructuring of the K-ABC based on the hierarchical model of intelligence known as the Cattell-Horn-Carroll (CHC) model. Eight subtests were eliminated from the original K-ABC, and 10 measures were created and added to

the current battery. Item discrimination and scale ranges were increased, and the theoretical foundation was updated from sequential-simultaneous processing theory. One of the unique features of the KABC-II is the flexibility that it affords the examiner in determining the interpretive model to administer to the examinee. Although examiners may select either the Luria or CHC models, the KABC-II manual advises users to interpret the KABC-II primarily from the CHC perspective.

Test Structure and Scoring

The KABC-II utilizes a dual theoretical foundation: (1) the CHC psychometric models of broad and narrow abilities and (2) elements of A. R. Luria's neuropsychological theory of cognitive processing that were fixtures of the previous version of the instrument. The KABC-II core battery takes between 30 and 75 minutes to administer depending on the examinee's age and the interpretive model that is selected.

CHC Model

The CHC model of intellectual abilities is hierarchical, with 50 to 60 narrow abilities at the bottom (Stratum I), 7 to 9 broad ability factors in the middle (Stratum II), and a general ability dimension (*g*) at the top (Stratum III). The model features 16 subtests (10 core and 6 supplemental), which combine to yield five first-order factor scale scores (Short-Term Memory [Gsm], Long-Term Storage and Retrieval [Glr], Visual Processing [Gv], Fluid Reasoning [Gf], and Crystallized Ability [Gc]), as well as a second-order full-scale composite named the Fluid Crystallized Index (FCI) that is thought to represent psychometric *g*. Each CHC factor scale is

composed of two subtest measures, and the FCI is derived from a linear combination of the 10 core subtests that compose the constituent factor scores.

Luria Model

The Luria interpretive model differs from the CHC model both in terms of factor structure (e.g., four - vs. five factors) as well as in content, specifically as it relates to the inclusion of measures of acquired knowledge. The Luria model emphasizes the role of cognitive processing while de-emphasizing acquired knowledge (i.e., it omits measures of Crystallized Ability from the CHC model). The factor-level scores and hierarchical structure mimics the CHC model; the only putative difference is how those variables are labeled. In keeping with the K-ABC lineage, the first-order factors are labeled as Planning (Gf), Learning (Glr), Simultaneous Processing (Gv), and Sequential Processing (Gsm). The eight core subtests in the Luria model combine to form a second-order full-scale composite named the Mental Processing Index (MPI).

According to the KABC-II manual, the Luria interpretive model is preferred in a variety of situations, including, but not limited to, examining individuals from culturally and linguistically diverse backgrounds, assessing individuals known or suspected of having autism spectrum disorder, and examining individuals with hearing or language deficits.

Nonverbal Index

A separate Nonverbal Index (NVI), composed of subtests that do not require verbal output, is also provided as an alternative to the FCI/MPI. The NVI provides a nonverbal estimate of overall cognitive ability for use with examines who have severe hearing loss, limited English proficiency, or moderate to severe speech or language disorders.

Scoring

All composite and factor scores are based on a mean of 100 and a standard deviation of 15. Full-scale composite scores range from 40 to 160, covering a wide range of intellectual abilities (±4 *SD*s). This allows for the assessment of intelligence from the lower levels of moderate intellectual disability to the higher levels of giftedness. Factor-level scores range from 48 to 160, providing a wide range of possible scores (Sequential/Gsm: 49-158, Simultaneous/Gv: 50-160, Learning/Glr: 48-160, Planning/Gf: 51-160, Knowledge/Gc: 48-160).

Recommendations for interpretation of KABC-II scores include the full-scale composite and comparisons of performance on the various combinations of first-order factor scores. In fact, the KABC-II manual suggests that users should focus most, if not all, of their interpretive weight on the factor-level scores.

Validity of the KABC-II

The total norming sample of the KABC-II ($N = 3,025$) was nationally stratified based on sex/gender, ethnicity, geographic region, and level of parent education (as a proxy for socioeconomic status) and was proportional to 2001 U.S. census estimates. Extensive normative and psychometric data can be found in the KABC-II manual. Mean internal consistency estimates were high for the factor scores (.88 to .93), the MPI/FCI (.95 to .97), and the NVI (90 to .92.). Validity evidence is provided in several forms in the KABC-II manual. It should be noted that not all of the CHC/Luria model factor scores could be replicated from ages 3 to 6; thus, the complete structural/theoretical models are only available from ages 7 to 18.

Independent Validity Studies

All independent reviews noted improvements over the K-ABC but also noted some problems; namely, no structural validity evidence to support the Luria interpretive model was provided in the KABC-II manual.

The authors of the KABC-II relied exclusively upon restricted confirmatory factor analyses (CFAs) to examine the structural validity of the instrument. For ages 7-18 a five-factor CHC measurement model was reported although standardized path coefficients between *g* and Fluid Reasoning were problematic (1.0 and 1.01) in the final models, suggesting that *g* and Fluid Reasoning were indistinguishable. Subsequent independent CFA analyses of the KABC-II have tended to support the structure described in the KABC-II manual. In 2007, Matthew Reynolds and colleagues found that the five-factor CHC measurement model was a better fit to the KABC-II dataset than other rival measurement models, and that the model was invariant across age groups. Consistent with the results reported in the KABC-II manual, the path loading between *g* and the Fluid Reasoning factor in the final model approached unity. Additionally, the Reynolds and colleagues utilized a latent variable approach to decomposition subtest variance and found that all of the measures contained non-trivial portions of *g* variance (16%-53%). Not surprisingly, an incremental validity investigation conducted by Ryan McGill in 2015 found that the CHC factor scores consistently accounted for trivial proportions of criterion achievement score variance after controlling for the effects of the more parsimonious FCI score, challenging the interpretive recommendations in the KABC-II manual.

Given the limited evidence provided in the KABC-II manual to support use of the Luria interpretive model, McGill and Angelia Spurgin also conducted a series of psychometric investigations in 2015 to appraise the utility of Luria model scores. Use of the same exploratory

factor analytic techniques employed by John Carroll failed to support the theoretical four-factor model posited by the test authors. In fact, forcing the theoretical model resulted in weak subtest loadings, impermissible factors, theoretically inconsistent subtest migration, and non-trivial cross-loading of measures. McGill was also able to replicate the CHC incremental validity results, finding that the Luria factor scores contributed weak increments of predictive achievement variance after controlling for the MPI.

In sum, the KABC-II has many strengths, but also some weaknesses. Whereas interpretation of the full-scale composites appears to have strong empirical support, as of 2016, more research is needed to support confident clinical interpretation of the lower-order factor scores.

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See also Buros Mental Measurement Yearbook; Catell-Horn-Caroll Theory of Intelligence; Construct-Related Validity Evidence; Exploratory Factor Analysis; Intelligence Tests; School Psychology; Stanford-Binet Intelligence Test; Wechsler Intelligence Tests; Woodcock-Johnson Tests of Cognitive Ability

FURTHER READINGS

Kaufman, A. S., & Kaufman, N. L. (2004). *Kaufman Assessment Battery for Children-Second Edition*. Circle Pines, MN: American Guidance Service.

Kaufman, A. S., & Kaufman, N. L. (2004). *Kaufman Assessment Battery for Children-Second Edition manual*. Circle Pines, MN: American Guidance Service.

McGill, R. J. (2015). Interpretation of KABC-II scores: An evaluation of the incremental validity of CHC factor scores in predicting achievement. *Psychological Assessment, 27,* 1417-1426. doi: 10.1037/pas0000127

McGill, R. J., & Spurgin, A. R. (2016). Assessing the incremental value of KABC-II Luria model scores in predicting achievement: What do they tell us beyond the MPI? *Psychology in the Schools, 53,* 677-689. doi: 10.1002/pits.2194

McGill, R. J., & Spurgin, A. R. (2015). Exploratory higher order analysis of the Luria interpretive model on the Kaufman Assessment Battery for Children-Second Edition (KABC-II) school-age battery. *Assessment*. Advance online publication. doi: 10.1177/1073191115614081

Reynolds, M. R., Keith, T. Z., Fine, J. G., Fisher, M. E., & Low, J. (2007). Confirmatory factor structure of the Kaufman Assessment Battery for Children-Second Edition: Consistency with Cattell-Horn-Carroll theory. *School Psychology Quarterly, 22,* 511-539. doi: 10.1037/1045-3830.22.4.511