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## Multivariate analyses of the profile stability of intelligence tests: high for IQs, low to very low for subtest analyses<sup>☆</sup>

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### Abstract

Profile stability involves the consistency of a set of scores over time. That is, does a profile of scores change on retesting and does this change affect clinical decisions? While psychologists routinely examine the reliability of individual scores, little research has examined the stability of a profile or set of scores. The first study described in this paper examined potential measures of profile stability using a simulation computer program. The results suggest that several measures show promise in this context, particularly Cattell's coefficient of pattern similarity ( $r_p$ ), salient variable similarity index ( $S$ ), and the  $D^2$  coefficient. In the second study, selected measures of profile stability were applied to Wechsler test–retest data. The results suggest that profiles composed of IQ and index scores demonstrate acceptable stability and can be usefully interpreted in clinical and research situations. However, subtest score profiles are inherently less stable and provide little useful clinical information.

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## 1. Introduction

It is common practice in psychological assessment for clinicians to consider not only individual scores when interpreting tests, but also profiles containing multiple scores. For example, when interpreting the Minnesota Multiphasic Personality Inventory-2 (MMPI-2: [Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989](#)) clinicians routinely consider profile configurations since this approach is thought to yield richer diagnostic information than an approach that examines individual scales independently ([Graham, 2000](#)). Likewise, when interpreting the Wechsler Intelligence Scale for Children-III (WISC-III: [Wechsler, 1991](#)), the Wechsler Adult Intelligence Scale-III (WAIS-III: [Wechsler, 1997](#)), and similar intelligence tests with multiple subtests, many clinicians examine the client's subtest profile to develop hypotheses about their cognitive strengths and weaknesses ([Kaufman, 1994](#); [Kaufman & Lichtenberger, 1999](#)). In her influential book, [Lezak \(1995\)](#) argued for a diminished interpretation of Verbal, Performance, and Full Scale IQs on the various Wechsler intelligence scales in favor of clinical analysis of the subtest profiles. [Lezak \(1995\)](#) argues that interpretation of the global IQs is archaic and that the most valuable information to be obtained from intelligence tests is from the pattern of subtest strengths and weaknesses, urging neuropsychologists in particular not to place too much stock in the IQs. These examples illustrate how psychologists interpret test profiles and how this information may impact diagnostic and intervention decisions.

When profiles of scores are interpreted, the issue of profile stability should be considered. The two-fold question is whether a profile of scores, taken as a whole, changes on retesting and whether this change would affect clinical decision making ([Reynolds, 1979, 1989, 1997](#)). It is not likely that many clinicians would incorporate information obtained through the interpretation of test profiles if they believed this information was fleeting, unstable, or inaccurate (i.e., unreliable). For example, when interpreting MMPI-2 profiles it is reasonable to assume that most clinicians believe the profiles reflect some fairly stable features of personality or psychopathology. However, the evidence supporting this belief is scant at best. [Graham \(2000\)](#) tells us that when two-point codes are examined, less than one in three individuals will obtain the same two-point code over a period of a few weeks. Even though two-thirds of examinees show distinctly different profiles even over a relatively brief period of time, the use of two-point codes to characterize individuals remains immensely popular (e.g., [Graham, 2000](#)) and forms the basis for the major computerized interpretive schemes for the MMPI-2.

Likewise, when interpreting WAIS-III subtest profiles it is reasonable to assume that clinicians believe these profiles contain information regarding relatively stable patterns of cognitive strengths and weaknesses. Again, there is evidence that subtest profiles are considerably less stable than many clinicians assume. Paul McDermott and his colleagues (e.g., [Glutting, McDermott, Watkins, Kush, & Konold, 1997](#); [Konold, Glutting, McDermott, Kush, & Watkins, 1999](#); [McDermott, Fantuzzo, Glutting, Watkins, & Baggaley, 1992](#)) have challenged the practice of IQ subtest profile analysis. They argue that there is little credible evidence to support this revered practice and that the analysis of subtest level profiles is essentially an exercise in the interpretation of error variance and errant variance unrelated to the constructs of interest. Many of their arguments are data based and persuasive. For example, they computed the reliability of difference scores across time for individual subtests of the Wechsler scales, and these values are indeed below what most prudent psychologists would accept as indicating reliable

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