

Validity and reliability of the Herrmann Brain Dominance Instrument® (HBDI®)

According to recent validation work, the Herrmann Brain Dominance Instrument® (HBDI®) continues to indicate strong validity and reliability.

As part of an on-going validation project, Herrmann International has commissioned several psychometric or measurement studies on the HBDI®. These studies are performed by the experts at the non-profit EduMetrics Institute and Alpine Media. This document highlights the results of these studies.

Two important criteria are normally used to evaluate an instrument's objectivity: validity and reliability.

What is validity?

Validity has many aspects, but the most central of these indicates the degree to which an instrument measures what it intends to measure. Psychometricians establish validity through a *validity argument*, using data and statistical analysis to do so. Structural validity is the extent to which the structure of the instrument is valid (structure is the set of underlying assumptions behind the instrument and the way the assumptions are expressed in the instrument scores). External validity looks at the similarities between the instrument and other instruments and theories, with the assumption that correct structures frequently manifest themselves in multiple ways.

Validity is normally tied to a particular use of the instrument. A strong validity argument for the HBDI suggests that HBDI respondents can be confident their results, and the way they are interpreted and used, are valid. That is, scores reflect their real preferences (to a high degree), in a way consistent with the Whole Brain® Theory behind the HBDI.

Validity is not something that is attained once and for all. It should be documented as a 'validity argument' and examined frequently, like an on-going quality control operation in manufacturing.

What is reliability?

Reliability indicates how consistently a test measures what it is supposed to measure. This document discusses one form of reliability, called test-retest reliability. It measures the consistency in results if the test is taken more than once by the same person.

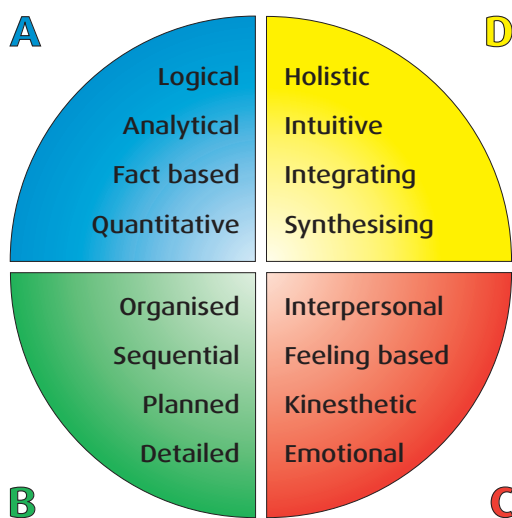
Study highlights

Year 2000 validation

EduMetrics' and AMC's validation of year 2000 data for HBDI shows the strong structural validity of the Herrmann Brain Dominance Instrument®. The study confirms the validity arguments for:

1. The four separate quadrants of the Whole Brain Model™.
2. The bipolar structure of Quadrants A and C, and Quadrants B and D, indicating that a person with strong interests in Quadrant A is less likely to have strong interests in Quadrant C (and vice versa), and a person with strong interests in Quadrant B is less likely to have strong interests in Quadrant D (and vice versa).
3. A general Left to Right dimension analogous to the Right and Left brain hemispheres in normal adults. This is the highest meaningful dimension in the HBDI.

Whole Brain Model™



The Whole Brain® Model graphic is a registered trademark of Herrmann International

The study's sample size of over 254,000 records represents individuals who completed the HBDI before 2001. In contrast, most validation studies of psychological instruments rely on a sample size of fewer than 1,800 records. Such a large sample greatly enhances the validity argument supporting the HBDI. Further the diversity of participants' race, ethnicity, educational and socioeconomic status, as sampled in the HBDI, strengthens the validity argument that the HBDI applies to a worldwide audience. In the analysis, the data is balanced by gender to mirror the male to female ratio in the United States.

Table 1—2000 Validation Study Results

Question	Result
1. Does the 4-quadrant model and double bipolar structure of preference clusters (ie, A vs C and D vs B) found previously for the HBDI still hold?	Yes

2. Does the long-established Left-Right higher-order factor found previously for the HBDI still hold? Yes

In summary, the study shows that despite internationalisation of the HBDI, the bipolar and left-right structure remains intact, and the meanings of the preference clusters as documented and taught by Herrmann International continue to be valid for interpretation and use.

Year 2004 validations

Two additional validation tests of the HBDI, performed on 2004 data, show results similar to those of the 2000 tests. EduMetrics and Alpine Media performed factor analysis of both English and French 2004 data sets. The English language results compare favourably to the results of the 2000 data. The French results also strongly confirm the higher-order left-to-right factor. In preliminary analysis, the French results reveal a somewhat different structure for the four quadrants than the 2000 or 2004 international data set. Further analysis may determine whether this difference is important enough to consider instrument changes unique to the French instrument. The results of these validation studies, and others in the future, may prompt future changes to the HBDI for each language translated version.

Test-retest reliability

Hundreds of respondents take the HBDI more than once, providing the data necessary to employ test-retest reliability, a measure of how consistent the HBDI is in measuring individuals' preferences over different test administrations.

Because people's preferences change over time, the test-retest of psychological instruments can tend to be somewhat weak. In spite of this general tendency, the HBDI numbers are, in comparison, very strong.

Repeated measures reliability estimate—Year 2000

	A-A	B-B	C-C	D-D
Total	.937	.915	.940	.932

N=343

Version control and demographic questions

The analyses of the 2000 and 2004 databases reveal opportunities to increase the ease of continuing validation research. Herrmann International is currently reviewing functional specifications of these database and instrument changes. The planned changes will allow close examination of the effects of linguistic and cultural differences on HBDI scores.

References to the HBDI® and external validity

EduMetrics has gathered 768 references that either cite the HBDI or support preference constructs similar to the ones the HBDI measures. These references include journal articles, dissertations, books, book chapters, unpublished articles, technical reports and web pages. They discuss: HBDI, brain dominance, hemisphericity, physiology, learning styles, and teaching styles.

These references begin a validity argument for the external aspect of validity. EduMetrics compares and contrasts the HBDI to underlying theories and associated

scores on preferences, personality, and related attributes describing important differences among individuals. EduMetrics has found an impressive amount of supporting evidence in this literature that the same general preference clusters measured by the HBDI are also found in the work and instruments developed by others. This similarity helps establish the core validity of underlying bipolar preference clusters.

In addition, external validity includes a comparison of the HBDI in real life. In this aspect, the HBDI is more similar to real life choices than most instruments. It taps into a broad range of situations where people must choose where to invest their time and energy, eg school subjects, work elements, descriptive adjective choices, hobbies, and questions about preferred levels of risk, order and situations. Further, the HBDI frequently offers several choices rather than a forced choice among pairs, a situation more similar to real life choices.

Summary

In summary, recent validation work by independent organisations EduMetrics and Alpine Media continues to show strong validity and test-retest reliability of the Herrmann Brain Dominance Instrument. On-going work will continue the validation effort and will, where possible, identify opportunities to further increase HBDI validity and reliability.

Herrmann International Asia works with leading companies and academic institutions to improve employee and team performance.

About Herrmann International Asia

Herrmann International Asia works with leading companies and academic institutions to improve employee and team performance.

Herrmann's work focuses on practical ways to leverage differences in individual thinking styles. Building on research originally begun at General Electric, the company has developed applications that range from developing strategy at the executive level to increasing sales force productivity.

More than two million people have completed the Herrmann Brain Dominance Instrument (HBDI), the assessment tool at the heart of the company's approach. Herrmann International Asia is headquartered in Sydney, Australia with offices in:

- ◆ Auckland
- ◆ Melbourne
- ◆ Perth
- ◆ Shanghai
- ◆ Singapore
- ◆ Tokyo

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