

Comparison of Two D-KEFS Models Utilizing Confirmatory Factor Analysis in a Mixed Clinical Sample

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These data were drawn from an archival sample of 512 mixed clinical case studies with imputed data conducted by students in the School Neuropsychology Post-Graduate Certification Program (2001 - 2010). A CFA using Linear Structural Relations software was conducted to explore the factor structure of the D-KEFS using an expanded set of 23 primary and supplemental process oriented scores. Two models, the one derived by the D-KEFS authors, and an alternative model derived from an analysis of the broad neurocognitive constructs being measured by the tasks were compared.

Factor Loadings for D-KEFS Model: 23 scores	
Cognitive Switching	
Trail Making Condition 4	.48
Design Fluency Condition 3	.32
Color-Word Interference Condition 4	.27
Verbal Fluency Condition 3	.43
Conceptual Reasoning	
20 Questions- Initial Abstraction	.71
20 Questions-Total Questions Asked	.56
20 Questions- Weighted Achievement	.63
Nonverbal Creativity	
Design Fluency Condition 1	.58
Design Fluency Condition 2	.95
Problem Solving	
Card Sorting-Confirmed Correct Sorts	.44
Retrieval (lexical/categorical/phonemic)	
Verbal Fluency Condition 1	.73
Verbal Fluency Condition 2	.66
Rule Governed Problem Solving	
Card Sorting-Free Sorting Description	.70
Card Sorting-Sort Recognition Description	.77
Spatial Planning	
Tower Test	.92
Verbal Abstract Thinking	
Word Context	.21
Letter Processing	
Trail Making Condition 3	.14
Motor Speed	
Trail Making Condition 5	.27
Naming Skills	
Color Word Interference Condition 1	.13
Numerical Processing	
Trail Making Condition 2	.31
Verbal Inhibition	
Color Word Interference Condition 3	.43
Speed of Reading	
Color Word Interference Condition 2	.53
Visual Scanning	
Trail Making Condition 1	.24

Factor Loadings for Author-Derived Model: 23 scores	
Cognitive Switching	
Trail Making Condition 4	.65
Design Fluency Condition 3	.29
Color-Word Interference Condition 4	.37
Verbal Fluency Condition 3	.32
Concept Generation	
Card Sorting-Confirmed Correct Sorts	.84
Card Sorting-Free Sorting Description	.75
Card Sorting-Sort Recognition Description	.71
Inhibition	
Color-Word Interference Condition 3	.70
Planning	
Tower Test	.77
Processing Speed	
Trail Making Condition 1	.55
Trail Making Condition 2	.68
Trail Making Condition 3	.70
Trail Making Condition 5	.32
Design Fluency Condition 1	.18
Design Fluency Condition 2	.23
Color Word Interference Condition 1	.37
Color Word Interference Condition 2	.35
Retrieval	
Verbal Fluency Condition 1	.77
Verbal Fluency Condition 2	.62
Verbal Reasoning	
20 Questions-Initial Abstraction	.59
20 Questions-Total Questions Asked	.86
20 Questions-Weighted Achievement	.80
Word Context	.14

Fit Indices	D-KEFS	Author-Derived
Chi-Square	2308.00	727.65
Df	226.00	218.00
Adjusted Chi-Square	10.21	3.34
RMSEA	.13	.07
CFI	.65	.89
SRMR	.16	.08
AGFI	.66	.86

Implications:

- Using the D-KEFS authors' conceptualization of the variables results in factor loadings that range from low to strong; however, the fit statistics are indicative of poor model fit. Whereas, in the alternatively derived model, the fit statistics suggest adequate fit of the data to the model and the factor loadings range from moderately strong to very strong.
- Cognitive switching (set shifting) appears to be the only common factor in both models.
- In the derived model the concept generation factor consisted of card sorting tasks that loaded strongly together. Because they appear to be so highly correlated (potentially the result of method invariance) it is likely that administering one task would be sufficient.
- In the derived model, processing speed and cognitive switching (set shifting) appear to be moderate to strong factors.
- Overall, the results of this study suggest that how the authors of the D-KEFS have defined the structure of the test and what the various subtests and process scores are thought to measure may be erroneous.
- Additional factor analyses incorporating all D-KEFS scores, including all process scores, may produce different findings; thus, future studies should examine process scores to further the understanding of the underlying factor structure of the D-KEFS.