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What do self-report measures of problems with executive function actually measure? Data from internet and laboratory studies.

Tom Buchanan

Faculty of Science and Technology, University of Westminster

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What do self-report measures of problems
with executive function actually measure?
Data from internet and laboratory studies.

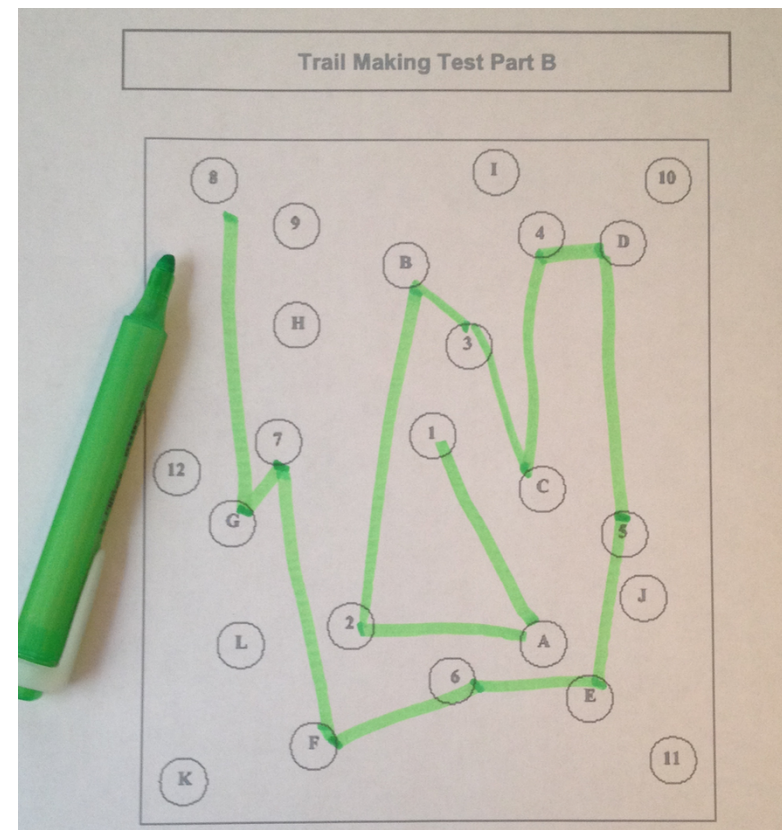
Tom Buchanan
University of Westminster, UK.

Executive Function

- Collection of processes that play critical roles in information processing.
 - “*updating* (constant monitoring and rapid addition/deletion of working-memory contents); *shifting* (switching flexibly between tasks or mental sets); and *inhibition* (deliberate overriding of dominant or prepotent responses)” (Miyake & Friedman, 2012).
- Executive Function failures found in clinical groups and also to some extent in everyday life.

Measurement: Objective Tests

- Gold-standard measures of EF are cognitive test batteries.
- Trails Making Test B
- Phonemic Fluency
- Semantic Fluency
- Digit Span Backward
- Digits Sequencing



Measurement: Self Reports

- “...indispensible instruments for the study of everyday cognition” (Rabbitt et al, 1995)
- Dysexecutive Questionnaire (DEX, Wilson et al., 1996)
- Webexec (Buchanan et al, 2010)

The image shows a screenshot of the 'BADS Dex Questionnaire Self-rating' form. At the top left is the TVTC Thames Valley Test Company logo. To its right are the letters 'BADS' in blue circles, followed by the title 'Dex Questionnaire Self-rating'. Below this is an introductory paragraph: 'This questionnaire looks at some of the difficulties that people sometimes experience. We would like you to read the following statements, and rate them on a five-point scale according to your own experience:'. The form contains five numbered items, each with a five-point scale from 0 to 4. The scales are labeled 'Never', 'Occasionally', 'Sometimes', 'Fairly often', and 'Very often'.

Item	Statement	0	1	2	3	4
1	I have problems understanding what other people mean unless they keep things simple and straightforward	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	I act without thinking, doing the first thing that comes to mind	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	I sometimes talk about events or details that never actually happened, but I believe did happen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	I have difficulty thinking ahead or planning for the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	I sometimes get over-excited about things and can be a bit 'over the top' at these times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Pros and Cons

- Easy to implement, especially online
- Argument for ecological validity and sensitivity to everyday problems
- However, challenges to validity
- Evidence self-reports may not correlate with objective tests
- Query over whether they are influenced by variables such as personality

Study 1: Do self-reported executive problems correlate with personality?

- $N=49,398$, relatively young & well educated, recruited via www.personalitytest.org.uk
- Webexec self-report measure of executive problems
- IPIP Five Factor inventory measuring Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness to Experience.

Study 1 Results

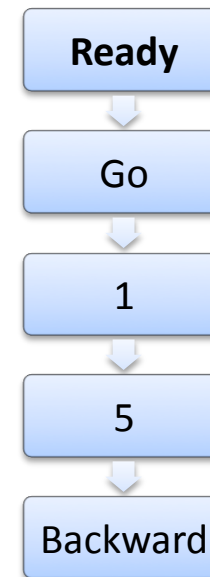
Dimension	Correlation with Webexec
Extraversion	-.11***
Agreeableness	-.20***
Conscientiousness	-.58***
Neuroticism	.37***
Openness to Experience	.02***

***p<.0005

- Self-reported executive problems correlate with personality (mainly low C and N)

Study 2: Do self-reported EF problems correlate with EF task when controlling for personality?

- $N=345$, relatively young & well educated, recruited via www.personalitytest.org.uk
- Webexec self-report measure of executive problems
- IPIP Five Factor inventory measuring Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness to Experience.
- Online Digit Span tasks (Forward and Backward).



Enter sequence of numbers then click 'Continue'

Survey Powered By Qualtrics CONTINUE

A screenshot of the online Digit Span task interface. It features a light gray rectangular box with a white text input field. Above the input field is the instruction 'Enter sequence of numbers then click 'Continue''. Below the input field, there is a small red button with the word 'CONTINUE' in white capital letters. At the bottom left of the gray box, there is small text that reads 'Survey Powered By Qualtrics'.

Study 2 Results

	Webexec	Digit Span Backward
Extraversion	-.17**	-.03
Agreeableness	-.16**	.13*
Conscientiousness	-.52***	.02
Neuroticism	.45***	-.05
Openness to Experience	-.04	.16**
Webexec	-	-.08

- Self-reported executive problems correlate with personality (mainly low C and N), not Digit Span Backward.

Study 3

- Face-to-face, laboratory study
- $N=103$ psychology undergraduates, mainly women, participating for course credit
- Two self-report measures of executive function problems: Webexec and DEX.
- Two personality inventories: IPIP Five Factor inventory, NEO-FFI
- WAIS IV Digit Span tasks, Trail Making Test, Phonemic Fluency (COWA), Semantic Fluency

Self report measures of executive problems did *not* correlate with test performance.

Variable	DEX	Webexec
Digits Backward	-.08	-.11
Digits Sequencing	-.04	-.08
Trails B	.08	.15
Phonemic Fluency	.11	.04
Semantic Fluency	.03	-.03

Self report measures of executive problems *did* correlate with personality.

Variable	Webexec	DEX
NEO-FFI N	.20*	.45***
IPIP N	.08	.31***
NEO-FFI E	-.04	-.09
IPIP E	.03	-.08
NEO-FFI O	-.05	-.17
IPIP O	.04	-.18
NEO-FFI A	-.05	-.27***
IPIP A	-.22*	-.26**
NEO-FFI C	-.56***	-.48***
IPIP C	-.52***	-.48**
Webexec	-	-.58***
DEX	.58***	-

p.05. *p*.005. *p*.0005.

So...

- Across all three studies:
 - No evidence that self-report measures of executive problems reflect objectively measured executive function
 - Good evidence that self-report measures reflect personality, particularly low C and N
- Implications for use of such measures with non-clinical samples

Outstanding questions

- Explanation for findings?
 - Awareness of everyday lapses may be associated with lower self-reported conscientiousness?
 - Tendency for high N people to report more problems?
 - Possibility that high N people experience more negative affect as a result of everyday mistakes, and this leads to higher self-ratings?
- Other measures?
- Lower-functioning populations?

Conclusion

- In three non-clinical samples, tested online and ftf, self-report measures of executive problems appeared to reflect personality rather than executive function.
- Several unanswered questions about mechanisms, and generalisability of findings.
- However, argument that self-ratings are more ecologically valid only holds true if those self-ratings do reflect executive problems. If instead they reflect personality traits, usefulness may be compromised.

- Buchanan, T. (in press). Self-Report Measures of Executive Function Problems Correlate With Personality, Not Performance-Based Executive Function Measures, in Nonclinical Samples. *Psychological Assessment*. doi:10.1037/pas0000192