The Implicit Relational Assessment Procedure’s trial-types

are not ‘functionally independent’

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I have frequently encountered the claim, whether in published literature or in peer review, that data from the Implicit Relational Assessment Procedure must be analyzed at the trial type level “because the IRAP trial types are functionally independent”. Inspection of the literature shows no direct evidence to support this claim. In order to investigate this directly, I employed a large existing dataset of 1464 participants who completed one of 35 IRAPs in 16 domains. Scores for each trial type within each IRAP were correlated with one another. 27% of correlations were significantly different from zero. 74% of IRAPs demonstrated at least one detectable correlation among its trial types. A meta-analysis demonstrated that IRAP trial types are typically correlated, albeit with significant heterogeneity between domains, *r* = .21, 95% CI [.16, .26], 95% PI [-.10, .48]. The evidence does not support the claim that IRAP’s trial types are in general “functionally independent”. Blanket statements about whether IRAP data should be analyzed as one overall score or four trial types scores should be avoided. More precise answers to this question should be sought through larger studies.

The claim that the IRAP trial types are “functionally independent” is relatively vague in theoretical terms, but it provides at least one precise and testable statistical claim: statistical independence requires a true correlation of zero. This claim was investigated by examining average correlations across a wide range of IRAP domains, in a large sample size.

**Figure 1.** Correlations among IRAP trial types



27.1% of correlations were significantly different from zero. 74.3% of IRAPs demonstrated at least one pair of detectable correlations among its trial types.

**Figure 2.** Distribution of correlations among IRAP trial types

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Even descriptively, the distribution of IRAP trial types does not center on zero.

**Figure 3.** Caterpillar plot



Meta-analysis of correlations among IRAP trial types: *r* = .21, 95% CI [.16, .26], 95% PI [-.10, .48]. This provides evidence against the claim that IRAP trial types are independent.

Of course, its possible that some might argue that this statistical claim of near zero correlation among trial types is not what they meant by “functional independence”. If so, I encourage such authors to translate their broad verbal claims into testable predictions, or remain unsupported. Scheel (2022) highlights that many such verbal claims are “not even wrong” in the sense that they are so vague as to be unsupportable, untestable, and incapable of being correct or wrong. Claims not supported by evidence should not rigidly dictate our research practices.

[Something about how this doesn’t mean it’s a free for all either. Pre-registration is even more needed when there are experimenter degrees of freedom like this. Larger studies on measurement properties needed.]

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# Statements and Declarations

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## Availability of data, code and materials

All data, code and materials are available at osf.io/XXX.

# References