

IRT Assessment of Readiness for Interprofessional Learning Scale (RIPLS): Dimensionality, Reliability, and Item Function

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Background and Context

- ✦ The RIPLS is one of the earliest published self-report instruments in IPE research (Parsell & Bligh, 1999)
- ✦ Translated into dozens of languages, available in public domain, and informs health education and care delivery policies

- ✦ More recent, IPE researchers are singing a different RIPLS tune



- ✦ And still others rightfully observe that measurement invalidity for RIPLS is only the 'tip of the iceberg' - "Unfortunately, these and other problems cited about the RIPLS... can probably be said of other measurement tools as well." (Schmitz & Brandt, 2015)



Research Question and Proposition

Question → Can Mahler et al.'s (2015) "three key problems with the RIPLS", as follows: **1)** psychometric invalidity as indexed by Cronbach's α , **2)** unstable latent-factor structure, and **3)** sensitivity or appropriateness for assessing attitude-change be successfully applied to empirical RIPLS data?

Proposition → Evidence from modern psychometric methods will bear information as to RIPLS usefulness in IPE.

Summary Sample

- RIPLS was administered to $N = 287$ pre-licensure MD & BSN students participating a mixed-methods IPE session

Results

1) Cronbach's α as invalidity index

- RIPLS critics' follow-up study Abstract - "Cronbach's alpha was used to examine internal consistency" . . .

- Low subscale- α is evidence of poor psychometrics quality.
- Spearman-Brown formula predicts lower α for short scales.
- Current data verifies with $\alpha = .90$ (9-item), $.84$ (4-item), & $.20$ (3-item).

- Furthermore, estimated common variance (ECV) from a bifactor-model of RIPLS = 97% (total score attributable to general-latent factor)

2) Unstable Latent-Factor Structure

- This is related to issue #1.

- Primarily, this is due to over-factorization (analogous to adding items)
- This is empirically demonstrated with RIPLS (Table 1)

Table 1

Comparative Global Data-Fit Indices of RIPLS.

Model	-2lnL (df)	AIC	BIC	RMSEA
1-Dim	8114.43 (56)	8274.43	8558.36	.02
2-Dim _c	8098.10 (55)	8260.10	8547.57	.02
3-Dim _c	8090.55 (53)	8256.55	8551.12	.02
Bifact ₁	8044.15 (40)	8236.15	8576.86	.00
Bifact ₂	8039.74 (40)	8231.74	8572.45	.02

3) Sensitivity for Change-Assessment

- This is a content- and sample-determined criterion.
- Mean-level changes were indicated in our dataset
- Further inspection of item-difficulty parameters indicated that item #s 2, 6, & 11 may be best candidates for pre-licensure IPE assessments

There is indeed something odd about the common practice of using factor analysis to establish the dimensionality of a scale but then ignoring the parameter estimates themselves when creating scale scores. Statements about the adequacy of a model from a factor analytic standpoint may not apply when the parameters from that model are ignored" (Edwards & Wirth, 2009; p. 84-85).

Conclusion

- The RIPLS has shortcomings, but every IPE self-report questionnaire is 'technically' insufficient from measurement-construction standards (see, Oates & Davidson, 2015)
- There are well-discriminating items and general support for RIPLS' unidimensional interpretations
- The only reason for SUBscores is meaningful SUBscale interpretation (as we showed, empirical justification of subscores based solely on global-fit is insufficient). Simply, broad constructs require 'broad', rather than 'narrowed' (over-factorized) measurement models.