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TITLE: Fitting Problems: Evaluating Model Fit in Behavior Genetic Models

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ABSTRACT:
In behavior genetics, like many fields, researchers must decide whether their models adequately explain their data – whether their models "fit" at some satisfactory level. Well-fitting models are compelling, whereas poorly-fitting models are not (Rodgers & Rowe, 2002). Oftentimes, researchers evaluate model fit by employing "universal" rules of thumb (e.g., Hu and Bentler, 1999). However, these rules are not universal, and are – in fact – model specific (Kang et al., 2016).

Accordingly, I focused on developing fit criteria emulating Hu and Bentler (1999) for classic univariate models (ACE; CE; AE) by fitting simulated twin data to correctly- and incorrectly-specified models. Ideal criteria should consistently accept correct models and reject incorrect models. Classic ACE models were indistinguishable and virtually all fit indices were non-informative because (or especially when) they are saturated models. For

non-ACE models, criteria were informative. Nevertheless, every metric employed, except TLI differed markedly across models and/or conditions. Universal solutions remain elusive, but promising approaches include nested model comparisons, increasing degrees of freedom, and ruthless skepticism.

Li−Tze & Bentler (1999) Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives, Structural Equation Modeling, 6:1, 1-55.

Rodgers & Rowe (2002). Theory development should begin (but not end) with good empirical fits: A comment on Roberts and Pashler (2000). Psychological Review, 109(3), 599.

Kang, McNeish, & Hancock (2016). The role of measurement quality on practical guidelines for assessing measurement and structural invariance. Educational and Psychological Measurement, 76(4), 533-561.

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