**Exploratory Factor Analysis**

Exploratory factor analyses (EFA; Wirth & Edwards, 2007) will be conducted at both the between and within person level using either items or facets as indicators. EFAs will be estimated using either full information maximum likelihood (FIML; for continuous indicators) or mean and variance adjusted weighted least squares (WLSMV; for categorical indicators) in Mplus version 8.6 (Muthen & Muthen, 2021). Oblique, oblimin rotations will be applied to all factor solutions. Parallel analyses with 10,000 random draws will also be conducted when computationally tractable. The appropriateness of different factor solutions will be evaluated via examination of the scree plot, results of the parallel analysis, changes in model fit, and conceptual coherence of the factor loadings and correlations.

**Graded Response Models**

Unidimensional graded item response models (GRM; Samejima, 1969) will be fit for both facets (e.g., the four items of the Energy Level facet of Extraversion) and dimensions (e.g., all 12 items of the Extraversion dimension at once). GRMs will be fit at both the within and between level; two-level GRMs will also be estimated if computationally tractable. GRMs will be fit using FIML or Metropolis-Hastings Robbins-Monro (MH-RM; if the two-level models are not computationally tractable with FIML) estimation in flexMIRT version 3.6 (Houts & Cai, 2020). Item discrimination values, item and scale information, and marginal reliability will all be considered in order to evaluate the psychometric robustness of the different factors across levels of analysis. Higher-order and/or bifactor models (fit with FIML or WLSMV in Mplus depending on the computational tractability of the former) may also be used to explore the psychometric properties of the dimensions given the structure of the scales (items🡪facet scales🡪trait dimensions), however we focus on the unidimensional trait models as in practice all items across all facets are typically aggregated into single trait composite scores. Continuous confirmatory factor analytic models (fit with FIML in Mplus) may also be used to explore the psychometric properties of the traits at the facet composite score level.