# Online Supplemental Material 1

Supplement to "Personality characteristics below facets: A replication and meta-analysis of cross-rater agreement, rank-order stability, heritability and utility of personality nuances" by Mõttus, Sinick, Terracciano, Hřebíčková, Kandler, Ando, Mortensen, Colodro-Conde, & Jang.

Properties of individual items and their residual scores

The items are the 240 items of the Revised NEO Personality Inventory (Costa & McCrae, 1992). Original study refers to Mõttus and colleagues (2017), whereas replication refers to the current study. Point estimates for individual items alongside their standard errors and sample sizes are reported in the spreadsheet Online Supplemental Material 1A.
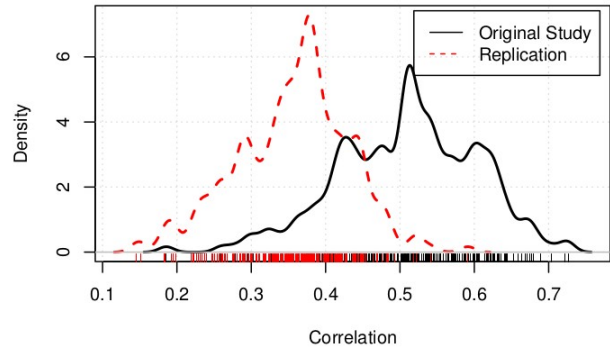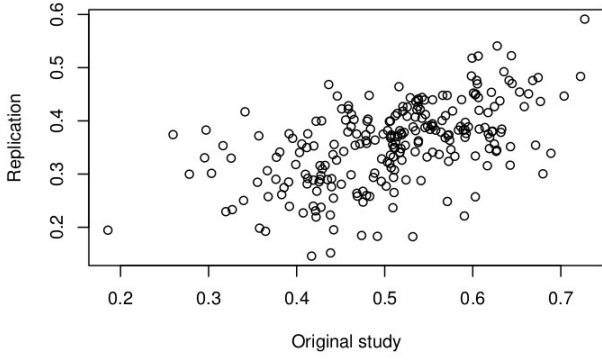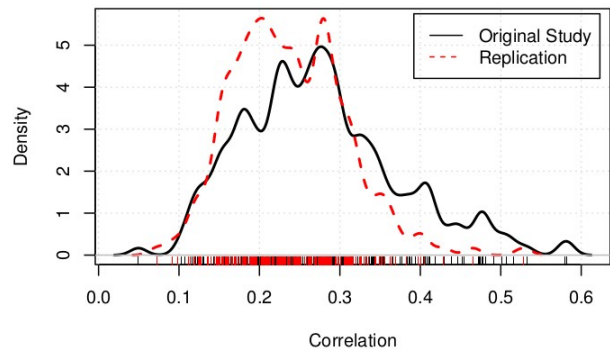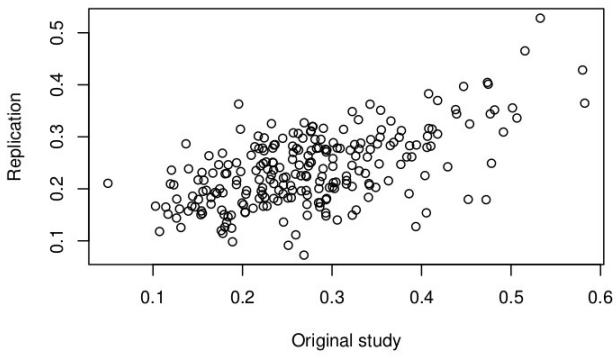

Cross–rater correlations of raw item scores
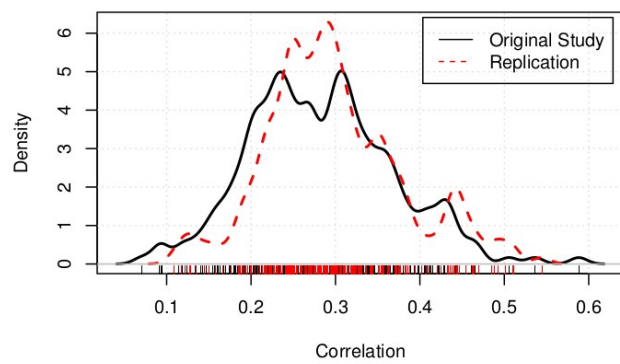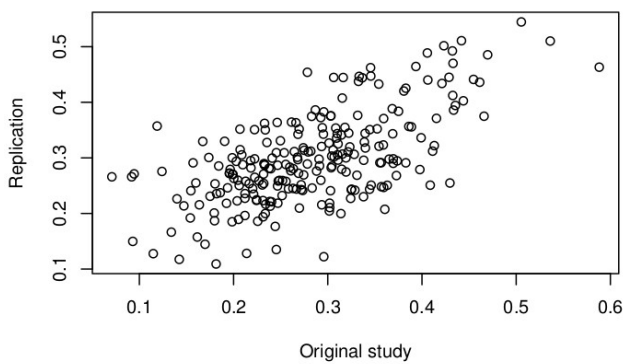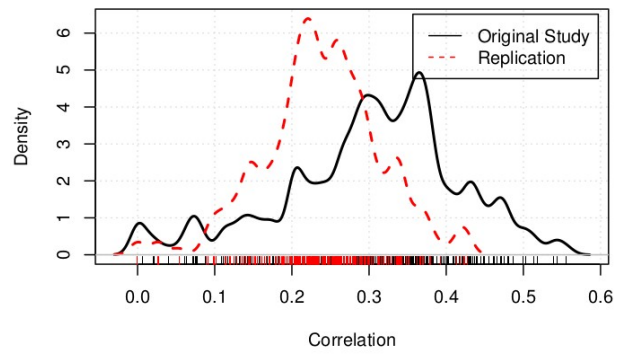

Cross–rater correlations of residual item scores
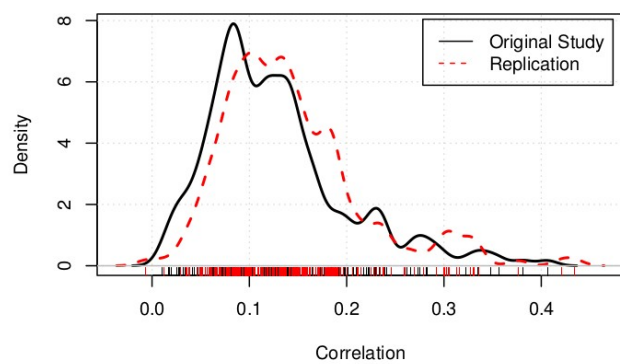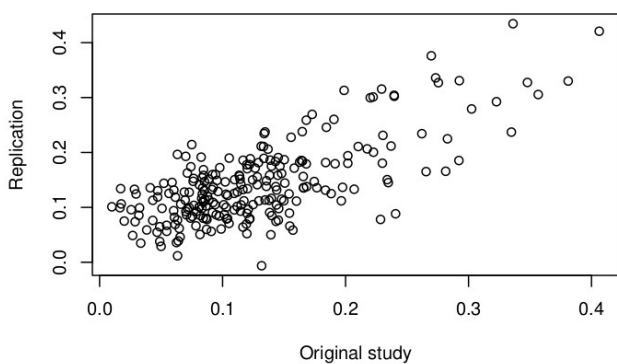
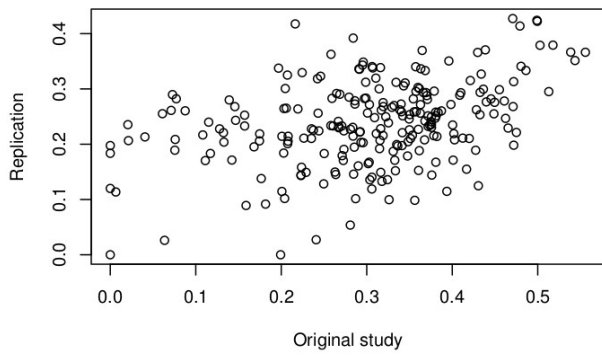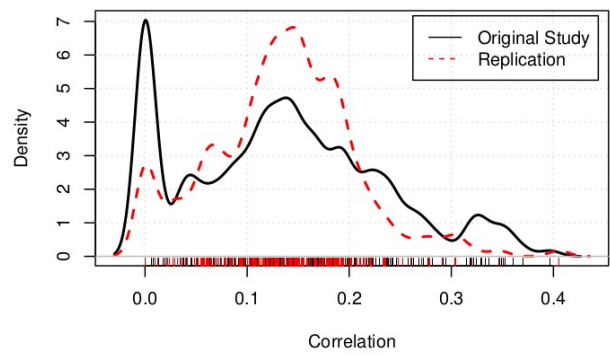## Rank−order correlations of raw item scores

Rank−order correlations of residual item scores

Heritability of raw item scores

Heritability of residual item scores

Shared environmental effect estimates of raw item scores
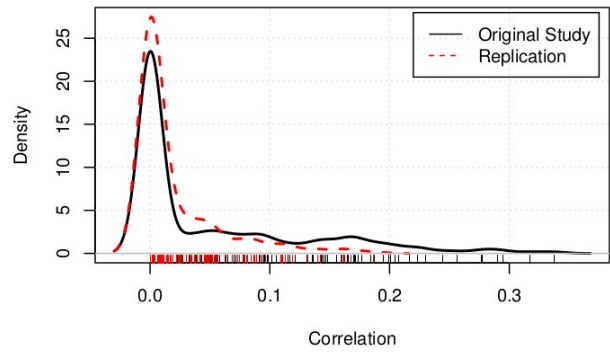
Shared environmental effect estimates of residual item scores
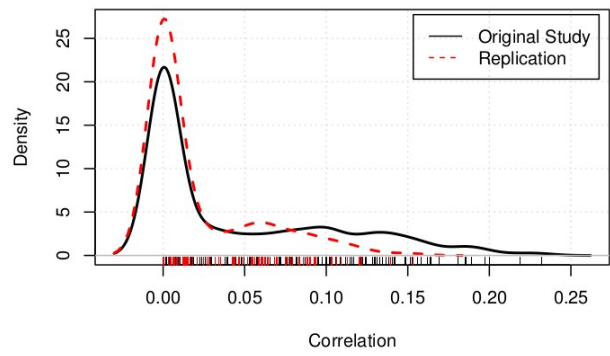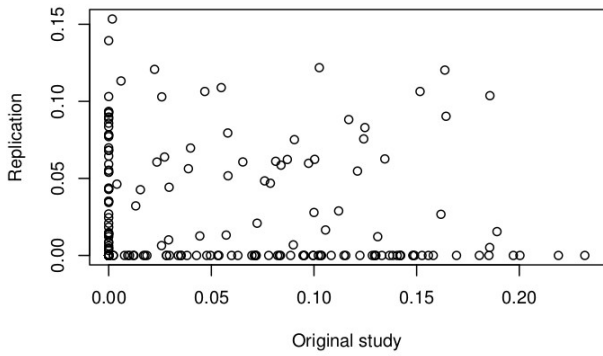
Gender associations in raw item scores

Gender associations residual item scores

Age correlations in raw item scores

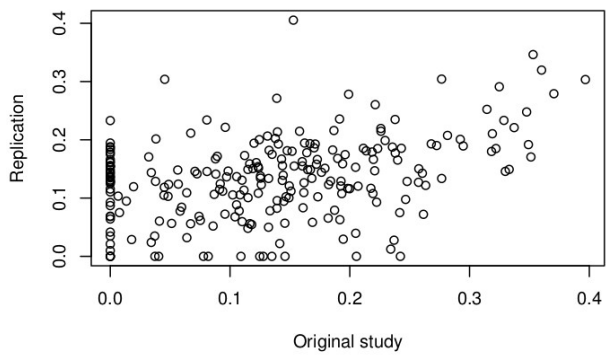**Age correlations residual item scores**

BMI correlations in raw item scores

BMI correlations residual item scores

Meta-analysis adding Estonian Genome Bank Data

Mõttus and colleagues (2017) cross-validated their hypotheses pertaining to Body Mass Index (BMI) in an Estonian adult dat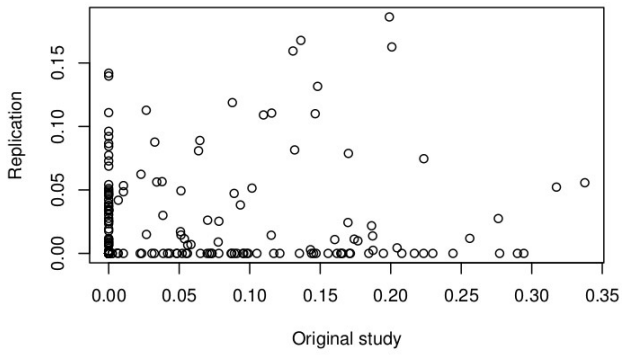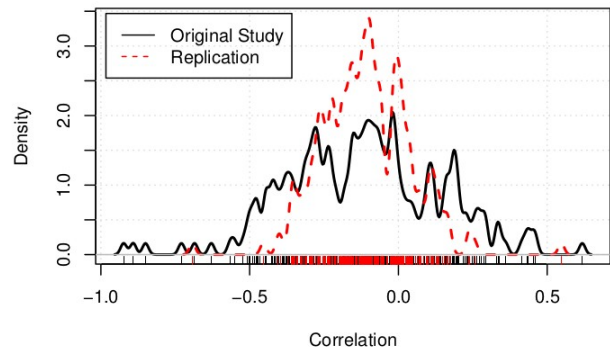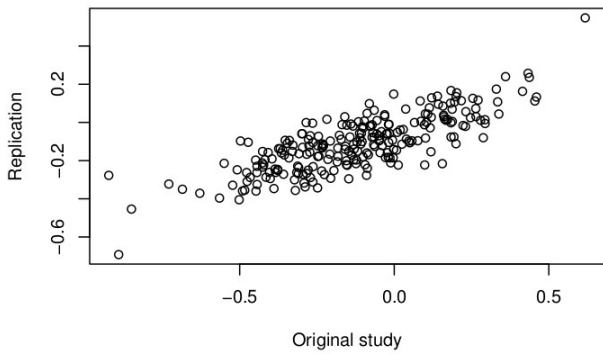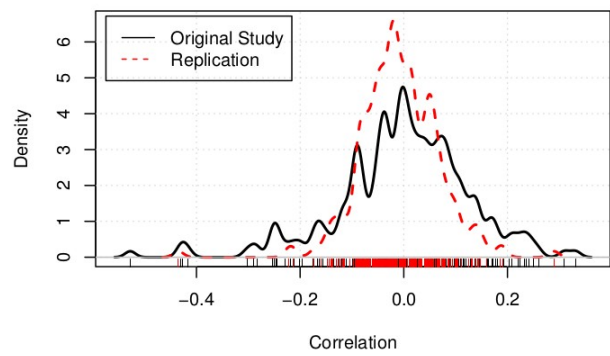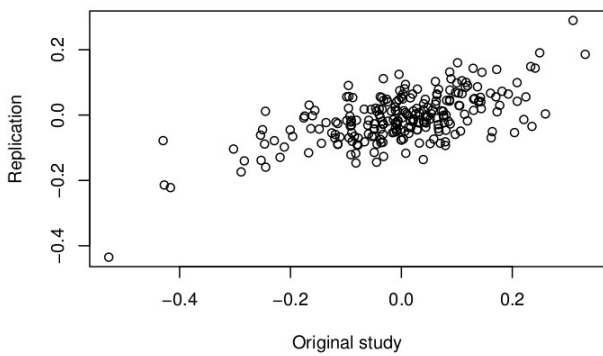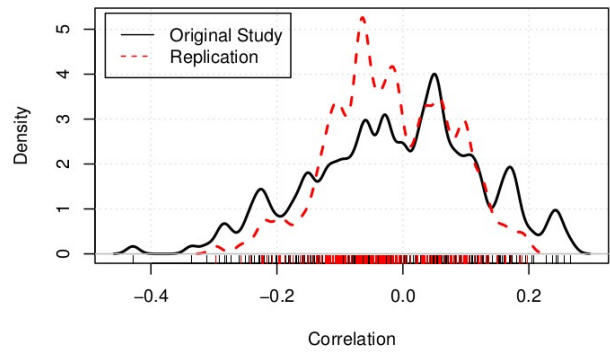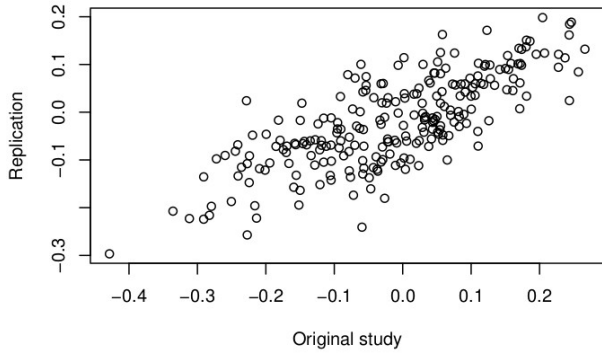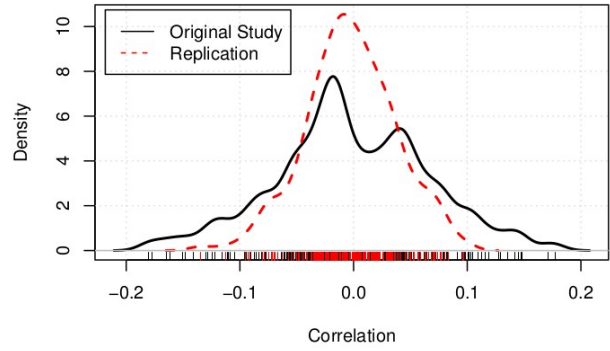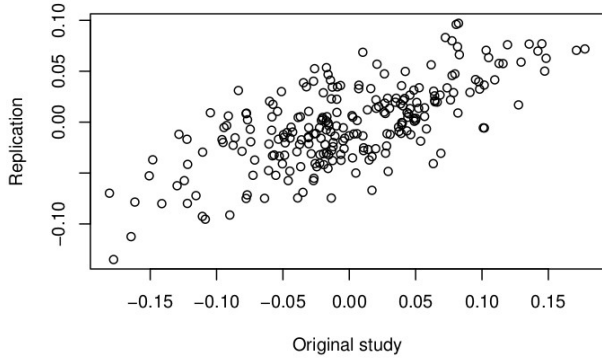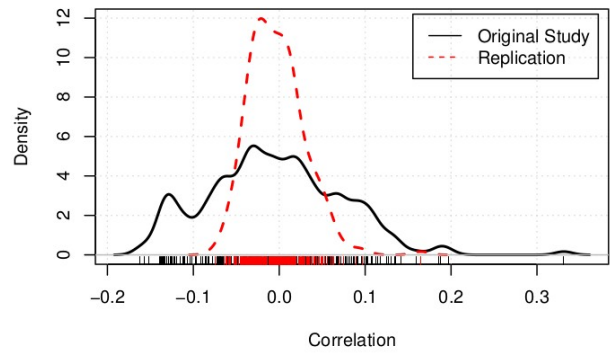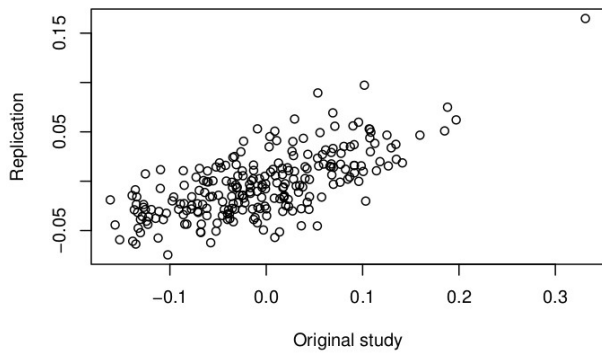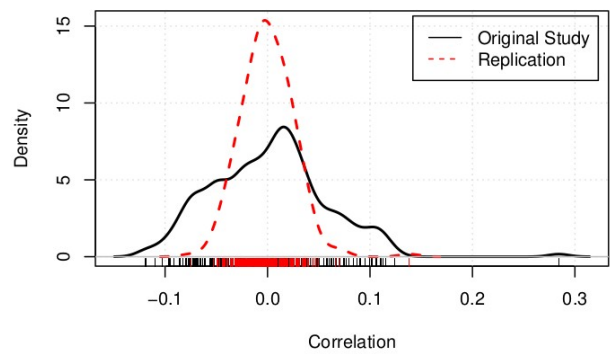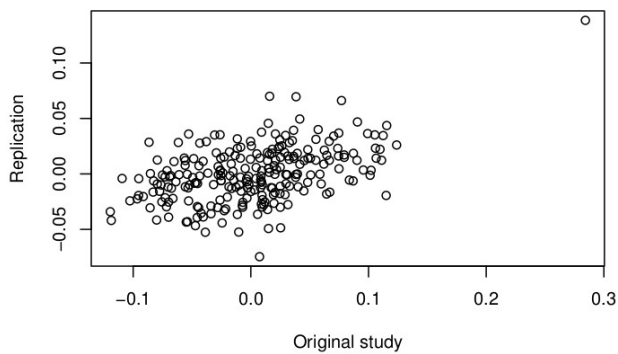aset (Estonian Genome Bank; EGB) and a large part of the same data had been used by Mõttus and colleagues (2014) to estimate cross-rater agreement on item's unique variance. In the EGB cohort, personality traits were measured with an updated version the same inventory that was used throughout this study [i.e., the NEO Personality Inventory 3 (NEO-PI-3) was used instead of the NEO Personality Inventory Revised (NEO-PI-R)]; in the Estonian version of the NEO-PI-3, 46 items were reworded in order to improve the readability although in most cases the reworded items attempted to capture similar habits as the original items.

Despite these slight differences in about four dozen items, we investigated whether the present findings mirrored cross-rater agreement and associations with age, gender and BMI in the EGB NEO-PI-3 data. The EGB sample used here included 3,561 individuals (2,124 females; mean age 46.68, with a standard deviation of 16.96 and range of 18 to 91).

The main patterns clearly replicated. For cross-rater agreement on the unique variance, the rankings of the 240 items based on the current meta-analysis of Czech and German data correlated with the rankings based on the EGB data (ρ = .64, p < .001), whereas the respective correlations were ρ = .55 for the associations with age, ρ = .49 for the associations with gender and ρ = .48 for the associations with BMI (here, the meta-analysis of Canadian, Czech, Danish, US and German data was used for age differences; p < .001 for all correlations).

We therefore ran another set of meta-analyses, adding both Estonian and German data to the samples of the current study; the results are reported alongside the results of other meta-analyses in Online Supplemental Material 1A (spreadsheet) and are summarized in the figure in the following page. In this meta-analysis, unique variances of all items displayed False Discover Rate (FDR)-corrected significant cross-rater correlations, whereas all but two items showed Bonferroni-corrected significant correlations; for most correlations p < 10^{-10}. Unique variances of 56/115 items had Bonferroni/FDR-corrected significant associations with gender, 83/131 had Bonferroni/FDR-corrected significant correlations with age, and 30/93 had Bonferroni/FDR-corrected significant associations with BMI.

Therefore, the unique variance in substantial proportions of the 240 items was significantly associated with age, gender and BMI, and the patterns of findings clearly replicate across samples, even if somewhat different versions of the questionnaire are used.

References

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, Fl.: Psychological Assessment Resources.

Mõttus, R., Kandler, C., Bleidorn, W., Riemann, R., & McCrae, R. R. (2017). Personality traits below facets: The consensual validity, longitudinal stability, heritability, and utility of personality nuances. *Journal of Personality and Social Psychology*, 112, 474–490. doi:10.1037/pspp0000100

Mõttus, R., McCrae, R. R., Allik, J., & Realo, A. (2014). Cross-rater agreement on common and specific variance of personality scales and items. *Journal of Research in Personality*, *52*, 47–54. doi:10.1016/j.jrp.2014.07.005
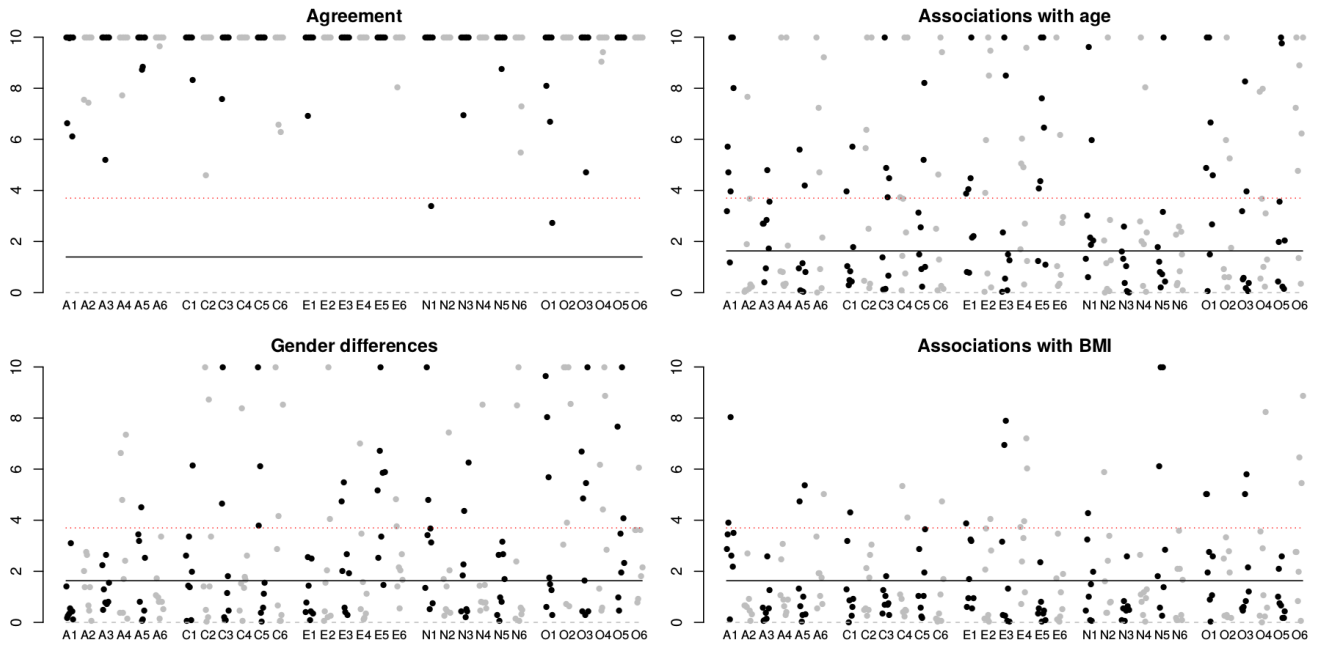
-Log10 *p*-values (on vertical axes) of the cross-rater correlations of item residuals (controlling for all facets) and their associations with age, gender and BMI. Values are capped at 10 (i.e., $p < 10^{-10}$). *P*-values are grouped along the horizontal axes by facets and facets are grouped by the Five-Factor Model domains (A = Agreeableness; C = Conscientiousness; E = Extraversion; N = Neuroticism; O = Openness). Solid lines indicate FDR-corrected significance, whereas the red dotted lines indicate Bonferroni-corrected significance threshold.