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"Bidirectional Association between Self-Control and Internalizing Problems among College

Freshmen: A Cross-Lagged Study"

By

Authors

SUPPLEMENT 1: RESULTS OF LONGITUDINAL INVARIANCE

We used Mplus to examine whether self-control and internalizing problems were invariant across the two time points. Since chi-square is sensitive to sample size, the differences in the value of CFI instead of chi-square are recommended to judge measurement invariance (Cheung & Rensvold, 2002). Longitudinal invariance should be tenable if the difference in the value of CFI does not exceed 0.01 while other fit indexes are acceptable (i.e., RMSEA <= .08, CFI & TLI >= .90; Cheung & Rensvold, 2002).

The factor structure of self-control was invariant across the two time points: Configural: $\chi^2(5)$=8.833, *RMSEA*=.049, *CFI*=0.993, *TLI*=0.978; Metric: $\chi^2(7)$=14.405, *RMSEA*=.058, *CFI*=0.986, *TLI*=0.970; ΔCFI=0.007; Scalar: $\chi^2(10)$=28.900, *RMSEA*=.077, *CFI*=0.964, *TLI*=0.946; ΔCFI=0.022. Since the differences in the value of CFI between the metric and scalar variance model exceeded the cut-off point (i.e., 0.01), we attempted to release the constraint of intercepts one by one. We found that after setting the intercept of the first and third components of the self-control measure, the model fit significantly increased, $\chi^2(8)$=15.778, *RMSEA*=.056, *CFI*=0.985, *TLI*=0.972, ΔCFI=0.001. These results suggested partial scalar invariance of the self-control scale achieved.

The factor structure of internalizing problems was invariant across the two time points: Configural: $\chi^2(5)$=4.196, *RMSEA*=.000, *CFI*=1.000, *TLI*=1.004; Metric: $\chi^2(7)$=5.258, *RMSEA*=.000, *CFI*=1.000, *TLI*=1.006; ΔCFI=0.000; Scalar: $\chi^2(10)$=14.620, *RMSEA*=.038, *CFI*=0.993, *TLI*=0.989; ΔCFI=0.007.

SUPPLEMENT 2: RESULTS OF CROSS-LAGGED MODEL BASED ON

WINSORIZING APPRAOCH TO REPLACE OUTLIERS

In addition to excluding outliers from formal analysis, we also used Winsorizing approach (Turky, 1962) to deal with outliers. Specifically, we replaced the outliers of 3 SD lower or 3 SD greater from the means with the nearest number within the -3 ~ +3SD range. Using this approach to deal with outliers can maximize the statistical power since it does not simply exclude outliers. The cross-lagged model (Fig. Supplement 1) based on Winsorizing showed a good fit, $\chi^2(42)=40.959$, *RMSEA*=.000, *CFI*=1.000, *TLI*=1.001. The results found that after controlling for T1 internalizing problems, T1 self-control significantly predicted T2 internalizing problems (β=-.179, S.E.=.063, *p*=.005). In a similar vein, T1 internalizing problems also significantly predicted T2 self-control even though levels of T1 self-control were controlled for (β=-.189, S.E.=.066, *p*=.004). The two cross-lagged paths did not significantly differ from one another, Wald(1)=1.176, *p*=.278.

References

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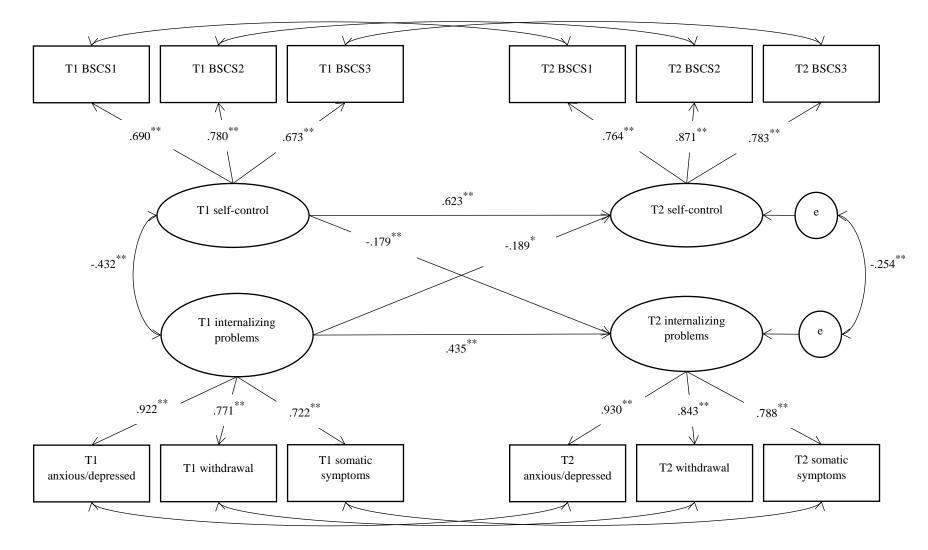
Figure Supplement 1. Cross-lagged association between self-control and internalizing problems based on Winsorizing approach to deal with outliers. Standardizes coefficients are shown. ** $p < .01$.