Effortful Control and Executive Functions: One Construct or Two?
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Introduction
- Effortful Control (EC) and Executive Functions (EFs), both implicated in the self-regulation of behavior and emotion, are typically studied within different sub-disciplines of psychology.
- EC, typically considered a temperament construct, is the ability to inhibit a prepotent response in favor of performing a sub-dominant response and the ability to detect errors.
- Based on factor analytic work, EC is typically comprised of attention shifting, activation control, effortful attention, and inhibitory control.
- EFs are higher-order cognitive processes required for organizing and planning behavior.
- Factor analytic work has identified three inter-related aspects of EF: Attention shifting/cognitive flexibility, inhibition, and monitoring/updating information in working memory.
- In addition to conceptual similarity, EC and EF have both been linked to the functioning of the Anterior Cingulate Cortex and the Prefrontal Cortex.
- EFs and EC have also been associated with similar outcomes, such as academic achievement, childhood externalizing behaviors, and internalizing difficulties in adulthood.
- In light of the conceptual similarity between EC and EFs, the current investigation uses SEM to examine the distinction/similarity between these constructs.

Hypotheses
- It was anticipated that EC would be related to the EF of Inhibition and the EF of Monitoring/Updating Information in Working Memory.
- The EF of Inhibition and the EF of Monitoring/Updating Information in Working Memory were expected to be associated with one another.
- Depressive symptoms, Full Scale IQ, and Gender were all expected to be related to EC and EF in the same direction.

Method - Participants
- 188 young adults (67.7% female, 32.3% male)
- Mean age = 19.85 years (range = 18 to 29 years)
- Most participants self-identified as Caucasian (54.3%), African American (28.9%) or Hispanic/Latino (11.4%).
- All participants were enrolled in psychology courses and received course credit for participating.

Method - Measures
- EF Inhibition: Delis-Kaplan Executive Function System (D-KEFS)
- Color-Word Inference Test – Inhibition Task, Inhibition-Switching Time
- EF Monitoring/Updating Information in Working Memory (WM): D-KEFS
- Verbal Fluency Test – Letter Fluency Total Correct, Category Fluency Total Correct, Category Switching Accuracy
- EC: Adult Temperament Questionnaire - Short Form (ATQ-SF)
- Effortful Attention subscale
- Inhibitory Control subscale
- Full Scale IQ (FSIQ): Wechsler Abbreviated Scale of Intelligence (WASI)
- Similarities and Matrix Reasoning Subtests
- Depressive symptoms: Beck Depression Inventory-II (BDI-II)
- Method – Procedure
- Participants completed the BDI-II, ATQ-SF, and demographics during an individual lab session.
- Research assistants administered the D-KEFS and the WASI subsets to each participant.
- SEM, using EQS 6.12 software, was used to test hypotheses.
- The SEM model was an excellent fit to the data: X²(23) = 22.74, p > .05; RMSEA = 0.00 (90% CI: 0.00 - 0.06); SRMR = 0.037; AIC = 23.26
- There was a significant association between EC and the EF of Monitoring/Updating Information in Working Memory; a trend in the anticipated direction was observed between EC and the EF of Inhibition.
- Consistent with Miyake’s (2000) model, the significant relationship between the EF of inhibition and the EF of Monitoring/Updating Information in Working Memory demonstrates that these EFs are core aspects of higher-order cognition.
- Depressive symptoms were significantly associated with all three latent variables.
- Full Scale IQ (FSIQ) and Gender, with women performing more poorly than men, were associated with the EF of Inhibition.
- A trend such that FSIQ was associated in the expected direction with the EF of Monitoring/Updating Information in Working Memory was observed.
- Trends such that women obtained lower scores than men on the EF of Monitoring/Updating Information in Working Memory and EF were observed.

References

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- Corresponding Author: Lauren M. Laake (lalake1@niu.edu)
- To download a copy of this poster, please visit the Emotion Regulation & Temperament website at www.niu.edu/emotionreg