A Meta-Analysis of Effortful Control and Child Outcomes Part II: Externalizing Problems
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Background/Purpose
• Effortful control (EC) is defined as the ability to inhibit a prepotent response in favor of a subdominant response1.
• EC has been linked to the anterior attention network2, and that it is important for effective self-regulation3.
• Effective EC has been linked to numerous children’s outcomes, and specifically externalizing problems (EXT).
• For example, low EC has been related to increased aggressiveness2 and symptoms of ADHD4.
• Although negative associations between EC and EXT are frequently identified, some studies have found that EC is not related to EXT5.
• Mixed findings between studies suggest that differences in study methodology may contribute to varying outcomes.
• Furthermore, a quantitative synthesis of the accumulating literature examining associations between EC and EXT has not been conducted.
• The goal of the present study is to perform a meta-analysis of the existing literature examining the effects of EC on EXT in children.

Hypotheses
• It was predicted that the mean effect between EC and EXT would be negative.
• Given existing work, gender6 and method7 used to measure EC were examined as potential moderators of the association between EC and EXT.
• Other moderators were also examined: high vs. low risk samples, clinical vs. non-clinical samples, and age of child.

Method
• As part of a larger meta-analysis of EC and children’s outcomes, PsyInfo and MedLine databases were searched using 14 terms for EC (e.g., Effortful Control and Inhibitory Control) and 53 terms for children’s outcomes, including EXT related search terms (e.g., Aggression).
• Based on database searches, 203 studies were retrieved that met inclusion criteria.
• Reference lists of studies meeting inclusion criteria were searched, yielding an additional 7 studies.
• 88 studies had relevant data for this investigation.
• After accounting for multiple reports using the same sample, and multiple effect sizes (ES) within single studies:
  • Studies contributed 537 total ES, yielding 82 single ES for analysis; total N across studies was 13,742.
  • Possible Moderator Variables
    • EC measurement: Behavioral, Parent Report, Other Report, Cross Informant (e.g. Parent rated EC and Teacher rated EC).
    • Age: 0-5 (early childhood), 6-12 (school aged), and 13-17 years (adolescence).
    • Gender
    • Clinical sample: Greater than 66% of the sample was selected based on psychiatric status or group differences were reported between psychiatric and control groups.
    • High Risk: Greater than 66% of the sample was demographically at risk (e.g. low SES, low maternal education, etc)
• Effect Size Coding
  • ES for this study were correlations.
  • For studies reporting group differences the standardized mean difference ES was calculated and transformed to a correlation.
• The meta-analysis was conducted using the random effects model8.
• Consistent with meta-analytic practice homogeneity tests were used to test for the absence of moderators of the association between EC and EXT.
• If the homogeneity test was significant, follow-up moderator analyses were performed9.
• To evaluate the potential effects of publication bias on the findings, the fail-safe N10 and sufficiency11 indices were calculated

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Results
• Unit of Analysis
  • EC Source
  • k
  • Mean ES
  • Std. Error
  • 95% CI
  • Fail Safe N
  • Sufficiency
  • Homogeneity
  • All Studies
    • Method: Multiple ES1
      • Behavioral: 60
        • Parent Report: 22
        • Other Report: 16
        • Cross Informant: 26
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      • Other Report: 16
      • Cross Informant: 26
      • Mean ES: 0.33
      • Std. Error: 0.012
      • 95% CI: -0.31 to 0.38
      • Fail Safe N: 83,621
      • Sufficiency: 1672.43
      • Homogeneity: 124.69
    • Other Studies
      • Single ES
        • Early Childhood: 21
        • School Age: 53
        • Adolescence: 8
        • Mean ES: 0.31
        • Std. Error: 0.010
        • 95% CI: -0.28 to 0.36
        • Fail Safe N: 22,379
        • Sufficiency: 447.57
        • Homogeneity: 77.56

Discussion
• The effect of EC on EXT appears to be robust, and methodological differences between studies appear to minimally influence the effect.
• Despite well established gender differences in EC12, studies almost never performed analyses based on gender.
• Adolescent samples are underrepresented in the literature.
• Few studies reported sufficient information regarding demographic risk.

References and Author Contact
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References


