

**Underpowered Studies and Overrepresented Significant Findings in
Educational Psychology:
A Comprehensive Examination of Empirical Evidence**

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Abstract

Systemically underpowered research persists in behavioral science. A critical concern arises when meta-analyses synthesize findings in a literature dominated by underpowered studies, resulting in strongly biased summary effects. No study has, however, examined the credibility of meta-analyses in educational psychology. We conduct a comprehensive assessment of meta-analytic outcomes by calculating the median retrospective power (MRP) based upon selected meta-analyses published in the top five educational psychology journals between 2012 and 2022. The MRP is a novel power analysis method, serving as an indicator of the credibility of meta-analyses and the replicability of typical studies within the field. Preliminary results reveal a substantial difference in power between meta-analyses involving experimental studies and those focusing on correlational studies: 31% vs 95%, highlighting that the power of typical experimental studies in educational psychology falls well below the commonly accepted threshold. Consequently, these studies are at a significantly increased risk of replication failures. We conduct further investigation to explore the methodological factors contributing to this pronounced power discrepancy. In light of these findings, we strongly advise researchers to interpret positive meta-analytic findings with great caution. This study underscores the pressing need to strengthen the credibility and replicability of experimental research in educational psychology.

Keywords: median retrospective power, false positive rate, replication crisis, meta-analysis