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Interpreting "Nakedly" Reported Observed Effects in Behavioral Science

Publications in behavioral science typically report the observed effect size of individual studies by relying on standardized effect size measures such as Cohen's $d=(m_1-m0)/s$ or its transformation into Pearson's $r=d/\sqrt{d^2}$ +4. These measures also apply in meta-analytical research to quantify the observed mean difference, (m_1-m0), across object-level studies that rely on different measurement-scales, as well as in theory-construction research to point-specify (m_1-m0) as a theoretical prediction. The standardization of (m_1-m0) to the observed standard deviation, s, is conceptually related to the amount of error under which (m_1-m0) is observed (aka the quality of measurement). This entails that the observed (m_1-m0) is interpretable only relative to the error-theory that determines s. Differentially sophisticated versions of this error-theory can let an identical observed mean difference vary massively in size, because the amount of effect generally depends on the following factors: the observed (m_1-m_0) itself, the observed standard deviation (s), the reliability of the dependent variable ($r_{xx'}$), the measurement error (s_e), the quality of the experimental setting (s_e**), and how the setting is standardized. When determining s, these factors can be distinctly leveraged in the first place because behavioral science tends to lack theoretically motivated measurement-scales. This invariably forces researchers to choose their own error-theory. Although the meaning of an observed effect thus depends on this error-theory, behavioral science publications normally report observed effects "nakedly," without a transparent error-theory. But this seriously undermines the goals of a cumulative science of human behavior. We discuss implications for theory construction, meta-analysis, and generally for evaluating the amount of observed effect. We recommend that observed effects be published exclusively in combination with a transparent error-theory.