

## Prompting Psychological Research from Whether, If, studies to How, When and 'When of the How' Studies

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Sir,

The empirical literature in social, psychological, medical, clinical, health, and communication literatures and among numerous other scientific discipline is bourgeoned with research that provides answers to questions of whether or if. Investigations of "whether" or "if" emphasize mainly on whether two variables are connected, causally or otherwise, or if something is more or less likely to occur in one set of circumstances or conditions than another's.<sup>1,2</sup> With the advancement of time, the research questions have become more complex, and noting these complex questions, researchers are no longer satisfied with demonstrating simple associations. Establishing association does not disambiguate into profound understanding even when a causal association can be established. Presently, researchers' questions are looking into the domain of process, mechanism and the conditional peculiarities that 'How?' 'In what route?' 'By which pathway?' 'Under what circumstances?' An impact a process or mechanism might unfold. The "how" question relates with the underlying mental, cognitive, or biological process that causally links X to Y, whereas, the "when" question pertains to the conditions that influence the causal associations. For instance, under what circumstances, or for which sorts of individuals, does X push an effect on Y and under what circumstances, or for which type of individuals; does X not exert an impact?<sup>3</sup>

To address these complex questions, mediation and moderation analysis are frequently used. A content analysis of researchers published in *Journal in social psychology*<sup>4</sup> exhibited that over one-half of the articles depicted a mediation analysis, many of which take the simple mediation analysis. Presently a days, Mediation and Moderation analysis are two of the more generally used statistical methods in the social, behavioral and health sciences, as well as in, medicine and other areas. Some of the most highly cited papers in social science methodology this century are about mediation or moderation analysis. Models with more than one mediator, allow a variable's effect to be transmitted to another through multiple mechanisms simultaneously. Two forms of multiple mediators models are commonly in practice, serial multiple mediator models and the parallel multiple mediator models. In addition, models that incorporate both mediation and a moderation component are called conditional process model. In these models, either the direct and/or indirect effect of X on Y through M is moderated by or conditioned on one or more variables. To explain these models terms moderated mediation and mediated moderation are likewise used to uncover the complex mechanisms, often known as 'when of the how'.<sup>3</sup>

This article is expected to raise interest in conducting the studies that

unfold the mechanisms or process between two or more variables and identify the factors that influence the relationships between X and Y. Empirical literature is full with the illustrations of mediation, moderation and conditional process analysis, and there have been various papers and book sections underscoring the value of moderation and mediation analysis. Many of which also provide methodological tutorials,<sup>3</sup> both historically<sup>5</sup> and more recently.<sup>6,7</sup> SPSS, SAS, MPlus, LISREL, and AMOS and so on are widely used software programs to examine these processes and mechanisms. It is almost vital nowadays that prospective researcher ought to comprehend the changing trends in behavioral studies and know how to execute moderation and mediation analysis in their researches.

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