Endemic Use Of Mediation And Moderation In Research; A Conceptual Explanation

Dr. Medina Halako Twalib
halaquo@uonbi.ac.ke
University of Nairobi
School of Business

DOI: 10.29322/IJSRP.11.05.2021.p11367
http://dx.doi.org/10.29322/IJSRP.11.05.2021.p11367

Abstract

Mediation and moderation concepts have over the years gained much popularity in research. This has brought concerns about how they are used, the concepts and contexts underlying these two models. Mediation and moderation’s causal nature has always been confused or misunderstood which leads to misuse and misconception in majority of applied research. Ideally these two concepts are used for sanitizing and explaining a causal relationship. This paper is meant to bring to light the proper usage of these concepts and highlighting situations where it is not proper to use them. The paper focused on studies that are of causal nature. Conclusions and recommendations were then inferred based on the conceptual discussion of the paper.

Keywords: Mediation, Moderation

Introduction

The humdrum custom of adding mediating and moderating variables in research projects and thesis has recently grown to a cult like following by students, academics and researchers. One’s research is not complete without these variables, a feeling that majority of researchers agree with. In a discussion with some scholars who are proponents of the inclusion of these variables in every research, it was clear that majority of the scholars and researchers are using these variables with the backing up of the saying “if it isn’t broken, why fix it”. “This is how everyone else is doing it, it has been like this for eons“, others say, “I must have more than three variables in my research and the only way is to include mediation and moderation”. There is nothing wrong with their arguments, however, the question is, are they used in the right context with the right concepts? Does the relationship make any sense with the inclusion of a mediator and moderator? Is there any value addition in terms of contributions to theory, policy and practice when mediation and moderation are used in a study? This paper therefore embarked on shedding light on the usage of mediation and moderation variables. It brings out the meaning and proper understanding of these variables in applied research. Thereafter, the paper concludes and recommends with an aim of breaking the cult of using mediation and moderation haphazardly.

Mostly, in social sciences and management studies, mediation and moderation allude to increasing information by producing hands-on evidence about intercessions and theory testing as well. This has been supported by MacKinnon’s (2011) work, where he defined a mediator as a variable that is pertinent in understanding the process by which it influences a dependent variable. A mediator acts as a bridge that links independent variable with a dependent variable. Zumbo and Wu (2008) described a mediator, not only as an outcome of independent variable, but as an antecedent of dependent variable as well. They advised that the operation of a mediator should carefully follow this temporal sequence. In the works of Frazier (2004), Rose (2004) and Kraemer (2002) et al, they conclusively noted that a mediation framework has an intrinsic prerequisite for antecedence control in the design. A mediating variable, also known as intervening variable or indirect variable or surrogate variable or intermediate variable (MacKinnon and Luecken, 2011) can only be thought of existing, if the independent variable influences or rather has an effect on the dependent variable. It cannot exist when there is no causal relationship between the independent variable and the dependent variable. An intervening variable, also known as a mediator variable play dual roles; it plays the role of a dependent variable to the independent
variable and plays the role of an independent variable to the dependent variable. This therefore means that the independent variable brings out the mediator and in turn the mediator affects the dependent variable.

When Picking a mediating variable (Frazier et al 2004), notes the great importance of theory in order to determine the proposed relationships. There should be clear reason based in literature within a given field, for the hypothesis that the predictor is associated to or caused the mediator. Beaujean (2018) notes another factor to consider when picking a mediating variable is the size of the relationship between the mediator variables as this has a direct influence on power to detect mediation.

At this point, it is better to use an illustration to demonstrate mediation. An employee starts performing better after an increment in his compensation. The explanation will be, that the independent variable was Compensation which then influenced the employee to perform better. It is not the money that made the employee to perform better per se, but something happened that was caused by the money. This “something” is Motivation. So, after the employee got an increment, he became motivated and in turn, he started to perform better than before. This is as illustrated in figure 1 below:

![Figure 1 illustrating the relationships between Independent, mediating and dependent Variables](image)

Figure 1 above shows the relationships between independent, mediation and dependent variables using concepts of compensation, motivation and performance as an example. The figure borrows largely from Baron and Kenny (1986). As shown in the diagram, there are four paths, a, b, c and c'. There has to be some correlation between Compensation and Performance for a mediation to come through. Path “a” show the effect of compensation on motivation. At this point, motivation acts as a dependent variable as explained earlier in this paper. Path “b” denotes the relationship between motivation and performance. At this point, motivation plays the role of an independent variable to the dependent variable (Performance). As indicated earlier, the independent variable must correlate with the dependent variable for any mediator to be included in the model. The direct relations between Independent variable (Compensation) and the dependent variable (Performance) is denoted by path “c” as shown in figure 1. After the introduction of a mediator, the independent variable (Compensation) now relates to the dependent variable (Performance) indirectly, therefore the path c' as shown in figure 1 above.

Holmbeck (1997), notes that a moderator variable influences the relationship between two or more concepts to bring about the nature of the influence of the independent variable on the dependent variable differs based on the level or value of the moderator. In addition, Preacher et al (2007) noted that, moderation is said to be occurring when the strength of the relations amongst two variables is dependent on a third variable. The main purpose of a moderating variable is to strengthen or weaken the connection between the independent and dependent variable. A moderator’s role is to strengthen the direction of the causal relationship between two or more variables. Other authors (Saunders, 1956), commonly refer to a moderator as interaction term.
Figure 2 below illustrates the moderation effect using a conceptual model. Using the concepts that have been used earlier to demonstrate mediation, compensation will be used here as an independent variable which will influence performance as the dependent variable. An employee is expected to perform better after a salary increment. However, if the employee does not have the necessary skills to perform the work, then there is no way the performance will improve. The relationship between salary increment and employee’s performance will either be strengthened or weakened by the presence of another variable, which in this case is employee’s competence. Therefore, competence in this illustration can be used as a moderator as shown in figure 2 below:

Figure 2 illustrating the relationships between Independent, moderating and dependent Variables

As shown in Figure 2, the relationships between independent, moderation and dependent variables using concepts of compensation, competence and performance are elaborated. Path c indicates the relationship between independent (Compensation) and dependent (Performance) variables. West et al (1996) posits that measurement of the moderator should either be on a continuous scale or a categorical scale. Moderation is detected better with a substantive causal effect (Jaccard and Turrisi, 2003, Chaplin 1991, Frazier et al 2004). If a model envisages that X–Y causal effect changes with the moderator, interpretation of the causal effect would focus on how the moderator impacts X–Y causal relationship. Unlike a mediator, a moderator plays a solitary role; it acts as an auxiliary independent variable for the dependent variable. A moderator precedes both independent variable and dependent variable and it is uncorrelated with the independent variable.

From the works of Beaujean (2018), it is noted that although moderation and mediation are distinct concepts, with different types of hypothesis and different tests of effects (Frazier et al 2004; Holmbeck, 1997), it does not mean they cannot be used together. For example, baron and Kenny (1986) wrote that one may begin with a moderator but end up finding a mediation process. More explicitly, they write that finding a moderating variable could help suggest a possible mediation variable. Thus, when predicting moderating variables, one should select them to do more than improve predictive power. Likewise, mediators can help to find moderating variables. If one can understand the mediational process behind a relationship, one can choose an appropriate intervention and then test whether the intervention has a moderating effect on the variables’ relationships. In other analyses mediators and moderators can work together to help better understand the predictor-outcome relationship (Kraemer, Stice, Kazdin, Offord and Kupfer, 2001). Of particular note, a variable, in and of itself, does not necessarily lend itself to either mediation or moderation analysis; the same variable can serve as either.

The paper has so far elaborated the definitions and usage of mediating and moderating variables. It is worth noting that a researcher can have just dependent and independent variables in a research provided that the research adds value to the either practice, policy and knowledge or both. This is the most important aspect of research. Most of the variables especially in social sciences have been researched on, however, it is the responsibility of a research to think out of the box. A research should not limit him/herself in addition of the number of variables involved, gaps can be found in methodology and context as well.

In conclusion therefore, it is advisable for researchers to review the literature widely and deeply in order to find different gaps. One can have concepts which have been widely researched on, however, it is the responsibility of a researcher to find what value they
can add to the already available literature hence one can use different methodology, different contexts with the same concepts to try and find out if they will get any different results from the ones researched.

This paper recommends that researchers should think out of the box. Ideas of using moderators and mediators are vast for example, diversifying into using different methodologies, the usage of more than one moderator, usage of multiple mediators, combining moderation and mediation among other innovative ways of carrying out research.

References


