

Much has changed since Baron and Kenny's (1986) classic paper: let us learn what Kenny's (2012) contemporary mediation analysis prescribes

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Abstract

The procedure set for mediation analysis in the Baron and Kenny's (1986) classical research article did not go without criticism (MacKinnon and Fairchild, 2009; Hayes, 2009; Bullock, Green, & Ha, 2010; Zhao, Lynch and Chen, 2010), and thanks to those critics, that Kenny (2012) had to bring a number of modifications and improvements through his today's contemporary mediation analytic procedure. This paper presents a comparison of what Baron and Kenny (1986) had originally proposed, and what Kenny (2012) has now suggested after incorporating critics' concerns. For this purpose, the two approaches of mediation analysis have been practically applied on an organizational justice - trust in supervisor - employees' job satisfaction case, wherein variable 'trust in supervisor' was used to mediate between various facets of organization justice and employees' job satisfaction. Whereas the classic approach required the estimation of the four paths (c , a , b & c'), through four steps and running three regression equations and testing for their statistical significance; the contemporary mediation analysis has shortened the paths from four to three (a , b & c'), requiring taking only two steps (Steps 2 and 3), and running two regression equations, declaring the first equation as unnecessary. The classic approach required that path b needs to become statistically significant and path c' insignificant in step 3 & 4 for a complete mediation; contemporary approach asks for adding c' with ab for determining total effect c , and then decomposing c in to direct effect (c'/c) and indirect or mediation effect (ab/c). Whereas classic approach aimed at solving for full or partial mediation in abstract form, the contemporary approach has the edge over the classic, in quantifying the mediation effect (ab). In case of our solved example, classic approach could only help to indicate that 'trust-in-supervisor variable is partially mediating', while in case of contemporary approach, mediation effect of this variable for INJ facet of organizational justice was not only quantified (17.36%) and tested for its non-zero effect, but zero-effect of other two facets, DJ and IJ, were also differentiated.

JEL Classification:C01, C12, C13, C18

Keywords: Mediation analysis, Baron & Kenny's (1986) classic approach, indirect effect, Kenny's (2012) contemporary approach.

A. RESEARCH THEME

I. INTRODUCTION

A. Baron and Kenny (1986) versus Kenny (2012)

Mediator (M) is an intervening or process variable, and mediation analysis is the process analysis, that helps understand the mechanism through which the factor (X-variable) affects the outcome (Y-variable). Mediation analysis aims at to find whether the mediator M partially or totally mediates X - Y relationship; and if partially, then how much? (Wikipedia, 2012; Kenny, 2012; MacKinnon, 2008).

Reuben Baron and David Kenny are considered among the major early pioneers who laid down foundations for extensive research in the area of mediation analysis. Their classic research article entitled "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations", published in the Journal of Personality and Social Psychology (Baron and Kenny, 1986), is one of the most-read papers, with 35467 citations (Google Scholar, December 19, 2012). This paper made a sharp distinction between 'Moderator' and 'Mediator' variables (Baron and Kenny, 1986). Most importantly, this article sets the procedure which not only has been followed for mediation analysis over the last 25 years, but is still being followed in its original shape by a vast majority of academia and researchers all over the globe.

The procedure set for mediation analysis in the Baron and Kenny's (1986) classical research article has not been without criticism (MacKinnon and Fairchild, 2009; Hayes, 2009; Bullock, Green, & Ha, 2010; Zhao, Lynch and Chen, 2010), and thanks to those critics, that Kenny (2012) had to bring a number of modifications and improvements in his today's contemporary mediation analytic procedure. The purpose of this paper is to present a comparison of what Baron and Kenny (1986) had originally proposed, and what Kenny (2012) has now suggested after incorporating critics' concerns.

For this purpose, the two approaches of meditational analysis, classical and contemporary, have been practically applied on an organizational justice - trust in supervisor - employees'

job satisfaction case, wherein variable 'trust in supervisor' is being taken to mediate (as M-variable) between the various facets of organization justice (X-variable) and employees' job satisfaction (Y-variable).

B. Organizational justice - trust in supervisor - employees' job satisfaction

The theory of organizational justice is concerned with the employee perceptions of the fairness of work-related issues; this concept has evolved over the years, from two dimensions in 1970s to three dimensions in 1980s and finally to four dimensions in the 1990s. Today, justice scholars generally agree that organizational justice is comprised of four major dimensions, namely distributive justice, procedural justice, interactional justice and informational justice. Its first facet, distributive justice, refers to the perceived fairness of decision outcomes such as pay, recognition, promotions, performance appraisal, and rewards. Employees compare the ratio of their inputs (efforts) and outcomes (rewards) to that of a referent employee. Procedural justice refers to the perceived fairness of the decision-making processes and procedures. Interactional justice refers to the respect and propriety of the relationship between employees, and their supervisors and managers, and the assessment that relationships are disrespectful or improper leads to perceptions of unfair treatment. Informational justice refers to the truthfulness and justification of information provided to employees, and the assessment that information is inadequate or untrue leads to perceptions of unfair treatment (Bies & Moag, 1986; Greenberg, 1990; Greenberg, 1993; Colquitt, 2001; Colquitt & Shaw, 2005).

The experts in the area have found various facets of organizational justice linked with key organizational outcomes, including job satisfaction, organizational citizenship behavior, commitment, favorable assessment of supervisors, and trust. Perceived unfair treatment, in contrast, has been shown to lead to counterwork behaviors such as sabotage, intention of quitting, and antisocial behavior (Ambrose, Seabright and Schminke, 2002; Greenberg, 1997; Greenberg and Lind, 2000; Henle, 2005). Organizational justice has become such an important topic in organizational research that there have been more than 500 research articles written and more than 20 books devoted to this topic up to 2005 (Colquitt, Greenberg & Scott, 2005).

The discussion in the preceding section on various facets of organizational justice and its outcomes naturally brings up a question to the forefront: whether or not these facets of organizational justice prevail in Pakistani organizations, and if they do, then whether or not the levels of their prevalence are sufficiently enough to determine employees' job satisfaction. Since, in almost all facets of organizational justice, supervisors are supposed to play positive role, trust-in-supervi-

sor is therefore included to test its role as mediator between organizational justice and job satisfaction.

C. Research questions

While pursuing the following research questions, we will demonstrate what has been the Baron and Kenny's (1986) procedure of analyzing mediation, and what improvements Kenny (2012) has brought in the procedure.

- Do the four facets of organizational justice prevail to the extent to determine employees' job satisfaction in Pakistani organizations?
- Does the 'trust in supervisor' mediate between the various facets of organizational justice and job satisfaction?
- Does the Kenny's (2012) mediation analysis yield better results relative to what Barron and Kenny's (1986) procedure provides?

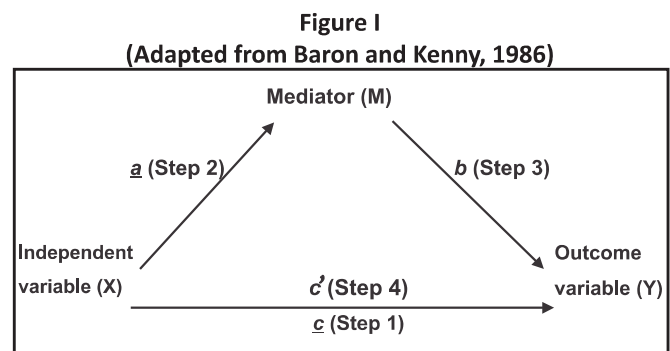
D. Organization of research

After having presented introductory material in this part, Part II and III of this paper will, respectively, demonstrate Barron and Kenny's (1986) and Kenny's (2012) applications, while Part IV will summarize the findings and conclude on the topic.

B. APPLICATION OF BARON AND KENNY'S (1986) MODEL

A. Baron and Kenny's (1986) model

As already discussed, Baron and Kenny (1986) have originally contributed the basic model for testing of the mediational effect of some variable, like the one we have introduced in our above given research question 2. To clarify the estimation procedure of mediation, the researchers introduced the following path diagram (Figure I).



Baron and Kenny's (1986) mediation analysis requires taking four distinct and consecutive steps for establishing mediation; these steps are, as follows (Judd and Kenny, 1981; Baron

and Kenny, 1986; Kenny, 2012):

First, initially in step 1, it is required to show that some initial variable (X) is correlated with the outcome variable (Y); that means estimating and statistically testing path c for $H_0: c = 0$, in the above figure, suggesting that there is an effect (c) that may be mediated.

Second, step 2 should show that the initial variable (X) is correlated with the mediator (M); that means estimating and statistically testing path a for $H_0: a = 0$, suggesting to treat the mediator as if it were an outcome variable.

Third, step 3 should show that the mediator (M) affects the outcome variable (Y), while initial variable (X) is used as control variable; that means estimating and testing path b for $H_0: b = 0$; suggesting that M-variable may affect Y.

Fourth, step 4 is required to establish that M-variable completely mediates the X-Y relationship; that means estimating and testing path c' – the coefficient of X-variable while controlling for variable M; path c' should be zero for complete mediation, otherwise not.

The Baron and Kenny's (1986) four steps narrated above necessitate that:

- The relationships between variables X, M and Y be established through regression analysis;
- Statistical significance of the paths (c, a, b & c') be established using proper procedure, that is, evaluating via $H_0: c = 0; a = 0; b = 0; c' = 0$.
- In case $c \neq 0$ in step 1, $a \neq 0$ in step 2, $b \neq 0$ in step 3 and $c' = 0$ in step 4, there would be complete mediation; otherwise, in case of $c' \neq 0$ in step 4, there would be partial mediation.

B. Applying Baron and Kenny's (1986) model

We now apply Baron and Kenny's (1986) analytic framework to establish whether 'trust in supervisor' (TS) mediates the relationship between four facets of organizational justice - distributive justice (DJ), procedural justice (PJ), interactional justice (IJ) and informational justice (INJ) – and employees' job satisfaction (JS). Figure II represents the case, with various paths to be evaluated as per discussion made earlier.

The above graphical representation of the variables X-Y relationship, via a moderator M, requires estimation of an econometric model specified as follows:

Step 1:

$$JS = c_0 + c_1DJ + c_2PJ + c_3IJ + c_4INJ + e_1 \quad (1)$$

Step 2:

$$TS = a_0 + a_1DJ + a_2PJ + a_3IJ + a_4INJ + e_2 \quad (2)$$

Step 3 & 4:

$$JS = c'_0 + c'_1DJ + c'_2PJ + c'_3IJ + c'_4INJ + bTS + e_3 \quad (3)$$

II. ESTIMATING THE MODEL/EMPIRICAL RESULTS

A. Data collection measures/constructs

In order to estimate the relationship specified in Figure 2 and econometric models 1 – 3, the required data were collected from 276 employees relating to both public and private sector organizations situated in Rawalpindi-Islamabad area, using the measures on JS, TS, DJ, PJ, IJ and INJ as parts of a self-administered Likert-scale questionnaire, provided in Appendix IV.

B. Data Reliability test

The respondents' responses on the respective elements of all six measures (JS, TS, DJ, PJ, IJ and INJ) were tested for reliability, and the Cronbach's alphas were estimated (appendix I). According to Uma Sekaran (2003), the closer the reliability coefficient Cronbach's alpha gets to 1.0, the better is the reliability. In general, reliability less than 0.60 is considered to be poor, that in the 0.70 range, acceptable, and that over 0.80 are good. The reliability tests of our measures/constructs happened to be in the acceptable-to-good and very-good range. After having reliability tests of all measures/constructs in good ranges, data on elements of constructs were averaged row-wise to generate data on respective variables, namely 'Job Satisfaction' (JS), 'Trust in Supervisor' (TS), 'Distributive justice' (DJ), 'Procedural justice' (PJ), 'Interactive justice' (IJ) and 'Informational justice' (INJ).

C. Regression analysis and results

According to the two research questions set earlier for this research, the researchers need to test the following respective hypotheses:

H_1 : *The four facets of organizational justice prevail to the levels that seem sufficiently enough to determine employees' job satisfaction in Pakistani organizations*

H_2 : *Trust-in-supervisor plays mediating role between the four facets of organizational justice and employees' job satisfaction.*

As per hypothesis H_2 , if one is interested to test whether a variable is mediating or not, then, according to Baron and

Kenny's (1986) model, a 3-step regression needs to be run, as discussed earlier. Doing so yielded the following empirical results:

Step 1:

$$\begin{aligned}
 JS &= c_0 + c_1DJ + c_2PJ + c_3IJ + c_4INJ + e_1 \\
 &= 2.155 + 0.092DJ - 0.010PJ + 0.071IJ + 0.278INJ \\
 &\quad (0.045) \quad (-0.042) \quad (0.0385) \quad (0.0658) \\
 &\quad (2.045) \quad (-0.237) \quad (1.8420) \quad (4.2260) \\
 &\quad (0.042) \quad (0.8140) \quad (0.0670) \quad (0.0000)
 \end{aligned}$$

$$F = 21.055 \quad (p = 0.000) \quad R^2 = 0.237 \quad R^2_{\text{adjusted}} = 0.226 \quad (4)$$

(Figures in the 1st, 2nd and 3rd parentheses, respectively, are standard errors, t-ratios & p-values)

The estimated model 4 is found statistically significant ($F = 21.055$, $p < 0.001$). With the exception of variable procedural justice (PJ), all other three components of organizational justice statistically significantly contribute towards job satisfaction. Informational justice (INJ) has the greatest contribution ($c_4 = 0.278$, $p < 0.001$), followed by distributive justice (DJ; $c_1 = 0.092$, $p < 0.05$) and interactional justice (IJ; $c_3 = 0.071$, $p < 0.10$).

Step 2:

$$\begin{aligned}
 TS &= a_0 + a_1DJ + a_2PJ + a_3IJ + a_4INJ + e_2 \\
 &= 1.770 + 0.037DJ - 0.042PJ + 0.063IJ + 0.322INJ \\
 &\quad (0.4551) \quad (0.0437) \quad (0.0396) \quad (0.0673) \\
 &\quad (0.8130) \quad (-0.962) \quad (1.5890) \quad (4.7850) \\
 &\quad (0.4170) \quad (0.3370) \quad (0.1130) \quad (0.0000)
 \end{aligned}$$

$$F = 24.270 \quad (0.000) \quad R^2 = 0.264 \quad R^2_{\text{adjusted}} = 0.253 \quad (5)$$

Model 5 is found statistically significant ($F = 24.270$, $p < 0.01$). However, with the exception of informational justice (INJ) variable, all other three components of organizational justice have turned out to be statistically insignificant. INJ variable has the greatest contribution ($a_4 = 0.332$, $p < 0.001$), followed by others with statistically negligible contributions.

Step 3 (& 4):

$$\begin{aligned}
 JS &= c'_0 + c'_1DJ + c'_2PJ + c'_3IJ + c'_4INJ + bTS + e_3 \\
 &= 1.891 + 0.086DJ - 0.016PJ + 0.062IJ + 0.230INJ \\
 &\quad (0.0444) \quad (0.0413) \quad (0.039) \quad (0.0679) \\
 &\quad (1.9370) \quad (-0.387) \quad (1.610) \quad (3.3870) \\
 &\quad (0.0540) \quad (0.6990) \quad (0.109) \quad (0.0010)
 \end{aligned}$$

$$\begin{aligned}
 &+ 0.150TS \\
 &\quad (0.0588) \\
 &\quad (2.5500) \\
 &\quad (0.0110)
 \end{aligned}$$

$$F = 18.487 \quad (0.000) \quad R^2 = 0.255 \quad R^2_{\text{adjusted}} = 0.241 \quad (6)$$

Model 6 is found statistically significant ($F = 18.487$, $p < 0.01$). According to step 3, the contribution of TS variable is substantial and statistically significant ($b = 0.150$, $p = 0.011$). In accordance with step 4, with the inclusion of variable 'Trust in supervisor' (TS), the contributions of DJ, IJ and INJ variables have decreased from $c_1 = 0.092$, $c_3 = 0.071$ and $c_4 = 0.278$ (Step 1) to $c'_1 = 0.086$, $c'_3 = 0.062$ and $c'_4 = 0.230$ (step 3), respectively; however, the latter c' have not turned out to be statistically equal to zeros – the condition for complete mediation. This fulfils the condition for 'Trust in supervisor' (TS) of being a mediator, and since the contributions of DJ and INJ variables are still statistically significant, the TS variable is therefore partially mediating. As far as hypotheses H_1 and H_2 are concerned, both hypotheses are accepted; however, the former one is fully accepted while the latter one partially.

C. APPLICATION OF KENNY'S (2012) PROCEDURE

The aforementioned analysis was carried out in accordance with Baron and Kenny's (1986) paper; however, Kenny (2012) makes a number of noticeable changes in the Baron and Kenny's (1986) earlier procedure of mediation analysis; these changes are discussed, as follows:

According to Baron and Kenny (1986), 'A variable functions as a mediator when it meets the following conditions:

- variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., Path a);
- variations in the mediator significantly account for variations in the dependent variable (i.e., Path b)
- when Paths a and b are controlled, a previously significant relation between the independent and dependent variables is no longer significant, with the strongest demonstration of mediation occurring when Path c is zero.

According to Kenny (2012):

- 'We note that Baron and Kenny (1986) steps are at best a starting point in a mediational analysis. More contemporary analyses focus on the indirect effect'.
- 'Note that the steps are stated in terms of zero and nonzero coefficients, not in terms of statistical significance'.
- 'Most contemporary analysts believe that the essential steps in establishing mediation are Steps 2 and 3', and not Step 1 and 4.

A. Estimation of direct, indirect and total effect

Kenny (2012), whereas asks for not emphasizing on statistical significance of the estimated coefficients (c , a , b & c'), he

gives more importance to measuring of total effect of X on Y through Path c, and its decomposition in to direct effect of X on Y through Path c' and indirect (meditational) effect through a measure ab (product of a & b); hence:

$$\begin{aligned} \text{Total effect} &= \text{Direct effect} + \text{Indirect effect} & (7a) \\ c &= c' + ab & (7b) \end{aligned}$$

where c, c', a and b have already been introduced in the earlier sections. However, the equality of equation 7 holds in certain conditions and does not hold in others. This equation exactly holds in: (a) multiple regression and structural equation modeling (SEM) without latent variables; (b) when same cases are used in all the analyses; and (c) when the same co-variables are used in all the equations. While the two sides of the equation are only approximately equal for multilevel models, logistic analysis and structural equation modeling with latent variables included. For the latter models, "it is probably inadvisable to compute c from Step 1, but rather c should be inferred to be c' + ab, and not directly computed" (Kenny (2012)). Since, in majority of the cases, the three coefficients (c', a & b) would suffice, and for that, the required steps are steps 2 and 3, and not steps 1 and 4. However, it seems necessary that the product term ab, which measures indirect or mediational effect, be checked for its statistical significance by (i) checking of significance of coefficients a and b individually, (ii) Sobel test for mediation and/or (iii) bootstrapping.

B. Applying Kenny's (2012) procedure

As discussed above, Kenny's (2012) contemporary mediation analysis requires putting values of c' and a and b coefficients in model 7, and solving it for total effect c, and then decomposing the total effect in to its direct (c') and indirect effects (ab), using the following formulas.

$$\text{Direct effect (\%)} = (c'/c) \times 100 \quad (8a)$$

$$\text{Indirect effect (\%)} = (ab/c) \times 100 \quad (8b)$$

The values of c', a and b, required for substituting in models 7 and 8 (a – b), are already available in estimated models 4 – 6; however, it should be noted that the contribution of variable PJ appears extremely insignificant (equal to zero), in all the three estimated models (4 – 6), relative to other three facets of organizational justice (DJ, IJ & INJ). Additionally, the coefficient of this variable (PJ) carries a negative sign, which makes it 'inconsistent candidate' for mediation analysis; Kenny (2012) discusses a number of such 'inconsistent mediation' cases in his webpage. Appendix II uses formulas 7 and 8 (a – b) and provides estimates of direct and indirect effects, suggesting that variable DJ, IJ and INJ apparently exert 93.94 percent, 86.77 percent and 82.64 percent direct effect, respectively, while the indirect (meditational) effect of 'trust in supervisor'

relative to these variables estimates at 6.06 percent, 13.23 percent and 17.36 percent, respectively. Whether the variable 'trust in supervisor' (TS) significantly mediates towards the respective total effects of each of the three facets (DJ, IJ & INJ) of organizational justice, Kenny (2012) suggests to check the statistical significance of their respective indirect effects 'ab', using one of the following measures.

- a) Testing a and b separately
- b) Using Sobel test
- c) Bootstrapping

We carry out the first two tests here, as under.

C. Testing a and b separately

As one way to test $H_0: ab = 0$, is to test $a = 0$ and $b = 0$; according to Kenny (2012), a number of other researchers, including Fritz and MacKinnon (2007) and Fritz, Taylor and MacKinnon (2012) strongly urge that researchers use this test in conjunction with other tests, such as Sobel test.

Hypothesis $H_0: a = 0$ has already been tested in Step 2; estimated model 5 indicates that p-value of a4 and a3, which relate to variables INJ and IJ, respectively, are 0.00 and 0.113, and that of a1, which relates to variable DJ, is statistically insignificant.

Hypothesis $H_0: b = 0$ has already been tested in Step 3; estimated model 6 indicates that p-value of b, relating to mediation-variable TS, is 0.011.

On the basis of this approach, the indirect/mediational effect (ab) of variable INJ appears to be strongly statistically significant, followed by variable IJ, which seems to be moderately significant, while variable DJ happens to have little mediational effect.

D. Sobel test

To check $H_0: ab = 0$, Sobel test uses the following test statistic.

$$\text{Test: } Z_{ab} = ab/s_{ab} \quad (9a)$$

which follows Z-distribution, that is, ab/s_{ab} will fall within $1.96 \pm$ interval for an $ab = 0$; otherwise, it will fall outside of the stated interval. Where s_{ab} has to be computed, using the formula:

$$s_{ab} = \sqrt{(a^2s_b^2 + b^2s_a^2)} \quad (9b)$$

where s_a and s_b are the standard errors of a and b, respectively. Appendix III provides detailed computations done for

Sobel test, using formulas given in 9 (a & b). Statistic Z_{ab} , computed for mediational effect (ab) of TS on variables DJ and IJ, falls within the $1.96\pm$ interval, and that of variable INJ outside of the interval, suggesting that the mediational effects in respect of the former two variables are statistically insignificant, and latter variable significant.

III. SUMMARY AND CONCLUSION

The purpose of this paper, as explained in Part I, has been to demonstrate and compare the applications of Barron and Kenny's (1986) classical methodology of mediation analysis and the one Kenny (2012) has called contemporary mediation analysis. Part II and III of the paper, respectively, provide detailed applications of the two approaches, classical and contemporary, using the same case of organizational justice – employees' job satisfaction relationship via the mediational role of trust-in-supervisor. The two referred parts of the paper have explained the differences of the two approaches in detail; this part reproduces the differences in summarized form along with the explanation as to how and why the contemporary mediational analysis has certain edge over the classical one.

First, the classic approach required the estimation of the four paths (c , a , b & c'), through four steps (Steps 1, 2, 3 & 4) and three regression equations (Equations 1 to 3 or Equations 4 to 6), and their testing for statistical significance. The contemporary mediation analysis has shortened the paths from four to three (a , b & c'), requiring only two steps (Steps 2 and 3), and two regression equations, declaring the first equation as unnecessary.

Second, the classic approach required that path b needs to become statistically significant and path c' insignificant in step 3 & 4 for a complete mediation; contemporary approach asks for adding c' with ab for determining total effect c , and then decomposing c in to direct effect (c'/c) and indirect or mediational effect (ab/c).

Third, contemporary approach requires that mediation effect ab needs to be tested for non-zero, using diagnostic methods, including (i) testing a and b for non-zeros, separately, (ii) running Sobel test and (iii) performing Bootstrapping.

Fourth, whereas classic approach aimed at solving for full or partial mediation in abstract form, the contemporary approach has the edge over the classic, in quantifying the mediation effect (ab). In case of our solved example, classic approach could only help to indicate that 'trust-in-supervisor variable is partially mediating', while in case of contemporary approach, mediation effect of this variable for INJ facet of organizational justice was not only quantified (17.36%) and tested for its non-zero effect, but zero-effect of other two fac-

ets, DJ and IJ, were differentiated.

APPENDIX I RESULTS OF RELIABILITY TEST

Construct	Cronbach's alpha
Job Satisfaction (JS)	0.739
Trust in supervisor (TS)	0.692
Distributive Justice (DJ)	0.828
Procedural Justice (PJ)	0.890
Interactional Justice (IJ)	0.920
Informational Justice (INJ)	0.834

APPENDIX II TOTAL, DIRECT AND INDIRECT EFFECTS

Coefficients	DJ	IJ	INJ
a	0.037	0.063	0.322
b	0.15	0.15	0.15
c'	0.086	0.062	0.23
ab	0.00555	0.00945	0.0483
$c = (c' + ab)$	0.09155	0.07145	0.2783
Direct effect (c'/c)	0.93938	0.86774	0.82645
%	93.94	86.77	82.64
Indirect effect (ab/c)	0.06062	0.13226	0.17355
%	6.06	13.23	17.36

APPENDIX III COMPUTATIONS FOR SOBEL TEST

Sobel test computations	DJ	IJ	INJ
a^2	0.001369	0.003969	0.103684
b^2	0.0225	0.0225	0.0225
s_a	0.045510455	0.039647577	0.06729363
s_b	0.058823529	0.058823529	0.05882353
s_a^2	0.002071202	0.00157193	0.00452843
s_b^2	0.003460208	0.003460208	0.00346021
$a^2 s_b^2$	4.73702E-06	1.37336E-05	0.00035877
$b^2 s_a^2$	4.6602E-05	3.53684E-05	0.00010189
s_{ab}	0.007165128	0.007007282	0.02146294
Z_{ab}	0.774584912	1.348597125	2.25039044

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Note: The 2nd author, Mr. Shujahat Haider Hashmi, has developed macros for estimation of 'Total, direct and indirect effects' (Appendix II) and carrying out 'Sobel test' (Appendix III), and the both of these macros are being placed at this Journal's website for use by the interested researchers on mediation analysis.