

Organizational Behavior: Science or Scientism?

Nadin Beckmann

*Accelerated Learning Laboratory
Australian Graduate School of Management
University of New South Wales
Sydney NSW 2042 Australia
Telephone work: 61 2 9931 9187
Facsimile: 61 2 9931 9199
Email: nadinb@agsm.edu.au*

Robert E. Wood

*Accelerated Learning Laboratory
Australian Graduate School of Management
University of New South Wales
Sydney NSW 2042 Australia
Telephone work: 61 2 9931 9190
Facsimile: 61 2 9931 9199
Email: rwood@agsm.edu.au*

Amirali Minbashian

*Accelerated Learning Laboratory
Australian Graduate School of Management
University of New South Wales
Sydney NSW 2042 Australia
Telephone work: 61 2 9931 9181
Facsimile: 61 2 9931 9199
Email: amiralim@agsm.edu.au*

Organizational Behavior: Science or Scientism?

ABSTRACT

The belief that OB is more than a set of applied techniques and claims to it being a science rest primarily on the validity of the explanatory mechanisms used to explain how personal and situational factors influence outcomes of interest in organizations, such as job performance and citizenship. Within OB, explanatory mechanisms are typically referred to as mediators and are tested using mediation analysis. A review of mediation analyses over the past 25 years revealed the state of knowledge does not support claims to scientific status by OB. We argue that if OB is to achieve the scientific goal of understanding it needs to improve the validity of inferences about its explanatory mechanisms. We provide recommendations for achieving this aim.

Keywords: Basic versus applied research, explanatory mechanisms

The belief that OB is more than a set of applied techniques and claims to it being a science rest primarily on the validity of the explanations it yields for organizational phenomena. In the first part of the paper we contrast two views of science, and outline their implications for the way in which OB research is conducted. According to the first view, OB can be conceptualized as an applied science that is concerned with what works, but less concerned with why it works. The second view, on the other hand, allows OB to take on both, an explanatory function as well an applied focus. Consistent with this latter view, we argue in this paper that current OB research has sought to move beyond descriptions and predictions of phenomena to provide insight into the explanations for how situational and personal factors influence organizational outcomes, such as job performance and citizenship.

Although, testing explanatory mechanisms has become increasingly important to the ‘scientific’ status of the field¹, the pursuit of explanations of organization phenomena without proper adherence to the rigors of the scientific method exposes OB to claims of scientism. The second part of the paper evaluates how well OB researchers have achieved the aims of scientific explanation. We outline the findings of a recent review of studies that have included tests of explanatory mechanisms (Wood, Goodman,

¹ In this paper we limit our arguments to empirical research that employs statistics for inferences regarding the validity and generalizability of effects, that is theory testing. While qualitative research is essential to theory building and other critical forms of understanding, it lays outside the scope of the present set of arguments.

Beckmann & Cook, 2006). Based on these results, we call into question the validity of many claims regarding explanatory mechanisms within OB. This leads us to recommend that the OB researchers pause and reflect on the scientific aims of the field and reevaluate the way in which they obtain knowledge about explanatory mechanisms.

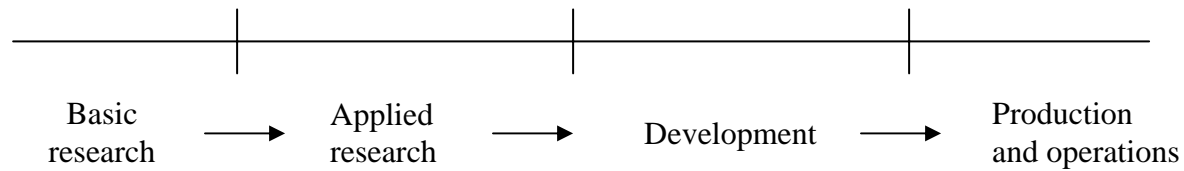
BASIC SCIENCE AND APPLIED SCIENCE

“Every new product—from software to widgets—goes through a cycle that begins with basic research, then applied research, then incubation, then development, then testing, then manufacturing, then deployment, then continuation engineering in order add improvements. Each of these phases is specialized and unique.”

Friedman, 2005, pp29-30

The opening quote from the highly popular book *The World is Flat*, reflects a common view on the relationship between basic science, applied science and application. It is a view that has long shaped OB research (e.g., McGrath, 1979) and draws extensively on basic findings from a variety of disciplines (see Figure 1A). According to this view, there is an inherent tension between basic research and applied research that derives from the contrasting goals of a science that is directed toward understanding and a science that is intended for use (see Stokes, 1997). Specifically, there are three main ideas in the view of research portrayed in Figure 1A that are relevant for our argument. First, that basic research is a search for explanations of how phenomena work without consideration of practical applications, which can constrain the discovery process. The extreme of this position is characterized by the quote “Here’s to pure mathematics, may it never be of use to anyone”. Basic psychological research on human perceptual biases (Kahneman & Tversky, 2000), affect processing (Forgas, 1995) and attribution processes (Weiner, 1986) are just few examples of basic research in psychology that has shaped applied research in OB in ways that were not considered when that research was undertaken and may have been more narrowly focused and less useful had they been.

A. Linear Model



B. Quadrant Model

		Considerations of uses?	
		No	Yes
Quest for fundamental Understanding?	Yes	Pure basic research (e.g., social perception)	Use-inspired basic research (e.g., motivation)
	No		Pure applied research (e.g., personnel selection)

Figure 1: Linear (A) and quadrant (B) models of scientific research. Adapted from Stokes (1997).

The second idea is that applied research is a search to discover what works in practice, which leads to new technologies that are of practical benefit, without consideration of the processes by which the technologies produce the desired outcomes. A case in point is the large body of research that relates individual differences in human skills, abilities, and personal characteristics to organizational behavior (e.g., Schmidt & Hunter, 1998; Schmitt, Gooding, Noe, & Kirsch, 1984). The assessment of individual differences in personnel selection is based on predictive validity and not on the validity of explanation of why a particular personal factor influences job performance. Ilgen (2000) notes that “what passes for theory in this domain often is little more than a taxonomy to be judged primarily on its utility for guiding practices at work than on its ability to explain human behavior” (p. 256). As the Ilgen (2000) comment illustrates, basic science can be differentiated from applied science by theory that includes causal mechanisms that explain how independent variables influence the outcomes or dependent variables of interest.

The third idea in the opening quote is that basic research provides research findings to be converted into new practices and tested in applied settings by applied researchers. The previously mentioned basic work on attribution theory is a good example of how basic research findings, such as the fundamental attribution error and self versus other biases, shaped the ideas for practice and theorizing of OB researchers on applied topics like leadership (Mitchell, Green & Wood, 1981) and performance appraisal (Feldman, 1981). An extension of this idea is that OB will not be a true science until it has developed and tested theories that contain explanatory mechanisms describing how personal and situation factors influence outcomes of interest.

The view that an applied science like OB is a product of basic research is not universally accepted. Many science historians have questioned the assumption that the primary influence necessarily flows from basic sciences to applied science and not the reverse, and that the two areas of research are separate and unique. For example, Stokes (1997) proposed a view in which basic and applied research are not seen as opposite ends of a single dimension but rather as two relatively independent dimensions that together form the Quadrant Model of Research shown in Figure 1B. Consequently, according to Stokes science does not need to be confined to either being applied or

basic, but that it can have characteristics of both. Moreover, it is also possible that progression can flow in the reverse direction, from applied science to basic science.

Within OB, much that passes as valid and useful knowledge has emerged from studies of what works without any attention to how or why it works. A case in point is the research on personality and work performance. Much of the research on the Big Five personality variables that was conducted by organizational researchers during the 1990's had a particularly applied focus in that it sought to evaluate the validity and utility of these personality dimensions for predicting important organizational outcomes, such as job performance (e.g., Hertz & Donovan, 2000; Mabon, 1998; Salgado, 1997). Having established the validity of these instruments, a moratorium was then called on further research of this type and a recommendation was made for studies that attempted to explain the mechanisms through which personality relates to behavior at work (Barrick, Mount, & Judge, 2001). That is, finding from applied science research on the effects of personality became a basis for more basic research into the processes through which those effects occur. Similarly, a number of original ideas within the management field—such as Six Sigma and Management By Objectives—originally came from the need to solve applied problems but were then refined by basic science. Consequently, OB research is best characterized as combining both basic and applied aspects of science, and some of the major contributions in practice have emerged from research that, initially at least, ignored explanatory mechanisms. The research focused on what worked and not why it worked, at least not until it had been shown to work.

To summarize, although OB has traditionally been placed within the domain of “pure applied research” (quadrant III see Figure 1A), and despite the major contribution to applied research targeted at practical problems, OB researchers have increasingly focused on the study of explanatory mechanisms within their field.

EXPLANATORY MECHANISMS IN OB

Above it was noted that a fundamental characteristic of basic research, and one that distinguishes it from applied research, is that it seeks understanding of some phenomenon. Consequently, a measure of how well OB has accomplished its move to “use inspired basic research”

(quadrant II, Figure 1B) is reflected in the validity of the explanatory mechanisms employed to understand how personal and situational factors influence outcomes of interest in organizations.

Within OB, explanatory mechanisms are typically referred to as mediators and are tested using mediation analyses (e.g., Baron & Kenny, 1986). Mediation is defined as occurring when the effects of one variable on another are explained by a third, intervening variable (Baron & Kenny, 1986; Kenny, Kashy, & Bolger, 1998; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Wood et al., (2006) reviewed 409 mediation studies published in leading OB journals (JAP, OBHDP, AMJ, PPsych and ASQ) for the 25 years from January, 1981 to August, 2005. On the basis of their analyses of the characteristics of those studies, the authors reported five conclusions about the conduct and reporting of research that hypothesized and tested explanatory mechanisms.

1. Incomplete testing of statistical conditions. Research methodologists have recommended a set of conditions that need to be satisfied to establish mediation (Baron & Kenny, 1986; James & Brett, 1984; MacKinnon, et al., 2002). At least 48% of all claims regarding the role of explanatory mechanisms (mediators) were based on incomplete testing of conditions, compared to the recommended procedures for testing mediation (Baron & Kenny, 1986; James & Brett, 1984; MacKinnon, et al., 2002).
2. Inappropriate bases of claims for mediation. Having established the conditions for mediation, there are specific tests that can be conducted to determine the statistical significance of the observed mediation effect. Only 9% of the reported effects included some significance test of the mediation effect. Therefore, the majority of the conclusions that were drawn about mediation are potentially invalid.
3. Inappropriate testing of complex mediation models. Mediation models can either be of a simple form (i.e., one independent variable, one mediator, and one dependent variable), or of a more complex form (i.e., several independent variables, and/or mediators and/or dependent variables). More than a quarter of all hypothesized models were of a complex form, however, were broken down into simple form for testing purposes (X-M-Y). Only one study in which this was done

included Bonferroni corrections for the family-wise Type-I error rate that can occur when conducting multiple, related tests, suggesting that some of the claims of mediation may have capitalized on chance effects.

4. Inappropriate bases for claims of causality. Claims of causality were made or implied for 66% of all mediation models tested. Just over half of these claims of causality were for models tested in non-experimental designs, including models which did not comprise the conditions required for inferences of causality (e.g., proper specification of causal order, non-spurious relationship, strong theory; see Cohen, Cohen, West, & Aiken, 2003) in relation to the explanatory mechanisms tested.
5. Incomplete reporting of results. In more than half of the studies, the reporting of the results of the mediation analysis was incomplete in one or both of two ways. First, inadequate description of the conditions tested in the analyses made it difficult to ascertain what was done. For example, a large number of studies did not explicitly specify any of the equations that were tested as part of the mediation analyses. Second, the reports of statistical results were incomplete and did not present enough information for the reader to be clear about the grounds for inferring support for either full or partial mediation (e.g., inconsistent sample sizes across conditions tested, provision of path diagrams without related tables containing the full regression analyses).

A sixth finding was identified in supplementary analyses of the data on which the Wood et al., (2006) findings were based.

6. Lack of replication of mediation effects. The frequency of various mediator labels in 57% of the studies was also examined. Only two mediators were observed more than ten times—self-efficacy (16 times) and justice-related perceptions (12 times). A number of goal-related mediators were studied under different labels such as goal commitment, goal difficulty, and goal content none of which occurred more than ten times. However, when aggregated, the goal category as a whole was

observed 13 times. Across the studies noted numerous mediators were hypothesized and tested, many with no replication. The diversity of hypothesized explanations and lack of replication means that the accumulation of knowledge about how situational and personal factors influence organizational outcomes has been minimal.

In summary, the Wood, et al (2006) and supplemental analyses of 25 years of empirical research shows that there has been very little focus or replication in the testing of explanatory mechanisms and that a majority of conclusions regarding explanatory mechanism in OB are of questionable validity due to: (1) incomplete or inaccurate application of defined approaches for testing mediation; (2) basing claims of mediation on changes in the magnitude of coefficients, without testing the significance of that change; (3) using procedures developed for simple mediation models ($X \rightarrow M \rightarrow Y$) to test complex models, instead of using available procedures for the analyses of complex models; and (4) making causal claims when conditions for causality are not met. In addition, (5) the incomplete descriptions of the conditions for inferences of mediation followed and the incomplete or inefficient reporting of results of mediation tests make it difficult for readers to judge the validity of mediation inferences and impede the accumulation of knowledge across studies. These findings lead to the conclusion that OB is still a long way from achieving the desired status as a scientific field. In the next section we outline a set of recommendations that we hope will improve the validity of knowledge about explanatory mechanism within the field of OB and move us toward the goal of becoming a science.

SOME RECOMMENDATIONS

Having identified the problems raised by the Wood et al (2006) and supplemental analyses, we need to present solutions. Table 1 and 2 offer specific solution that we believe will lead to more systematic identification and testing of explanatory mechanisms and, as a result, to the more rapid accumulation of knowledge. Table 1 presents a set of simple recommendations that are targeted at the limitations in current studies described in points 1 to 6 in the previous section; Table 2 outlines an integrating framework for OB, which will discuss in more detail below.

Table 1: Recommendations Targeted at the Limitations in Mediation Studies Within the OB Literature

Limitation	Recommendation
Incomplete testing of statistical conditions	As a general rule, authors should abide by all of the conditions specified by the statisticians whose work they cite. Readers should consult MacKinnon et al. (2002) for available options and a statistical comparison of the options. When authors choose to skip a condition or test, the approach should be explicitly acknowledged and justified.
Inappropriate bases of claims for mediation	Inferences of full, partial and no mediation should be grounded in sound statistical testing. The significance of the mediation effect can be tested using a difference of coefficients test or a product of coefficients test. Product of coefficients tests (e.g., Sobel, 1982) will be significant only when the change in coefficients is also significant, and therefore provide grounds for an inference of significant change. An inference of partial mediation requires that there be a significant change in coefficients plus a remaining significant direct relationship between the independent and dependent variables after controlling for the mediator. Recent methodological articles (James, Mulaik, & Brett, 2006; Mathieu & Taylor, 2006) advocate <i>a priori</i> specification of hypotheses for full mediation, partial mediation or indirect effects and outline strategies for testing these hypotheses using SEM.
Inappropriate testing of complex mediation models	Appropriate tests of mediation should be chosen to accommodate complex models, such as those that include multiple mediators and/or dependent variables. Available options include: (1) the hierarchical regression approach described by Cohen and colleagues (Cohen & Cohen, 1984; Cohen et al., 2003), supplemented with a statistical test for the size and significance of the mediation effect; (2) SEM, if the sample size is sufficiently large and requisite statistical assumptions are met; (3) MacKinnon's (2000) extension of the regression approach for testing multiple mediator models and the methods for estimating individual mediator effects in complex models.
Inappropriate bases for claims of causality	As much as possible, authors should design their studies to meet the conditions for causal inference. Those conditions that are not met should be explicitly acknowledged, and care should be taken to use "non-causal" language when interpreting the results of mediation tests (see James & Brett, 1984). We acknowledge that the very definition of mediation implies causality, and some statisticians argue that conditions for causality are required for valid inferences of mediation (Stone-Romero & Rosopa, 2004). We refer readers to the "Preconditions for Mediation Tests" section of Mathieu and Taylor's (pp. 2-9; 2006) article for a thoughtful treatment of this issue.
Incomplete reporting of results	Complete descriptions of the conditions for mediation authors used (e.g., Baron & Kenny's, 1986, four causal steps conditions) and the associated steps followed in the analyses (e.g., the three regression equations, plus the Sobel test) should be provided in a Method section, and results of analyses should be reported in one, complete mediation table.
Lack of replication of mediation effects	Authors should embed the mediator constructs that they study within the broader accumulative body of knowledge in the field. This would also facilitate the replication of specific mediation effects.

In addition to the methodological issues outlined above, a further challenge is related to the extent to which these mediation studies contribute to the accumulated body of knowledge within the field. The problem stems at least partly from the large number and diverse range of hypothesized explanatory mechanisms that have been studied in separate research silos, such as motivation, leadership, groups and personality. In the absence of an overarching framework for organizing these findings, OB researchers will continue to pursue similar questions under different labels and deny themselves the opportunity to learn from one another and to use our limited resources to develop and explain interventions for improving organizations.

To address this challenge, we provide two recommendations. First, we present one potential organizing framework that researchers may find useful for categorizing mediators (see Table 2). Derived from outside OB, the Knowledge and Appraisal Personality Architecture (KAPA) model (Cervone et al., 2006) provides a useful framework for classifying the various social-cognitive variables often studied in OB. According to this model social-cognitive variables can be classified either as representing enduring knowledge structures, such as self-concepts, or dynamic appraisal processes, such as specific situational attributions. Knowledge structures and appraisal processes can be further categorized according to whether they represent beliefs, evaluative standards, or aims (Cervone, et al. 2006). Table 2 summarizes our categorization, according to the KAPA model, of the most commonly studied mediators in OB over the past 25 years. We believe that similar frameworks for affective units and personal competencies would also be helpful.

A second recommendation following from the previous point is that researchers seek to identify a small set of explanatory mechanisms for explaining behaviour and outcomes in organizations. The work on core self-evaluation (Judge, Locke, Durham, & Kluger, 1998) is one such attempt. If more work is done on a small set of explanatory mechanism it will help the accumulation of knowledge. At the same time, it will free OB researchers up to focus more on what works. The design and testing of interventions based on knowledge of the underlying explanatory mechanisms can be used to make organizations more effective and contribute to better places to work, which is the primary aim of OB research.

Table 2: KAPA Taxonomy Within the Field of OB - Often Studied Explanatory Mechanism From 1980 To 2005

	<u>Beliefs</u> (today's world)	<u>Evaluative standards</u>	<u>Aims/goals</u> (future)
<u>Appraisal processes</u> (dynamic evaluations of the relation between oneself and the world)	Attributions (for job loss, responsibility judgments & justifications) Social perceptions (e.g., evaluations of others, identification processes, trust, interpersonal attraction, perceived similarity) Job & Work Reactions (e.g., job satisfaction) Instrumentality perceptions Control (locus of control, control desired vs. possessed, changes in control, versus risk/risk propensity) Self-efficacy (e.g., computer SE, training SE, collective efficacy) Confidence, (e.g., in decision making, empowerment) Support perceptions (organizational, group/team, leader etc.) Motivation (task, intrinsic motivation, commitment, competitiveness, willingness, job/task importance, initiative) Performance/job/organization evaluations (specific outcome evaluations) Climate perceptions (team, organization)	Justice & fairness perceptions (organizational, group/team, leader etc., e.g., fair-pay perceptions) Perceived job stress (e.g., withdrawal cognitions, psychological distress & psychological strains, role/job overload, life events) Perceived conflicts (e.g., role, task, family-work, intra-group, relationship, psychological contract violations) Costs vs. benefits calculations (personal profit, subjective fit)	Goal setting (e.g., self-set-salary goals) Goal commitment Goal progress Planning (career planning, task panning, perceptions of developmental needs) Expectancies (outcome, performance, self-expectancies) Goal driven motivations Intentions (turnover intentions)
<u>Knowledge structures</u> (mental representations of oneself, others and the world)	Self-concepts (e.g., perceptions of ability & performance) Role definitions (e.g., OCB) Domain-specific knowledge, expertise (based on experience & education) Knowledge & perceptions about the job & organization (job mobility, job security, job autonomy, job authority, job alternatives, job complexity, organizational structure & social network variables)	Communication/cooperation norms & standards (including perceived co-workers permissiveness, subordinates professional orientation) Performance norms & standards (standards of desirable performance) Anticipated rewards Social comparison standards Ethics & morality (social-sexual behaviour & sexual harassment, ethicality, integrity)	Personal goals Values

REFERENCES

- Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51, 1173-1182.
- Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? International Journal of Selection and Assessment, 9, 9-30.
- Cervone, D. Shadel, W. G., Smith, R. E., & Fiori, M. (2006). Self-regulation: Reminders and suggestions from personality science. Applied Psychology: An International Review, 55, 333-385.
- Cohen, J. & Cohen, P. (1983). Applied multiple regression/correlational analysis for the behavioral sciences (2 ed.). Hillsdale, NJ: Erlbaum.
- Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences (3 ed.). NJ: Erlbaum.
- Feldman, J. M. (1981). Beyond attribution theory: Cognitive processes in performance appraisal. Journal of Applied Psychology, 66, 127-148.
- Forgas, J. P. (1995). Mood and judgment: The affect infusion model. Psychological Bulletin, 117, 39-66.
- Friedman, T. L. (2005). The world is flat: A brief history of the twenty-first century. New York: Farrar, Strauss, and Giroux.
- Hurtz, G. M. & Donovan, J. J. (2000). Personality and performance: The Big Five revisited. Journal of Applied Psychology, 85, 869-879.
- Ilgén, D. R. (2000). Industrial and organizational psychology: Theories and methods of study. Encyclopedia of Psychology. Washington, DC: American Psychological Association.
- James, L. R. & Brett, J. M. (1984). Mediators, moderators, and test for mediation. Journal of Applied Psychology, 69, 307-321.

- James, L. R., Mulaik, S. A., & Brett, J. M. (2006). A tale of two methods. Organizational Research Methods, 9, 233-244.
- Judge, T. A., Locke, E. A., Durham, C. C., & Kluger, A. N. (1998). Dispositional effects on job and life satisfaction: The role of core evaluations. Journal of Applied Psychology, 83, 17-34.
- Kahneman, D. & Tversky, A. (2000). Choices, values, and frames. New York: Cambridge University Press (and Russell Sage Foundation).
- Kenny, D.A., Kashy, D.A., & Bolger, N. (1998). Data analysis in social psychology, (pp. 233-265). In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.) Handbook of Social Psychology, (4th Ed). New York: McGraw Hill.
- Mabon, H. (1998). Utility aspects of personality and performance. Human Performance, 11, 289-304.
- MacKinnon, D.A. (2000). Contrasts in multiple mediator models. In J.S. Rose, L. Chassin, C.C. Presson, & S.J. Sherman (Eds.), Multivariate Applications in Substance Use Research: New Methods for New Questions (pp. 141-160). Mahwah, N.J.: Erlbaum.
- MacKinnon, D.A., Lockwood, C.M., Hoffman, J.M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. Psychological Methods, 7, 83-104.
- McGrath, J. E. (1979). Toward a “theory of method” for research on organizations. In R. T. Mowday and R. M. Steers (Eds.), Research in organizations: Issues and controversies. Santa Monica, CA: Goodyear.
- Mathieu, J.E. & Taylor, S.R. (2006). Clarifying conditions and decision points for mediational type inferences in organizational behavior. Journal of Organizational Behavior, 27, 1-26.
- Mitchell, T. R., Green, S.G., & Wood, R. E. (1981). An attributional model of leadership and the poor performing subordinate: Development and validation. In B. Staw and L.L. Cummings (Eds.), Research in Organizational Behavior, 3, 197-234, JAI Press.
- Salgado, J. F. (1997). The five-factor model of personality and job performance in the European community. Journal of Applied Psychology, 82, 30-43.

- Schmidt, F. L. & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. Psychological Bulletin, 124, 262-274.
- Schmitt, N., Gooding, R. Z., Noe, R. A., & Kirsch, M. (1984). Metaanalyses of validity studies published between 1964 and 1982 and the investigation of study characteristics. Personnel Psychology, 37, 407-422.
- Sobel, M.E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), Sociological methodology (pp. 290-312). Washington, DC: American Sociological Association.
- Stokes, D. E. (1997). Pasteur's quadrant: Basic science and technological innovation. Washington, D.C.: Brookings Institution Press.
- Stone-Romero, E.F. & Rosopa, P. (2004). Inference problems with hierarchical multiple regression-based tests of mediating effects. In J. Martocchio (Ed.), Research in Personnel and Human Resources Management (Vol. 23, pp. 249-290). Greenwich, CT: Elsevier.
- Weiner, B. (1986). An attributional theory of motivation and emotion. New York: Springer-Verlag.
- Wood, R. E., Goodman, J. S., Beckmann, N., & Cook, A. (2006). Mediation testing in management research: A review and proposals. Working paper.