Editorial

The beginning of a new editorial term at the *Attitudes and Social Cognition* section of the *Journal of Personality and Social Psychology* (*JPSP*) is a natural occasion for reflection on this journal's mission. My reflection has centered on two points.

First, this journal has traditionally sought to publish articles that make a meaningful theoretical advance by linking empirical findings to underlying processes. Most *JPSP* articles are relatively long and rich, incorporating several studies that not only document a theoretically predicted effect but often offer replications to establish its robustness and perhaps some moderating factors or boundary conditions. Most articles will certainly continue to fit this mold, especially given the recent proliferation of outlets for shorter one- or two-study articles. But, in my view, the inclusion of multiple studies in an article is not a criterion but a means to an end, which is exploring, developing, and validating new theoretical ideas. Sometimes a single-study article can achieve this goal, and I welcome such articles. Conversely, multiple studies that simply replicate a single primary finding uncontextualized by serious theoretical development are not what I am looking for. My goal is for the signature of a *JPSP* article to continue to be a genuine advance in theoretical understanding.

Second, *JPSP* is often regarded as a core service to or resource for our field, meaning personality and social psychology. But *JPSP*'s role and mission extend outside our field. Recent scientometric analyses establish that personality and social psychology as a whole and *JPSP* in particular constitute a hub of science. Focusing specifically on psychology, Yang and Chiu (2009) examined citation data from 17 American Psychological Association journals and concluded that "personality and social psychology is located at the heart of psychological knowledge" (p. 349). *JPSP* is identified as a "knowledge broker" that "absorbed and integrated knowledge from many other subfields and disseminated value-added knowledge to various consumers" (Yang & Chiu, 2009, p. 355). *JPSP* imports knowledge from more basic areas of psychology (e.g., cognitive and neuroscience) and generates results that prove useful to the more applied areas of psychology (e.g., clinical or organizational). The authors noted that

> JPSP, representing personality and social psychology, has been positioned at the center of different fields of psychology . . . personality psychology and social psychology . . . share a holistic perspective on human behaviors, integrate insights from biological and experimental psychology, suggest general principles for intervention in concrete situations, and examine the contextualized nature of basic psychological processes. These may explain why personality and social psychology are situated at the center of psychology. (Yang & Chiu, 2009, pp. 355–356)

Broadening the focus beyond psychology to science in general, Boyack, Klavans, and Börner (2005) used citation information from the Science Citation Index and the Social Sciences Citation Index to map the large-scale structure of science. Their analysis identified hubs, scientific fields on which many other fields depend, as indicated by their journals receiving asymmetrical levels of citation from journals in other fields. Social psychology is one of these hubs on which major fields of science, including communication, sociology, management, clinical psychology, applied psychology, and others, depend. Social psychology is not only at the heart of psychological science but is also a key resource for disciplines across a broad range of the sciences.

Thus, I hope that as authors, reviewers, and editors, we will avoid parochialism and keep our external audiences (as well as our colleague next door) in mind when writing, reviewing, and editing for *JPSP*. As science rapidly becomes increasingly international, integrated, and multidisciplinary, I welcome papers exemplifying an interdisciplinary approach, with teams of authors from different academic specialties and levels of analysis. In such ways, this journal can continue to export powerful theories and empirical findings to broad areas of science and application.

On Mediation

As noted above, explanation of observed effects in terms of underlying processes is almost a signature of articles that *JPSP* has historically published. Only rare articles demonstrate an effect without making at least

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some progress toward identifying the contributing processes. The most common approach to identifying those processes is mediation analysis. Thus, recent developments in both the theory and the methods of mediation analysis are particularly significant for this journal. These developments have been on three fronts.

First, new techniques improve the power and precision of estimating mediating paths (indirect effects) while requiring fewer assumptions than the old Baron and Kenny (1986) approach (see MacKinnon, Fairchild, & Fritz, 2007). Authors should recognize that the Baron and Kenny approach is no longer the state of the art and apply newer, more powerful estimation methods.

Second, Spencer, Zanna, and Fong (2005) and others have addressed the difficulties in justifying stringent causal assumptions in designs in which the mediator is measured and have argued for the usefulness of designs where the hypothesized mediator is manipulated. Where appropriate, authors should consider adopting the experimental approach, which is still underrepresented in the literature compared with measurement of mediation designs.

Third and most important, there is increased recognition of the stringency of the fundamental assumptions underlying mediation analysis (Bullock, Green, & Ha, 2010; Judd & Kenny, 2010). In brief, if the independent variable (X) is manipulated and the mediator (M) and dependent variable (Y) are measured, the usual analysis will be biased if unobserved causes of M are correlated with unobserved causes of Y. Among other things, this assumption implies that X is the only common cause of both M and Y—a strong assumption indeed. It also implies that M is uncorrelated with any unmeasured potential mediators (because mediators, by definition, are causes of Y). These assumptions are not empirically testable within a single study, but if they are invalid, estimates of mediation will be biased. Even experimental mediation designs rest on untestable assumptions. For example, it must be assumed that the manipulation used to vary M affects only M and not other potential mediators (including highly general constructs, e.g., mood, motivation to process information, or general arousal level). Often it will be very difficult to make a persuasive case for these assumptions within the context of a single study. Thus, Bullock et al. (2010) concluded that mediation generally cannot be established with a single statistical procedure, nor within a single study, nor (usually) even in a multistudy article. It is a goal of an entire program of research, probably over several years and often with contributions from multiple laboratories.

Recognition of this fact suggests several changes in current practices. First, authors should follow the recommendations by Bullock et al. (2010, p. 555). In particular, authors should try to make the causal assumptions underlying mediation analyses plausible in the specific situation of their study. These arguments will often not be fully convincing, suggesting that authors and readers should not place too much trust in the exact magnitude of mediation estimates and should consider plausible alternative mediators.

Second, as Judd and Kenny (2010) pointed out, some articles are written in a way that suggests "that there is a statistical 'test' of mediation and that all one needs to do to argue for mediation is to have that 'test' be statistically significant. . . . What the statistics do is estimate and test the indirect path *if the model is true*. However, the model might be wrong in many ways and the statistics never inform us about that" (p. 118, emphasis in original). Language that has such implications should be avoided. Discussion of a mediation analysis can be phrased along the lines of "given these assumptions, here is our estimate of the indirect path," or "these results are consistent with our mediation hypothesis" (not "confirm or establish our mediation hypothesis").

Finally, with the new understanding of the limits on the conclusions that can be drawn from a mediation analyses, I want to emphasize that *JPSP* is open to many different types of evidence relevant to mediation. Most articles that *JPSP* publishes will still offer insights into underlying processes as well as simple demonstrations of an empirical effect, but other approaches besides the typical mediation analysis can do that. Among the many other approaches are process dissociation procedures. Response time or neuroscience-based measures, although they may involve their own potentially problematic assumptions, aim to triangulate processes in other ways, such as brain localization. Literature reviews or meta-analyses can be helpful in showing that across a number of studies, instantiations or variants of the independent variable that have greater effects on the mediator also tend to have greater effects on the dependent variable. Theoretical models of mediation often generate predictions about moderators or boundary conditions; for example, the mediated effect should not occur if individual differences or situational constraints prevent the mediating process from operating. Finally, researchers can use modeling procedures to show that a formal model incorporating a particular mediator generates predictions that fit data, whereas competing models without that mediator fail to fit. This is the characteristic approach in sciences where postulated mediators (e.g., subatomic particles or forces) are not independently observable, but models based on their hypothesized properties can generate specific predictions.

With our growing understanding of the strengths and limitations of different types of evidence for mediation, these recommendations can help all of us (authors, reviewers, and editors) maintain and strengthen

JPSP's irreplaceable role as a repository of our findings and theoretical explanations, both for our own field and for the other disciplines that draw on what we create.

—Eliot R. Smith, Editor, *JPSP–Attitudes and Social Cognition*

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. doi:10.1037/0022-3514.51.6.1173

Boyack, K., Klavans, R., & Börner, K. (2005). Mapping the backbone of science. *Scientometrics, 64,* 351–374. doi:10.1007/s11192-005-0255-6

Bullock, J. G., Green, D. P., & Ha, S. E. (2010). Yes, but what's the mechanism? (Don't expect an easy answer). *Journal of Personality and Social Psychology, 98,* 550–558. doi:10.1037/a0018933

Judd, C. M., & Kenny, D. A. (2010). Data analysis in social psychology: Recent and recurring issues. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., Vol. 1, pp. 115–139). Hoboken, NJ: Wiley.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58,* 593–614. doi:10.1146/annurev.psych.58.110405.085542

Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology, 89,* 845–851. doi:10.1037/0022-3514.89.6.845

Yang, Y.-J., & Chiu, C.-Y. (2009). Mapping the structure and dynamics of psychological knowledge: Forty years of APA journal citations (1970–2009). *Review of General Psychology, 13,* 349–356. doi:10.1037/a0017195