

On the Growth of Psychological Science

September 01, 2007

Being offered the job of editor at *Psychological Science* is a bit like being offered a ride in the Belmont Stakes on a horse that just won the Preakness and the Kentucky Derby. No matter how ill-equipped or inappropriate to the task one might feel, it is simply not something one can easily turn down.

To be sure, the metaphor is not perfect. If editorial terms are races and editors are jockeys, there were three editors before me, not two, and there will be many more after; the journal will not be put out to stud, whatever that could mean; and there is no firm criterion for winning, only finishing. Nonetheless, even some of the inaptness of the metaphor is enlightening. Imagine the horse growing twice its size beneath you during the course of the race. Most compellingly, however, being editor of *Psychological Science* is an exhilarating ride.

You hold on with all your might for some equilibrium, go as fast as you can, your pulse races, you don't chance to look back and rarely to the side, and the felt rewards are great. But now that the race is over for me, I get a chance to look back and around.

Perhaps the most salient aspect of the last four years is the growth of the journal. It has been considerable and sustained. Even before receiving my first manuscript, the APS office and I decided that the journal needed to be a monthly, and no longer a bimonthly. That was the right decision in late 2002. Our Ithaca office received 1,287 manuscripts in 2006 — up 25 percent from 2005, 47 percent from 2004, 94 percent from 2003, and 141 percent from 2002. This growth seems fairly precipitous, but in fact the journal has a bit more than doubled in size with each editorial term. Rob Kail, the new editor of the journal, is on track to receive more than 1,500 manuscripts in 2007. And it seems likely in the not-too-distant future that the journal will expand even more. Whatever its reason, such growth seems good for the journal and good for APS. But where did all of these papers come from?

The conundrum is that such growth is not discipline-wide. For example, from annual reports of the American Psychological Association, one finds that the increase in submissions across their 26 journals from 2001 to 2005 was 26 percent. Looking at the Institute for Scientific Information category that includes *Psychological Science* ("Psychology, Multidisciplinary"), increases for the two APA journals in the category were 42 and 51 percent (for *Psychological Bulletin* and *Psychological Review*, respectively). However, in the same period *Psychological Science* grew in submissions by 240 percent. It seems reasonable to try to work through some possible causes of this growth, which also allows discussion of changes in the journal in the context of the larger discipline.

One possible cause follows from an analysis by Webster (2007). He showed that the longer articles appearing in APA journals beginning in the late 1980s, which Reid Hastie has called "bloated carcasses,"¹ have now reached asymptote. That is, they started at about eight pages in 1985, crested at about 13 pages in 2000, and have stayed there since. Alas, I confess to having been slightly ahead of this curve. As editor of the *Journal of Experimental Psychology: Human Perception and Performance* from

1989-1993, paper length increased during my tenure from 12 to 17 pages. But, by the analyses of Webster, researchers may be poised to package their research in smaller bundles. Such bundles, given the same output of experimentation, could mean more articles. But the trend is not yet observable in APA journals. Thus, none of *Psychological Science*'s submissions increase can be due to the comparative attractiveness of smaller packaging across the whole discipline.

A second possibility concerns changes in practices of collaboration. Generally, there are now more authors on a given manuscript than there were a decade ago. This spread of authors could reflect an increasing specialization of roles in research and, as a consequence, an increase in efficiency. Thus, a team of four authors might be able to produce, say, six publications in the time that four individual authors produced only one each (or four total). With this idea in mind, I assessed the number of authors per article published in *Psychological Science* over its history. The median number of authors on an article started at one in 1990 and moved to three by 2007, and the mean number of authors almost doubled (from 1.7 in 1990 to 3.2 in 2007). This is a trend seen across all of science (Wuchty, Jones, & Uzzi, 2007). Nonetheless, even accounting for some increased efficiency, this trend is much more gradual than that of submissions to the journal, particularly over the last four years. Thus, research efficiency from multi-authored papers cannot be more than a very small part of the answer.

A third possible factor might be the expansion of authors outside of the United States. There is no denying that such authorship has been increasing in the journal — by itself justifying the APS name change from the American Psychological Society to the Association for Psychological Science. Nonetheless, that increase is not as dramatic as that for submissions. In 1990, there were no non-U.S. or non-Canadian authors in the journal; by 1998, there were 13 percent; and in 2002, there were 33 percent. Over the course of the last four years, however, non-North American authorship accounted for about 23 percent of the journal with one or two percentage-point increases each year. Thus, although there has been a sustained increase in European and Asian authorship, that increase cannot have been the result of increased submissions alone. But published authorship is an indirect measure; a more direct one would be in the submissions themselves.

The submission data for the past four years are shown in the left panel of Figure 1, log scaled. In such a plot it is easier to see differences in rates of increase. Canadian, Israeli, Asian, Australian, New Zealand, and other authors are placed in the group “other.” Notice that the rate of increase in European submissions, in particular, has been faster than that for the United States. Indeed, in 2006, only 59 percent of submissions came from the United States.

Growth of submissions from the rest of the world also has been brisk. In the last four years, the journal received manuscripts from corresponding authors in 31 different countries (noncorresponding authors were from many more) and accepted them from 22. Outside the United States, the most frequent submissions were from the United Kingdom, Canada, Germany, the Netherlands, and Australia in that order. Israel, Italy, Japan, and France were not far behind. In the spirit of cross-cultural research, however, I note that there were no reliable differences across all countries in terms of percentage of acceptances. I take such uniformity as a measure that we really are one culture when it comes to scientific research in psychology and allied disciplines.

Any seasoned editor knows that a good way to solicit new manuscripts is to request reviews (on a good paper) from researchers who haven't yet published in the target journal. Thus, one might suspect that the

European increase might parallel, even result from, an increase in review requests sent to European researchers. The right panel of Figure 1, however, suggests that European submissions have outstripped European reviews, even though the latter have grown substantially. Moreover, this appears true for the rest of the world, too. Nonetheless, while a growth in European and other manuscripts in the journal drives some of the increase in submissions, the domestic (U.S.) increase is also very strong.

A fourth possible explanation for burgeoning submissions concerns the increase in the relative stature of the journal over the last decade. The most concrete measure of this is the impact factor as computed by the Institute for Scientific Information. This measure is based on citations to articles in a given journal that appear in all journals within a time window. This value has risen from about 2.5 in 2000 to about 4.6 in 2006, the most recent year for which data are available. On average, articles in the journal are now more cited than those in *Child Development*, *Cognition*, *Cognitive Psychology*, *Developmental Psychology*, *Journal of Abnormal Psychology*, *Journal of Social and Personality Psychology*, *Neurobiology of Learning and Memory*, and *Neuropsychologia*. Thus, the journal has surpassed all of the leading journals in the sub-areas of psychology within its research watershed — cognition and perception, social psychology, personality, and development. I think this is terrific news.

However, an increase in the impact factor cannot be the explanation for submissions growth. Instead, it must be an indirect consequence. The impact factor follows by three and four years the content of a particular volume. Thus, data announced in 2007 were for citations in 2006 to articles from 2004 and 2005. The increase in submissions beginning in 2003 has far outstripped the increase in the impact factor, and did so long before those increases were known.²

The final possibility — and I think a substantial reason — for the growth of the journal is broader than the impact factor. Before my term, the journal reached a tipping point (Gladwell, 2000). Or perhaps a better description follows from Merton (1968) that a Matthew Effect is now in full swing: “For unto every one that hath shall be given, and he shall have abundance” (*Matthew 25:29*, KJV). After a number of years of steady growth, *Psychological Science* now hath and will now grow in abundance.

Part of the reason for this is that APS is doing many things right. Publicity is important, and more and more of the content of *Psychological Science* is brought to a wider intellectual audience. A considerable number of times in the last year I heard work published in the journal discussed on the *NBC Nightly News* and the *PBS News Hour*. It appeared with some regularity in *The New York Times*. In each of the last two years, research from the journal’s articles has made *Discover* magazine’s Top 100 Science Stories. And the list goes on, as outlined recently by West (2007) in these pages. The journal, now more than ever, occupies a known and coveted niche as the showcase for important psychological research. Another part is that Michele Nathan, our Managing Editor and the real soul of the journal, has kept up her amazing work in rendering all of our “psychologese” into real English prose. This matters greatly.

The overall results of this 18-year experiment are becoming ever more clear — short, high-quality papers are read and cited, and a diverse mix of empirical works covering the entire discipline and beyond is received with interest, even eagerness. Consider an anecdote in testimony to the latter: Two years ago, when taking my younger daughter around to look at colleges, I often visited psychology departments anonymously. On one trip, we happened to arrive the day the journal came in the mail. Twice, and at different colleges, I saw researchers whom I did not know walking swiftly to the bathroom with *Psychological Science* under their arm. I can think of no higher compliment.

All of this serves to unify the discipline, imbuing it with increasing energy and esteem. It's now even more fun to be a psychological scientist. In becoming editor of *Psychological Science*, my timing was right. I accepted the job *au point* (as the French would say), when perhaps everyone else out there felt less directly that the journal was going to be an analog of a Triple Crown winner. And I got to ride the horse. To be sure, I also got to shovel out the barn.

References

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¹ As quoted in Eric Jaffe's article, "New Psychological Science associate editor," *APS Observer*, December, 2003, p. 24.

² These data and more are available in my final report of the journal to APS. Interested readers may obtain a copy of that report from me at jec7@cornell.edu. An additional assessment of the timing of researchers and research in the journal will appear as an editorial in the December 2007 issue of *Psychological Science*, entitled "Rhythms of Research."