Connections Past and Present: Bringing our Scientific Influence Into Focus

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Over the past several years, SIOP has directed considerable attention toward efforts intended to increase the visibility of I-O psychology. For example, our new brand logo and tagline are ways to better connect us with the outside world and a tool by which we can build and strengthen our influence. Our efforts to become more visible are related to our desire to increase opportunities for our members and to make an impact. This morning I want to talk about impact and visibility in a way I think is different from the usual conversation. I want to consider a different form of connection, the connection between our science and other science domains.

When we discuss impact, it is commonly addressed from an applied perspective. Are we visible to the business community and decision makers within organizations? Are we conducting research that helps to bridge science and practice? These are important questions and we need to continue to do the work that ensures the answer is yes.

However, another question is what is the impact of our research on science? What science domains are drawing from our work? Are we visible to other areas of science?

Through an analysis and visualization of our science, we should be able to identify patterns and better understand where our influence lies. A tool for doing such work is scientometrics. Scientometrics is the study of measuring and analyzing science research, which includes citation analyses. Citations serve as a common barometer of scientific impact.

With support from the SIOP Foundation and partnership with Innovacer, a scientometric I-O science mapping project has been completed over the last year. To center the study on I-O, I first identified 20 journals in which I-O psychologists publish (see Table 1).

We could argue about the list, but these are the journals that underlie the data. To conduct the study, each article published

Table 1

I-O Journals Included in Science Mapping Project

| Academy of Management Journal | Journal of Occupational Health Psychology |
| Applied Psychology: International Review | Journal of Occupational & Organizational Psychology |
| European Journal of Work and Psychology | Journal of Organizational Behavior |
| Group & Organization Management | Journal of Management |
| Human Performance | Journal Managerial Psychology |
| Industrial and Organizational Psychology: Perspectives on Science and Practice | Leadership Quarterly |
| International Journal of Selection and Assessment | Organizational Behavior and Human Decision Processes |
| Journal of Applied Psychology | Organizational Research Methods |
| Journal of Business & Psychology | Personnel Psychology |
in these 20 journals was extracted, as were the backward and forward citations.

To try to provide a clear understanding of how this works, Figure 1 is an example from a single article published by Jose Cortina in 2011. The 2011 article cited 42 articles. Those are **backward citations**. The 2011 article has been cited by seven other articles. Those are **forward citations**. Each citing article can be categorized into one or more scientific domains (e.g., management, psychology, nursing).

The science mapping project is based on publications that began in 1917, which was when the first issue of the *Journal of Applied Psychology* was published, through early 2014. It includes 33,396 published articles, 662,971 backward citations/1,631,984 citation categories, and 809,109 forward citations/1,417,007 citation categories.

A total of six different visualization maps have been created: one backward and forward set that connects I-O with other science domains, a second that breaks I-O out from the rest of psychology across all science domains, and a third set that looks at the connection between I-O and other areas of psychology. Here is the link to all six maps [http://innovaccer-demo.appspot.com/map-of-science](http://innovaccer-demo.appspot.com/map-of-science).

Figure 2 is a snapshot of the map of forward citations from I-O to all science domains. The number in the middle (19,397) shows the total number of forward citations from articles published in 2010 in our 20 I-O journals. Those citations are distributed across one or more science domains and appear in order of proportion from left to right. You can see here that we are primarily cited by psychology, followed by management, and then business.
The map is dynamic and interactive with the user. You can hover over any slice to get the specific number of citations from that domain. If you click on the slice, you will find the specific journals from that domain. The slider at bottom can be used to quickly to go a specific year, you can control speed, and you can toggle between the backward and forward data.

To begin to summarize some of the trends across time I created figures based on specific time periods. Figure 3 shows the relative contributions of citations coming to and from psychology, management, and business across all science.

What these data show is that with regard to the literature that we are citing, we remain primarily rooted in psychology but are increasingly drawing from management and business. What has markedly changed is the trend with regard to forward citations. Across time, our science is contributing less to psychology and more to management and business.

Figure 4 summarizes citation trends from and to science domains other than psychology, management, and business. The first thing to notice is that percentages are rather small across the board, underscoring the insularity of our science. We are not connecting very frequently to science domains outside of psychology/management/business. Although there appears to be a substantial increase in forward citations in 2010, a review of 2009 and 2011 show values close to those of 1990, so there does not appear to be real growth.
Figure 5 illustrates how I-O is connecting with other areas within psychology across time. I-O is referenced as “applied.” The data show that in terms of backward citations we generally cite from our own literature. The next highest values come from...
multidisciplinary psychology and from social psychology, which has been increasing. With regard to forward citations, there is a pronounced trend indicating we are increasingly only being cited by ourselves.

Those are a few initial patterns that pertain to our scientific influence revealed from the project. These data give us a lot to think about in terms of the future of our science. One of the key questions that emerges is why does I-O research have limited scientific impact outside of I-O psychology and management?

There are several potential causes. It could be that what we are publishing has little perceived value beyond ourselves. Or it could be that what we are publishing would be perceived as valuable, but we have not communicated it or found ways to make it visible to others. We need to address both possibilities.

Next are some thoughts on ways we can continue or begin to either directly or indirectly enhance the visibility and/or value of our science.

1. Continue to build our science advocacy efforts – internally and externally
2. Increase recognition of and support of I-O in psychology departments
3. Broaden the way we view impact

1. Continue to Build Our Science Advocacy Efforts—Internally and Externally

Science advocacy has been one of our strategic objectives since they were formulated in 2006. It has been difficult however to gain traction in that arena. Table 2 shows some of the key milestones.

There have been two key turning points. The first was the taskforce report chaired by Steve Kozlowski. The recommendations
issued in that report have been instrumental to our current efforts. The second was the hiring of government relations firm Lewis-Burke in July of 2013.

Our overarching objective is to build our internal and external infrastructure for science advocacy. We are guided by three goals: (a) create opportunities to engage federal and congressional support for I-O research; (b) engage in activities to enhance SIOP members’ understanding of federal policies, funding, and process; and (c) increase external visibility of I-O with federal decision makers. Our work with Lewis-Burke is helping to shape our advocacy agenda and increase our visibility with policy makers and government officials.

We are also developing our internal infrastructure. These efforts include the creation of opportunities to strengthen the scientific capabilities of our members, a TIP column on external funding, a TIP column with updates on advocacy efforts, and our first science funding speed mentoring event at this conference. Right or wrong, funded science is perceived as important science and helps to connect us with other science domains. By increasing our science funding and advocacy, we increase both the visibility and the perceived value of our research.

2. Increase Recognition of and Support of I-O in Psychology Departments

There are two channels I propose this morning. The first is through education and the second is through endowments.

The importance of our science is communicated through what is taught. A few weeks ago, I received an email from a colleague in a psychology department that included the following text, “I know that it is shameful, but I have never covered I-O in my intro psych class. I want to do this... this year.” When I-O psych is not included in Intro to Psych, the message is that it is not important. A metrics study conducted as part of our branding effort showed that students were the least likely group to be familiar with I-O psych and that one of the
best channels for familiarizing individuals with I-O is through course-related material. A commitment that everyone can make is to do what you can to see that I-O is included in introductory psychology courses.

The importance of our science and our grounding in psychology is also communicated through what is financially supported. We are all aware that many I-Os choose to work in business schools. This no doubt is a factor in the citation trends shown earlier. It is also no secret that a primary driver of that move is that business schools pay higher salaries than psychology departments. So why not make an effort to create more endowed chairs in I-O psychology?

Endowed psychology professorships can be used to attract, reward, and retain the best faculty in I-O. On the surface this may seem like an issue just for the academics, but when you consider that I-O practitioners in the U.S. are trained in psychology departments and not business schools, the significance to practice becomes clear.

I have identified four different models of endowed professorships in I-O: (a) endowments made by SIOP members, (b) endowments made by alumni/family members in honor of a faculty member, (c) endowments made to the university obtained by an I-O professor, and (d) university endowment created specifically for an I-O position. Bill Byham, the president and founder of DDI has generously endowed two professorships in I-O psych, one at Purdue and one at Ohio University. I asked Bill if would comment on his motivation for creating these endowments. Here is part of what he said, I did this to pay back to I-O psychology for the wonderful life that it has provided for me and my family. I’m disappointed that we have not increased the output of I-O psychologists, particularly those interested in working in a business environment. It is my hope that my chairs will go a small way toward increasing the number of I-O psychologists in general and particularly those interested in working outside academia.

Minnesota has been successful at securing several endowments for their IO faculty including one initiated by the students of Marv Dunnette. As stated by Paul Sackett, “At Minnesota, we view endowed positions as essential; not sure we could recruit successfully without them.”

Endowed professorships keep top scholars in psychology, signal our relevance to others, and help ensure the continued training of I-O psychologists for careers outside of university settings.

3. Broaden the Way We View Impact

It was my goal that the science mapping project would be used to start a conversation about how I-O science is connected to and is contributing to the broader discipline of psychology and to other domains of science.

The question now is where is the field going? What is it that we want our science to do or to be known for? Undeniably, one of the key strengths of our profession is the impact we have on organizations. Our research and practice has contributed significantly toward enhancing the quality of
work life for employees. Similarly for organizations, we help to improve their results and effectiveness in a multitude of ways.

However, by evaluating and valuing our impact along these lines, we may have inadvertently boxed ourselves into a relatively narrow line of thinking, research, and practice. So often we ask ourselves, as academics or practitioners, the “so what” question. More often than not, implied or directly stated, the “so what” question is focused on the effects or applicability of our work to organizations: the bottom line, the culture, employee retention, employee satisfaction. Perhaps as a result of this kind of narrow thinking, our attention focuses internally and we become consumed with psychology versus management, science versus practice. Is it any wonder then why so few outside of those directly engaged in our profession know what we do?

I’m not suggesting that we abandon practical application as a context for our science. Rather, I’m proposing is a shift in the conversation about impact, a reconsideration and expansion of how we see ourselves impacting the psychology of work.

For example, could we accept as worthy of our attention I-O research that endeavors to understand not only the impact of work on employee outcomes but how employee’s work affects family member outcomes? Could research be considered impactful whose main goal is to increase our understanding of the human condition at work, without any clear or immediate notion of how results can be applied to the work setting—as Weiss and Rupp have described it, a more personcentric work psychology. Could we endeavor to understand the work experiences of individuals on the periphery of society and outside of organizations such as migrant farm workers?

By broadening our scope and forming a more in-depth understanding of the individual at work, we then open up more opportunities to increase our connection with other areas of psychology and other sciences. With greater connections to and impact on other sciences, we then increase our reach to and impact on society in general. As we become less parochial, and less self-referential, people will know what we do, how we do it, and what our science can do for them.

In essence, what I’m proposing is a three-pronged definition of impact. Certainly we need to have impact on the organizations, but just as important is our impact on the psychological knowledge and understanding that we gain about the human being at work, as well as our impact on science and society.

Notes

1 This article is based on a portion of the presidential address that was given at the Annual Conference of the Society for Industrial-Organizational Psychology, Honolulu, HI, May 2013.
2 Cortina, J. M., & Landis, R. S. (2011). The earth is not round ($p = .00$). Organizational Research Methods, 14, 332-349.