# Chapter 14
# Mapping the Impact of Collaborative Research with David Plane


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**Abstract** Citation counts have become a standard way of assessing the impact of a research paper. Plane and Mitchneck published two interdisciplinary and theoretically contextualized papers over 25 years ago. Plane's formal retirement marks an appropriate time to assess the impact that the papers have had in the scholarly domain. After reviewing the critical literature about citation indices and discovering that a paper with a woman, Mitchneck, as lead author has less of a likelihood of high citation than if a man, Plane, had been lead author, Mitchneck begins to count the citations of the two papers in different sources. She then conducts a qualitative assessment of the impact of the papers by reading the majority of the citations within the text in which the citation is found with the goal of understanding how the papers impacted conversations on the research topics of net migration and employment and migration during times of political and economic shock. The qualitative assessment finds contributions to conversation around the world by an international and interdisciplinary group of scholars.

**Keywords** Migration · Economic shocks · Citation counts · Interdisciplinary research

## 14.1 Introduction

Have you ever wondered what impact your research has? Have you looked at citation counts? Have you calculated your H-index? Checking out a paper's citation count or a journal's impact factor or even one's own H-index have become everyday methods of assessing impact even by avowed qualitative researchers. Many in the social, physical, natural, and life sciences and engineering use citation counts to make their cases for tenure and promotion, and, indeed, some universities require or

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suggest providing this information in promotion packets. While citation analysis has become a major form of research assessment at universities, we know relatively little about the dynamics and underlying influences over citation practices or how citation counts differ across measures—especially in interdisciplinary research and research conducted prior to the digital explosion of research dissemination through social media and tracking other forms of research impact. These underlying relationships undoubtedly influence any index reliant on human practices such as citations.

Now about 25 years on from the publication of two interdisciplinary papers by Mitchneck and Plane, it seems appropriate to assess their impact. What is the best way to measure the impact? As an academic, I started with citations. Little did I know that when I first started counting citations for each paper, it would lead me to seriously question the method and become even more curious about the impact of our truly collaborative and interdisciplinary research. I concluded that we needed to map out the impact rather than assess it with citation counts. The mapping included reading how other authors had cited our papers to assess whether or not we had some impact over the ways people conducted their research, did we start conversations or contribute to them, or were our papers just another one in a long list of papers on similar topics. This journey led me to conduct a qualitative analysis of the impact our papers had on related research. Below, I describe the papers that we wrote, present evidence to promote questioning the use of citation analysis alone as a measure of research impact, and then conduct a qualitative analysis of how our interdisciplinary research may have impacted other research on migration and, particularly, migration in nonmarket contexts and during economic and political shocks.

## 14.2 What Did We Do?

In the early 1990s, David Plane and I wrote two papers at the intersection of both of our research areas. I was an assistant professor recently hired in the Department of Geography and Regional Development (now called the School of Geography and Development). We both thought that working together would be good for my career and interesting for him to move into a new region. The time was the immediate post-Soviet period, new data on Russian migration and labor markets became available, and we could use a dataset that I had collected for a project on local economic development in Yaroslavl, Russia. Questions about the Soviet/Russian labor market that had long been considered unanswerable in Russia were now open for research. For example, was there a labor market in the new Russia, and given the nature of the emerging economy, did the labor market in Russia function as it did in a market economy? Were the demographic responses similar in the new Russia to what we experience in the United States? Although Plane and I have different specialties and approaches, we each work on topics related to human migration, and it seemed ideal to bring us together in an interdisciplinary analysis of these kinds of questions. Plane works primarily, but not exclusively, on topics related to spatial interaction and migration in the United States and from a primarily quantitative and modeling

perspective. I worked on migration and economic development primarily, but not exclusively, in Russia and from a mixed methods approach both quantitative and qualitative.

## 14.3 The Papers

Plane and I were motivated to analyze and compare migration systems under periods of economic and political shock. While the breakup of the Soviet Union created a sensational series of shocks around the world, it was a unique period of time to establish impact on human migration that might have been useful in understanding future change. While the case is unusual, it occurred without large-scale violence (although a number of significant civil conflicts arose) and created a series of changes in the region that could trigger similar changes to migration systems.

Mitchneck and Plane (1995a), *Migration patterns during a period of political and economic shocks in the former Soviet Union*, assessed Russian migration patterns relative to past Soviet patterns and international migration systems that Soviet demographic patterns did not follow. Using newly available data on Russian migration systems, we tested a series of hypotheses that were both related to migration systems elsewhere and contextually distinct to the post-Soviet case in Russia (e.g., the impact of 15 republics becoming separate countries). We found importantly that the economic and political shocks both created new migration systems in Russia that were unique at that point in time and others that brought Russian migration more in sync with patterns that we see in market economies like the United States. We tested traditional hypotheses related to stable migration systems such as the volume, distance, rural-urban direction, and gender, age, and ethnic composition of flows. These hypotheses are linked to migration systems around the world.

Our primary finding from this study is that by using standard approaches to migration analysis with historical geographical context, we could predict the composition of flows during economic and political shock in Russia. We also highlight contextual differences, importantly the reversal of the established rural to urban labor flows due to a poorly functioning housing market and continued government attempts to manage migration by making residential permits difficult to obtain. Equally important were our findings that the shocks evident in the migration system were largely predictable and that the system was likely to continue changing due to future political and economic shifts. This paper set the scene for the use of market-based theories and analyses for this context. In addition, it also served as one of the first contextually and theoretically driven analyses of population migration patterns in the New World Order that could be reflected in other parts of the former Soviet Union and its sphere of influences, namely, Central Europe.

Mitchneck and Plane (1995b), *Migration and the quasi-labor market in Russia*, also takes a contextualized theoretical approach to investigate the relationship between migration and employment change. For example, within the Soviet Union and the post-Soviet context, do we find expected relationships between levels of net

migration and employment change? Does net in-migration signify an increase in job availability? We find in this paper that employment change and net migration were not predictable in the same manner as in market economies during the Soviet period and that the economic shocks of the early 1990s made this relationship even less predictable. In a way, these findings suggest that factors other than economic ones were underlying the patterns of change that we found significant in Mitchneck and Plane (1995a). The lack of significance of employment for driving net migration in the Soviet and post-Soviet periods highlight the role that other social and political factors may have over migration systems. In particular, the social contract of full employment and the replacement of administrative determination of employment needs over the market create different incentive and information systems than one would find in a capitalist economy.

### *14.3.1 Summary*

While the 1995 papers are distinct from one another, they share a number of qualities that make it appropriate to look at their impact together. First, both papers bring standard theoretical analysis of migration to Russia and the Soviet Union in a contextually driven way. Second, both focus on a unique period in history—the time immediately before and after the breakup of the Soviet Union. The breakup created political and economic shockwaves through the global economic and world political order as well as Russian migration systems.

## 14.4 Measuring the Impact of Research Papers

Measuring the impact of a research paper is important for several reasons in the academy. First, we have fallen into a pattern of checking the number of citations a paper receives so we can follow changes to our H-index (a measure of an individual's overall impact on science) or other indices which account for many of the major criticisms of the H-index—including the amount of time an individual has been publishing (see Gasparyan et al. (2018) for a strong review of the indices). Second, these indices as well as citation rates of individual papers have become standard fare in assessing the success of academics and many institutions suggest (or even require) including them in annual or promotion reviews. These indices and measures are a shorthand for assessing the impact of research because they are easy to locate and many websites calculate them for us. We are essentially using citations and the H-index as a proxy for quality rather than as a measure of quality or impact (Lehmann et al. 2006).

As I began this exercise, I collected information about citation rates for the two papers (see Table 14.1). Aware of the many critiques of citation analysis, especially around research on the social forces over how individuals cite and the lower rates of

**Table 14.1** Citation counts according to major sources

| Citation counts for Mitchneck Plan articles | Migration patterns during a period of political and economic shocks (1995a) | Migration and quasi labor market in Russia (1995b) |
|---|---|---|
| Google Scholar | 33 | 35 |
| ResearchGate | 13 | 25 |
| SCOPUS | 14 | 20 |
| Web of Science | 13 | 18 |
| Dimensions | | 14 |

citations for interdisciplinary work, I began this process with some skepticism which was only confirmed by what I found!

Table 14.1 indicates clearly that each measure of the citations for the articles shows different levels of impact. Given that the majority of research papers receive relatively few citations (see Van Noorden (2017) for an in-depth discussion of the literature on low citations and the underestimation of impact by using citation counts), I am pleased that our papers any received attention!

The literature documents both advantages and hazards of using citation analysis to assess the impact of research. The advantages are limited to easily available data and a belief that these data are comparable across individual researcher (see Gasparyan et al. (2018)). Far more research has suggested that the ways that individual researchers choose which papers and individuals to cite deems citation analysis a hazardous way to assess impact (e.g., Milard and Tanguy 2018). By hazardous, I mean that substantial research has indicated that so many different social factors impact how we choose to cite that citation indices are far from an objective source of impact and more likely a measure of fashion in science and a reflection of the demographic and disciplinary background of individual authors as well as social relations.

Let's begin with how we cite interdisciplinary research. We classify Mitchneck and Plane (1995a, b) as interdisciplinary because we combine demographic, economic, geographic, and area studies knowledge. As such, in our papers, we cite multiple specialties within our disciplines and journals outside our disciplines. This kind of interdisciplinary research generally means it is less cited and takes longer to have an impact—as measured by citations in the published literature (Van Noorden 2015).

What other factors have been documented as reducing the likelihood or at a minimum influencing article citation? Ethnicity and gender are factors in the way that we cite other research papers. Freeman and Huang (2015) in their analysis of 2.5 million authors in the United States from 1985 to 2008 found that papers with authors of different ethnicities and geographic diversity were cited more often than authors of the same ethnic background from the same geographic location. When men and women collaborate, their papers are generally cited less often than when men collaborate with other men (Beaudry and Lariviere 2016). And when the lead author is a woman, the paper is less cited than if the lead author were a man (Lariviere et al. 2013).

Research shows that the influence of gender over frequency of citation is widespread across fields. Beaudry and Lariviere (2016) find that across science and medicine, the larger the proportion of women co-authors, the lower the citations and that the same authors, when co-authoring with a male-dominated group, are cited more. A group of researchers analyzed citation patterns in international relations journals and found that women are three times more likely than men to cite work by other women and that papers written by men are highly likely not to cite work by women in international relations (Mitchell et al. 2013). Vanclay (2013) finds that in environmental science, authors can manage their citation counts by writing review articles in high impact journals.

Our professional networks also influence the ways that we cite; Milard and Tanguy (2018) find that the closer within social sphere the cited author is to the citing author, the more likely they are to cite one another. They find a significant connection between social networks and how we cite other authors. In other words, we tend to cite within our own professional networks.

The research on citations by gender and related valuation of highly cited work is not without debate. Chibnik (2014), the editor-in-chief of the *American Anthropologist* at that time, finds that there are no statistically significant citation patterns by gender in the journal. Others note that self-citation by prolific authors contributes to skewing the data and that men tend to self-cite more than women (Cameron et al. 2014). The fact that substantial attention is now being paid to developing alternative ways to assess the impact of one's research suggests that there is broader consensus around the scientific conclusion that more citations means more impact.

The perspective that assessing article value should focus on alternative measures through how that research is disseminated (Fenner and Lin 2014) is gaining popularity. There is recognition that a New World Order has developed around measuring impact that ties to control for the type of attention an article receives, through what mechanisms and then what impact really means. Altmetrics (https://www.altmetric.com) is an excellent means to map out the impact of one's work in a twenty-first-century world including social media and public policy reports. While opening up the assessment of research impact to a larger variety of sources other than journal citations is a step in the right direction, assessment of the impact of social factors on how individuals choose what to cite should continue.

Considering the widespread influence of factors unrelated to the quality of research over citation rates, Mitchneck and Plane (1995a, b) should not receive many citations at all! We published before the Internet explosion of social media and altmetrics, a woman is the lead author, we come from the same racial and geographic profiles, and the work is interdisciplinary. Given how the cards are stacked against us, I am thrilled that our work is cited at all!

## 14.5 Mapping Research Impact: A Qualitative Assessment

Using traditional citation analysis is not likely to provide a deep understanding of the impact of our work in the 1990s. Knowing this, and still wanting to assess the impact of our research, I conducted a qualitative analysis of how the two papers were cited rather than the number of times. Using the literature on citation analysis, I developed a methodology to map out the impact of the research according to a number of criteria that would be meaningful to us and that we could assess. To assess the audience we reached, I collected information based on what we know about the influences over who we cite in our research. Were we reaching the same people we are always in a conversation with? If so, we would know the majority of those who cited our work. Were we reaching the targeted interdisciplinary and international audience, one that was interested in similar topics like what happens to people in an emerging economy or under political and economic shocks? If the work was truly interdisciplinary that too would be reflected in the characteristics of who cited us and how. Assessing how we were cited would get at the issue of how our work impacted other research on the topic.

I used both ResearchGate and Google Scholar to document the number of citations and detailed information on the author and the publication in which our papers were cited. Using the literature on citation analysis and the underlying forces that influence how we cite, I collected data on the title, author(s), year of publication, journal or book name, discipline of the author, topic and region of the paper, and whether or not we knew the author(s). I then read the portion of the text where our research was cited (when possible through the internet) to assess by whom and how we were cited. To see if the citations signified some positive quality of our work, I assessed whether or not our work was cited to simply document that work is done in our subject area, or if we were part of a conversation such as to support a finding, tell a story, or summarize our research. The latter would suggest that our work had some impact on research that came after our papers. I also assessed if the authors are known to us or if we self-cited (the literature suggests that both would increase our citation count). Finally, wanting to assess whether or not our research was viewed as off base, I read to make sure that we were not at the center of any debate or nasty disagreement.

## 14.6 Findings

By whom were we cited? My analysis suggests that we were cited by a diverse group of authors who create a map that is highly international in terms of where the authors live and work and the regional topics on which they published. Our map of influence extends really around the Western world from the United States (e.g., Heleniak 2009) and Canada (e.g, Lo and Teixeira 1998) throughout Europe (Russia, Greene (2012); Germany, Lerch (2014); Norway, Gentile (2006); Finland, Lonkila and Salmi (2005)). The fields that the citing authors come from include demography,

economics, geography from various subdisciplines, history, political science, sociology, and urban planning.

How were we cited? My analysis indicates that we were cited in ways to suggest that we impacted conversations about the effects of economic and political shocks on migration systems and how information about employment influences migration systems. Those were our intentions! As expected, we were cited in a variety of ways including being part of a list of citations on the topic of internal migration (e.g., Gerber 2006; Lonkila and Salmi 2005) and economic disruption (Curran et al. 2016).

More importantly, we were cited in diverse ways such as in a paper about the possible breakup of Canada (Lo and Teixeira 1998) in terms of both our methodology and findings. In a note, Lo and Teixeira (1998: 495) write:

> In an empirical analysis of migration in Yaroslavl Oblast, a region in central Russia, Mitchneck and Plane (1995a) examine how severe economic and political shocks due to disintegration of the former Soviet Union might change the Russian migratory system. While the data clearly show a migration system undergoing shocks, the authors found the structure of the system still predictable using analyses of historical trends and standard approaches.

Another paper about Albania (Lerch 2014: 1535) cited our research to support structural reasons for migration in a transition context:

> Structural effects can be expected to a lesser extent, particularly in the first decade of transition in the societal system, which motivated undifferentiated migration in other post-communist contexts. (Mitchneck and Plane 1995a)

Our paper on employment and net migration (Mitchneck and Plane 1995b) was also cited in substantive ways. For example, Fan (2005: 296) notes:

> Even after the late 1980s, mobility in Russia was still unduly affected by the legacy of the Soviet-period registration system and access to services and resources tied to that system (Mitchneck and Plane 1995b). Likewise, migration control exists in China (covered in the next section).

And Greene (2012: 138) writes citing to Mitchneck and Plane (1995b):

> Beth Mitchneck and others remind us of the importance of one's workplace for the provision of social services and, indeed, for the maintenance of one's entire lifestyle during the Soviet period, and argued that the continual provision of such services through the workplace in the early transition period acted as a brake on labor migration.

In what geographic context was our work cited? Our work was cited in publications about migration in Albania (Lerch 2014), Estonia (Sjoberg and Tammaru 1999), Russia and Central Asia (Sahadeo 2013; Earle and Sabirianova (2002), and others), Thailand (Curran et al. 2016), Asia and the Pacific (Skeldon 1998), Hungary (Zueva 2005), China (Fan 2004 and others), and the Soviet Union (Eastman 2013). The map of our papers' influence extends beyond the borders of the authors to places in Asia that are experiencing similar processes to what happened in Russia.

Our papers were cited in mainly interdisciplinary journals supporting our intention to target an interdisciplinary audience. As noted above, the authors come from many different disciplinary backgrounds. Also supporting the interdisciplinary nature of the

work is the slow to gain citations noted in *Nature* about interdisciplinary research (Van Noorden 2015). Mitchneck and Plane (1995a) has roughly half of its citations after the 13-year mark, and Mitchneck and Plane (1995b) has about only one-third. Google Scholar did not have complete citation information for all of the citations. Mitchneck and Plane (1995b) about the quasi-labor market continues to be cited, most likely because scholars continue to have interest in the functioning of the Soviet labor market.

Self-citation does not seem to play a role in our citation counts. Our own citations to this work account for only four of the over sixty citations.

## 14.7 Summary and Implications

Citation analysis provides a relatively simple method of assessing the impact of a scholarly paper. The literature shows, however, that by only looking at citations in other scholarly publications, we undervalue the impact of a paper. As Lehmann et al. (2006: 1004) so eloquently state, "Unfortunately, the potential benefits of careful citation analyses are overshadowed by their harmful misuse." Altmetrics are an improvement on how we measure impact because they include a variety of different channels for assessing impact beyond journal or book publication. Yet, there is substantial evidence that points toward how social forces mold the ways that the original citations and sharing of our research occurs related to gender and ethnicity.

In the case of our two papers, the fact that the lead author is a woman and that a man and a woman from the same general discipline or interdiscipline are co-authors suggests that our papers will be undercited or at a minimum cited less than if Plane were the lead and if he had written the paper with another man! Being interdisciplinary further disadvantages the likelihood for citation. Yet, the qualitative analysis of who and how our papers are cited show that the papers had a wide reach in terms of geography and discipline and that they continue to be cited 26 years after publication. The textual read of how we were cited shows that most often our papers were cited in a substantive way rather than documenting that it was written on a topic about which other authors are also writing. In that sense, these papers have had impacts on conversations in research about Russia and the Soviet Union and contributed to conversations about many other countries that experience political and economic shock.

What are the implications of this analysis of the impact of the two papers? Clearly, citation counts are not nearly enough information to assess the impact of research or the productivity of a scholar. The H-index has had enough criticism in the literature. But citation counts have not. Can everyone read through and assess the ways in which their papers have been cited to document the impact of our work? Probably not, but it does document some important areas of assessment in the academy such as high values given to the map of our research—the geographic extent of our reach/reputations and interdisciplinarity. Yet, if we are going to use counts and indices toward faculty advancement practices, we need to better understand the advantages and hazards of citation counts. Perhaps an in-depth analysis

such as I have done here would be useful for one or two papers in a promotion package. The use of alternative metrics for newer publications is an excellent way to include a larger variety of ways that our research can impact conversations and public engagement.

In his career, Plane has contributed to many conversations and has had a global reach through his research and his leadership in scholarly associations. The mapping of these papers fills out that map in new ways.

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