Title

The Impact of Specialization Centrality, Departmental Stratification, and Sociodemographic Clustering on the Relative Popularity of Research Specializations in Sociology, 1976-2016

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The Impact of Specialization Centrality, Departmental Stratification, and Sociodemographic Clustering on the Relative Popularity of Research Specializations in Sociology, 1976-2016

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by

Quinn Edward Bloom

March 2024

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ABSTRACT OF THE DISSERTATION

The Impact of Specialization Centrality, Departmental Stratification, and Sociodemographic Clustering on the Relative Popularity of Research Specializations in Sociology, 1976-2016

by

Quinn Edward Bloom

Doctor of Philosophy, Graduate Program in Sociology
University of California, Riverside, March 2024
Dr. Steven G. Brint, Chairperson

The purpose of this dissertation was to use sociology in the United States as a case study to explore the extent to which the relative popularity of topics which scientists choose to study are influenced by inequalities in three major aspects of the social structure of a discipline: (1) the network of specializations in a discipline, (2) the network of PhD-granting departments in a discipline, and (3) sociodemographic clustering within specializations. A longitudinal dataset containing 70,960 total observations of 5332 full-time sociologists at 92 US PhD-granting departments between 1976 and 2016 was constructed from several publicly available data sources. The results showed that there is evidence to support the conclusion that specialization centrality, and in limited cases, specialization communities, impacted the relative popularity of sociological specialization claims between 1976 and 2016. The results also showed that popularity among the top-5 departments influenced the relative popularity of specializations, and that this was likely due the stratified graduate placement network rather than these top departments being the first to adopt new specializations. However, sociodemographic clustering on gender did not appear to impact the popularity of specializations. The results contribute to advancing our understanding of the identities of scientists, scientific disciplines, and academic departments. They also have important implications for research policymaking and funding aimed at guiding the production and validation of knowledge within a discipline.

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Among the lists of specializations that are recognized by the American Sociological Association (ASA) and by various regional US sociological associations and prominent PhD-granting departments, there are certain topics of research that are institutionalized. How have these specific topics come to be seen as worthy of the attention of sociologists, or as “real” sociology, while other potential topics are not? Why are some topics or areas of research much more popular than others among sociologists? Why does the popularity of research specializations change over time?

The purpose of this dissertation was to use sociology in the United States as a case study to explore the extent to which the relative popularity of the topics which scientists choose to study are influenced by inequalities in three major aspects of the social structure of a discipline: (1) the network of specializations in a discipline, (2) the network of PhD-granting departments in a discipline, and (3) sociodemographic clustering on gender across specializations.

The research questions guiding this dissertation were:

(1) How is the popularity of specializations influenced by their position within the network of specializations in sociology?

(2) How is the popularity of specializations within sociology influenced by the stratification of PhD-granting departments?

(3) How is the popularity of specializations within sociology influenced by sociodemographic clustering by gender across specializations?

Each of the three aspects of social structure explored in these research questions contains some form of inequality. Some specializations are far more popular or more central to the identity of the discipline than others. Some departments are far more successful than others in placing graduate students. And the number of women in science has changed dramatically over the past several decades.

Previous research has explored the relationships between major subject areas within disciplines, the status hierarchies of departments within disciplines, and the gender composition of disciplines. This dissertation builds on the foundation provided by past research in these three areas, by exploring the impact of inequalities in these three social structures on the discipline itself. The results of this analysis contribute to advancing our understanding of the identities of scientists, scientific disciplines, and academic departments. They also have important implications for research policymaking and funding aimed at guiding the production and validation of knowledge within a discipline.

Another important contribution of this dissertation is the large, longitudinal dataset assembled specifically for this dissertation from a variety of publicly available sources. Past research on specializations has relied primarily on bibliographic data sources, inferring scientist specializations from the contents of articles, citations, co-authorships, subject keywords, or journal topics. This dissertation takes advantage of a more direct and previously under-utilized data source: a scientist's own claims of specialization.

Across 41 waves from 1976 to 2016, there are 70,960 observations in the dataset, representing 5332 individuals from an attempted census of full-time, non-joint, tenured and tenure-track faculty at 92 US PhD-granting departments. For each observation, the dataset contains information on variables such as the specializations claimed by that scientist, graduation year, graduating department, current employing department, gender, amounts of NIH and NSF government grants received, and article publications and citations received that year. This dataset will be made available to other researchers and can be extended to include additional variables for future research.

THEORY

This section provides a description of the theoretical framework of the dissertation. It first illustrates the importance of specializations in sociology and some reasons for studying them. Second, it defines specializations as used in this dissertation. Finally, it outlines the three main research questions guiding this dissertation and states the hypotheses which were tested related to each research question. Three alternative explanations which are commonly assumed to be associated with the relative popularity of specializations: publications, citations, and grant funding, are also stated as hypotheses to be tested.

Why Study Specializations?

Specializations are a central aspect of a scientist's professional identity, with fellow specialists being the primary audience, and community of evaluators, of a scientist's work (Wray 2010:471). Specializations are frequently listed near the top of a scientist's university webpage or in their curriculum vitae as central elements of professional self-presentation, alongside their rank and university affiliations. Scientists who claim the same specialization also typically have similar knowledge of "theories, experimental data, techniques, validation standards, exemplars, worrisome contradictions, controversies, and theory limitations" (Morris and Van de Veer Martins 2008:241) as they relate to their specialization. Specializations have also played a constraining role in a scientist's academic career mobility. Only 28 percent of academic positions advertised in the ASA job bank in 2018 were "open" positions. The remainder of the advertised positions requested applicants with particular specializations (ASA 2019).

Specializations are also central to disciplinary identities and the structure of a scientific discipline, acting as focal points for the social organization of research and teaching activity. The focus of research within a discipline can be thought of as the collective research interests of the scientists within that discipline at that time. A decent answer to the question of "what is sociology?" would be to say that "sociology is the study of …" and then list the most popular specializations. Specializations are also used outside of the discipline, for example as search and categorization terms in article databases.

Specializations are institutionalized to different degrees. Specializations sometimes have dedicated journals, such as *Sociology of Education* or *Journal of World Systems Research*, and are often listed as subject key terms attached to articles published in scientific journals. Popular specializations often have dedicated chapters in introductory textbooks and are the focus of most courses taught in sociology departments. The largest specializations within a discipline are often offered by universities as special programs of study consisting of multiple courses, or as qualifying exams in graduate sociology departments. Popular specializations also often have dedicated sections in scholarly associations such as the ASA, with their own officers, official meeting sessions, and professional awards. All these institutionalized forms represent formal manifestations of the underlying social organization of scientists around shared identities based on claims to research specialization.

Specializations are important to the advancement of science because they are a key site for the creation and validation of scientific knowledge. The "cumulating corpus of knowledge, embodied in educational theses, books, conference papers, and a permanent journal literature" (Morris and Van de Veer Martins 2008:215), is produced by specialists working within specializations. Weber argued that "the individual can [achieve] something truly perfect in the field of science only in case he is a strict specialist" Weber ([1919] 1958:112). And the products of sociological specializations are not simply beneficial to academic sociologists. Examples of widely used concepts which originated in sociological specializations include: "charisma, self-fulfilling prophecy, status symbol, role model, peer group, significant other, and [...] social construction" (Best 2001:111). Sociological specializations also pioneered the study of organizations, public opinion polling, demography, and criminology, and [...] contributed heavily to fields such as social work (Best 2001:109).

The social organization of a scientific discipline can either facilitate - or frustrate - its development as a science (Turner and Turner 1990:8). Specialization allows scientists to focus deeply on topics close to their interests, and provides a sense of solidarity among scientists with similar goals (Collins 1990), and can also lead to greater research productivity (Leahey 2007). However, specialization also potentially poses a problem for a discipline. Some sociologists have expressed the concern that the discipline could become incoherent due to expansion into specializations which no longer effectively communicate with each other (e.g. Turner 1989; Hand and Judkins 1999; Cole 1994; Turner 2006). These discussions may have been also associated with a perceived crisis in sociology, related to a decline in undergraduate sociology enrollment in the late 1970s and early 1980s (e.g. Watts, Short, and Shultz 1983; Fabianic 1991; Hand and Judkins 2002).

Inequalities and inefficiencies in the organization of a discipline can have important implications for the benefits we expect from the work of scientists, such as the production of important findings, conceptual tools, and policy recommendations. The social organization of research also has important implications for the coherence of the research profession, and the work lives and career trajectories of scientists. A better understanding of the forces that shape the progress of a scientific disciplines is of interest to policy makers, funding agencies, and scientists who work in those disciplines, as well as historians of science.

Since at least Mannheim (1936), sociologists of science have challenged the common assumption that disciplines are simply “the natural product of ‘functional differentiation’ of the cognitive superorganism” (Fuller 2007:24), arguing that various social factors influence the development of science. However, previous studies of how individual scientists choose theories and research problems (e.g. Stehr and Larson 1972; Mulkay, Gilbert and Woolgar 1975; Edge 1977; Zuckerman 1978; Gieryn 1987, 1980; Busch, Lacy, and Sachs 1983; Ziman 1987) on how scientists collectively interpret, decide upon, and accept scientific facts (e.g. Kuhn [1962] 2012; Bloor 1978; Latour and Woolgar [1979] 1986; Collins 1981), and historical accounts of the development of specific scientific institutions (e.g. Abbott 1999) have not systematically examined how the social structure of a discipline might influence choices about what the scientists within it choose to study.

Defining Specializations

Many different terms have been used by sociologists to describe loosely connected groups of scientists focused on a particular sub-disciplinary area or research topic. Some examples include: invisible colleges (Price 1965; Crane 1972; Griffith and Mullins 1972), research networks (Mulkay, Gilbert, and Woolgar 1975), problem areas (Mulkay, Gilbert, and Woolgar 1975; Gieryn 1978, 1980), social worlds (Gerson 1983), social/intellectual movements (Frickel and Gross 2005), and intellectual communities/ networks (Collins 1989, 1998). This dissertation relied primarily on the definition given in Mullins (1973).

According to Mullins (1973) a specialization is a group of scientists - who consider themselves to be similar and cite similar sources - which has grown large enough (approximately 20 to 100 or more practitioners), and also diffuse and well enough institutionalized that the group may no longer have singular intellectual leaders(s) or training centers(s). Instead, most leaders in a specialization are primarily social organizational leaders who carry on the legacy of what has become relatively established and routine academic work through their control over important positions in the discipline (Mullins 1973:27-30). In many ways, a specialization is similar to a tiny discipline, which (Sugimoto and Larivière 2018:45) define as: “a community of scholars, organized around a particular knowledge domain, with an infrastructure for researching and disseminating knowledge.” The difference being that specializations are generally smaller and less institutionalized than their larger parent discipline.

Specializations are typically a more abstract level of categorization than individual scientific theories, and there is often a broad spectrum of research activity occurring among claimants of a specialization. Many specialization areas encompass an array of theoretical frameworks, problem areas, and methods of data collection and analysis. For example, Burke (2018:1) claims there are around 40 different theories which fall under the umbrella of contemporary sociological social psychology, about a dozen of which were deemed important and active enough to warrant their own chapter length discussion in a contemporary survey of the specialization.

Specializations are not mutually exclusive categories. For example, scientists specializing in Education and scientists specializing in Organizations might both be interested in how a university operates. Specializations are also not static over time, with new concepts and findings continuously introduced, and various theories and methods rising and falling in popularity over time. Sociological specializations are also not a collectively exhaustive categorization system for every topic that a sociologist might study. Sociologists are also not equally distributed across existing specializations.

Sociological specializations are also not contained entirely within the field of sociology. Many specializations have claimants outside of the discipline or have close counterparts in other disciplines. For example, sociologists who specialize in areas such as organizations, education, and criminology are sometimes employed in business, education, or criminology departments, and often publish alongside scientists from those disciplines in journals specific to those fields. However, specializations are not always closely tied to their counterparts in other fields. For example, sociological social psychology has counterparts in psychological social psychology and in behavioral economics, but each discipline has their own journals, and scientists in each discipline work primarily within their own theoretical frameworks, and it is relatively rare for scientists from one discipline to be hired into a department in one of the other two disciplines.

Research Question 1: Specialization Centrality

How is the popularity of specializations influenced by their position within the network of specializations in sociology?

Previous research on specializations and subfields in sociology has created static maps of the rough relationships between specialization areas at specific points in time. Data sources for these past studies have included: ASA section membership data (Cappell and Guterbock 1992), ASA membership directory data (Ennis 1992, Daipha 2001), and *Sociological Abstracts* subject codes data (Moody 2004, Leahey and Moody 2014). These studies have typically not been focused on empirically examining changes over time. One exception is Moody and Light (2006), which used *Sociological Abstracts* data to investigate the network of topics of papers published between 1970 and 1990 at four time points. These previous papers provide high-level, descriptive overviews of the network of specializations in sociology, but none investigate the potential impact of the shape of the network on the popularity of the specializations themselves.

Specialization legitimacy.

Some specializations are more central to the network of specializations than others, suggesting that they might be more central to the discipline. As Hess (2011:341) notes: "in any research field some topics are considered more worthy of study than others, and the dominant networks of a research field can be expected to defend their notions of intellectual taste in the form of a desirable research for the field." If more central specializations were seen as more legitimate, then we should expect that more central specializations would have been less likely to decline, and more likely to have grown in popularity over time, compared to specializations on the periphery of the network. The first hypothesis is:

H1a: Specializations more central to the network of specializations grew faster.

Specialization types.

Specializations are not mutually exclusive silos of ideas. Many scientists claim specialization in - and have interests in - multiple areas of research. If the popularity of a specialization was influenced by developments in the theory, methods, or subject matter of the specialization, then specializations with similar theories, methods, or subjects should have grown and declined together. For example, excitement about theoretical developments in Criminology or a rise in the societal importance of Criminology should have been shared by with similar specializations such as Law or Deviance, compared to more distant specializations, such as Labor Movements. The second hypothesis is:

H1b: Specialziation type influenced growth of specializations.

Research Question 2: Department Stratification

How is the popularity of specializations within sociology influenced by the stratification of PhD-granting departments?

The departments from which most scientists graduate, and in which many of them find employment, vary greatly in their ability to place graduate students. This has been shown, for example, in physics (Hargens and Hagstrom 1967; Cole and Cole 1973), biology (Hargens and Hagstrom 1967), biochemistry (Long, Allison, and McGinnis 1979), management (Bedeian and Feild 1980), accounting (Fogarty and Saftner 1993), law (Merritt and Reskin 1997), economics (Amir and Knauff 2008), anthropology, (Kawa et al. 2019), computer science and business (Clauset, Arbesman, and Larremore 2015), and in a nationally representative sample of US faculty members which included scientists in 41 different fields (Warshaw, Toutkoushian and Choi 2017). Although graduate placement among departments in sociology has been found to be mostly stable over time (Baldi 1994; Hanneman 2013), some important changes in the last few decades include the relative rise of departments in the Ivy League, and the decline of departments in the major research universities in the Midwest (Hanneman 2013).

Departmental position in the graduate placement network has typically been interpreted as a measure of departmental prestige, and has been found to explain a substantial amount of the observed variation in reputational rankings such as the *U.S. News and World Report* rankings (Matsuoka, Grofman, and Feld 2007; Clauset, Arbesman, and Larremore 2015).

Previous research has shown that employment outcomes for sociology doctoral graduates are associated with the perceived prestige of the department from which they received their doctorate (Hanneman 2001; Burris 2004). In the disciplines of sociology, history, and political science for example, Burris (2004) found that, after controlling for publications, 82 to 84 percent of the variation in the graduate placement could be explained by the prestige of the department from which an individual obtained their PhD.

In periods of high competition, both exclusion (by departments) and adaptation (by applicants) can operate simultaneously to expand inequality (Alon 2009). Decreased possibilities for upward mobility within a discipline can potentially push scientists to move downward into less prestigious departments (Hanneman 2001, Burris 2004), into less prestigious neighboring disciplines (Ben-David and Collins 1966), or outside of higher education entirely (Bloch et al. 2015).

Top-down influence.

The logic underlying this hypothesis was: (1) each department offered training in only a limited selection of the full range of research specializations within a discipline; (2) graduates were more likely to claim specializations that match those of the faculty of the department from which they graduated than to claim specialziations that are different[1]; (3) graduating from departments higher in the graduate placement hierarchy

[1] One possible expansion of the dataset to further explore the effects of stratification would be to compare the specializations claimed by dissertation committee members with specializations of the graduates they advised. In this dissertation, the comparison is with the specializations of all faculty at the degree granting department.

greatly increased the chances of finding employment in a PhD-granting department; and (4) changing specializations mid-career was infrequent (Stehr and Larson 1972).

If these conditions were true, specializations which had few or no claimants among top departments should have been less likely to pass on their interests to future generations of scientists and therefore should have decreased in popularity over time. Specializations which had more claimants among the top departments should have increased in popularity.

H2a: Specializations that were more popular among the most central departments grew more quickly in the other departments.

Bottom-up imitation.

It is also possible that top departments influence the discipline not through their dominance of graduate placement, but through leading the discipline into new areas of specialization by being the first to claim specializations which are then more widely adopted by faculty in less prestigious departments. In other words, regardless of whether scientists graduated from a top department, they may have adopted the same specializations as the scientists employed at more prestigious departments, perhaps in pursuit of the legitimacy or career success associated with those top departments.

H2b: More central departments were the first to claim new specializations.

Research Question 3: Sociodemographic Clustering on Gender

How is the popularity of specializations within sociology influenced by sociodemographic clustering by gender across specializations?

Sociodemographic clustering is the tendency of scientists with similar sociodemographic characteristics, attitudes, or behaviors to be more likely to claim the same specializations compared with scientists with different characteristics. Sociodemographic clustering - a more general term for what is sometimes also called homophily (Goodreau, Kitts, Morris 2009) - on characteristics such as race, age, education, occupational rank, and gender can be widely observed in society (McPherson, Smith-Lovin, and Cook 2001). For reasons described in the Methods section, the focus of this dissertation is on sociodemographic clustering on gender.

Feminization of sociology.

In the 1970's, women were a small minority of sociologists, but today women constitute a majority of sociology Bachelor's (ASA 2023b), Master's (ASA 2023d), and PhD's (ASA 2023c) awarded, and a majority of members of the American Sociological Association (ASA 2023a). Figure 1 shows the percentage of sociology doctorates awarded each year by gender (NCSES 2006), and the percentage of ASA members who were women.

As seen in Figure 1, in 1980, 38.5 percent of sociology doctorates awarded were to women, but by 2016, this number had risen to 62.3 percent. Data on the percentage of

ASA members who were women was only available for 2002 to 2016, but this curve appears to follow a similar pattern of growth in doctorate recipients over time.

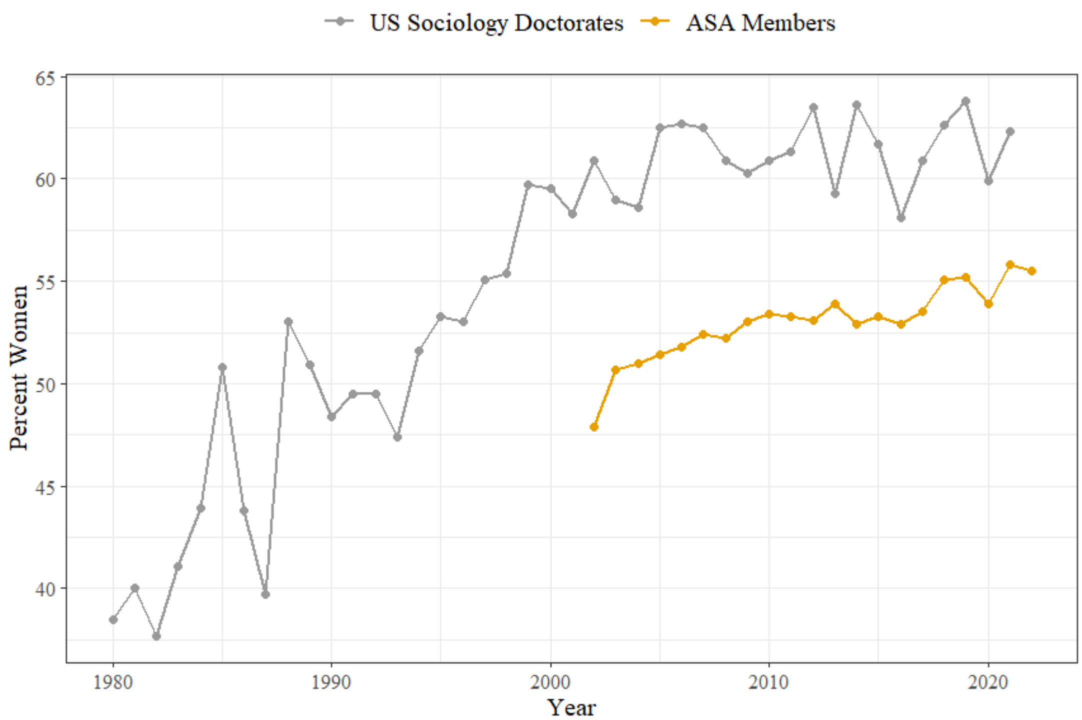

Figure 1 - Percentage of Sociology Doctorates vs. Percentage of American Sociological Association Members who were Women, 1980-2016.

DiFuccia, Pelton, and Sica (2007) and Bucior and Sica (2019) reported an ongoing "feminization" of sociology, with much of sociology in more recent years being majority women, except for the highest academic ranks. They found that as women were entering the discipline, there was also a corresponding increase in graduate-level course offerings and dissertations with topics corresponding to ASA sections with a supermajority of women members. At the same time, there was a decrease in graduate-level course offerings and dissertation topics corresponding to ASA sections with a supermajority of men as members (Bucior and Sica 2019).

The membership of individual ASA sections has exhibited widely varying concentrations of scientists who claimed the same gender. For example, in 2020, 54 percent of all ASA members identified as women, but 78 percent of the section titled ‘Sex and Gender’ identified as women (ASA 2020). This clustering could be the result of a variety of different factors such as geographic proximity, similarity of interests, or common experiences associated with similar positions in social structure.

The logic for the next hypothesis is: (1) if some specializations were persistently more likely to be claimed by women, then (2) the dramatic increase in the number of women in sociology since the 1970s could have caused those specializations to grow more quickly[2].

H3a: Specializations with a higher percentage of women grew faster.

Women leading innovation.

Following Bucior and Sica (2019) it is possible that women were not only changing the discipline through a large-scale feminization of the discipline, but were also changing the discipline through leading innovation in the creation and adoption of new specializations. If this was happening, we should expect that women would have been more likely to be the first adopters of new specializations, particularly those new specializations which were majority women.

H3b: New specializations are more likely to be first claimed by women.

[2] Possible expansions of the dataset to explore sociodemographic clustering in more detail in future research include: (1) analyzing the published work produced by each specialization, and (2) following (Bucior and Sica 2019), assess the dissertation topics of scientists in each specialization, to quantify the extent to which work in the specialization is focused on topics related to women.

Alternative Hypotheses: Hot Topics

In addition to the three components of social structure explored with the previous six hypotheses, three additional hypotheses related to alternative explanations for the growth or decline of specializations were tested: publications, citations, and grants. All three expected outcomes are rooted the idea that a specialization growth might be influenced by a topic being relatively trendy or "hot" at a particular time. A topic of research might have been hot - or cold - for a variety of reasons, including: (1) current events outside of the discipline which were relevant to the specialization[3], (2) new discoveries or the development of new tools within the specialization, or (3) a general feeling that most of the "interesting" questions related to the specialization had already been answered. The common logic for these three hypotheses was that scientists hoping to advance their careers or pursuing exciting developments in sociology might have been inclined to adapt their research specializations to follow "hot" topics, abandoning "cold" topics.

Article publications.

It is possible that publication or work norms may have differed across specializations, or that societal or theoretical developments at a particular time may have resulted in different numbers of articles published across specializations. If some specializations were more productive than others, then scientists working in those

[3] Growth of interest in a topic of research does not necessarily correspond directly with birth or growth of specializations. For example, even a very socially significant event such as a global pandemic would likely result in an increase in publications, citations, and grants about pandemics across many specializations, not just in Medical Sociology. One potential opportunity for future research is to explore the extent to which these types of events impact scientific outputs in various specialization areas.

specializations should have produced higher numbers of publications per person. If scientists were aware of these differences, and were influenced to claim or switch claims to a specialization because of the prospect of increasing their productivity, then:

H4a: Specializations with a higher average number of article publications per scientist grew faster.

However, it is also possible that variance in the average number of article publications per scientist across specializations is limited due to similar constraints on time and similar pressures to produce faced by virtually all scientists working in PhD-granting sociology departments.

Article citations.

Citation counts can be influenced by a large number of factors (Tahamtan, Afshar, and Ahamdzadeh 2016), and small differences in citation counts between two specializations are likely not very meaningful, but a large difference in the number of citations per scientist between two specializations of a similar size could indicate: (1) a higher concentration of late-career, highly-productive, or otherwise prominent scientists, or (2) developments in the specialization at that time which were seen as exciting to scientists outside of the specialization in addition to those working within that specialization.

Inequality in citation concentration appears to have decreased over time. Larivière, Gingras, and Archambault (2009) showed that in 1956, 80% of citations in the social sciences referenced just 14% of papers. However, by 2005, the same percentage of citations referenced 28% of papers. This same general pattern can be observed across the sciences (Larivière et al. 2009). Possibly related to the decentralization of citations is that the number of journals in which an author can publish has increased dramatically. For example, between 1970 and 2015, the number of journals in sociology and related fields more than tripled (Hermanowicz 2016).

If scientists were influenced to claim a specialization in order to follow the lead of highly cited scientists in the discipline as a whole, or by a perception that some specializations are more highly cited, then:

H4b: Specializations with a higher average number of article citations per scientist grew faster.

Grant funding.

Research often requires funding and support, and scientists typically apply for this funding under competitive conditions, with some areas of research receiving much more funding than others. Because of this, individual scientists may have had an incentive to attempt to tailor their projects somewhat to fit the interests of funders, and this could potentially even have included switching specializations.

H4c: Specializations with a higher average grant funding per scientist grew faster.

On the other hand, it seems unlikely that large numbers of scientists were routinely changing their specializations to pursue funding. In fact, it may have been the case that many scientists were largely unaware of funding opportunities outside of their own specializations.

A counter argument to all three hypotheses is that it probably would have required a substantial up-front investment of time and energy to acquire sufficient expertise in a new specialization to ensure successful publication, citation, and/or grant funding. This large investment could potentially have discouraged frequent changes of specialization among scientists who were constantly under pressure to produce a steady stream of publications in addition to other duties such as teaching and administrative work. This time investment would likely have been more of a barrier when switching between specializations that were more distant from each other.

In addition, publications, citations, and grants may also have been as much or more a result of department prestige than they were a cause of it (Way et al. 2019), since scientists working at more prestigious institutions often have better access to grant funding or postdocs and graduate research assistants (Way et al. 2019). It might also have been an effect of gender. Leahey (2007) found that women were likely to specialize less intensively than men, which could lead to fewer publications and citations than their male colleagues (Leahey 2007).

METHODS

To test the nine hypotheses mentioned in the previous section, I constructed a dataset of individual scientists including a total of 70,962 individual data points across 41 waves, from 1976 to 2016. Each datapoint was a full-time, non-joint, assistant, associate, full, distinguished, or endowed sociology faculty member, employed in one of 92 U.S. PhD-granting Sociology departments.

Data Sources

I first assembled data on individual scientists, drawn from records of the American Sociological Association (ASA), Web of Science (WOS), National Science Foundation (NSF), National Institutes of Health (NIH), U.S. Social Security Administration (SSA), ProQuest (PQ) dissertation records, curriculum vitae, obituaries, and biographical sketches.

For each of the faculty in this first dataset, I collected information on the specialization areas they claimed each year, which department employed them each year, which department granted their PhD, their gender, articles they published in peer-reviewed sociology journals and citations they received in those journals each year, and grants they received each year. Despite some unavoidable limitations of the available historical records, I believe this is currently the most complete and detailed dataset possible using publicly available information.

From this first dataset, I then constructed a second dataset of specializations which grouped the individuals from the first dataset according to their claims of specialization in each of the 113 specializations identified from the data. For each specialization, and for each year, I calculated the number of claimants, the percentage of claimants who were women, the total NSF and NIH grant funding received, and the number of publications and citations.

Although they make up a minority of those who identify as sociologists, the fixed population of departments and the faculty included in these datasets play a key role in defining the structure and content of both contemporary and future sociological science. They collectively produce a large percentage of all the peer reviewed papers published in the most prestigious sociology journals, they exercise significant control over hiring decisions for new faculty, and their graduates comprise the bulk of the faculty in sociology departments at most other U.S. colleges and universities. They also exercise a large degree of control over the content and form of the curriculum to which future faculty in training are exposed, and set the standards for scientific journals for which they work as reviewers and editors, as well as providing mentorship and professional connections for their students and junior colleagues hoping to work in academic research.

Timeframe of analysis and historical context.

Contemporary social science disciplines, including sociology, first began to institutionalize as independent academic specializations in the US during the latter half of the 1800s. Over the next few decades, the social sciences continued to diversify and institutionalize. Perhaps the first introductory sociology textbook was published in 1890 (Calhoun 2007:20). The University of Kansas claims to have founded the first US sociology department in 1891 (Sica 1990). The American Sociological Association[4] was founded in December of 1905 (ASA 2023e).

The 1970's was an important starting point for analysis of contemporary sociology because it marked the beginning of many features of the contemporary academic research environment. The decades following World War II saw a tremendous expansion in US higher education. There was an explosion of growth in both the number of institutions and total number of students in the 1950s through the early 1970s. But beginning in the 1970s, financial pressures led to competition between institutions for funding, along with the introduction of the more "corporate" management techniques that are still in use today (Brint et al. 2012; Rice 1986). As Slaughter and Leslie (1997) note: "The 1980s were a turning point, when faculty and universities were incorporated into the market to the point where professional work began to be patterned differently" (Slaughter and Leslie 1997:5). Many of the old-guard of distinguished professors and upper-level administrators at major universities today completed their training during the beginning of this period. Many of the major theories taught in U.S. sociology graduate departments today were also developed during this time period.

Figure 2 shows the growth in membership in the ASA from 1906 to 2022 (ASA 2023f). The area between the vertical dashed lines on the graph is the time-window for which the most complete data was available. Data from this period was used as the basis for the analysis in this dissertation. As can be seen in Figure 1, the time period covered

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[4] The original name was the American Sociological Society (ASS), but this name was changed to American Sociological Association in 1963 (Turner 1989).

by the dissertation coincides with a relatively flat period of growth following the rapid expansion of the discipline from the 1940s until the early 1970s.

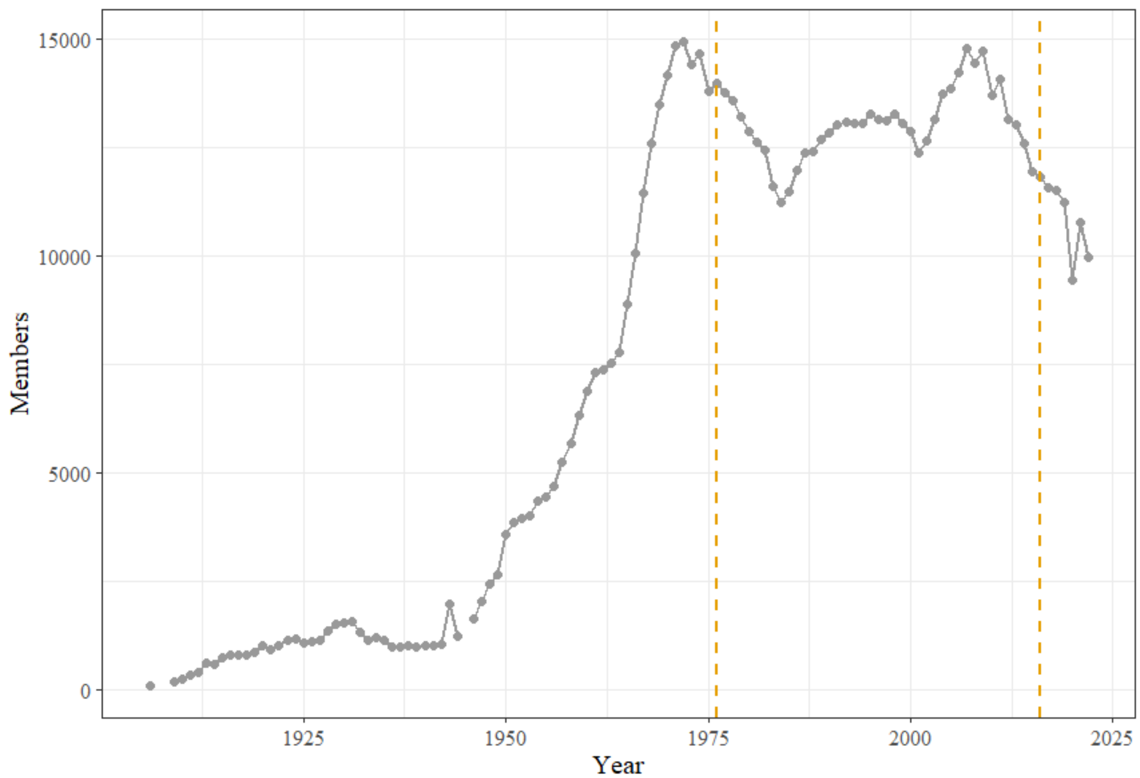

Figure 2 - Total membership in the American Sociological Association, 1906-2016[5]*, vertical dashed lines show time-window for the analysis.*

Although the total number of members was relatively flat starting in the 1970s, there were still important changes occurring in the composition and activities of the members. Some of the major trends in sociology that occurred during the time-window of the analysis were a steady increase in the number of ASA sections (shown in Appendix E), a dramatic increase in the number of women in sociology, a large increase in the

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[5] Membership data from ASA. No membership data was available for 1907, 1908, or 1945 (2023f). Vertical dashed lines show the time-window covered by the dissertation.

average age of faculty, and an increase in the average number of articles published by faculty.

Research specializations data.

There were several sets of possible data sources which were considered for constructing measures of specialization popularity within U.S sociology, including: (1) article metadata for publications in academic journals, (2) scholarly association membership records, (3) university websites, and (4) graduate department directories.

The first set of possible measures of specialization popularity was based on the *article metadata* for scholarly articles published by sociologists. An example is the author keywords attached to articles in many contemporary academic journals. Previous cross sectional research using data from recent years, suggests that differences between how a scientist describes their own specialization and classifications based on the type of work they publish are relatively small[6]. For example, Leahey and Reikowsky (2008:436) created a measure of author specializations using keyword descriptors on publications and found that 20 out of the 21 authors they interviewed agreed with how they had been classified based on these keywords.

However, there were some major disadvantages of author keywords for constructing a longitudinal dataset. For many of the years covered by the period of this study, most sociology journals did not have author keywords. Only 32.8 percent of all the articles in "sociology" journals in WOS between 1976 to 2016 had author keywords

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[6] A potential future project could include a more in-depth investigation of the extent of differences between these two types of measures.

included in the article metadata at the time this data was collected for this dissertation, with different journals first including keywords at different dates. For example, *American Sociological Review* had author keywords for its articles starting in 2006, but *Social Forces* and *American Journal of Sociology* had no keywords during the time-window of the study[7].

However, even when keywords are available, there are other disadvantages: (1) some scientists published much more frequently than others, (2) scientists sometimes published in irregular bursts of articles, (3) the publication date of an article may have varied considerably from when the research was conducted, (4) scientists who were early in their career or who had fewer publications would have fewer articles to draw specialization conclusions from, and (5) many sociology articles, particularly in more recent years, had more than one author, and there was often no clear indication of which keywords should be assigned to each author. Together these challenges made it very difficult to create a complete longitudinal dataset of scientist specializations using article metadata.

While they were not very useful for constructing a longitudinal dataset, keywords were used as a rough, conservative estimate of the univerise of *possible* specializations. Each keyword was a topic upon which sociologists have actually conducted and published research, and which sociologists *could potentially* have claimed as an area of specialization. Between 1976 and 2016, across all 150 "sociology" journals in the WOS,

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[7] Using the full text of the articles rather than the metadata to estimate author specialization areas might be one way to expand the dataset in the future. But this would require acquiring the full text of all articles from around 500 journals between 1976 to 2016, which was prohibitively expensive.

there were 150,170 unique keywords in the article metadata. This is a conservative estimate because only 32.8 percent of the articles actually had keywords included in the metadata.

A second possible set of measures of specialization popularity was based on *scholarly association membership records,* such as: (1) the general membership directory the American Sociological Association (ASA), or (2) ASA section membership counts. Although some scientists have used this type of data to provide cross-sectional snapshots of sociology as a discipline in the past (e.g. Cappell and Guterbock 1992; Ennis 1992; Daipha 2001), there are several disadvantages to constructing longitudinal measures based on these data: (1) not all sociologists were members of the ASA, (2) not all members of the ASA were sociologists, and (3) there was wide variation among ASA members on commitment to and involvement in the discipline. Similarly, not all members of the ASA were members of ASA sections, which typically required paying additional annual dues. Although willingness to pay these dues could have been interpreted as one indicator of commitment to the section (Daipha 2001:75), it may also have been the case that some paid members were less committed, but had had their membership paid for by someone else, such as if a professor offered to pay for the section membership fees of their students.

There were several additional disadvantages specific to section membership data that are important to note. The first is that there were a relatively small number of ASA sections compared to the vast array of topics that sociologists have claimed as their research specializations. In 1976, there were only 11 official sections. Although the number of sections grew steadily over time, there were still only 52 official ASA sections by 2016. Figure 42 in Appendix E shows the growth of official ASA sections. A related limitation of section membership data is that many ASA section titles combined the interests of more than one area of specialized study under a single umbrella, such as in the cases of “Race, Gender and Class,” “Altruism, Morality, and Social Solidarity,” “Methodology,” or “Theory.” The names of these sections also sometimes changed over time, making their connection to specializations even less clear. In addition, relative proportions of members with more specific interests within each of these sections were not part of the membership counts, so it was impossible to use these data to study change in the more specific areas over time. For example, 10 scholars departing “Theory” and being replaced by 10 new scholars would not have changed the section membership total, despite the fact that the departing and arriving scholars might all have specialized in different types of theory.

Despite these limitations, the ASA membership data which was available was still helpful for verifying the results from other sources and for providing some context. The ASA was able to provide me with total section membership counts for the period from 1992 to 2022, but the data could not be atomized to the level of individual scientists, so it could not be linked from one year to the next, or linked to other types of data. The ASA also provided numbers for section membership overlap for 2018 to 2022, which allowed for some superficial assessment of the relationships between sections, even though these years were outside of the window of the study.

A third possible source of specializations popularity information was *university websites*. Department websites often include lists of faculty and biographical sketches, information about where they received their PhD, and some indication of their specialization areas. These data have been used in the past to study graduate placement patterns (see for example, Clauset, Arbesman, and Larremore 2015).

However, university websites were not well suited to collecting longitudinal historical records, since for many of the years during the time-window of this study, university websites did not exist. Additionally, university website formats were not standardized. Also, when a university updated their website, the previous information was often overwritten and lost. In some cases, the Internet Archive Wayback Machine was able to partially reconstruct missing webpages[8]. However, the records in this archive were only a partial record. Universities often only updated their websites every few years, and they did so asynchronously, so even for a cross-sectional study, a wave constructed from information collected from university websites was often only accurate within a range of a few years.

Instead of using publications metadata, scholarly association membership records, or websites, I used a fourth possible source of faculty specializations information, *The Guide to Graduate Departments of Sociology* (hereafter *The Guide*). Since 1965, the ASA has published this directory based on an annually updated record of an attempted census of US graduate sociology departments. Information collected and reported about

[8] One possibility for future expansion of the dataset is to use the Internet Archive to try to fill in missing data for years after 2001, which is when the Internet Archive began indexing websites. It is possible that this might allow inclusion of a small number of additional departments that were missing data for consecutive years only after 2001. This might allow for extending the dataset beyond 2016.

departments has evolved somewhat over time, but the first edition of *The Guide* which contained specialization areas for each individual full-time faculty member was published in 1974[9]. Every year since, the ASA has contacted departments to give them an opportunity to update their information, and these directories have been published annually since 1974, providing a measure of specialization claims for a large number of sociology faculty for every year from 1973 to the present. These directories were used as a starting point for the construction of the dataset used for this dissertation.

There were some important limitations to *The Guide* as a data source. The first was that departments that only offered a bachelor's degree were not included, and the records for departments which only offered a master’s degree were incomplete. Only PhD-granting sociology departments were highly represented. Also, not all types of faculty were included in *The Guide*. Full-time, non-joint faculty appear to have been very highly represented, but emeritus, adjunct, and jointly-appointed faculty appear to have been less likely to be reported completely in *The Guide* for all departments. As a result, the specializations data was a measure of the claimed specializations of this relatively small and elite group of sociologists.

The second limitation to *The Guide* as a data source was that the data was collected from departments, rather than directly from individuals. Some departments may have been more fastidious in updating their information each year than others. One way this might impact the data was if faculty continued to be listed in *The Guide* for additional years beyond their departure from the department, or for newly arriving faculty

[9] The first editions of *The Guide*, which included the names of full-time faculty, but did not include their specialization areas, were published in 1965, 1969, 1970, 1971, and 1972.

to not be listed starting on their first year. However, in approximately one hundred cases where I found that faculty who changed departments were listed in more than one department during the same year, a comparison with available CVs seemed to indicate that the arrival and departures of faculty were typically updated accurately in *The Guide*. Another way this might have impacted the data would be if faculty specialization changes were not updated every year. With the existing data, it is impossible to know the extent to which these possible measurement errors impact the data[10].

Probably the most important limitation to the data in *The Guide* was that in 1994, the ASA changed the way that they collected specializations data for *The Guide*, and this appears to have impacted the data for a year or two immediately after the change, and created a large permanent change in the data for all years after the change. Prior to 1994, the specialization information for each faculty member was written in by hand and was reported in text form as it was written in. After the change, the specializations data was collected by allowing respondents to choose from a list of specialization areas, or to choose "other" and write specializations in. The ASA did not have an exact record of which specialization areas were offered as options to choose each year. But the options available were updated periodically, and according to the ASA, they were likely to be very similar to the major specialization areas which were listed in the index of *The Guide* that year. In the 1994 edition of *The Guide*, which was the first year reporting using the new data collection system, 60 specialization areas were indexed.

[10] It is possible that a comparison with individual-level ASA membership data would allow an estimate of the extent of this potential problem. It would not provide a full accounting however, because not all of the faculty in these departments are paid members of the ASA each year, and not all paid members update their records in with the ASA each year. ASA was unable to share individual-level ASA membership data with me for this project.

One effect of this change on the data was that, starting with the first year after this change and continuing thereafter, the total number of unique specializations claimed each year decreased dramatically compared to the years prior. In the year prior to the change, there were 925 unique specialization claims. In the year after the change, there were only 217 unique specialization claims. Many of the most popular specializations appear to have been unaffected by the change in data collection, likely because they were included as one of the approximately 60 options to choose from in the data collection form. Claims in smaller specializations would have required selecting the “other” category and then writing in the specialization, as had been done prior.

Many of the claims which were made by only one person or a very small number of scientists disappeared completely after the change in data collection. Some medium-popularity specialization claims also disappeared, and there were also new claims which first appeared after the change. Also, in the first year or two after the change, a small number of the medium-popularity claims had counts which appear to be uncharacteristic of the trends before and after that year. For example, the number of listings for comparative/macrosociology are about 10 times higher during the first two years after the change than what would be expected given the apparent trend seen in the years immediately prior and following these years. I think cases like these were likely caused by a mismatch between what people wanted to claim and the options that were available, or by a temporary problem with the new database. Because of this change in data collection, trends across the gap should be interpreted cautiously, and most of my analysis looks at trends before and after the gap separately. For reference, Appendix D shows the popularity of all the specializations identified for this dissertation over all waves, including across this gap.

Despite these limitations, I believe *The Guide* was the best available foundation for the construction of a longitudinal dataset of US sociologists and their specialization claims between 1976 and 2016. Unlike membership data, the data in *The Guide* was essentially an attempted census of a fixed population of sociology faculty. Because the population was limited to full-time faculty in PhD-granting sociology departments, their specialization claims were as - or more - purely sociological than general membership claims. Unlike the article metadata and university website data, *The Guide* was updated at roughly the same time each year, every year, over this entire time period.

Employing department data.

The department in which each faculty was currently employed was based on the department under which they were listed in *The Guide*. The availability of data in *The Guide* constrains which departments were able to be included in the dataset, and which types of faculty were able to be included. For network analysis, it was important to construct a dataset which was as-complete-as-possible, because missing data can change the shape of the network.

From 1976 to 2016, a total of 92 departments were either: (1) present every year, or (2) present almost every year, and only missing non-consecutive years[11]. A list of the included departments is included in Appendix A. Data for the years 1975, 1976, and 2017

[11] It is possible that alternate sources of data, such as records kept by individual departments, could be used to extend the number of waves of the dataset in the future.

to 2022 were also collected, but were not included in the final dataset, because several of the departments that were present from 1976 to 2016 were missing from *The Guide* for consecutive years either before or after those years.

The resulting list of 92 departments included in the dataset represents 47 of the 64 US universities that were members of the AAU as of 2016 (73.4 percent). 78 of the 92 departments (84.8 percent) were at universities that were on the 2021 Carnegie Classification list of 146 US doctoral universities with the highest levels of research activity.

In about 300 cases, individuals were listed as full-time faculty at two different departments during the same year. The most common cause of this situation appeared to be cases where faculty were switching from one department to another around that time, and both departments claimed them as faculty. In order to avoid double counting faculty and their specialization claims, each faculty was assigned to a single department each year. CVs and biographical sketches enabled placement of about 100 of these faculty at a single department. In cases where it was still unclear which department was their primary department that year, the remaining faculty were assigned to the department in which they were new arrivals.

Graduating department and graduating year data.

The department from which each faculty received their PhD, and the year in which they received their PhD, were also collected from *The Guide*. The data from *The Guide* has been used in the past to study department graduate placement hierarchies (e.g. Hanneman 2001, Burris 2004, Hanneman 2011). In cases where there was an apparent typo or change of degree granting university or year, I was often able to verify the PhD year and university by comparison with PQ dissertation database records, curriculum vitae, obituaries, or biographical sketches. Aside from typos, the most common cases of changes in year of graduation appear to have been when faculty were hired before their actual graduation date, and were listed as a new faculty with a graduation matching the edition year of *The Guide*, but then in a subsequent edition, their graduation date was updated to a later year. Graduation dates and degree granting universities were triangulated if there was a discrepancy in *The Guide* by cross-checking with PQ dissertation records whenever possible.

One additional limitation of the degree granting information in *The Guide* was that only the university which awarded the PhD is listed, not the department. However, the majority of full-time faculty members in PhD-granting sociology departments are likely hires from within their discipline. Survival of disciplines is contingent on departments hiring primarily from the pool of individuals with PhDs in their discipline (Abbott 2000).

Gender data.

Gender for scientists in the dataset was estimated using first names data from the SSA with triangulation of uncertain cases using pronouns found on university websites, obituaries, and other publicly available sources.

Availability of other sociodemographic data.

The NSF collects data on race, parent's highest level of education, immigrant status, and disabilities as part of its Survey of Earned Doctorates (SED). The SED is a restricted dataset based on an annual census of graduates obtaining doctorates from accredited U.S. universities beginning in 1957. The response rate is typically around 92 percent (Plewes 2010:2). This data would be essential for further testing the effects of sociodemographic clustering on specialization popularity beyond gender. Unfortunately, access to the restricted, unaggregated, "microdata" from the SED was necessary to match the scientists in my dataset with their records from the SED. The licensing agreement necessary for matching data from the SED had extensive requirements which were intended to protect the confidentiality of survey respondents, but which also imposed a significant obstacle to access. For example, individual scientists are not given access to the data without being sponsored by an organization, and it appeared that an organization wanting to sponsor a scientist seeking to access the data may have been required to employ a contractor to fill out the application (see NCSES 2006; NSF 2008). For the purposes of this dissertation, I only used the estimated gender coding described earlier.

I was unable to find alternate sources of publicly available data which could be used for an estimation of these other sociodemographic variables. Many of the scientists in the first half of the dataset retired prior to widespread adoption of the internet, leaving very little publicly available data other than their publications. However, a good first step was to test whether estimated gender had an impact on specialization popularity, as this was the sociodemographic characteristic which changed the most in sociology between 1976 and 2016[12].

Publications and grants data.

Article publications data for each individual scientist in the dataset was acquired from WOS for all years from 1976 to the end of 2016. Records were collected for the 499 journals in the SSCI classified with one or more of the WOS subject codes most closely related to sociology: “Sociology,” “Social Issues,” “Social Work,” “Social Sciences, Interdisciplinary,” “Social Sciences, Biomedical,” “Social Sciences, Mathematical Methods,” “History of Social Sciences,” or “Psychology, Social.” These records were then matched with scientists in the dataset using last name and first initial[13].

As with the grants data, for individuals with common first and last names, article publications amounts could have been inflated due to limited ability to disambiguate. But because the journals used were limited to sociology and closely related social science journals, the instances of this were lower than if generalist journals or journals outside of social science had been included.

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[12] If funding is available in the future, the NSF’s SED microdata data would be an excellent opportunity for expanding the dataset to more thoroughly test the hypotheses with other sociodemographic variables.

[13] Matching scientists to their publications in databases like WOS is an ongoing area of research and is not a trivial task (see for example, Tekles and Bornmann 2020; D’Angelo and van Eck 2020), because these databases are built around data submitted from journals rather than around individuals or publications, and different journals have reported different information over time. In addition to typos, sometimes only an initial or abbreviation is available instead of a full name, sometimes a middle name or Jr. or Sr. is left out, sometimes names change, sometimes authors have similar names and similar fields of research, etc… Two measures sometimes used to assess the effectiveness of matching algorithms are *recall*, which is the percentage of an author’s total publications which are accurately matched to their unique identity, and *precision*, which is the percentage of articles which were not authored by the individual that are correctly excluded from the match (D’Angelo and van Eck 2020). One opportunity for expansion and improvement of the dataset used in this dissertation for future research is to improve the matching of scientists with their work.

An important limitation to note is that WOS is a database of journals rather than a database of scientists or articles. It did not include every scientist or every published article - only articles in the relatively prestigious journals that were part of its curated list. However, because the population analyzed in this dissertation was limited to full-time faculty at PhD-granting institutions, a substantial portion of the total articles published by these individuals were probably in these databases.

Using only the WOS core collection data ensured that a standard set of journals was available for comparison and that the results would be replicable. Some major generalist journals which were not focused primarily on social sciences during this time, but which had published articles by sociologists, such as *Science* or *Nature,* were not included in the SSCI. Some specialization-focused publications that were newer and influential among scientists within a particular specialization, but that were not widely cited by scientists outside of that specialization were also not on the list. For example, *Journal of World Systems* was not included in the SSCI, and was instead included in a separate index called the Emerging Sources Citation Index, which was not included in the analysis.

Collecting more complete article publications data for all of the individuals in the dataset from other sources would have been extremely difficult, because many of the scientists in the dataset either: (1) passed away or left academia for other work before the internet was widely used, (2) had a CV or publications list which was either not current or only contained a select list of the author's publications, or (4) did not have a CV or publications list posted. In addition, data collected through CVs or publications lists on websites was not standardized, which creates the potential to introduce additional error through coding decisions about where to draw the line on which publications from a record should or should not have been included. One CV, for example, included books of poetry published by the author.

Unfortunately, WOS, like all other contemporary publication databases, did not have a good record of books and book chapters over the entire time period covered by this dissertation. I did attempt to collect book publication records from Google Books, which appeared to be as - or more - comprehensive than other publicly available sources of books. After comparing the Google Book results to available CVs, it was apparent that a large percentage of books listed on CVs are missing from Google Books. The availability of CVs was limited, with a high of around 70 percent of faculty in the dataset in 2016, and decreasing rapidly towards earlier years of the dataset. Due to the large number of missing books from any available source, books were not counted in the analysis for this dissertation. As a result, some specializations in which book publishing was more important than the average for the discipline have had their productivity underrepresented.

Grants data was obtained from the NSF for all years from 1976 to 2016, and the NIH for all years from 2000 to 2016. These records were then matched with scientists in the dataset using the author's last name and first initial. For some individuals with common first and last names, grant amounts from both sources might be inflated due to limited ability to disambiguate principal investigators and co-principal investigators with the same first and last names using the data from these sources.

To reduce the incidence of inflated grant amounts, I only counted NSF grant amounts if the grant was awarded under the Directorate for Social, Behavioral, and Economic Sciences. In 2023, this directorate included four divisions: Behavioral and Cognitive Sciences, National Center for Science and Engineering Statistics, Social and Economic Sciences, and Multidisciplinary Activities. This means that sociologists collaborating on grants in areas outside of this directorate had their grant totals undercounted. For NIH data, it was not possible to narrow down the grants to more sociologically relevant projects in the same way, so NIH grant totals were more likely to be inflated in cases of principal investigators or co-principal investigators with common first and last names. NIH grants were probably also more likely to be awarded for research in certain types of specializations, such as Medical Sociology. In total, 1000 NSF grants and 773 NIH grants were found in which a principal investigator or co-principal investigator shared a last name and first initial with a scientist from the dataset, in a year in which that scientist was part of the dataset.

There were many other sources of grant funding for sociologists besides the NSF and NIH during the time-window of the study, but these were two of the largest, and despite their limitations, these data allowed for an estimate of the potential impact of grant funding on specializations.

Inference of missing data.

One of the challenges of the data from *The Guide* was that when a department was missing for one year, all information about the department, including all of the faculty for that department, were systematically missing that year as a result. To address this problem, I first attempted to construct the largest possible span of years, with the largest set of departments which were either present in all years, or were only missing for one year at a time, not two or more contiguous years. Then within the resulting dataset of 92 departments, for the cases where these departments were missing from *The Guide* for a year, I attempted to infer as much of the remaining missing data as possible.

For the 44 instances of departments with non-contiguous missing years, the data for the year *prior* to the missing data was compared to the data for the year *following* the missing data. If a faculty member was listed as a full-time tenure-track faculty member in both the prior year and the following year, it was inferred that they were also a member of the department during the missing year. Faculty who were only present in either the prior year or the following year, but not both, were left as missing data. In cases where faculty presence was inferred, all of their associated information, including rank and specialization claims, was assumed to be unchanged from the year *prior*.

This reduced, but did not completely eliminate, the systematically missing data problem caused by departments occasionally missing from *The Guide*. For departments that were missing from *The Guide* for non-contiguous years, a small number of faculty and specializations were undercounted for the missing departments because those faculty either first entered the dataset during the missing year, or because they left during the missing year. In total, 562 instances of faculty were inferred across the 44 instances of departments missing from the dataset for noncontiguous years. Of the 70,960 total faculty datapoints across the 41 years in the dataset, 0.79 percent of the faculty data points were inferred using the method described above.

It was also possible to estimate the number of potential undercounts. There appear to have been 269 instances where a faculty member *could possibly* have left or joined the dataset during an inferred year, because they were only present in either the prior year or the following year when a department was missing data. The true number of undercounts is likely lower than the potential undercounts, since some of these faculty actually departed the year before or joined the year after the missing year and were not in fact undercounted. If approximately 1/3 of these 269 possible instances were actually undercounts, this would be approximately 0.13 percent of the datapoints which were undercounted. For comparison, for departments that were not missing from *The Guide*, the total turnover each year (due to faculty entering or leaving the dataset each year because of hiring, retirement, or other reasons) was approximately 10 percent.

There may also be a very small number of individual faculty who were missing from a department for one year even though their department was included in the dataset. If they were in fact missing, it could be that they were on sabbatical, or that they left the department for a year, or that their information was incorrectly missing because of a typo or some other mistake. In these cases, it was assumed that their absence was reported accurately in *The Guide*, and data was not inferred.

Data Coding

This section describes how the collected data was coded to create the main measures used in the analysis.

Specializations coding.

Specialization claims of each of the faculty members were first collected from the ASA *Guide to Graduate Departments of Sociology*, for each year in which they were listed in *The Guide.* As an example, Figure 3 shows the information provided in *The Guide* for the individuals listed as full-time faculty at Columbia University (ASA 1978:48):

Barton, Allen H. (PhD, Columbia 1957; Prof) Methodology, Stratification, Organizations
Beveridge, Andrew A. (PhD, Yale 1973; Asst Prof) Survey Methods, Economies
Blau, Peter M. (PhD, Columbia 1952; Prof) Theory, Organizations, Stratification
Cole, Jonathan R. (PhD, Columbia 1969; Prof) Theory, Science
Diamond, Sigmund (PhD, Harvard 1953; Prof) Historical, American Society
Etzioni, Amitai (PhD, California, Berkeley 1958; Prof) Macrosociology, American Society
Fisher, Wesley A. (PhD, Columbia 1976; Asst Prof) Soviet Society, Family
Gans, Herbert J. (PhD, Pennsylvania 1957; Prof) Urban, Public Opinion, American Society
Merton, Robert K. (PhD, Harvard 1936; Univ Prof) Science, Theory, Organizations
Messner, Stephen (MA, Princeton 1976; Lect) Stratification, Political, Deviant Behavior
Passin, Herbert (MA, Chicago 1941; Prof) Comparative, Family, Social Change
Schutte, Jerald (PhD, UCLA 1974; Asst Prof) Social Structure, Techniques of Social Research
Silver, Allan (PhD, Michigan 1962; Prof) Political, Comparative, American Sociology
Winckler, Edwin A. (PhD, Harvard 1973; Asst Prof) Political, Comparative
Zuckerman, Harriet A. (PhD, Columbia 1965; Assoc Prof) Science, Theory

Figure 3 **-** *Typical Faculty Data Lines in The Guide to Graduate Departments of Sociology*

Each year, each faculty member had between 0 and 10 specializations listed next to their name in a semi-structured format as shown above. Approximately 97 percent of faculty members had 3 specializations listed. Often, particularly in later years, one or more of the specializations listed was a compound-claim, containing more than one constituent term. For example: “race, gender, and class,” or “sex and gender,” or “gender and sexuality." In rare cases, specializations were listed in sentence form, such as "19th and 20th Century American History and African American History, and the U.S. civil rights movement."

Simply counting compound-terms and sentences as listed in *The Guide* as specializations would not have accurately reflected the relative popularity of sub-disciplinary specialization areas within sociology. For example, simply counting the claims "race, gender, and class," "sex and gender," "gender and sexuality," and "gender" as four separate claims would have dramatically undercounted the popularity of gender as a specialization.

In order to more precisely assess the relationships between specialization areas, I used a four-step coding process: (1) atomize compound terms, (2) standardize spellings of clearly similar claims, (3) identify the most popular specializations, and (4) group clearly related terms with the closest specializations.

First, I atomized compound specialization terms into their constituent parts. For example, the common specialization claim "race, class, and gender" was broken into the three constituents: "Race," "Class," "Gender."

Second, I standardized any of the atomized constituent parts which appeared to only differ because of typos, pluralization, spelling preferences, or abbreviation or absence of a word. To preserve as much as possible the intent of the original claims, I generally maintained the original spellings contained in *The Guide*, except for cases which appeared to only differ in the use of common plural forms, spelling differences, abbreviations, or typos. In these cases, in order to avoid potentially obscuring the true size of a specialization by coding them separately, I coded them as a single specialization claim. For example, the largest instance of combining constituent claims was that: "methodology," "methodologies," "method,' "methods," "research methods," and "metodology," along with several other clearly-related alternate spellings, misspellings, abbreviations, pluralization, and typos, were all coded as "Methodology." If I was unsure about whether very similar terms were clearly related, I left them unrelated during this step of processing.

It is possible that standardizing constituent claims in this way may have resulted in obscuring some real differences of identity claims within a group of scientists or preferences for particular spellings of specialization claims. However, with the existing data, it was impossible to perfectly distinguish cases of differences of identity from cases where scientists had the same specialization, but where there was no consensus about spellings, where abbreviation was used, or where there were typos. I generally used the most common form present in the dataset as a standardized name for all cases. For example: "World-Systems," "World Systems," and "World-System," were all coded as "World-Systems." After making the coding decisions described in these two steps, there were a total of 3913 unique constituent terms in the dataset[14].

In the third step, I identified the most popular specializations among those unique constituent terms by counting the number of occurrences of each constituent term, each

[14] A list of the thousands of coding decisions made for specializations was preserved, and will be available alongside the dataset when the dataset is eventually published. This can also be used to verify and validate the quality of the dataset through intercoder reliability calculations.

year. If a term was claimed by at least one percent of the faculty in at least one of the 41 waves of the dataset, it was considered a specialization for this analysis. This resulted in 113 specializations, which are listed in Appendix B. Because the number of faculty present in the dataset each year varied, the one percent threshold means that a specialization must have been claimed by at least 17 to 18 separate scientists during a single year to be considered a specialization and included in the final analysis. This is very close to the lower bound of approximately 20 which was used by Mullins (1973) to define specializations.

After these specializations were identified, I then attempted to group them with other constituent claims which could be clearly linked to them. For example, "Youth" was popular enough to be considered a specialization, while "Youth Unemployment" and "Orthodox Jewish Youth" were two much less popular constituent terms that contain the word "Youth." "Youth Unemployment" was claimed a total of 10 times and "Orthodox Jewish Youth" was claimed a total of 5 times across all 41 waves, while the specialization "Youth" alone was claimed 785 times across the 41 waves. Both constituent terms containing the word "Youth" were counted as claims of specialization in "Youth," which seemed to be the closest fit with any of the 113 specializations, including what was probably the next closest specialization "Children." "Children" and "Youth" were left as separate specializations, but later identified as a relatively persistent community and grouped together into the same type, as discussed in the next subsection on specialization types coding.

There were about 500 cases where constituent terms could be associated with two or more specializations. For example, “Urban Community” appears to be related to two specializations: “Community” and “Urban.” In these cases, I broke the term down further and counted this as claims for each of the specializations contained in the term.

There were also some cases where there were variations of parts of constituent terms which could potentially be seen as similar, but which could not be grouped together following the rules described above. For example, the terms: “African Demography” and “Sub-Saharan Africa” were not considered specializations because they each only occurred a few times throughout the 41 waves. “African Demography” was grouped with the closest specialization “Demography.” However, there were several other infrequent constituent terms which contained the words “African,” “Africa,” or “Africana.” In cases like this, it is possible that if all were grouped together, they could have reached the threshold of one percent. Alternatively, they could have been grouped together as a type, as described in the next section. I did not combine terms like this, but one possibility for future analysis is to more fully explore alternate coding schemes that group loosely similar terms like this together, to check the robustness of the original coding scheme and look for additional hidden specializations across the 3913 unique terms found in *The Guide*.

In one case, a single word was apparently used to mean more than one very different type of research. The term “Development” was used 3787 times across the 41 waves. It appeared that at least three distinct categories of research were associated with this term: psychological development (e.g. “Child Development,” Personality

Development”), program/organizational development (e.g. “Organizational Development,” “Instructional Development”), and socioeconomic development. In this specific case, I felt that it was unlikely that scientists in these three areas would consider themselves to be part of the same specialization, so when it seemed clear that one of these three types was intended, I separated them into different categories. It is possible that there are other terms in the dataset which were also used to refer to more than one very different type of research, and this could lead to those specializations having inflated counts.

Specialization popularity counts.

After coding the data as described above, specialization popularity was calculated as the total number of faculty who claimed each specialization. One important consequence for the analysis is that because almost all faculty claim more than one specialization, the popularity counts for each specialization are not independent. This is necessary for constructing the network of specializations as shown in Appendix C, and for identifying communities of relatively persistent specialization types, as discussed below. However, it should be kept in mind when interpreting the results of the regression analysis. Also, because some of the faculty claim more specializations than others, there are some individual faculty who contribute more to the data than others, although as noted earlier, most faculty claimed three specializations.

Specialization types coding.

Having identified the most popular specializations using the rules described above, I then attempted to identify communities of closely related specializations. There were two possible approaches to identifying similar types of specializations.

The first option was a top-down approach of attempting to group specializations according to broad, pre-defined categories sometimes used for comparisons between different disciplines, such as in Collins (1994)'s "high consensus vs low consensus", or Becher (1989)'s: soft/hard, pure/applied, urban/rural, convergent/divergent. One problem with this approach was that these "family resemblances" between disciplines often turn out to be less useful when the categories are analyzed more closely (Trowler 2014:1723). Because the sub-disciplinary specializations analyzed in this dissertation were all within sociology, the distinguishing characteristics were likely to be even less pronounced than across disciplines. Also, many sub-structures within a discipline can share sub-sub structures resulting from common fundamental problems or questions faced by scientists within the same discipline (Abbott 2001). A further limitation of this approach was that the data that I have did not readily facilitate characterizations of the cultures within each specialization, or changes in these cultures over time, because all I had was the terms chosen by scientists when making their specialization claims.

Therefore, instead of a top-down approach, I used a bottom-up approach. First, I constructed a network of specializations, with each specialization as a node, and with links between specializations generated whenever a single scientist, in a single year, claimed two specializations simultaneously. For example, if one scientist claimed "Race, Gender, and Class," this created the links: Race-Gender, Gender-Class, and Class-Race. The links in the network were weighted by the frequency with which scientists in the dataset made the same simultaneous claims that year. The specialization networks for for 1976, 1986, 1996, 2006, and 2016 are shown in Appendix C.

Then the Leiden community detection algorithm (Traag, Waltman and van Eck 2019) in igraph (Csardi and Nepusz 2006) was used to find communities of closely related specializations within the specializations network for each year. This algorithm, like the Louvain community detection algorithm (Blondel et al 2008) it is based on, starts by assigning each specialization to its own community, but uses modified procedures after this step to improve the results. In essence, the algorithm repeatedly calculates the change in modularity of the network that occurs when moving a single specialization into a community with another specialization. The specialization is assigned to the community that results in the greatest increase in modularity for the network. The movement of specializations into new communities and evaluating modularity continues until no further modularity increases are possible.

I first ran the Leiden algorithm on the 1976 specialization network, trying out different resolution parameters to find a seemingly good fit for the data. In general, a larger resolution parameter results in a greater number of very small communities. Setting the parameter to 3 resulted in 26 communities ranging in size from 2-10 specializations each. Using this same parameter for the 2016 specialization network resulted in 21 communities ranging in size from 2-11 specializations. The seed for the random number generator was fixed at 1 for reproducibility. I then used the Leiden algorithm to identify communities for each of the 41 waves.

Because the relationships between specializations evolve over time, in order to identify relatively persistent specialization types between 1976 and 2016, I initially coded specializations into the same type if they were assigned to the same community on at least 21 waves. This resulted in 77 of the 113 specializations being assigned to a persistent type. There were four other specializations that were assigned to the same community as another specialization for 18 of the 41 waves, and two for 17 of 41, and these were all assigned to the closest persistent type. In a few cases, a specialization could have been assigned to more than one type, in these cases, I assigned it to the type with the greatest number of years matching. The remaining specializations were not consistently assigned to the same communities as any other specializations. In total, I was able to assign 83 of the 113 specializations (73.451 percent) to one of 26 relatively persistent types. The types and their assigned specializations are listed in Appendix B.

Specialization popularity and centrality.

Specialization popularity was calculated as both a count of the total number of faculty claiming each specialization in a given year, and as the percentage change from one year to the next. *Specialization centrality* was calculated as the eigenvector centrality of the specialization in the network of specializations for a given year.

Department graduate placement hierarchy.

Compared to surveys where individuals are asked to rank a long list of departments, such as *U.S. News and World Report* rankings, graduate placement rankings were likely to be at least, if not more accurate. One reason is because graduate placements were less likely to be biased by personal experiences of individual evaluators (such as when polling individual department heads or journal editors), or by constraints on individual evaluators' access to the information needed to make their assessments (Fogarty and Saftner 1993:429). Another reason is that these types of rankings were typically not collected every year, and were also not published every year during the time-window. Another advantage of using graduate placement is that the rankings produced from graduate placement were inherently relational, compared to simply ordering departments by their attributes or outcomes as in the *U.S. News and World Report* rankings (Hanneman 2001:69). For these reasons, graduate job placement was an ideal indicator of stratification.

Following Hanneman (2001), the position of the department within the graduate placement hierarchy within the discipline was calculated as the eigenvector centrality of the department in the network of graduate placements. Departments were nodes in the network, and graduates from one department hired in other departments were links between the nodes. The links were weighted by the total number of PhDs exchanged between the two departments.

Gender coding.

The gender of each faculty member was estimated as either man, woman, or left as unknown, using a three-step procedure.

The first step involved subtracting 30 from the year each scientist's degree was awarded to get an approximate birth year, and then comparing the first name of the faculty member to the US Social Security Administration (SSA) records of first names for that year. If: (1) there were at least 30 babies with the same first name in the SSA records that year, and (2) at least 90% of those babies were registered as either male or female, then the gender of the faculty member was assumed to match the majority. This step produced a gender estimate for more than 80 percent of the faculty in the dataset. The remainder of the faculty had first names which were either uncommon or atypically spelled for the US during that year.

Step two attempted to estimate the gender for the remaining individuals. For these individuals, I looked online for biographical sketches on university faculty web pages, or, if those did not exist, for obituaries or personal webpages which appeared to be the same person. If none of the previously used sources of information existed, there were sometimes news articles or Wikipedia pages that could be matched to the individual. It was considered a match if information for (1) first name, (2) last name, (3) year of doctoral degree, and (4) university awarding doctoral degree were the same as the information in the dataset. If an academic or personal website used pronouns associated with the individual, I assigned gender based on the pronouns used on the webpage. In a few cases, pronouns were not used explicitly, but a photo was attached, and the photo was used to estimate gender. This step allowed gender to be estimated for almost all of the remaining faculty (approximately 850 additional individuals) in the dataset. Two of the individuals found during this second step explicitly used non-binary pronouns in their online bio-sketches, and were assigned "unknown" as their gender estimate.

The third step of the procedure was to assign "unknown" as the gender estimate to all remaining individuals. For the most part, these individuals were those with atypical names for the US population during the approximate time of their birth, who also passed away prior to wide adoption of the internet. In some cases, these individuals had university or personal web pages which did not have bio-sketches.

Coding gender as a binary variable introduced some error into the measurements. A person's gender also might not have matched their name, might have changed during the time period covered by the dataset, might have been misattributed by a third person such as an obituary writer, or could have been incorrectly coded in cases where only a photo was available. However, because I was primarily using gender to estimate the changing gender composition of aggregations of individuals in specializations and departments over time, it was unlikely that this small amount of error would have greatly impacted the results.

Data analysis software.

Networkx (Hagberg, Schult and Swart 2008) in Python was used to calculate eigenvector centrality for the specialization and departmental networks. The network diagrams in Appendix C were generated in Gephy 0.10.1, using the ForceAtlas 2 algorithm with LinLog mode (Jacomy et al. 2014). Hypothesis testing and time series analysis was performed using the plm package (Croissant and Millo 2008) in R, and xt packages in STATA 18.

RESULTS

The purpose of this dissertation was to use US sociology as a case study to explore the extent to which the relative popularity of topics which scientists choose to study are influenced by inequalities in three major aspects of the social structure of a discipline: (1) the network of specializations in a discipline, (2) the network of PhD-granting departments in a discipline, and (3) sociodemographic clustering within specializations. This section reports the results of the tests of the hypotheses described earlier in the Theory section.

Specialization Centrality

This section discusses the analysis related to the first of the three research questions: How was the popularity of specializations within sociology influenced by the network of specializations?

Changes in the sociology specialization network over time.

Overall, as can be seen in the specialization network diagrams for 1976, 1986, 1996, 2006, and 2016 in Appendix C, the network of specializations was very densely connected, with very few steps required to link even the most distant specializations. In these networks, one step between specializations means two specializations were both claimed by a single scientist that year. Two steps indicate specializations which were not claimed together by any single scientist that year, but which were both linked through a third specialization which was claimed alongside each of the two specializations.

In these diagrams, the thickness of the line connecting two specializations indicates the relative number of claimants who claimed both specializations simultaneously in the same year, with thicker edges indicating more popular combinations. The size of each node indicates the relative popularity of specializations, with larger nodes indicating more popular specializations. Node proximity indicates relative similarity, and nodes towards the center of the diagrams are more central to the network.

Some specializations, such as “Theory” and “Stratification” stay close to the top of the list of the most central specializations each year, indicating that they are relatively central to the discipline over the entire 41 waves. Other specializations seem to have a clear trend in their change of position. “Social Psychology” appears to be becoming less central to sociology over time. Others, such as “Culture” appear to be becoming more central. In 1976, “Culture” is in position 60 of 113 of the centrality rankings. In 1996, and 1986, it is in position 34, in 2006 it has risen to 18th, and by 2016 it is the 2nd most central. “Gender” has the most dramatic rise. It is not at all central in early years, and is not even claimed at all during the first two years. But by the mid-1990s it has become the most central specialization, and maintains that position for the remainder of the waves. This rise is explored in more detail in the section on sociodemographic clustering.

Specialization legitimacy and hot topics.

This sub-section discusses the results of the hypotheses tests for specialization legitimacy and hot topics:

H1a: Specializations more central to the network of specializations grew faster.

H4a: Specializations with a higher average number of article publications per scientist grew faster.

H4b: Specializations with a higher average number of article citations per scientist grew faster.

H4c: Specializations with a higher average grant funding per scientist grew faster.

Table 1 shows descriptive statistics for the variables associated with the four hypotheses tested in this section. Among the full time, non-joint, tenured and tenure-track faculty of the 92 PhD-granting sociology departments, specialization popularity in 1976-1992 ranged from 0 to 326, with a mean of 42.730 claimants.

Methodology in 1976 had the highest specialization popularity during the first time-window, claimed by 326 scientists, and Gender in 2007 had the highest specialization popularity during the second time-window, claimed by 324 scientists. In both time-windows, there are some specializations that either start after a time-window begins or drop to zero claimants during the time-window. There are also a few specializations that only have claimants in one time-window, but not the other.

As shown in Table 1, the mean number of publications, citations, and grant award dollars per scientist was higher in the second half of the dataset than in the first half. The large increase in all the average number of citations per scientists was likely at least partly due to the increase in the average years since graduation for these sociologists, as scientists with more publications and more established careers are likely to receive a greater number of citations in a given year. This may also explain the smaller increase in articles per scientist, if scientists with more established careers are more efficient at producing papers. The large increase in grant dollars per scientist could be partly due to inflation. The mean time since graduation for faculty in this dataset almost doubled from 10.880 years in 1976 to a maximum of 19.623 years in 2015.

Table 1 - Descriptive Statistics for Specialization Popularity, Specialization Centrality, Publications, Citations, and Grant Amounts per Scientist, 1976-1992 and 1996-2016.

	Specialization Popularity	Specialization Centrality	Articles per Scientist	Citations per Scientist	Grants Dollars per Scientist	Percent Women
1976 - 1993						
Mean	42.730	0.086	0.844	5.349	1031.993	23.877
Min	0	0.002	0	0	0	2.222
Q_1	9	0.051	0.597	2.492	0	12.500
Q_2	23	0.081	0.800	4.409	0	18.919
Q_3	47	0.119	1.000	6.910	0	28.651
Max	326	0.214	12.000	48.000	561,127	100.000
1996 - 2016						
Mean	58.555	0.086	1.215	34.675	15,791.837	38.544
Min	0	0.001	0	0	0	3.703
Q_1	11	0.048	0.861	13.500	0	25.000
Q_2	27	0.086	1.107	25.000	1,540.958	35.000
Q_3	87	0.127	1.487	49.155	13,509.542	50.000
Max	324	0.177	11.000	270.000	2,293,520	100.000

There was a moderate positive correlation ($r = 0.496$) in the first half of the pooled data, and a moderate positive correlation ($r = 0.256$) in the second half of the pooled data, between specialization popularity and the absolute value of the change in popularity from the previous year. In a balanced dataset, which only included the 86 specializations which had at least one claimant in all waves during both halves of the dataset, there was also a moderate positive correlation (r = 0.476) in the first half, and a small positive correlation (r = 0.181) in the second half of the dataset. These positive correlations indicated a possible effect of specialization size on change in popularity, with the more popular specializations growing or declining faster.

To control for the possible effect of size, I calculated the dependent variable as fractional change in claimants from one year to the next, rather than simply a count of the number of claimants. The benefit of calculating the dependent variable in this way is that it directly controls for size. However, one downside of using fractional change as a dependent variable is that it reduces the number of waves by two (by losing the first wave in each half of the data). Another downside is that it compresses the variation and results in a very non-normal distribution. A logit transformation appeared to do the best job of making the distribution more normal-like, although it was still not normal after the transformation, as indicated by visual inspection and a Shapiro-Wilk test.

As expected, visual inspection and Shapiro-Wilk tests of the independent variables indicated that none were normally distributed. All the independent variables except for grant dollars per scientist were transformed with the goal of both: (1) improving the symmetry and spread of the individual distributions to make them more normal-like, and (2) straightening the relationship between the dependent and independent variables. Percent change in popularity, publications and citations per scientist, and percentage women were transformed using a logit transformation with the following adjustment to the formula to allow the logit to be applied to proportions of exactly 0 or 1 (Fox 2016:73, 75):

$$P' = \frac{F + ½}{N + 1}$$

$$logit(P') = ln\ (\frac{P'}{1 - P'})$$

In this equation, F was the count of the variable for a specialization in a year (e.g. the number of articles produced by claimants of the specialization that year), and N was the total count for the variable over all specializations that year (e.g. the number of articles produced by claimants across all specializations that year). Centrality was transformed with a square root transformation. Grant dollars per scientist was zero for a little over half of the specializations in the unbalanced pooled dataset, so it was difficult to find an effective transformation, and ultimately, grant dollars per scientist was left untransformed in order to try to make use of as much of the data as possible.

Pearson correlation was used to check for possible collinearity between the independent variables after transformation. A correlation greater than 0.9 between independent variables was considered collinearity. As shown in Table 2, in the transformed variables used in the models reported here, specialization centrality, articles per scientist published each year, and citations per scientist received each year were highly correlated. This multicollinearity means that the coefficients reported in the tables here have low power, and small changes in the data could result in relatively large changes in the coefficients (Fox 2016:341). Fully resolving this problem would require additional data that somehow avoids the collinearity, or redefining the research questions to avoid the collinearity (Fox 2016:366). Neither was possible here, but both options should be explored in future research. However, additional models were tested and are included in the following tables which may provide some additional insight into the reliability of the results.

Table 2 - Pearson Correlations for Independent Variables After Transformations.

	Specialization Centrality	Articles per Scientist	Citations per Scientist	Grant Dollars per Scientist	Percent Women
1977-1992					
Specialization Centrality	1.000	0.910 *	0.870	-0.040	0.000
Articles per Scientist	0.910 *	1.000	0.940 *	-0.030	-0.250
Citations per Scientist	0.870	0.940 *	1.000	-0.010	-0.270
Grant Dollars per Scientist	-0.040	-0.030	-0.010	1.000	0.000
Percent Women	0.000	-0.250	-0.270	0.000	1.000
1996-2016					
Specialization Centrality	1.000	0.930 *	0.900 *	-0.050	0.190
Articles per Scientist	0.930 *	1.000	0.940 *	-0.050	0.030
Citations per Scientist	0.900 *	0.940	1.000	-0.010	-0.030
Grant Dollars per Scientist	-0.050	-0.050	-0.010	1.000	-0.020
Percent Women	0.190	0.030	-0.030	-0.020	1.000

* indicates Pearson Correlation greater than 0.9.

Because a Pesaran (2015) cross-sectional dependence test indicated strong cross-sectional dependence in the residuals for the full model in the balanced dataset of 86 specializations present in all waves of both halves of the dataset, the results reported here utilize regression with Driscoll-Kraay (1998) standard errors, which are generally robust to heteroskedasticity, cross-sectional dependence, and serial correlation (Hoechle 2007). The results reported in the tables are for the full dataset of 113 specializations.

Tests of hypotheses 1a, 4a, 4b, and 4c are shown in Table 3 and Table 4. The results for the first time-window of 1977-1992 are shown in Table 3, and results for the second time-window of 1996-2016 are shown in Table 4.

Model 1 in Table 3 examined the effect of specialization centrality alone on specialization popularity. A Hausman test ($p<.001$) comparing fixed effects and random effects models confirmed that a fixed effects model was the better choice compared to a random effects model for specialization centrality. The fixed effects model examines the pooled within specialty variance, and ignores the between specialty variance. The coefficients are identical for all specializations, essentially removing the effect of factors within each individual specialization that might impact specialization popularity. A comparison of the results of this model with an ordinary least squares model (OLS) confirmed that the fixed-effects model was also a better fit than an OLS model.

As shown in model 1, the square root of specialization centrality had a statistically significant ($p<.001$), positive influence on the logit of fractional change in specialization popularity from the previous year. In other words, specializations that were more central to the network - i.e. specializations that were connected to a greater number of other specializations that were themselves connected to other highly connected specializations - appear to have grown faster.

Model 2 explored the impact of scientific article publications per scientist on specialization popularity. The results for model 2 showed that articles per scientist had a statistically significant ($p<.001$) positive influence on specialization popularity. Model 3 explored the impact of scientific article citations per scientist on specialization popularity. The results indicated that citations per scientist also had a statistically significant ($p<.001$) positive influence on specialization popularity.

Table 3 - Effect on Fractional Change in Specialization Popularity of Specialization Centrality and Publications, Citations, and Grant Amounts per Scientist, 1977-1992.

	1	2	3	4	5	6
Specialization Centrality	10.278 *** (0.410)				8.747 *** (0.340)	8.218 *** (0.339)
Articles per Scientist		0.489 *** (0.052)			0.138 *** (0.008)	0.102 *** (0.009)
Citations per Scientist			0.362 *** (0.041)			0.069 *** (0.011)
Grant Dollars per Scientist				-0.000 (0.000)		
within R^2	0.800	0.501	0.476	0.002	0.823	0.836
n	109	113	113	109	109	109
T	16	16	16	16	16	16
N	1683	1808	1808	1685	1683	1683

	7	8	9	10	11
Specialization Centrality	8.208 *** (0.342)	7.605 *** (0.362)	7.961 *** (0.353)	162.763 *** (5.317)	158.969 *** (7.769)
Articles per Scientist	0.101 *** (0.009)	0.095 *** (0.009)	0.098 *** (0.009)	1.993 ** (0.685)	1.353 *** (0.599)
Citations per Scientist	0.069 *** (0.011)	0.072 *** (0.006)	0.060 *** (0.010)	1.614 *** (0.400)	1.678 *** (0.458)
Grant Dollars per Scientist	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
within R^2	0.837	0.827	0.813	0.372	0.340
n	109	86	108	109	108
T	16	16	16	16	15
N	1683	1375	1667	1683	1577

Driscoll-Kraay standard errors are reported in parentheses.
*, **, *** indicates significance at the .05, .01, and .001 level, respectively.
n = number of specializations, T = number of years, N = total observations

Model 4 explored the impact of NSF and NIH grants per scientist on specialization popularity. The results for model 4 showed that there was insufficient evidence to conclude that grants per scientist had an influence on specialization popularity.

Models 5, 6, and 7 in Table 3 explored the impact of all four variables on specialization popularity, adding each variable sequentially. Model 5 tests the combined impact of centrality and articles per scientist. The results for model 5 showed that both centrality ($p<.001$) and scientific article publications per scientist ($p<.001$) had statistically significant ($p<.001$) positive influence on specialization popularity. Model 6 tested the combined impact of centrality, articles per scientist, and citations per scientist. The results for model 6 showed that both specialization centrality ($p<.001$) and citations per scientist ($p<.001$) had a statistically significant positive influence on specialization popularity. As in model 5, articles per scientist did not have a significant impact on specialization popularity. Model 6 had a slightly higher R^2 than model 5, indicating that this model explained a little more variation in specialization popularity than the model with only centrality and publications.

Model 7 tested the combined impact of centrality articles per scientist, citations per scientist, and grants per scientist. The Hausman test for model 7 indicated that a fixed effects model should be used. The results for model 7 showed that again, both centrality ($p<.001$) and citations per scientist ($p<.001$) had a statistically significant positive influence on specialization popularity. As with model 4, grants did not have a significant impact on specialization popularity. This model had almost the same R^2 as model 6, indicating that this model explained as much of the variation in specialization popularity as the model with centrality, publications, and citations, but without grants.

Model 7 indicated that, for 1977-1992, an increase of specialization centrality by one, across specializations, and across one wave, on average, would have, increased specialization popularity by 708.696, controlling for publications, citations, and grants. The untransformed specialization centrality during this time period ranged from 0.002 to 0.214. The range of the transformed centrality scores is 0.045 to 0.463, so a specialization going from the farthest periphery to the most central position in the network would be a change of about 0.418. As indicated by the rapid growth of Gender, a change in centrality like this appears to be rare, but possible.

Model 8 in Table 3 applied model 7 to a balanced dataset which only included the 86 specializations which had at least one claimant for all years in both halves of the dataset. Because the very rapid growth of gender might be considered an outlier, model 9, applied model 7 to the full dataset with all of the specializations except for Gender. Model 10 used the same independent variables as model 7, but used the raw count of specialization popularity rather than the fractional change used as the dependent variable in the other models. Model 11 used the same variables in each year to predict raw count of popularity in the following year. As shown in Table 3, the results for models 8, 9, 10 and 11 were largely similar to the results for model 7, increasing confidence in the robustness of the result to changes in the underlying data.

Table 4 - Effect on Fractional Change in Specialization Popularity of Specialization Centrality and Publications, Citations, and Grant Amounts per Scientist, 1996-2016.

	1	2	3	4	5	6
Specialization Centrality	11.860 *** (0.198)				10.328 *** (0.101)	9.196 *** (0.159)
Articles per Scientist		0.526 *** (0.030)			0.128 *** (0.013)	0.064 *** (0.017)
Citations per Scientist			0.467*** (0.014)			0.154 *** (0.020)
Grant Dollars per Scientist				-0.000 (0.000)		
R^2	0.806	0.502	0.608	0.000	0.828	0.850
n	111	113	113	111	111	111
T	21	21	21	21	21	21
N	2239	2373	2373	2240	2239	2239

	7	8	9	10	11
Specialization Centrality	9.193 *** (0.158)	8.051 *** (0.227)	9.201 *** (0.154)	191.863 *** (0.158)	185.416 *** (9.883)
Articles per Scientist	0.063 *** (0.017)	0.067 *** (0.016)	0.062 *** (0.017)	3.010 *** (0.665)	2.739 *** (0.645)
Citations per Scientist	0.156 *** (0.020)	0.214 *** (0.017)	0.156 *** (0.020)	4.620 *** (1.333)	3.827 *** (1.152)
Grant Dollars per Scientist	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 (0.000)
within R^2	0.851	0.806	0.851	0.333	0.276
n	111	86	110	111	111
T	21	21	21	21	20
N	2239	1806	2218	2239	2133

Driscoll-Kraay standard errors are reported in parentheses.
*, **, *** indicates significance at the .05, .01, and .001 level, respectively.
n = number of specializations, T = number of years, N = total observations

The results for the years 1996-2016 are shown in Table 4. They were largely similar to the results for the earlier time-window shown window in Table 3. Grant dollars per scientist was statistically significant ($p<.05$), but the effect size was zero.

Q-Q plots for model 7 showed that although the model seemed to be a reasonably good fit with the normal distribution for 1977-1992, the model did not appear to have quite as good of a fit for 1996-2016. One possible reason for this is that in the second half of the dataset, there were several specializations which were very often claimed together either because they were offered together as a single option when the data was collected, or because of the recent establishment of a corresponding official ASA section with a title that contained both specializations. As a result, these specializations were likely more highly correlated with each other in the second half than in the first half. As shown in some of the figures in Appendix D, there were several specializations where this occured in the second half of the dataset. For example, in Figures 16 and 25, the specializations for Race, Gender, and Class all experience a large drop in claimants around 2008. The ASA section titled “Race, Gender, and Class” was officially established in 1997.

Overall, the results shown in Tables 3 and 4 provide support for hypotheses 1a, 4a, and 4b. It appears that specializations which were more central to the network of specializations and specializations which had a higher number of publications and citations per person did grow faster. But there was insufficient evidence to conclude that specializations with a higher number of grant dollars per scientist grew faster. Because of this collinearity between publications and citations per scientist, the coefficients in these models should be interpreted cautiously, as small changes in the data could potentially result in relatively large changes the coefficients. Models 8, 9, 10, and 11 shown in Tables 3 and 4 appear to indicate that the coefficients are relatively stable to those changes, but further data is required to fully resolve the collinearity.

Specialization types.

H1b: ***Specialziation type influenced growth of specializations.***

The table in Appendix B lists the 26 relatively persistent specialization types that were identified using the procedure described in the Methods section. Table 5 shows the results of a random effects model for the effect on specialization popularity of specialization type, centrality, publications, citations, and grant amounts per scientist. Random effects was used in this case, treating the relatively persistent specialization types as time invariant properties of the specializations. As discussed in the Methods section, in order to be considered part of a type, a specialization had to be consistently identified as being in the same community as another specialization for at least 17 waves.

As shown in Table 5, For the waves in 1977-1992, specialization centrality ($p<.001$), publications per scientist ($p<.001$), and citations per scientist ($p<.001$), were statistically significant and positive, as in model 7 of Tables 3 and 4. Nine of the specialization types were also statistically significant: 2 ($p<.001$), 6 ($p<.01$), 7 ($p<.01$), 8 ($p<.05$), 10 ($p<.001$), 15 ($p<.001$), 18 ($p<.001$), 20 ($p<.001$), and 25 ($p<.05$). These nine types include a total of 36 of the 113 specializations. This indicates that in the case of these nine types of specializations, the overall growth in popularity of a specialization type from one year to the next did impact the growth of the individual specializations.

Table 5 -Random Effects Model for Effect on Fractional Change in Specialization Popularity of Specialization Type, Centrality, Publications, Citations, and Grant Amounts per Scientist, 1996-2016.

	1977-1992		1996-2016	
Specialization Centrality	8.738	(0.160) ***	9.407	(0.151) ***
Articles per Scientist	0.114	(0.010) ***	0.068	(0.008) ***
Citations per Scientist	0.075	(0.007) ***	0.160	(0.008) ***
Grant Dollars per Scientist	0.000	(0.000)	0.000	(0.000) **
Specialization Type 1	0.156	(0.092)	0.386	(0.087) ***
Specialization Type 2	0.329	(0.059) ***	0.308	(0.055) ***
Specialization Type 3	-0.016	(0.125)	0.252	(0.117) *
Specialization Type 4	0.119	(0.126)	0.072	(0.118)
Specialization Type 5	0.054	(0.104)	-0.043	(0.098)
Specialization Type 6	0.219	(0.077) **	0.252	(0.073) ***
Specialization Type 7	0.380	(0.126) **	0.507	(0.118) ***
Specialization Type 8	0.267	(0.126) *	0.182	(0.118)
Specialization Type 9	-0.013	(0.126)	0.119	(0.117)
Specialization Type 10	0.365	(0.104) ***	0.360	(0.098) ***
Specialization Type 11	-0.013	(0.104)	0.446	(0.099) ***
Specialization Type 12	0.137	(0.072)	0.144	(0.068) *
Specialization Type 13	0.032	(0.126)	0.576	(0.119) ***
Specialization Type 14	-0.134	(0.175)	-0.098	(0.117)
Specialization Type 15	-0.454	(0.127) ***	0.154	(0.097)
Specialization Type 16	-0.122	(0.106)	-0.341	(0.097) ***
Specialization Type 17	-0.074	(0.105)	0.256	(0.098) **
Specialization Type 18	0.511	(0.126) ***	-0.116	(0.117)
Specialization Type 19	0.196	(0.126)	0.551	(0.119) ***
Specialization Type 20	-0.479	(0.126) ***	-0.248	(0.117) *
Specialization Type 21	-0.100	(0.126)	0.301	(0.118) *
Specialization Type 22	0.039	(0.126)	-0.084	(0.118)
Specialization Type 23	0.110	(0.126)	-0.077	(0.117)
Specialization Type 24	0.172	(0.126)	0.292	(0.118) *
Specialization Type 25	0.191	(0.092) *	0.355	(0.086) ***
Specialization Type 26	0.073	(0.126)	0.035	(0.118)
R^2	0.901		0.913	
n	109		111	
T	16		21	
N	1683		2239	

Driscoll-Kraay standard errors are reported in parentheses.
*, **, *** indicates significance at the .05, .01, and .001 level, respectively.
n = number of specializations, T = number of years, N = total observations

For the waves 1996 to 2016, as in model 7 of Tables 3 and 4, specialization centrality ($p<.001$), publications per scientist ($p<.001$), and citations per scientist ($p<.001$), were statistically significant and positive. As before, grant dollars per scientist was statistically significant in the second half, but with an effect size of zero. Six of the specialization types from the first waves were also still statistically significant and positive in this second time-window: 2 ($p<.001$), 6 ($p<.001$), 7 ($p<.001$), 10 ($p<.001$), 20 ($p < .05$), and 25 ($p<.001$). There were also ten newly statistically significant and positive types: 1 ($p<.001$), 3 ($p < .05$), 11 ($p<.001$), 12 ($p < .05$), 13 ($p<.001$), 16 ($p<.001$), 17 ($p<.01$), 19 ($p<.001$), 21 ($p < .05$), and 24 ($p < .05$). For the second time-window, a total of 59 of the 113 specializations were classified in a specialization type where there was a statistically significant, positive relationship between specialization popularity and specialization type. For these specific specialization types, the overall growth in popularity of a specialization type from one year to the next did appear to impact the growth of the individual specializations.

Department Stratification

The second of the three sub-goals of this dissertation was to explore whether and to what extent the relative popularity of sociological research specializations might be impacted by stratification of departments within the discipline.

Stratification in graduate placement.

There is a clear pattern of stratification in gradate placement within U.S. sociology departments between 1976 and 2016. This is particularly noticeable in the gap between the top five departments and the other 86 departments in the dataset. The top five departments: University of Wisconsin-Madison, University of Chicago, University of Michigan-Ann Arbor, University of California-Berkeley, and Harvard University, were consistently ranked among the top five most central departments in the graduate placement network. The first three departments on this list were among the top five most central departments for all 41 waves of the dataset. University of California-Berkeley was in the top five for 34 waves, and Harvard was in the top five for 31 waves. The department with the next highest frequency of appearing in the top five was Indiana University-Bloomington, which was among the top five for only 5 waves. Only six other departments were ever among the top five most central departments at any point: Northwestern University (3 times), University of North Carolina-Chapel Hill (3 times), University of Washington (2 times), Columbia University (2 times), Princeton University (1 time), and Cornell University (1 time).

The graduates of the top five departments make up between 8.7 and 10.4 percent the total faculty in the dataset. In addition to being more likely than graduates of other departments to be employed in the dataset, they are also more likely to be employed in more central departments, including the top five most central departments. Figure 4 shows the percentage of faculty employed at the top five departments who were also graduates of those top five schools. From Figure 4, it appears the inequality in graduate placement among the top five departments has been decreasing. At peak in 1978, 71.2 percent of the faculty employed in the top five departments had graduated from one of the top five departments. By 2016, this had dropped to 49.1 percent.

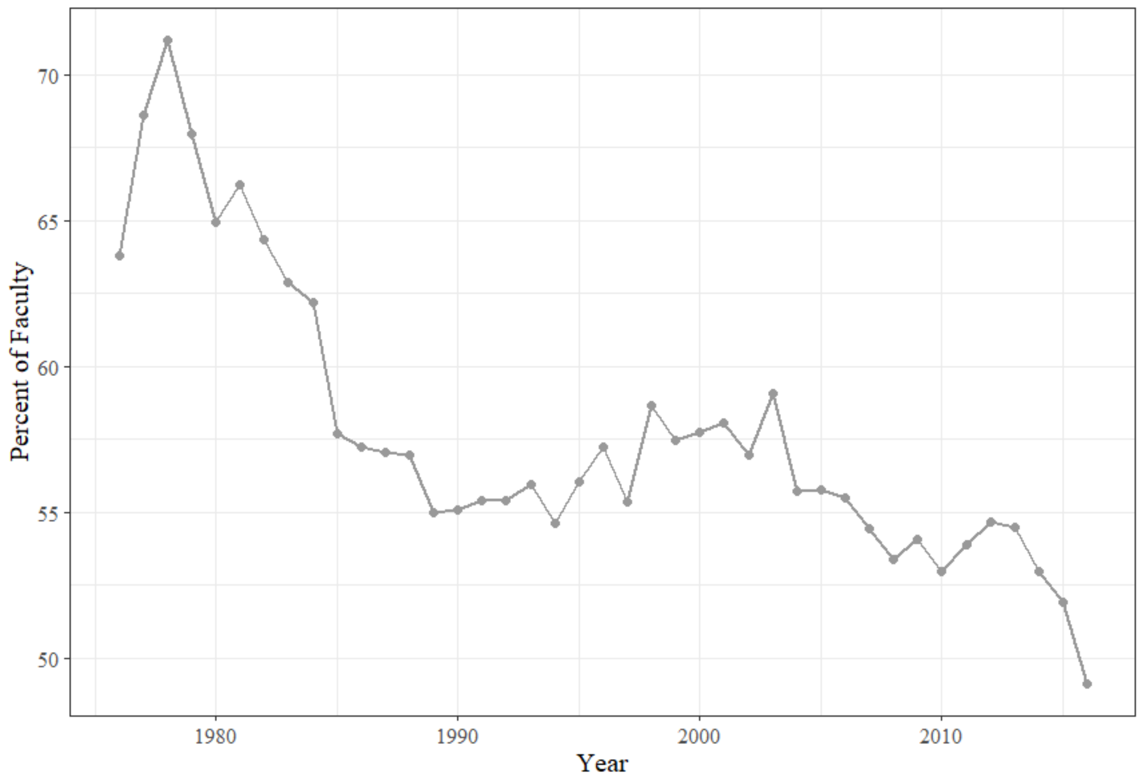

Figure 4 - Percentage of Faculty in the Top 5 Most Central Departments Who Were Also Graduates of One of the Top 5 Departments.

One possible contributing factor to this decline in social closure might be that the top departments have also been getting smaller at a slightly faster rate than other departments over this time period. The average number of non-joint, tenured and tenure-track faculty in the top five departments decreased from 25.4 to 23.2 from 1976 to 2016, while the average number of faculty for departments in the entire dataset decreased from 18.9 to 17.9. The decline in average number of faculty among the top five was driven primarily by the University of Wisconsin-Madison, which was for many years the largest department in the dataset. It declined from 48 in 2007 to 33 in 2016.

Top-down influence.

H2a: Specializations that were more popular among the most central departments grew more quickly in the other departments.

To test the hypothesis involving department stratification, specialization popularity, and publications, citations, and grants per scientist were calculated separately for the top 5 departments and for the bottom 87 departments. Specialization centrality was not included in these separately calculated by-strata calculations, because the centrality is based on overall network topography, and looking only at a small portion of the faculty would likely not have been meaningful. The dependent variable for this hypothesis test was the popularity of specializations among the bottom 87 departments. This was transformed using a logit transformation. The popularity of specializations among the top five most central departments was treated as one of the independent variables. This was transformed using a square root transform.

Models 1-4 in Table 6 indicate that the popularity of specializations among the top five departments had a statistically significant ($p < 0.001$), positive impact on the popularity of specializations in the bottom 87 departments between 1976 and 1993. Article publications ($p < 0.001$), citations ($p < 0.001$), and grants ($p < 0.05$) per scientist were also statistically significant during this time period, with grants being statistically significant but having an effect size of zero as before. The R^2 for model 4 was 0.544, indicating that about half of the variation in popularity among the bottom 87 departments can be predicted by this model, which is a little less than the model without grants.

Table 6 - Effect on Fractional Change in Specialization Popularity among Bottom 87 Departments of Specialization Popularity among Top-5 Departments, 1977-1992 and 1996-2016.

	1977-1992			
	1	2	3	4
Top-5 Popularity	0.277 *** (0.060)	0.108 *** (0.024)	0.068 ** (0.022)	0.074 ** (0.023)
Articles per Scientist		0.467 *** (0.048)	0.314 *** (0.031)	0.298 *** (0.032)
Citations per Scientist			0.185 *** (0.020)	0.173 *** (0.020)
Grants Amounts per Scientist				0.000 * (0.000)
within R^2	0.109	0.502	0.565	0.544
n	113	113	113	109
T	16	16	16	16
N	1808	1808	1808	1685

	1996-2016			
	5	6	7	8
Top-5 Popularity	0.379 *** (0.050)	0.162 *** (0.017)	0.115 *** (0.016)	0.110 *** (0.008)
Articles per Scientist		0.475 *** (0.027)	0.224 *** (0.021)	0.208 *** (0.021)
Citations per Scientist			0.312 *** (0.015)	0.323 *** (0.030)
Grants Amounts per Scientist				0.000 ** (0.000)
within R^2	0.170	0.527	0.670	0.603
n	113	113	113	111
T	21	21	21	21
N	2373	2373	2373	2240

Standard errors are reported in parentheses.
*, **, *** indicates significance at the .05, .01, and .001 level, respectively.
n = number of specializations, T = number of years, N = total observations

In models 5-8 in Table 6, it appears that for 1996-2016, top five popularity remains statistically significant ($p<.001$) and positive. As in the previous time period, scientific article publications ($p<0.001$), citations ($p<0.001$), and grant dollars ($p<0.01$) per scientist were also statistically significant during this time period, with grants being statistically significant but having an effect size of zero. The model with all the variables has a slightly higher R^2 values compared to the same model in the first half of the waves, indicating that it explains a little more of the variance in popularity among the bottom 87 departments.

The results shown in Table 6 indicate that specializations that grew in popularity in the top five departments also became more popular in the bottom 87 departments. As with the models in Tables 3 and 4, because of the collinearity between publications and citations per scientist, the coefficients in these models should be interpreted cautiously, as small changes in the data could potentially result in relatively large changes the coefficients.

Bottom-up imitation.

H2b: More central departments were the first to claim new specializations.

There are a total of 25 specializations which were first claimed by a scientist in the dataset between 1976 and 2016. Table 7 reports the Pearson correlation between the year in which each department first claimed a specialization, and the centrality of that department at 10-year intervals. As shown in Table 7, results for this test were mixed.

For example, for six specializations, there is a moderate positive correlation ($r > 0.3$) between department centrality in 1986 and the year that a department first adopted the specializations. These are Macrosociology, Life Course, Gender, Sexuality, Class, and Social Networks. There is a small positive correlation ($0.1 < r < 0.3$) for another six specializations: Transnational, Emotions, Sex, Immigration, Recreation, History of Social Thought. For about half of the specializations, there is a very weak correlation or no correlation ($-0.1 < r < 0.1$). There is a small negative correlation ($r < -0.1$) for Organizations-Formal and Complex, and a moderate negative correlation ($r < -0.3$) for Ethnography.

Table 7 - Pearson Correlation for Year of First Adoption by Each Department and Department Centrality, 1976-2016.

	1976	1986	1996	2006	2016
Macrosociology	0.428	0.432	0.379	0.371	0.385
Life Course	0.421	0.462	0.471	0.404	0.485
Gender	0.325	0.317	0.328	0.291	0.320
Sexuality	0.322	0.368	0.289	0.257	0.213
Class	0.294	0.313	0.322	0.266	0.295
Social Networks	0.265	0.316	0.357	0.297	0.242
Transnational	0.224	0.240	0.109	0.199	0.124
Emotions	0.191	0.221	0.267	0.235	0.281
Sex	0.169	0.178	0.164	0.100	0.116
Globalization	0.127	0.043	0.026	0.089	0.036
Immigration	0.108	0.141	0.132	0.090	0.073
Penology	0.094	0.047	0.062	0.065	0.023
Recreation	0.093	0.148	0.238	0.112	0.159
History of Social Thought	0.092	0.121	0.088	0.040	0.070
Homosexuality	0.048	0.026	-0.075	-0.099	-0.046
Policy Analysis	0.037	0.046	0.054	0.098	0.069
Public Policy	0.032	0.077	0.112	0.164	0.132
Social Disorganization	-0.006	0.017	0.074	0.061	0.096
Social Thought	-0.021	-0.057	0.021	-0.021	-0.106
Labor Movements	-0.027	0.032	-0.022	0.059	-0.023
History of Sociology	-0.033	-0.010	-0.008	-0.069	-0.035
Children	-0.047	0.026	-0.062	-0.159	-0.208
Organizations-Formal and Complex	-0.057	-0.158	-0.111	-0.064	-0.064
Labor Markets	-0.061	-0.034	0.005	0.025	-0.028
Ethnography (Anthropology)	-0.374	-0.328	-0.356	-0.355	-0.349

Taken as a whole, these results seem to indicate that the more central departments in the graduate placement network might also be more likely to be first adopters of a new specialization, but this seems to depend on the specialization.

Sociodemographic Clustering on Gender

The third sub-goal of this dissertation was to explore whether and to what extent the relative popularity of sociological research specializations might have been impacted by sociodemographic clustering in specializations within sociology, specifically on gender[15].

Demographic shift in sociology.

Figure 5 shows the dramatic increase in the number of women in the dataset from 1976 to 2016. Each grey line shows the percentage of tenured and tenure-tracked faculty in one of the 92 departments who were women. The blue line shows the average percentage of women over all 92 departments. The percentage of women in each wave of the dataset overall increased from a low of 14.671 percent in 1976 to 47.052 percent in 2016. The increase in women among these 92 departments is consistent with the larger trend in US sociology as a whole, shown earlier in Table 1, and consistent with the findings by DiFuccia, Pelton, and Sica (2007) and Bucior and Sica (2019) of a "feminization" of sociology.

[15] Data for race and SES were unfortunately unavailable, as discussed in the Method section.

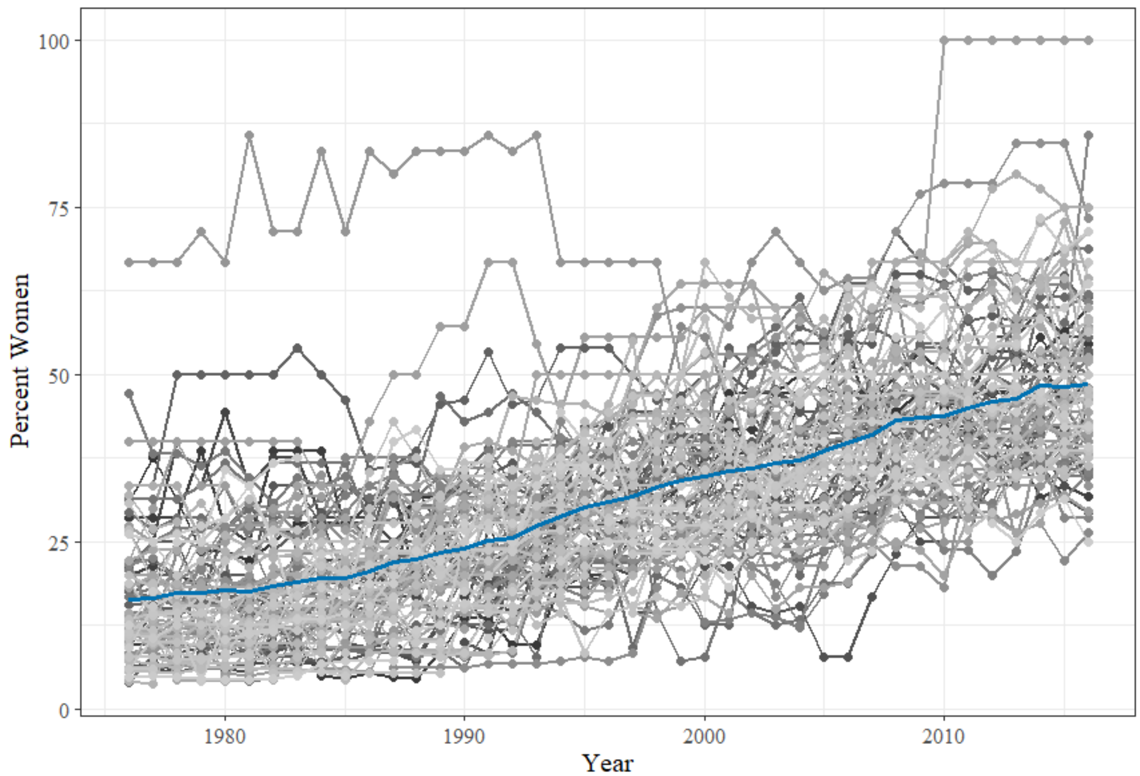

Figure 5 - Percentage of All Non-Joint, Full-Time, Tenured and Tenure-Track Faculty in Each of 92 U.S. PhD-granting Sociology Departments who are Women, 1976-2016. Blue line shows percent women over all 92 departments.

Feminization of sociology.

H3a: Specializations with a higher percentage of women grew faster.

For the models in Table 8, the dependent and independent variables used the same transformations as the earlier models. Model 1 tested of the effect of the percentage of claimants of a specialization who were women on specialization popularity in the bottom 87 departments. In this model, the percentage of women in a specialization did not have a significant effect on specialization popularity between 1977 and 1992. However, the R^2 for this model is extremely small (0.001), indicating that the model is a poor fit for the data.

Model 2 added specialization centrality, and publications, citations, and grants per scientist. When these other variables were added, gender became statistically significant ($p<.05$) significant but negative with a very small effect size. Model 3 added popularity among the top 5 departments. The percentage of women in a specialization remained statistically significant but with a very small effect size in the full model for the first half of the dataset.

Table 8 - Effect on Fractional Change in Specialization Popularity of Percentage of Women in the Specialization, 1977-1992 and 1996-2016.

	1977-1992			1996-2016		
	1	2	3	4	5	6
Percent Women	-0.021 (0.033)	-0.031 * (0.011)	-0.029 * (0.011)	0.104 ** (0.031)	0.031 ** (0.011)	0.031 ** (0.011)
Specialization Centrality		8.637 *** (0.433)	8.844 *** (0.411)		8.915 *** (0.207)	8.969 *** (0.220)
Top-5 Popularity			-0.040 * (0.014)			-0.009 (0.012)
Articles per Scientist		0.110 *** (0.012)	0.111 *** (0.012)		0.073 *** (0.015)	0.073 *** (0.015)
Citations per Scientist		0.054 ** (0.017)	0.057 ** (0.016)		0.148 *** (0.024)	0.149 *** (0.024)
Grants Amounts per Scientist		0.000 (0.000)	0.000 (0.000)		0.000 * (0.000)	0.000 * (0.000)
within R^2	0.001	0.806	0.808	0.013	0.833	0.833
n	113	109	109	113	111	111
T	16	16	16	21	21	21
N	1808	1683	1683	2373	2239	2239

Standard errors are reported in parentheses.
*, **, *** indicates significance at the .05, .01, and .001 level, respectively.
n = number of specializations, T = number of years, N = total observations

In the second half of the dataset, tested in Table 8, models 4, 5 and 6, the percentage of women in a specialization was statistically significant ($p<.01$) and positive. The change in effect from positive to negative could be due to the very small effect size. Adding or removing percent women in a specialization from model 6 (not shown) had very little impact on the R^2 of the model: a change of 0.0015, or 0.15 percent of the variation in specialization popularity. It is also important to note that in model 6, when both centrality and percent women are included in the model, popularity in the top 5 departments is no longer significant.

Taken all together, the results shown in Table 7 suggest that the specializations with a higher percentage of women did not grow faster than specializations with a lower percentage of women overall. Because of the collinearity between publications and citations per scientist, the coefficients in these models should be interpreted cautiously.

Women leading innovation.

H3b: New specializations are more likely to be first claimed by women.

For the specializations that were first claimed between 1976 and 2016, there were 120 scientists employed in one of the 92 departments who claimed the new specialization within the first three years of its first appearance. Of those claimants, 25.641 percent were women. However, this number underestimates the propensity for women to be first claimants because the number of women in the dataset began very low in the early years when many of the specializations were claimed. As shown in Table 9, there were 15 years in which at least one new specialization was claimed. In seven of those years, at least one of the claimants was a woman. In six of those seven years, the percentage of women who were among the first claimants of the specialization was higher than the percentage of women in the dataset that year.

Table 9 - Percent of First Claimants of New Specializations Who Were Women vs. Percentage of Women in Dataset Overall.

Year	Percent Women First Claimants	Percent Women Overall
1976	5.263%	14.963%
1977	27.273%	15.563%
1978	28.571%	15.796%
1979	50.000%	16.121%
1980	0.000%	16.119%
1981	0.000%	16.496%
1993	30.769%	27.588%
1994	40.000%	28.873%
1995	33.333%	30.152%
1996	0.000%	30.441%
1997	0.000%	31.107%
1999	0.000%	33.619%
2000	0.000%	34.492%
2001	0.000%	35.366%
2008	50.000%	42.065%

Table 10 shows the percentage of claimants who were women, among claimants in the first three years a specialization was claimed, by specialization. The claimants who were women appear to have been concentrated in just a few of the new specializations.

Table 10 - Percentage of Claimants Who Were Women, During First Three Years of Claims, For Specializations Which Were First Claimed Between 1976 and 2016, and Number of Waves Overall Where the Specialization Was More Than Two-Thirds Women.

Specialization	Percent First Claimants Women	Number of Waves > 66% Women
Gender	100.000%	41
Ethnography (Anthropology)	50.000%	4
Sexuality	50.000%	0
Sex	50.000%	29
Homosexuality	35.000%	2
Organizations-Formal and Complex	33.333%	0
Latino/a	31.579%	0
Social Networks	16.667%	0
Public Policy	12.500%	0
Children	0.000%	0
Social Thought	0.000%	0
Social Disorganization	0.000%	0
Recreation	0.000%	0
Policy Analysis	0.000%	0
Penology	0.000%	0
Life Course	0.000%	1
Macrosociology	0.000%	0
Drugs	0.000%	0
Labor Movements	0.000%	0
Labor Markets	0.000%	0
Immigration	0.000%	2
History of Sociology	0.000%	0
History of Social Thought	0.000%	0
Globalization	0.000%	0
Emotions	0.000%	3
Transnational	0.000%	0

Together, the results shown in Tables 8, 9 and 10 indicate that across all the specializations, the percentage of women in a specialization did not appear to strongly impact the growth of a specialization, however, Gender may be an exception. All of the claimants of Gender during its first three years in the dataset were women, and the percentage of women in Gender was higher than 66 percent for all 41 waves. Gender grew faster than any other specialization, and moved from the far periphery to the most central and most popular specialization in the dataset.

DISCUSSION

The purpose of this dissertation was to use US sociology as a case study to explore the extent to which the relative popularity of topics which scientists choose to study are influenced by inequalities in three major aspects of the social structure of a discipline: (1) the network of specializations in a discipline, (2) the network of PhD-granting departments in a discipline, and (3) sociodemographic clustering within specializations.

The results suggested that there was evidence to support the conclusion that specialization centrality (hypothesis 1a), publications per scientist (hypothesis 4a), and citations per scientist (hypothesis 4b), influenced the relative popularity of specializations in sociology between 1976 and 2016. Popularity among top 5 departments (hypothesis 2a) appeared to lose significance during the second half of the dataset when controlling for percentage of women in the specialization, but was significant otherwise.

The results also suggested that, for a small number of specializations, growth was influenced by growth of a related specialization (hypothesis 1b). However, most specializations were not impacted by the growth of seemingly specializations, and 30 of the 113 specializations (26.549 percent) could not be consistently associated with any other specialization over at least 17 years. One possible explanation for this is that because of the relatively few steps between even the most distant specializations, Sociology, at least among the faculty of these 92 departments, is a small world (Milgram 1967; Watts and Strogatz 1998). As a result, in many cases, information from one specialization should be able to diffuse relatively quickly throughout the entire discipline, quickly diffusing any temporary advantage a specialization might have as a result of new developments within the specialization.

One reason for the relatively compact nature of these networks might be that one way for scientists to establish a unique identity among other scientists, while still remaining connected to others in the discipline, is by claiming a relatively unique combination of otherwise popular specializations, or to claim two popular specializations and a third, more unique specialization.

For a small number of specializations, top departments were more likely to be first adopters of that specialization (hypothesis 2b). However, about half of the specializations had weak or no association between department centrality and year of first adoption, and a couple of specializations seemed to have been first adopted primarily by less-prestigious departments.

The percentage of women in a specialization (hypothesis 3a) was statistically significant in both halves of the dataset when controlling for the other variables. However, the effect sizes were small and in opposite directions in the first and second halves of the dataset, and adding or removing percent women from the model had very little impact on the R^2 of the model. Except in the specific case of the specialization Gender, women did not appear to be more likely to have adopted new specializations first (hypothesis 3b).

Grant dollars per scientist in a specialization (hypothesis 4c) did not seem to impact the growth of a specialization. The seemingly small impact of grant funding is somewhat counter-intuitive, because federal funding is awarded competitively, usually within topical areas, implying that some types of research are more important than others and should receive more support. In this dataset, the very frequent occurrence of claimants in a specialization receiving no grants from the NSF or NIH in a given year made it difficult to find a suitable transformation for the variable, and this might have thrown off the results. One other possibility is that because grant funding data for the NIH was only available from 2000 to 2016, specializations such as Mental Health or Medical Sociology could have had their grant numbers systematically undercounted during the first half of the dataset.

It could also be the case that grant funding per scientist was unlikely to influence a scientist's decision to switch specializations, since grant opportunities are often poorly advertised and only available for a limited time. It also seems likely that the time limited nature of many grant opportunities is simply too short of a window for most scientists outside the specialization to successfully switch specializations and out compete other applicants who are long time practitioners and have long lists of prior publications in that specialization. Most scientists' perceptions of relative amounts of grants awarded to specializations are also likely to be fairly rough, so unless the disparities between specializations were particularly large and persistent over time, most scientists probably would not notice. Also, most scientists in this dataset did not receive an NSF or NIH grant at any point in the dataset, so it is not clear how many were pursuing grant funding to such an extent that they would consider switching specializations.

The results for scientific article publications per scientists could possibly have been impacted by the fact that many journals began publishing sometime during the time-window of the analysis. As noted earlier, between 1970 and 2015, the number of journals in sociology and related fields more than tripled (Hermanowicz 2016). Because the number of faculty in the dataset was roughly the same over the entire time-window, it is possible that fewer journals resulted in increased competition and a higher rejection rate, and perhaps competition for some specializations was more impacted than others. As seen in Table 1, the average number of publications did increase in the second half of the waves, which is in line with the slowly increasing number of articles per scientist over time across all the sciences.

It is possible that the results for publications could be different for departments outside of the relatively highly productive departments which make up the bulk of this dataset. Productivity is likely to be heavily constrained by the department where it occurs. Allison and Long (1990) found that scientists who moved to a higher prestige department tended to increase both the number of publications and the citations they received.

One possible interpretation of the overall results is that they emphasize the role of prestige and legitimacy in shaping the evolution of a discipline filled with time-limited, boundedly rational (Simon 1979) actors constrained by their social environment and limits on their ability to know and process information (Thaler 1999; Kahneman 2011). The results indicate that specializations which were perceived to be more central to a discipline, specializations which had older and more prestigious members who received large numbers of citations each year, and specializations with many claimants among the most prestigious departments were more likely to grow. With the exception of a few specializations, most did not appear to grow or decline very quickly, and scientists at these 92 PhD-granting departments did not change specializations very frequently overall.

One possible explanation for these results is the "ideal science" Sismondo (2010) model of scientific growth. This model assumes the causal order is reversed, and the magnitude of interesting or important developments in one specialization relative to other specializations is what drives growth. From this viewpoint, the inequalities in the social structure of science primarily work to reward or penalize scientists according to the extent to which their behavior advances scientific knowledge (Sismondo 2010:8). In other words, rather than being seen as causes of specialization growth, centrality of a specialization, higher citations per scientists within a specialization, and the prestige of departments where specialization claimants were employed would all be assumed to be reflections of the fact that some specializations were more important or necessary to the discipline, or to science, or to society.

The fact that some specializations do seem to grow and decline together provides some possible support for this alternative explanation, and most sociologists in this dataset would probably argue that their specialization is very important to the discipline and to society. However, if this ideal model was the primary explanation of specialization growth, then there should have been a more consistent relationship between growth and specialization type as important ideas diffused through the network. There also likely would have been an impact on growth from the number of publications and grants per scientist, as these, like citations and prestigious employment, would be the rewards that scientists would be chasing and a reflection of their relative contributions. While there did appear to be an impact of publications on popularity, there was no apparent impact of grants.

The results for sociodemographic clustering were perhaps the most surprising, because of the changes in sociological curriculum associated with the "feminization" of sociology reported by Bucior and Sica (2019). One possibility is that, because the higher ranks in the most prestigious departments were the slowest to "feminize," maybe the full impact of the influx of women into sociology had not yet been felt by 2016. However, one of the interesting trends notable from specializations data is that even in the earliest years of the growth of gender, many other seemingly related terms, such as "Women" and "Sex Roles" and "Sex" began to decline. This seems to suggest that label "Gender" became institutionalized as *the* label used by sociologists to refer to virtually all types of research related to a broad array of gender relevant topics, and the other terms lost their legitimacy, and were seen as outdated or incorrect.

The difference in the way the data was collected in the second half of the dataset seems to support this. Starting in 1994, respondents were given a list of categories to choose from, and had to write in any choices that did not fit those options. However, as shown in the Figures in Appendix D many of the largest specializations seem to have been mostly unaffected by the change in data collection, while smaller specializations and specializations which shared labels with others were heavily impacted. This likely occured because the choices offered with the new data collection system were based in part on the most popular claims from the first half. Gender could be a case of this.

A second possible interpretation of the results is that they fit what we should expect if individual scientists were rational actors focused on career advancement, but had: (1) limited time and energy to devote to acquiring expertise in a new area, and (2) no purely objective measures at their disposal to compare the relative future importance of specializations or to predict the likelihood of success gained from switching specializations. These scientists would change specializations infrequently, as specialization change would be very risky. If they did change specializations, their choice would be influenced in part by their subjective perceptions of prestige and legitimacy associated with a specialization, as these would be some of the only measures available for predicting their own future success. A clearer view of the path to greater career success would be clouded by the inequalities in the social structure of the discipline, preventing them from switching quickly and effectively to specializations where they might have more success. If this was the case, reducing inequalities in the social structure of a discipline would make it more efficient (Williamson 1981) at pursing scientific advance.

A limitation of this rational actor approach is that although it might explain how the majority of specializations grow and decline relatively slowly, scientists being slow to change specializations doesn't fully explain why some specializations, such as Gender, Transnational, Globalization, Immigration, Migration, and others grew so quickly during certain windows of time (see the figures in Appendix D).

A third possible explanation for the overall result which could incorporate the growth of Gender is that, regardless of their importance at the level of an individual research paper, at the level of the evolution of a discipline, theoretical and methodological developments within specializations do not have much influence on specialization growth, compared to other aspects of the social organization of the discipline or of the academic profession in general.

Small changes were probably occurring within most specializations countinuously throughout the time-window either because scientists: (1) needed to distingusih themselves from their colleauges, (2) were constantly searching for the novel contributions exptected by many journals, (3) specialized in social problems and aspects of society that changed over time, or (4) relied on theories, methods, styles, and ideas within each specialization which shifted over time (e.g. Adams and Light 2014). Despite these small changes, the popularity of large specializations was likely relatively robust to unilateral decisions by scientists, because scientists cannot simply restructure a specialization by leaving for another specialization or changing the theories or methods they use. This is because dozens or hundreds of other scientists would continue to carry on the work of the specialization without them (Abbott 2000:296). At the same time, because of the relatively dense interconnections in the network of specializations, most new theoretical or methodological developments in one specialization can quickly diffuse to other specializations, with little reason for reseachers to switch specializations to take advantage of them.

Because there is relatively little switching between specializations, inertia appears to have played a strong role in the popularity of most specializations over time. As shown in Appendix D, large changes in popularity from one year to the next are relatively rare (excluding the disruption caused by changes in data collection in 1994 and 1995). Scientists would have had little reason to change their specializations if they could readily adapt most new theoretical and methodological developments in the discipline to their own subject matter expertise without changing specializations. This combined with the large potential cost of becoming an expert in a new field while also keeping up with the existing demands on their time may partly explain why scientists infrequently changed specializations.

Another plausible reason that specializations were slow to change may be that some aspects of the work within the discipline are tightly controlled, inspected and ritualized, such as the peer-review process, while other aspects could be viewed as similar to an extremely loosely coupled organization.

A neoinstitutional (Meyer and Rowan 1977, 1978) inspired perspective, which views disciplines like sociology as a loosely coupled organization of specializations, and each specialization as a loosely coupled organization of theories and methods, would allow for an explanation of seemingly negligible impact of publications alongside the significant impact of centrality, citations, and top-5 department popularity, which could all be interpreted as measures of the perceived legitimacy of a specialization.

The neoinstitutional perspective does not require an assumption of incompetence or malicious intent by scientists, and it does not imply that performance and accountability are irrelevant to scientific advancement (Meyer and Rowan 1978:92).

However, it does suggest that the overall performance of an organization (in this case a scientific specialization) is less important to its success than its perceived legitimacy.

Growth of a scientific specialization requires more than new or influential ideas. Similar ideas can typically be found in multiple places simultaneously and at different times, and in many cases can quickly and easily transfer to neighboring specializations. Sustained growth of a specialization over long periods of time only occurs only when scientists come to see the ideas as a legitimate basis for their intellectual identity and career success (Ben-David and Collins 1966:452). A scientist's identity is shaped by many factors both inside and outside of their scientific work, and their identity influences their scientific work.

But although scientists in sociology have claimed a wide array of specializations, a scientist is not free to claim *any* conceivable specialization without consequences. Scientists need employment, which requires acceptance of the scientist by, at minimum, the preexisting faculty in at least one hiring department. This requires at least some ritualistic conformance to specialization specific job postings and hiring and promotion decisions. Scientists also need to publish and be cited, which requires more tightly controlled acceptance of their ideas by other scientists more closely related to their field. These act through mechanisms such as journal subject matter constraints, the peer review process, citations, and career awards.

In all these evaluations, the scientist has to continuously demonstrate competence in the specialization to a tiny group of insiders in the specialization, such as during peer review of an article. But to build a career as a scientist, the specialization areas the scientist is claiming must be also sufficiently similar to what is viewed as legitimate research by other evaluators in the discipline. These other scientists are often outsiders to the specialization, such as fellow faculty in a department, members of a professional association, or journal editors for generalist journals. Outside evaluators do not always have the domain specific knowledge to fully evaluate the merits of a particular scientific contribution. As a result, their evaluations are more likely to be influenced in part by taken-for-granted beliefs supported primarily by the evidence that a specialization exists and scientists in that specialization are held in high regard (Bourdieu 1975:34), or similarly that a paper was published in a well-recognized journal and received many citations. In cases of evaluation where their specific expertise is exceeded, rather than directly assessing the most esoteric qualities of a scientific work or career, they rely on perceived legitimacy of the overall work or career instead. In other words, it could be said that "when [certain] categories are properly assembled, [good science] is understood to occur" (Meyer and Rowan 1978:84-85).

This approach would explain why Gender expanded with the feminization of sociology, and the growing importance of gender in society at large, but at the exact same time, Gender Roles, Women, and other seemingly related specializations did not expand. Gender came to be seen as the most legitimate term to describe sociological research related to gender, and the other terms fell out of favor. This would also provide an explanation for the relatively rare occurrence of specializations dying out, as these specific terms are highly legitimated and institutionalized.

CONCLUSION

The purpose of this dissertation was to use US sociology as a case study to explore the extent to which the relative popularity of topics which scientists choose to study were influenced by inequalities in three major aspects of the social structure of a discipline: (1) the network of specializations in a discipline, (2) the network of PhD-granting departments in a discipline, and (3) sociodemographic clustering within specializations.

The results showed that there is evidence to support the conclusion that specialization centrality, and in specific cases, specialization communities, did impact the relative popularity of sociological specialization claims between 1976 and 2016. The results also showed that popularity among the top-5 departments influenced the relative popularity of specializations as well, and that this was likely due to the stratified graduate placement network rather than top departments being the first to adopt new specializations. Article publications and citations per scientist also influenced specialization popularity. However, sociodemographic clustering on gender did not appear to have much impact the popularity of specializations overall.

Limitations

An important limitation of this research was that since popularity was the dependent variable and a threshold of popularity was also used as the determinant for whether specializations were included in the panel, it is possible that there could be some sample selection bias. In other words, these patterns may or may not hold true for the less popular specialization claims (any specialization term never claimed by at least one percent of the faculty in any of the 41 waves), that were not analyzed in this dissertation. Mullins (1973) suggests that "theory groups" or groups of scientists smaller than those studied in this dissertation, are likely to behave differently in some ways than larger specializations.

Another limitation is that the data do not fully reflect all the work that is being done by the scientists in each specialization, much of which happens at a lower level of analysis than what was carried out for this dissertation. It is also possible that departments in this dataset infrequently updated their record of faculty specializations, or that the specialization categories were sufficiently broad that a scientist could pursue a broad array of activities without changing their specialization. For example, a scientist who specializes in Education might respond to a global pandemic by writing a paper about the impact of that pandemic on the education system without feeling that they have changed their specialization to Medical Sociology. Similarly, the lack of data on book publications is a limitation for this study, because some specializations may rely more heavily on book publications rather than article publications.

Lastly, the current grants data is a limitation due to the large number of zeros in the data and the relatively large range of dollar amounts for those specializations which did have grants each year. Future research might investigate whether large foundations such as the Russel Sage Foundation have historical records that could be added to the dataset. Although grant funding did not appear to have a statistically significant impact in these results, one way that grant funding might still have an impact, but which cannot be tested using the data in this dataset, is if graduate students are likely to change their planned areas of specialization to match the areas of specialization of funded scientists in their current or future degree granting departments.

Opportunities for Future Research

Pooled cross section and time series was the best available data structure for analyzing the specific questions posed in this dissertation. However, because of the inherent limitations of the dataset, more research should be done to further explore the broader research questions investigated in this dissertation. There are several promising avenues for future research that build on this dissertation.

One of the important contributions of this dissertation is the dataset that was constructed to test these hypotheses. There are several opportunities for future research related to expanding this dataset to include a broader range of years or additional variables. For example, variables such as: (1) journal editorship positions in top sociology journals, to assess the possible influence of journals on the success of specializations, (2) dissertation advisors, to more directly link faculty with their likely influences in their graduating department, (3) citations and keywords from journal articles or their abstracts, and (4) several of the sociodemographic variables from the NSF SED.

It is also important to examine whether the findings of this dissertation are reflective of patterns in academic science as a whole, or whether they are unique to sociology. For example, the apparent decline in social closure among the top sociology departments, as noted in Figure 3, is an interesting venue for future research. The scope of this research could be expanded with additional data collection on: (1) sociologists working in neighboring disciplines (such as organizational sociologists working in business departments), (2) on sociologists working at other departments outside of this dataset (such as departments which only offer a Masters degree), (3) in countries outside of the United States, and (4) non-sociologist scientists in other disciplines.

Other disciplines likely have their own internal dynamics and social movements, but may also have similarities which could provide useful comparisons for studying the institutionalization of disciplines. One example of these similarities is that some disciplines, including anthropology, history, and physics, began publishing graduate department directories with similar information around the same time as the ASA directories. As noted earlier, these disciplines appear to have similar inequalities in graduate placement hierarchies. At the same time, there may be important differences between these disciplines in the other variables used in this dissertation, such as the amount of grant dollars received or the average number of articles and citations per year. A second example is the changes over time in the JEL (Journal of Economic Literature) codes in economics, which are widely-adopted hierarchical groupings of subject categories which economists often use to describe themselves. The major classifications used in the JEL codes today resulted from major revisions in 1988-1990 (the number of general categories almost doubled, along with other major changes), and have been incrementally modified since that time (Cherrier 2017). This could be considered similar in some ways to the data collection changes by the ASA in the mid-1990s.

Although sociodemographic clustering on gender did not appear to have a significant impact on specialization popularity, it is possible that it might have impacted the discipline in less direct ways, such as curriculum, as reported by Bucior and Sica (2019). There is also extensive sociodemographic clustering on other variables in sociology that might have an impact. For example, while only 7 percent of all ASA members in 2020 identified as black, 26 percent of members of the section titled “Racial and Ethnic Minorities” identified as black. The NSF SED data would be very useful for further analysis of sociodemographic clustering.

The growth and decline in claimants of a specialization is ultimately driven by individual decisions to join, stay, or leave, and research that looks at these individual decisions, perhaps utilizing interviews or biographies, may provide important insight into other factors influencing these decisions. Future research could also look at movements associated with certain specializations, such as the pushback against structural explanations, the “cultural turn”, or could look at major historical changes and social movements which occurred during this time period (such as with the growth of gender).

Methodologically, dynamic network models, such as Stochastic Actor Oriented Models (SAOM) and Exponential Random Graph Models (ERGM), combined with re-specification of the network of specializations as a two-mode network of scientists and specializations would allow for further exploration of these research questions. Theoretically, future research should also systematically test neoinstitutional theory as an explanation for specialization popularity over time.

Given the seemingly insignificant impact of grants on specialization popularity, one policy implication suggested by this research is that grant dollars might not be the most cost effective way to influence the type of science performed in a discipline. It might be more cost effective, for example, to invest the same amount of funding into creating specialization-restricted endowed positions at the top departments, because of their placement advantage and the similarity of specialization claims between faculty and PhD graduates who are placed at other PhD granting programs in the discipline.

In emphasizing the importance of social structure, I am not suggesting that ideas don't matter for the growth of specialization areas. But the results of this dissertation suggest that there are elements of social structures which have an effect on the popularity of specializations within a discipline, which need to be considered in future research. Sociologists of science have long argued that scientific knowledge is socially constructed, but the exact mechanisms of how this occurs need to be more systematically explored.

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APPENDIX A: SOCIOLOGY DEPARTMENTS INCLUDED IN THE ANALYSIS

Table 11 lists the departments which are included in the analysis, along with their university and department titles. One university had two sociology departments listed in *The Guide*. Some of the departments changed titles between 1976 and 2016. In these cases, the keywords from each of the department titles are listed on separate lines. For example, the department at Emory University was titled “Department of Sociology and Anthropology” in *The Guide* in 1976, 1977, and 1978, but “Department of Sociology” afterwards. Some universities also changed names during this time-window, but in these cases, only the most recent university name is listed.

Table 11 - Sociology Departments Included in Analysis

ID	University	Department Titles
1	Boston College	Sociology
2	Bowling Green State University	Sociology
3	Brandeis University	Sociology
4	Brown University	Sociology
5	Case Western Reserve University	Sociology
6	Colorado State University	Sociology
7	Columbia University	Sociology
8	Cornell University	Sociology
9	Cornell University	Rural Sociology
		Development Sociology
10	Duke University	Sociology
11	Emory University	Sociology, Anthropology
		Sociology
12	Florida State University	Sociology
13	Georgia State University	Sociology
14	Harvard University	Sociology
15	Howard University	Sociology, Anthropology
		Sociology, Criminology
16	Indiana University-Bloomington	Sociology
17	Iowa State University	Sociology, Anthropology
		Sociology
18	Johns Hopkins University	Social Relations
		Sociology

19	Kansas State University	Sociology, Anthropology
		Sociology, Anthropology, Social Work
20	Kent State University	Sociology, Anthropology
		Sociology
21	Loyola University Chicago	Sociology
		Sociology, Anthropology
22	Michigan State University	Sociology
23	Mississippi State University	Sociology
		Sociology, Anthropology
		Sociology, Anthropology, Social Work
24	New York University	Sociology
25	North Carolina State University	Sociology, Anthropology
		Sociology, Anthropology, Social Work
26	Northeastern University	Sociology, Anthropology
		Sociology
27	Northwestern University	Sociology
28	Ohio State University	Sociology
29	Oklahoma State University	Sociology
30	Pennsylvania State University	Sociology
31	Princeton University	Sociology
32	Purdue University	Sociology, Anthropology
		Sociology
33	Rutgers, The State University of New Jersey	Sociology
34	South Dakota State University	Rural Sociology
		Sociology, Rural Studies
35	Southern Illinois University-Carbondale	Sociology
36	Stanford University	Sociology
37	State University of New York-Albany	Sociology
38	State University of New York-Binghamton	Sociology
39	State University of New York-Buffalo	Sociology
40	State University of New York-Stony Brook	Sociology
41	Syracuse University	Sociology
42	Temple University	Sociology
43	Texas A&M University	Sociology, Anthropology
		Sociology
44	Texas Woman's University	Sociology, Social Work
		Sociology
45	University of Akron	Sociology
46	University of Arizona	Sociology
47	University of California-Berkeley	Sociology
48	University of California-Davis	Sociology
49	University of California-Los Angeles	Sociology
50	University of California-Riverside	Sociology
51	University of California-San Diego	Sociology
52	University of California-San Francisco	Sociology

		Social and Behavioral Sciences
53	University of California-Santa Barbara	Sociology
		Sociology, Anthropology
54	University of California-Santa Cruz	Sociology
55	University of Chicago	Sociology
56	University of Cincinnati	Sociology
57	University of Colorado-Boulder	Sociology
58	University of Connecticut	Sociology
59	University of Delaware	Sociology
		Sociology, Criminal Justice
60	University of Florida	Sociology
		Sociology, Criminology, Law
61	University of Georgia	Sociology
62	University of Hawaii-Manoa	Sociology
63	University of Illinois-Chicago	Sociology
64	University of Illinois-Urbana-Champaign	Sociology
65	University of Iowa	Sociology
66	University of Kansas	Sociology
67	University of Kentucky	Sociology
68	University of Maryland-College Park	Sociology
69	University of Massachusetts-Amherst	Sociology
70	University of Michigan-Ann Arbor	Sociology
71	University of Missouri-Columbia	Sociology, Rural Sociology
		Sociology
72	University of Nebraska-Lincoln	Sociology
73	University of New Hampshire	Sociology, Anthropology
		Sociology
74	University of New Mexico	Sociology
75	University of North Carolina-Chapel Hill	Sociology
76	University of Notre Dame	Sociology, Anthropology
		Sociology
77	University of Oklahoma	Sociology
78	University of Oregon	Sociology
79	University of Pennsylvania	Sociology
80	University of Pittsburgh	Sociology
81	University of Southern California	Sociology
82	University of Tennessee-Knoxville	Sociology
83	University of Virginia	Sociology
84	University of Washington	Sociology
85	University of Wisconsin-Madison	Sociology
		Sociology, Rural Sociology
		Sociology, Community and Environmental Soc.
86	Utah State University	Sociology, Social Work, Anthropology
87	Vanderbilt University	Sociology, Anthropology
		Sociology

88	Virginia Tech	Sociology
89	Washington State University-Pullman	Sociology
		Sociology, Rural Sociology
		Sociology, Community, Rural
90	Wayne State University	Sociology
91	Western Michigan University	Sociology
92	Yale University	Sociology

APPENDIX B: SPECIALIZATION TYPES

Table 12 lists the specializations which were assigned to a type. Specialization types were assigned on the basis of being grouped together by the Leiden community detection algorithm for at least 17 waves. 83 of the 113 specializations (73.451 percent) were assigned to a type. The remaining specializations were not consistently grouped together by the algorithm.

Table 12 - Relatively Persistent Specialization Types

Specialization Type	Specializations
1	Aging Medical Mental Health Social Gerontology
2	Alcohol Corrections Criminal Justice Criminology Delinquency Deviance Deviant Behavior Drugs Law Penology Social Control Social Disorganization
3	Applied Evaluation
4	Children Youth
5	Class Ethnicity Race
6	Community Community Development Development Environmental Political Economy Rural
7	Demography Fertility
8	Ecology Human Ecology
9	Complex Organizations Economy
10	Emotions Small Groups Social Psychology
11	Ethnic Relations Minority Relations Race Relations
12	Culture History of Social Thought History of Sociology Knowledge Religion Social Thought Theory
13	Gender Sex
14	Homosexuality Sexuality
15	Immigration Latino/a Migration
16	Leisure Recreation Sports
17	Mathematical Quantitative Methodology Social Networks
18	Methodology Statistics
19	Mobility Stratification
20	Policy Analysis Public Policy
21	Labor Markets Work
22	Occupations Professions
23	Mass Communication Public Opinion
24	Collective Behavior Social Movements
25	Comparative Historical Macrosociology Political
26	Science Technology

APPENDIX C: SOCIOLOGY SPECIALIZATION NETWORK DIAGRAMS

The diagrams of the specialization network for 1976, 1986, 1996, 2006, and 2016 are included below. Edge thickness shows the relative number of claimants who claimed both specializations simultaneously in the same year, with thicker edges indicating more popular combinations. Node size shows relative popularity of specializations, with larger nodes indicating more popular specializations. Node proximity indicates relative similarity, and nodes towards the center of the diagrams are more central to the network.

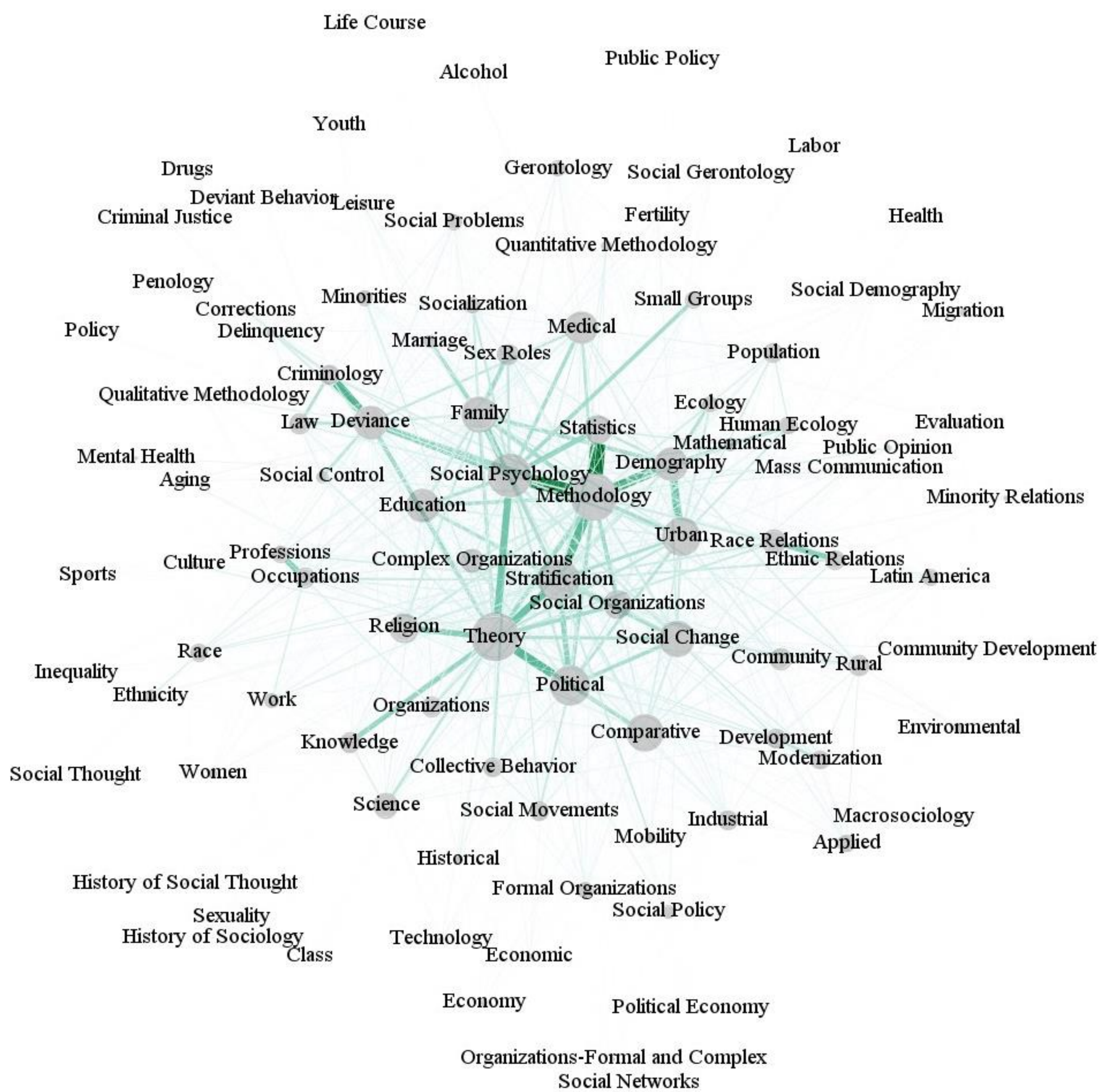

Figure 6 - Sociology Specialization Network in 1976.

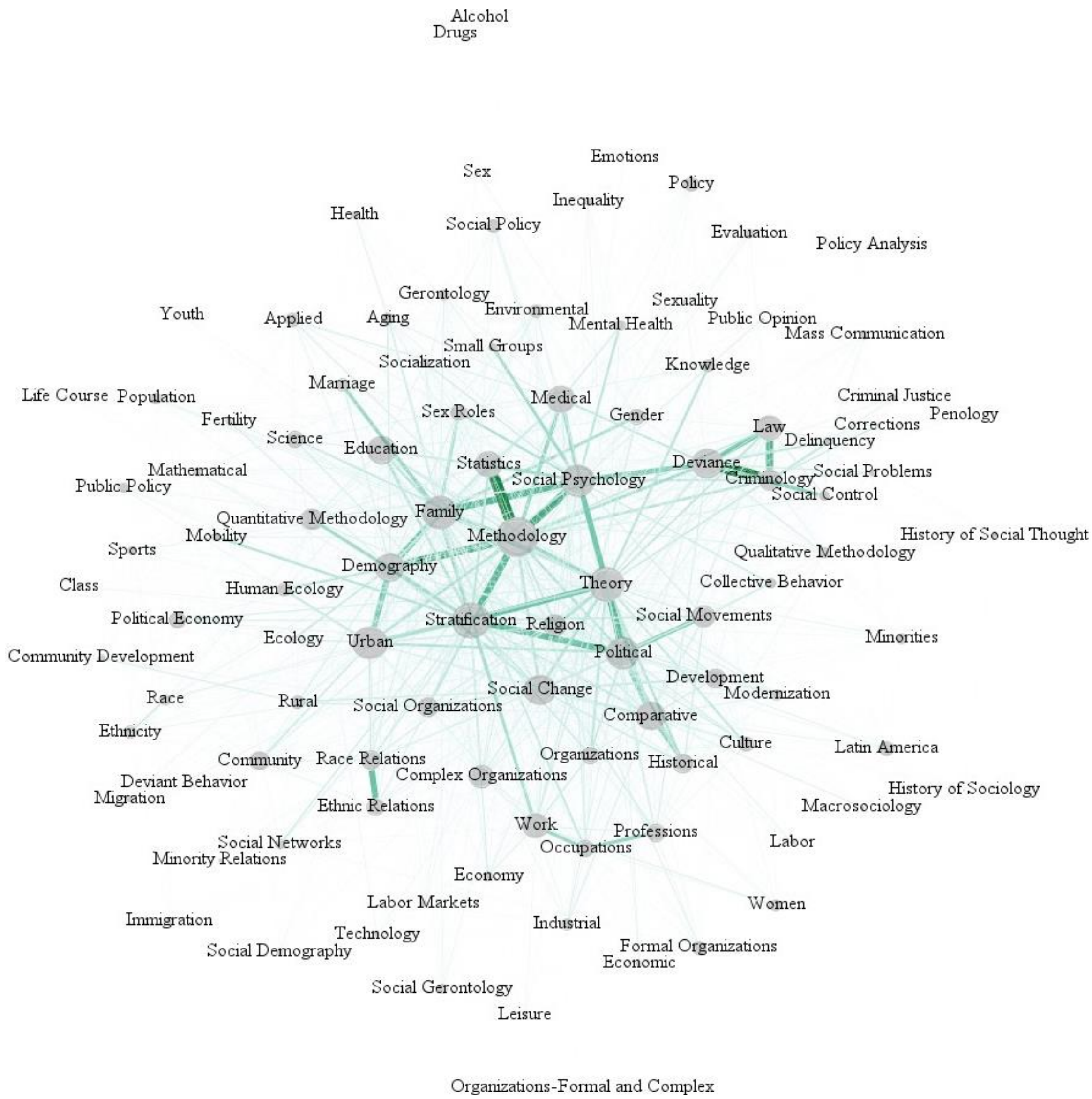

Figure 7 - Sociology Specialization Network in 1986.

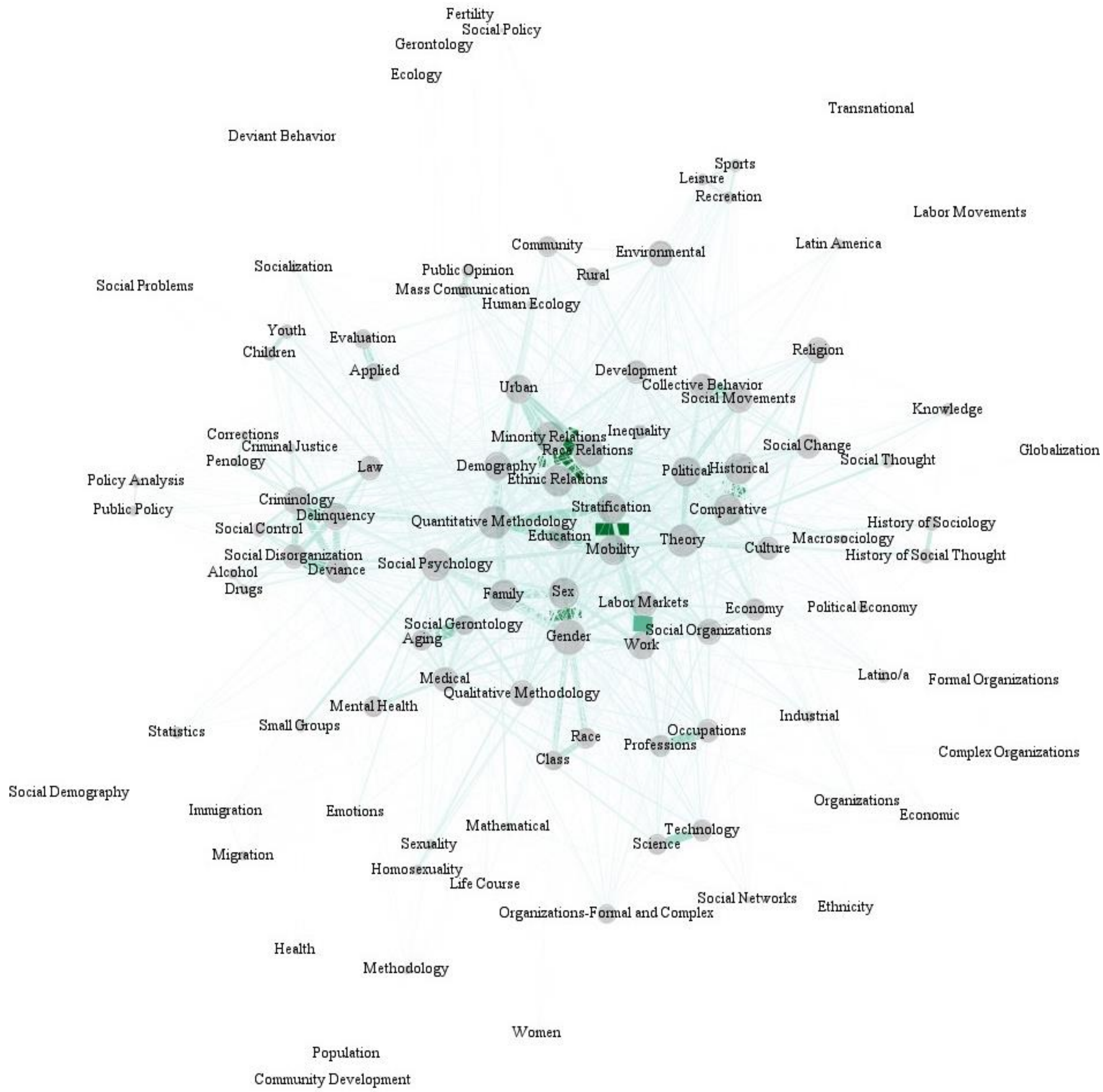

Figure 8 - Sociology Specialization Network in 1996.

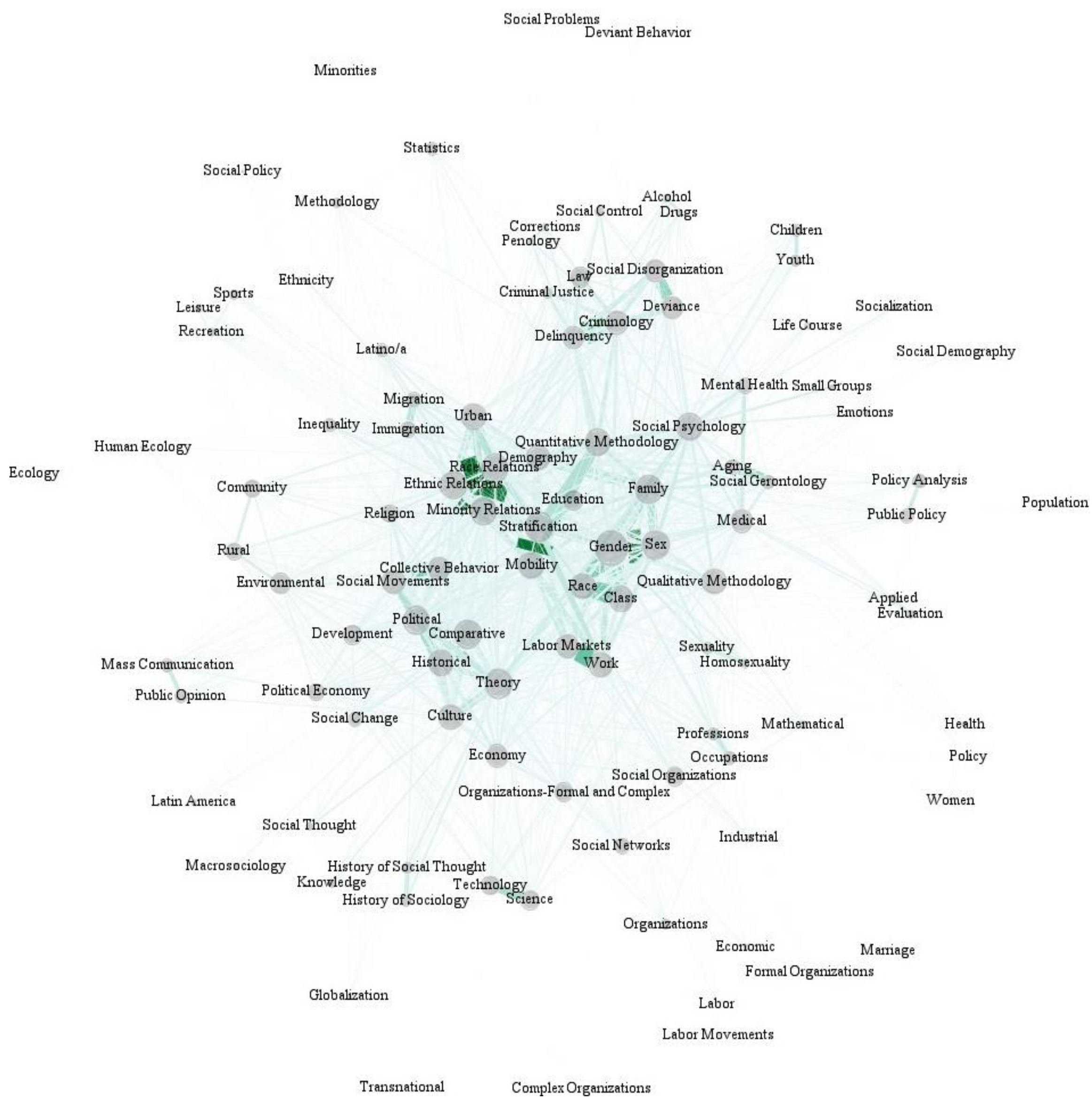

Figure 9 - Sociology Specialization Network in 2006.

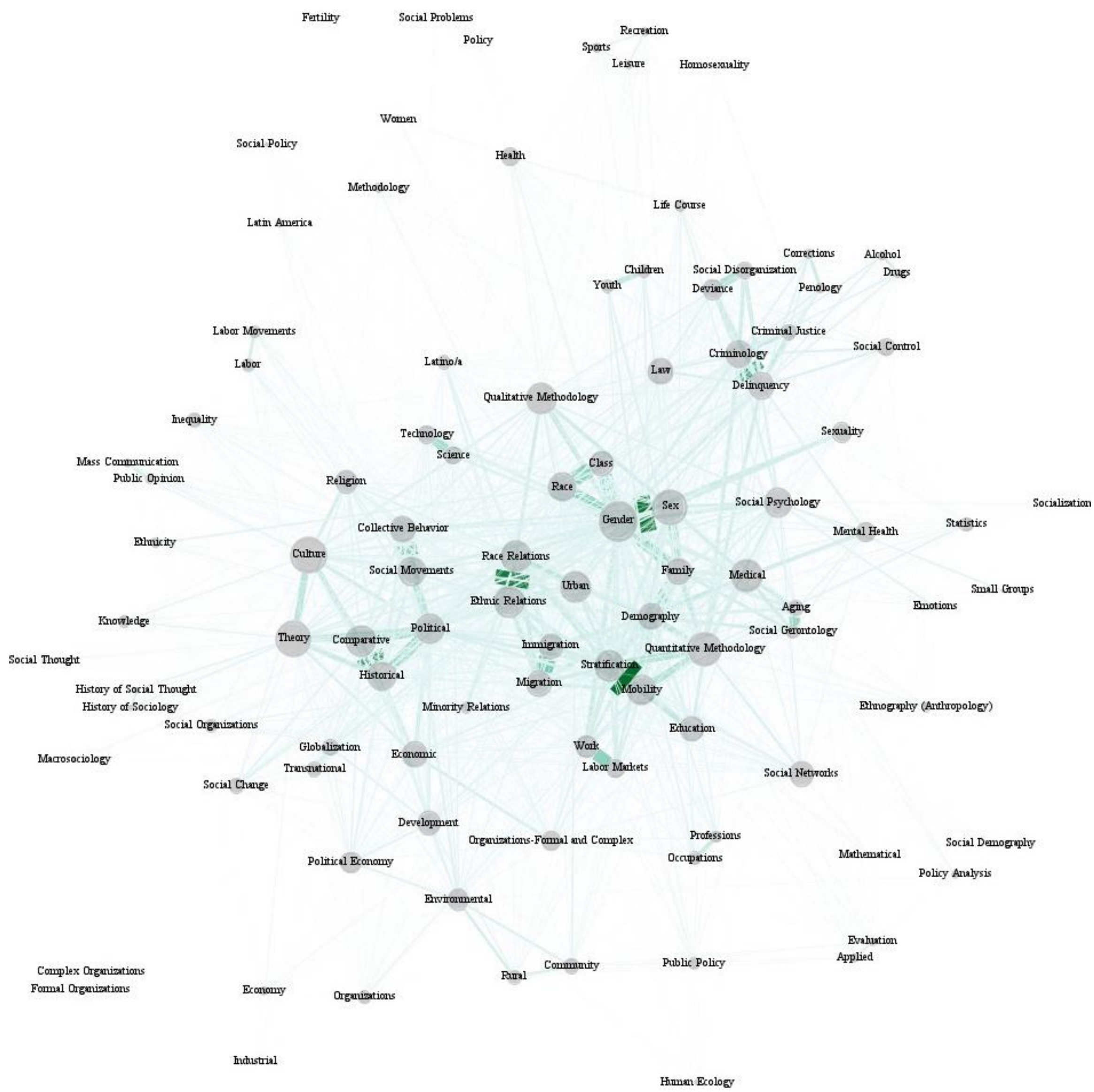

Figure 10 - Sociology Specialization Network in 2016.

APPENDIX D: CHANGES IN SPECIALIZATION POPULARITY, 1976 - 2016

Table 13 lists all 113 specializations that were claimed by at least one percent of the scientists, in at least one year between 1976 and 2016, ordered by popularity at both the beginning and the end of the time-window analyzed by the dissertation.

Table 13 - Specialization Popularity in 1976 and 2016.

Rank 1976	**Specialization**	**Pop. 1976**	**Rank 2016**	**Specialization**	**Pop. 2016**	**Rank Change**
1	Methodology	327	1	Gender	274	+102
2	Theory	303	2	Stratification	200	+2
3	Social Psychology	282	3	Demography	199	+5
4	Stratification	192	4	Political	196	+3
5	Family	171	5	Mobility	187	+57
6	Urban	163	6	Quantitative Methodology	184	+51
7	Political	154	7	Sex	177	+89
8	Demography	149	8	Family	176	-3
9	Social Change	132	9	Ethnic Relations	172	+29
10	Deviance	123	9	Race Relations	172	+13
11	Education	112	11	Theory	160	-9
12	Comparative	96	12	Medical	151	+2
13	Social Organizations	94	13	Comparative	150	-1
14	Medical	91	14	Historical	148	+41
15	Statistics	89	15	Culture	146	+26
16	Religion	87	16	Criminology	138	+1
17	Criminology	81	17	Delinquency	135	+23
18	Community	61	18	Urban	127	-12
19	Complex Organizations	59	19	Social Psychology	121	-16
20	Deviant Behavior	57	20	Social Movements	114	+10
21	Development	56	21	Qualitative Methodology	103	+50
22	Race Relations	53	22	Collective Behavior	100	+16
23	Law	52	23	Migration	96	+55
23	Science	52	24	Immigration	94	+78
25	Occupations	48	25	Race	91	+23
26	Population	44	26	Environmental	90	+36
27	Organizations	43	27	Education	88	-16
28	Rural	42	28	Economic	86	+23
28	Sex Roles	42	29	Work	82	+22
30	Mathematical	40	30	Development	81	-9
30	Social Movements	40	31	Law	77	-8
32	Industrial	39	32	Class	75	+56
33	Human Ecology	38	33	Religion	71	-17
34	Ecology	37	34	Social Networks	67	+58
34	Socialization	37	35	Aging	65	+29
36	Knowledge	35	36	Labor Markets	63	+66
36	Professions	35	37	Science	58	-14
38	Collective Behavior	34	38	Social Gerontology	57	+33
38	Ethnic Relations	34	39	Political Economy	56	+44
40	Delinquency	33	40	Orgs-Formal and Complex	53	+48
41	Culture	32	41	Deviance	52	-31
42	Minorities	30	42	Technology	51	+29
42	Small Groups	30	43	Mental Health	50	+37

44	Formal Organizations	29	44	Criminal Justice	49	+36
45	Modernization	27	45	Sexuality	44	+47
46	Latin America	25	46	Community	43	-28
46	Social Control	25	46	Globalization	43	+56
48	Race	24	46	Social Disorganization	43	+56
49	Social Problems	23	49	Rural	41	-21
50	Gerontology	22	50	Health	38	+17
51	Economic	21	51	Social Change	35	-42
51	Marriage	21	52	Latino/a	31	+50
51	Work	21	52	Social Control	31	-6
54	Applied	20	54	Inequality	29	+29
55	Historical	19	54	Statistics	29	-39
56	Mass Communication	18	56	Children	28	+40
57	Quantitative Methodology	17	57	Social Organizations	27	-44
58	Social Policy	15	57	Transnational	27	+45
59	Evaluation	14	57	Youth	27	+20
59	Women	14	60	Occupations	25	-35
61	Corrections	13	61	Professions	23	-25
62	Environmental	12	62	Methodology	22	-61
62	Mobility	12	63	Knowledge	20	-27
64	Aging	11	63	Labor	20	+4
64	Ethnicity	11	65	Life Course	19	+31
64	Public Opinion	11	65	Public Policy	19	+27
67	Health	10	67	Corrections	18	-6
67	Labor	10	67	Penology	18	+25
67	Social Demography	10	69	Ethnography (Anthropology)	16	+33
70	Community Development	9	69	Labor Movements	16	+33
71	Fertility	8	69	Public Opinion	16	-5
71	Leisure	8	72	Alcohol	15	+8
71	Policy	8	72	Drugs	15	+11
71	Qualitative Methodology	8	72	Mass Communication	15	-16
71	Social Gerontology	8	75	Emotions	14	+27
71	Technology	8	75	Minority Relations	14	+8
77	Youth	7	75	Organizations	14	-48
78	Economy	6	78	Applied	13	-24
78	Migration	6	79	Economy	12	+4
80	Alcohol	5	79	Ethnicity	12	-15
80	Criminal Justice	5	79	Evaluation	12	-20
80	Mental Health	5	79	History of Social Thought	12	+9
83	Drugs	4	79	History of Sociology	12	+17
83	Inequality	4	84	Sports	11	+1
83	Minority Relations	4	85	Human Ecology	9	-52
83	Political Economy	4	85	Latin America	9	-39
83	Sports	4	85	Policy Analysis	9	+11
88	Class	3	88	Leisure	8	-17
88	History of Social Thought	3	88	Recreation	8	+14
88	Macrosociology	3	88	Small Groups	8	-46
88	Orgs-Formal and Complex	3	91	Mathematical	7	-61
92	Penology	2	91	Women	7	-32
92	Public Policy	2	93	Socialization	6	-59
92	Sexuality	2	94	Macrosociology	4	-6
92	Social Networks	2	94	Social Policy	4	-36
96	Children	1	96	Homosexuality	3	+6
96	History of Sociology	1	96	Policy	3	0
96	Life Course	1	96	Social Demography	3	-29
96	Policy Analysis	1	96	Social Thought	3	0
96	Sex	1	100	Complex Organizations	2	-81
96	Social Thought	1	100	Industrial	2	-68
102	Emotions	0	100	Population	2	-74

102	Ethnography (Anthropology)	0	103	Ecology	1	-69
102	Gender	0	103	Fertility	1	-32
102	Globalization	0	103	Formal Organizations	1	-59
102	Homosexuality	0	103	Social Problems	1	-54
102	Immigration	0	107	Community Development	0	-37
102	Labor Markets	0	107	Deviant Behavior	0	-87
102	Labor Movements	0	107	Gerontology	0	-57
102	Latino/a	0	107	Marriage	0	-56
102	Recreation	0	107	Minorities	0	-65
102	Social Disorganization	0	107	Modernization	0	-62
102	Transnational	0	107	Sex Roles	0	-79

A closer look at the changes in popularity of individual specializations over time shows that specializations of seemingly similar types often - but did not always - experience the same trends, and that sometimes one term was much more popular than seemingly similar terms. Figures 11 through 41 show the changes in specialization popularity between 1976 and 2016 for all of the 113 specializations.

In these Figures, because of the changes in the way the data for *The Guide* was collected (discussed in the Method section), trends across 1994 and 1995 should be interpreted cautiously, particularly for the less popular specializations. The groupings in these Figures were based on the persistent types (listed in Appendix B) as determined by the Leiden community detection algorithm, but many of the figures include additional specializations of potential interest for comparison. The remaining specializations are shown in the final few figures.

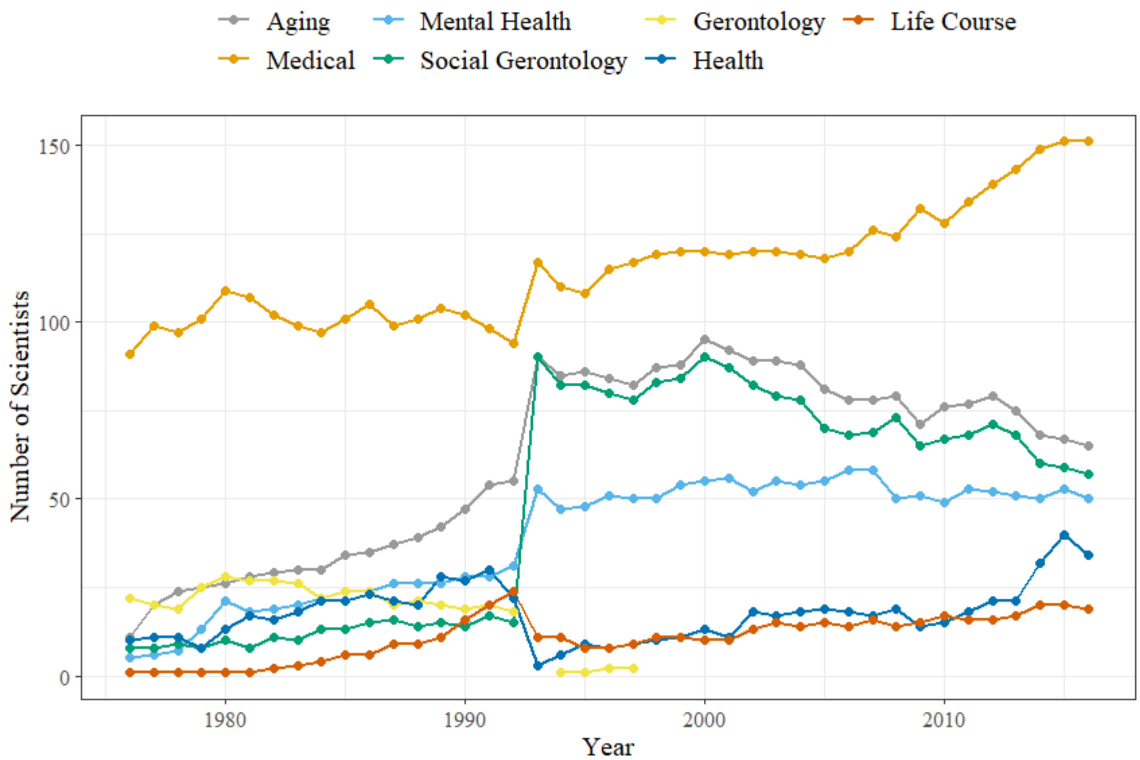

Figure 11 - Scientists Who Claimed the Aging, Medical, Mental Health, Health, Gerontology, Social Gerontology, and Life Course Specializations, 1976-2016.

Figure 11 shows the Aging, Medical, Mental Health, Social Gerontology, and Life Course specializations, which were grouped into the relatively persistent specialization Type 1. Life Course, Gerontology and Health were not part of any type, but are included here for comparison. Medical Sociology was the first official section of the ASA, established in 1959. Aging and the Life Course was established in 1980. The section Sociology of Mental Health was established in 1993. After the change in data collection in 1993, all four of the Type 1 specializations jumped upward in number of claimants and Aging and Social Gerontology become much more closely aligned.

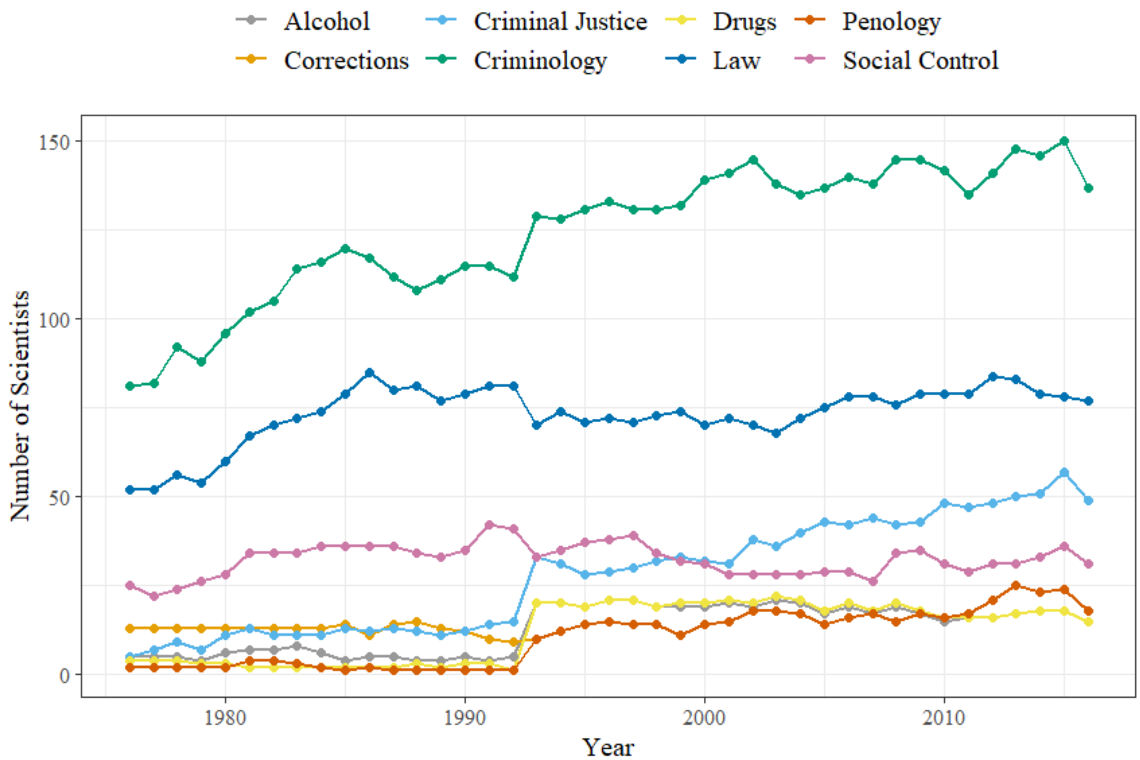

Figure 12 - Scientists Who Claimed the Alcohol, Corrections, Criminal Justice, Criminology, Drugs, Law, Penology, and Social Control Specializations, 1976-2016.

Figure 12 shows most of the Type 2 specializations. The remainder are shown in Figure 13. Type 2 was the largest of the relatively persistent specialization types. The American Society of Criminology was founded in 1941. The ASA section Crime, Law and Deviance was established in 1966. Alcohol, Drugs, and Tobacco was established in 1993. Sociology of Law was established in 1994. As shown in Figure 12, the terms "Criminology" and "Criminal Justice" seem to have both been growing more popular from 1976 to 2016, while many of the other terms are stagnant or, as seen in Figure 13, declining.

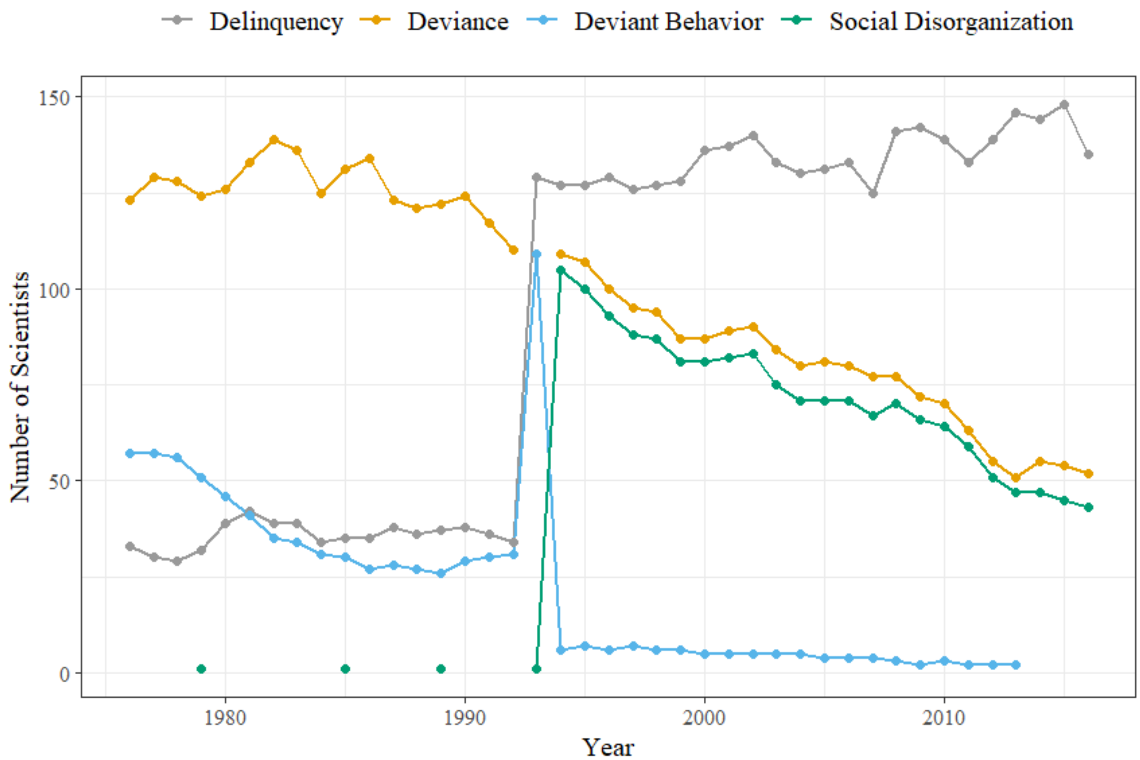

Figure 13 - Scientists Who Claimed the Delinquency, Deviance, Deviant Behavior, and Social Disorganization Specializations, 1976-2016.

In contrast to the specializations in Figure 12, the specializations in Figure 13, which are also part of Type 2, appear to have been heavily impacted by the change in data collection. Figure 13 also shows how the change in data collection seems to have resulted in "Deviance" being unavailable as a term of choice for one year, with "Deviant Behavior" being the closest available option. The next year, "Deviance" appears to have returned to its previous pattern of steady decline, but "Deviant Behavior" seems to have dropped permanently, with "Criminal Justice," and "Criminology" and "Delinquency" seeming to jump in popularity at the same time.

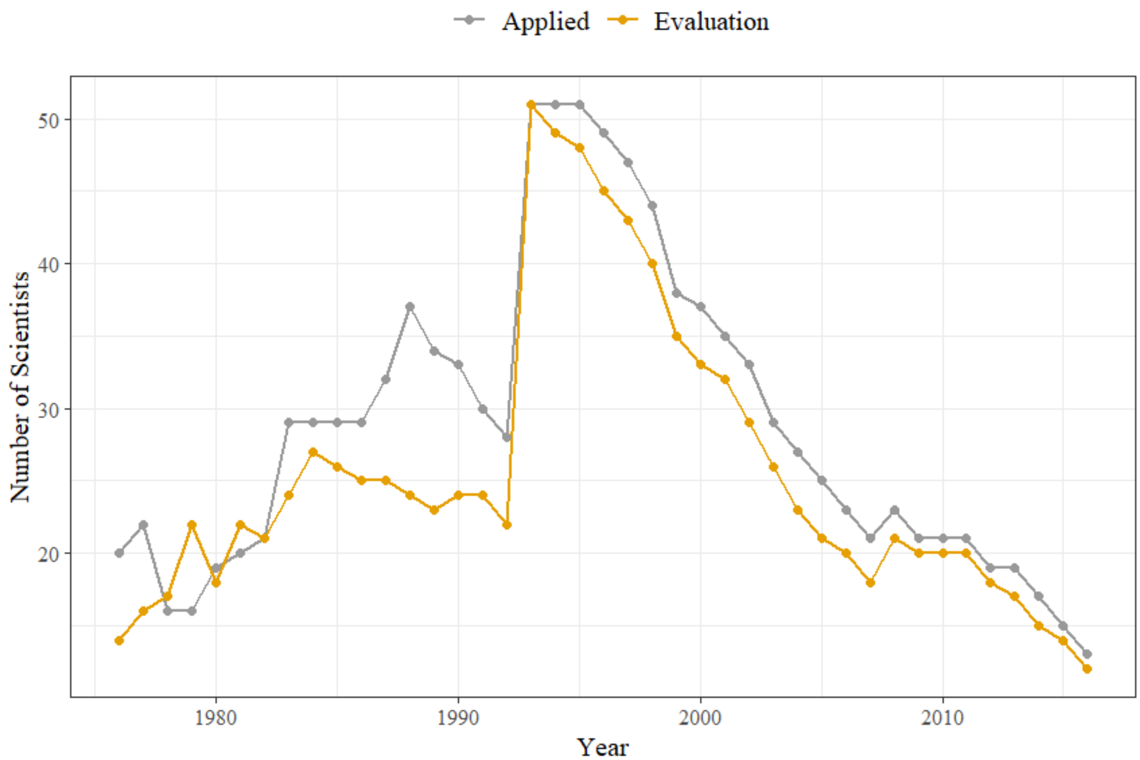

Figure 14 - Scientists Who Claimed the Applied and Evaluation Specializations, 1976-2016.

As shown in Figure 14, the Applied and Evaluation specializations have grown and declined together over most of the time-window covered by this dissertation. The ASA section Sociological Practice and Public Sociology, established in 1979, might be the closest official section to these two specializations. The ASA presidential address advocating for public sociology was in 2004 (Burawoy 2004).

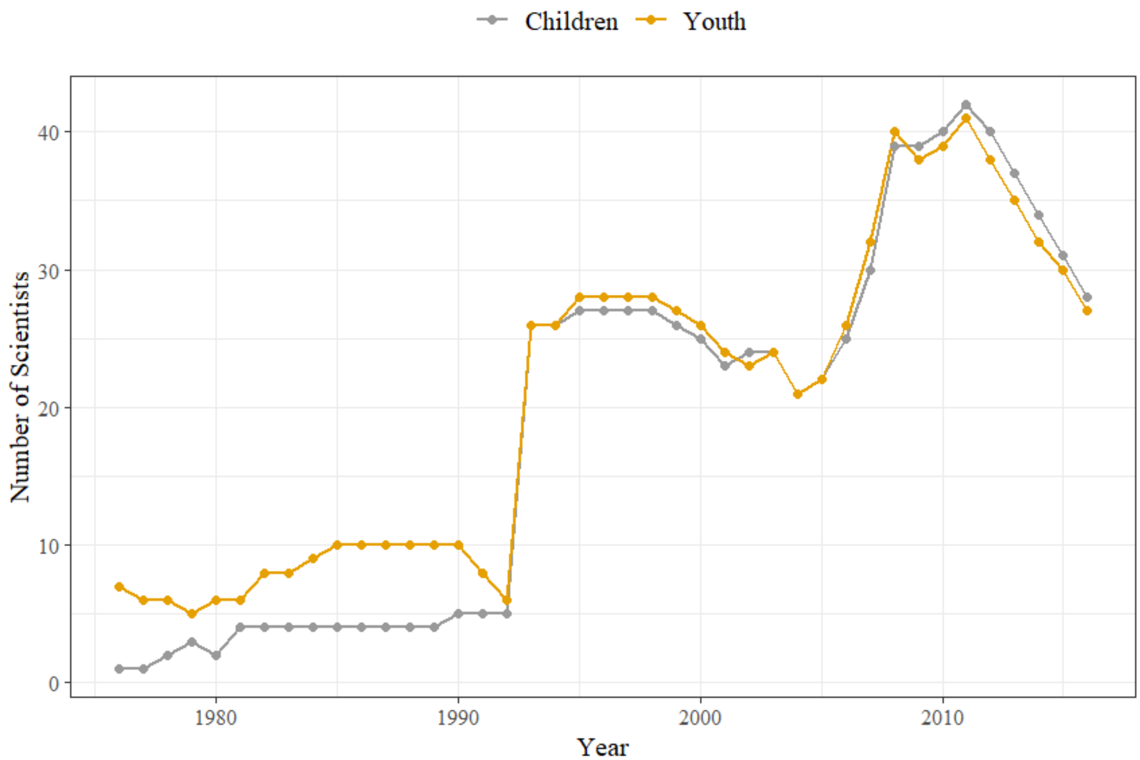

Figure 15 - Scientists Who Claimed the Children and Youth Specializations, 1976-2016.

Children and Youth were specialization Type 4. After the change in data collection, Children and Youth were very closely aligned, with very few scientists claiming one but not the other. The ASA section Children and Youth was established in 1994.

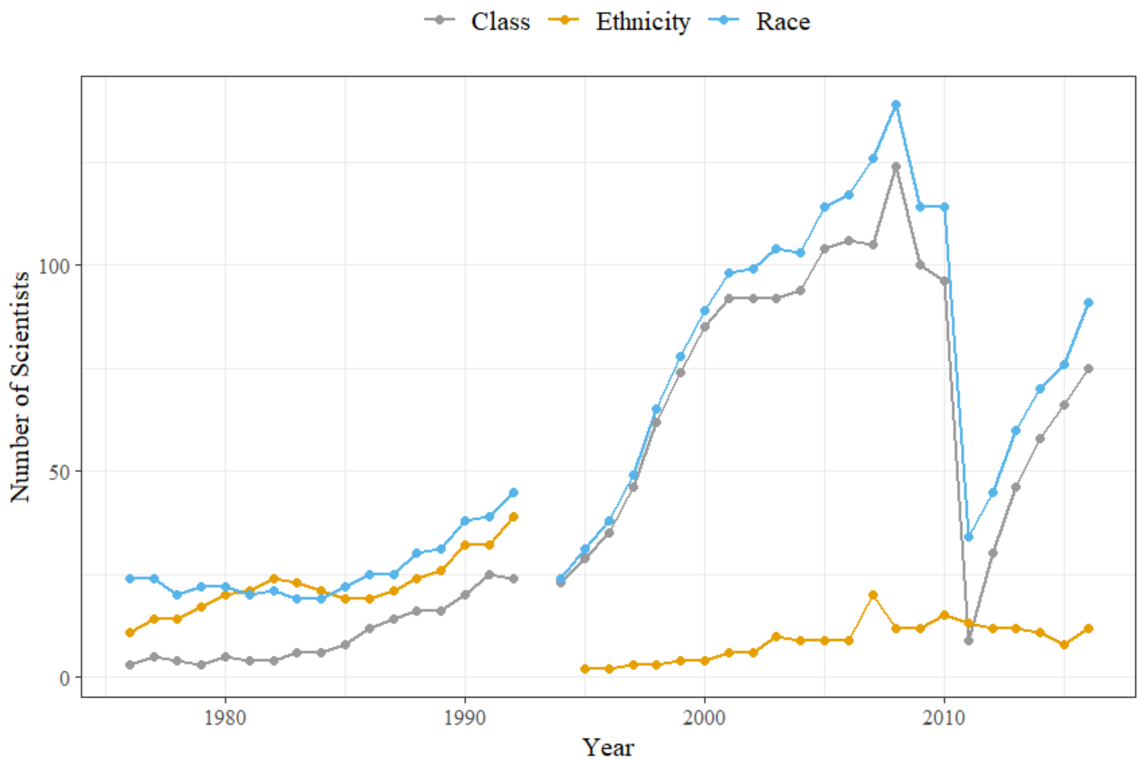

Figure 16 - Scientists Who Claimed the Class, Ethnicity, and Race Specializations, 1976-2016.

Type 5 was the specializations Class, Ethnicity, and Race. Prior to the change in data collection, all three specializations appear to have been following a similar trajectory. The ASA section Marxist Sociology was established in 1977. The section Racial and Ethnic Minorities was established in 1981. After the change in data collection, Race and Class became even more closely associated than before, likely related to the establishment of the section Race, Gender, and Class in 1997.

The large drops in Race and Class around 2008 were likely linked to a similarly timed drop in Gender, seen in Figure 25. At some point after the change in data collection for *The Guide*, “Race,” “Class,” and “Gender,” began to be grouped together as a single choice option: “Race, Class, and Gender.” The 2013 *Guide* was the first edition which listed this combined category in the “Index of Special Programs.” This change in *The Guide*, was likely associated with the earlier establishment of the ASA section Race, Gender, and Class in 1997.

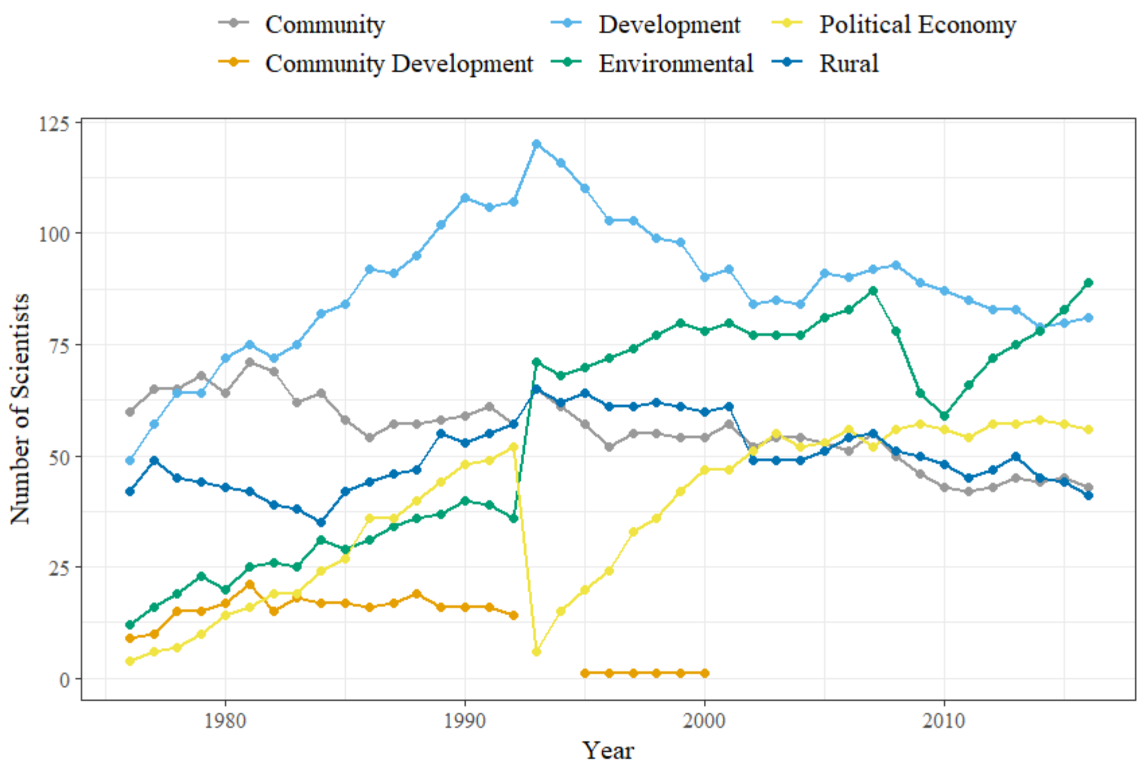

Figure 17 - Scientists Who Claimed the Community, Community Development, Environmental, Political Economy, and Rural Specializations, 1976-2016.

The sections shown in Figure 17 were identified as specialization Type 6. The ASA section Community and Urban Sociology was established in 1973. The section Environmental Sociology was established in 1977. Political Economy of the World-System was established in 1981, and Sociology of Development was established in 2012.

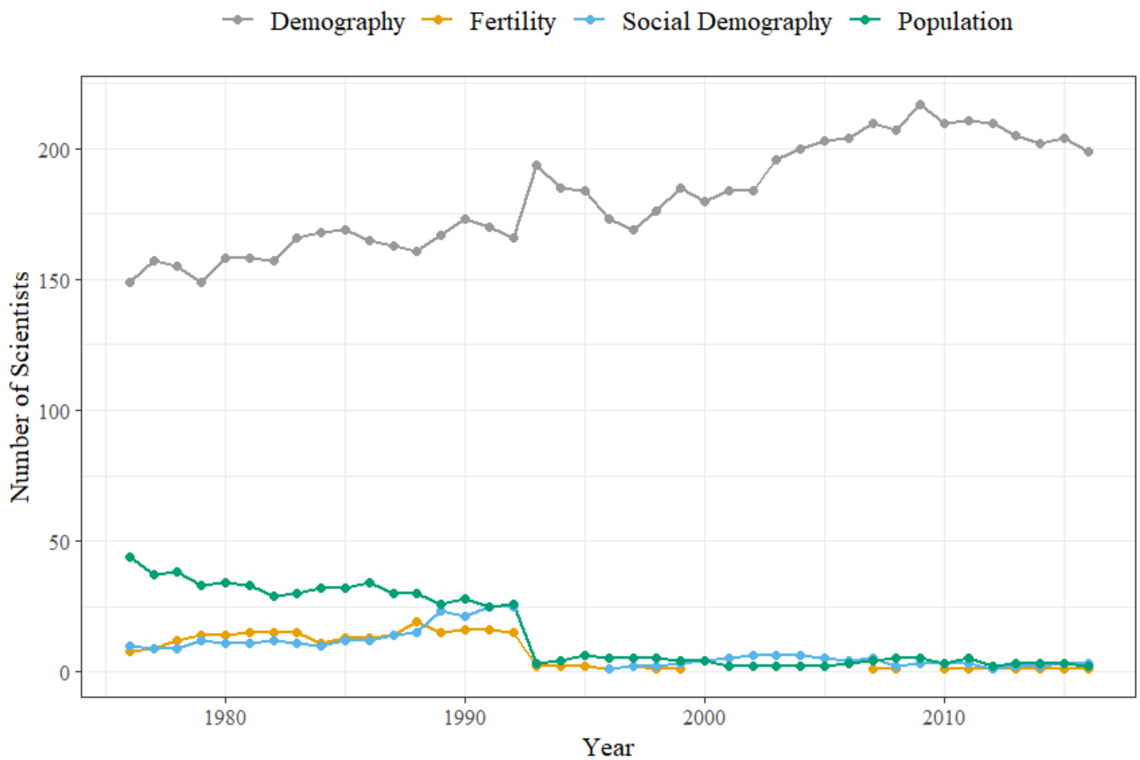

Figure 18 - Scientists Who Claimed the Demography, Fertility, Social Demography, and Population Specializations, 1976-2016.

Demography and Fertility were identified as specialization Type 7. Social Demography and Population were not part of a type. The ASA section Sociology of Population was established in 1978.

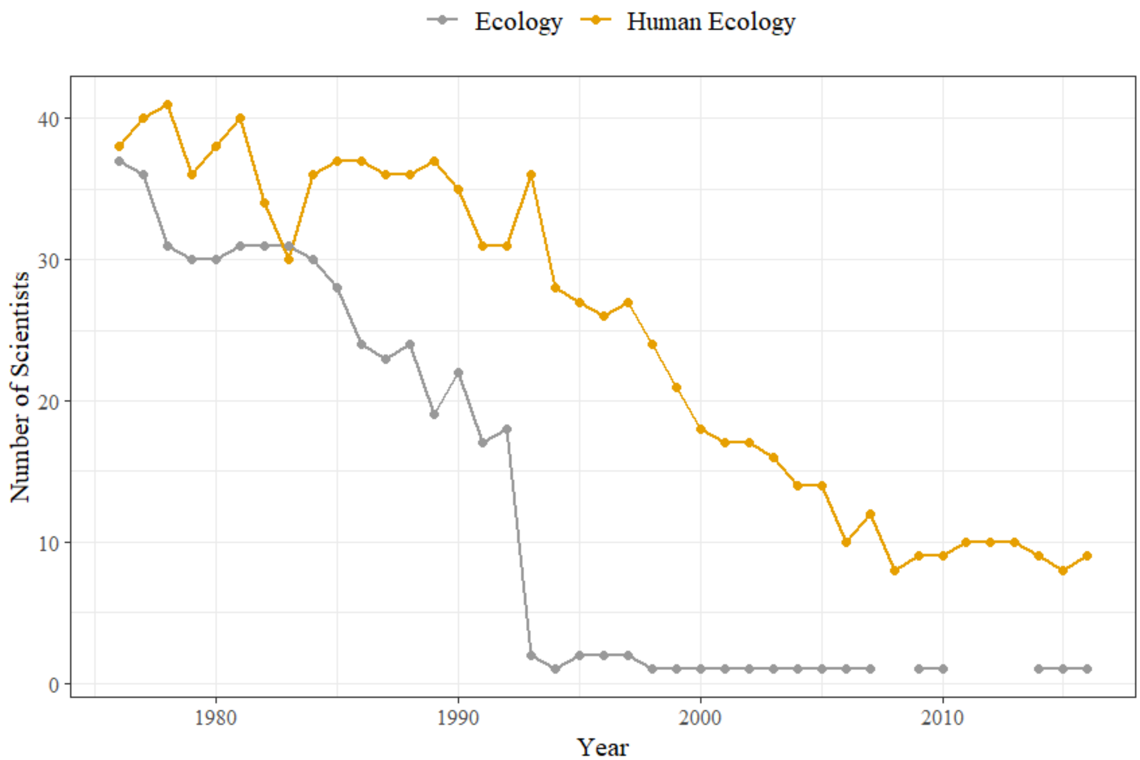

Figure 19 - Scientists Who Claimed the Ecology and Human Ecology Specializations, 1976-2016.

Ecology and Human Ecology were identified as specialization Type 8.

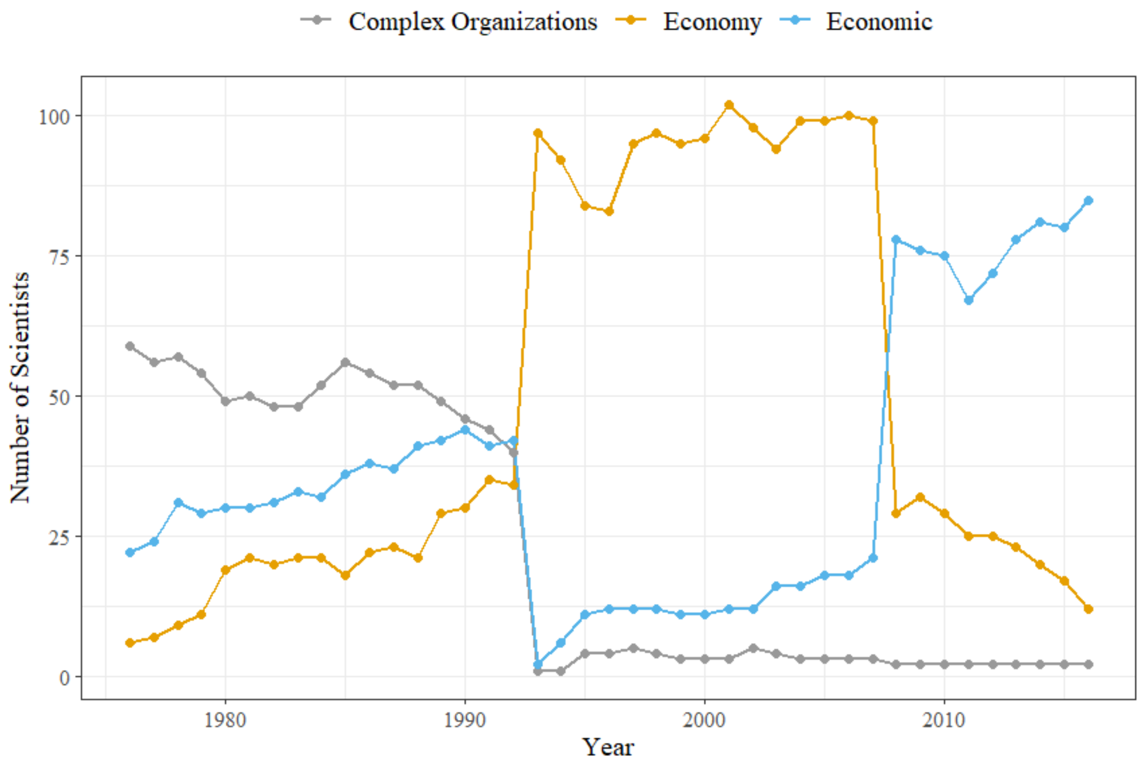

Figure 20 - Scientists Who Claimed the Complex Organizations, Economy, and Economic Specializations, 1976-2016.

Figure 20 shows the claimants for Complex Organizations, Economy, and Economic Specializations. Complex Organizations and Economy were identified as a relatively persistent specialization Type 9. Economic seems to have had an interesting relation with these two. The ASA section Economic Sociology was established in 2000. All three specializations in Figure 20 are likely to also be related to the specializations shown in Figure 21, where Complex Organizations is shown again for reference. The change in data collection in 1994 appears to have accompanied a large but temporary decrease in claimants of Economic Sociology and a permanent decrease in claimants of Complex Organizations. Economy and Economic appear to almost switch places again around 2007.

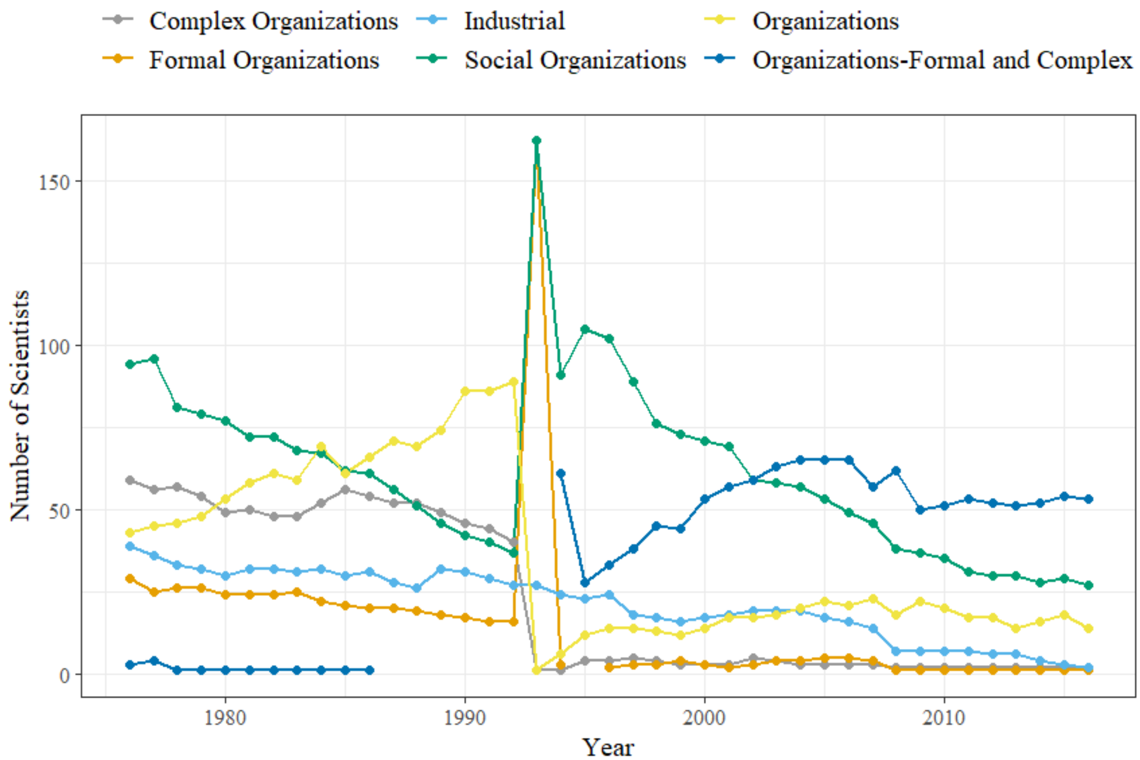

Figure 21 - Scientists Who Claimed Various Organizations Specializations, 1976-2016.

These specializations shown in Figure 21 were not identified as a type, and there were a large number of specializations claims with "organization" in the name, perhaps an indicator of the ubiquity and variety of organizations in society, and perhaps a reflection of a lack of consensus on terms used to describe research on organizations (unlike the case of Gender). It was also common for scientists to claim specialization in specific types of organizations, such as health care organizations or nonprofit organizations (similar to the case of Theory). The ASA section Organizations, Occupations, and Work was established in 1970.

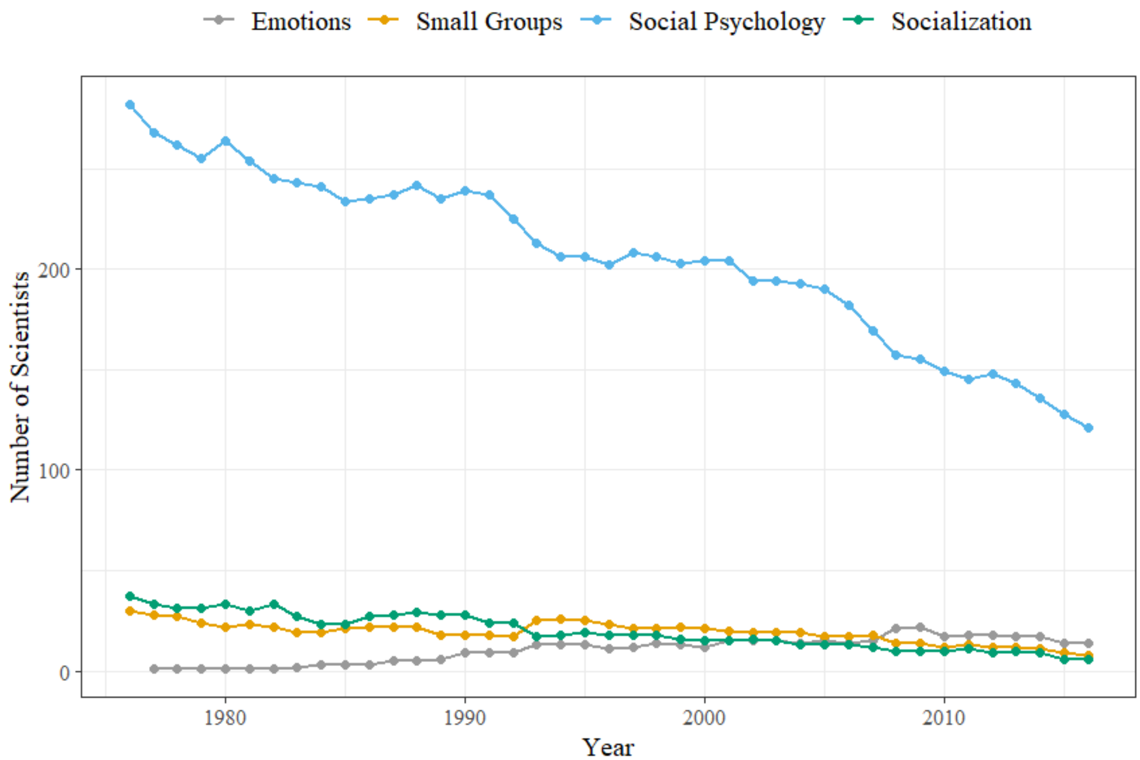

Figure 22 - Scientists Who Claimed the Emotions, Small Groups, Social Psychology, and Socialization Specializations, 1976-2016.

The ASA section for Social Psychology was the third official ASA section, established in 1961. The ASA section for Sociology of Emotions was established in 1988. The slow and steady decline of "Social Psychology" over at least the past five decades, as seen in Figure 22, is worth noting. In 1950, the 45th ASA annual meeting program was given the special title "Social Psychological Theory and Method in Sociology," when most annual meeting programs around that time apparently did not have a special title, perhaps indicating the importance of the specialization at that time. In 1976, at the start of this dataset, Social Psychology was claimed by more of the faculty at these 92 departments than any other single specialization, including Methodology. Although Social Psychology was still the 19th most popular specialization within the dataset in 2016, the percentage of scientists claiming it as a specialization had declined by more than half. This was the largest decline in raw popularity of any specialization in the dataset. In 2016, there were only three remaining claimants of Social Psychology in the top 5 departments, down from 24 in 1976.

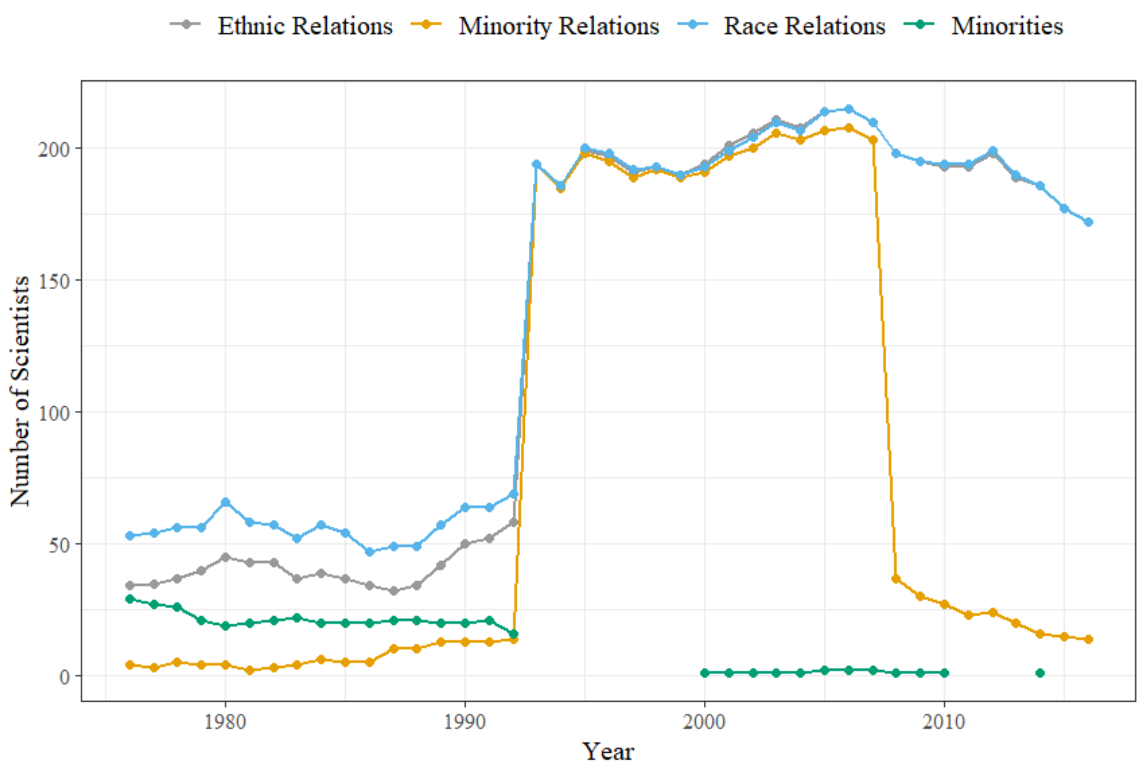

Figure 23 - Scientists Who Claimed the Ethnic Relations, Minority Relations, Race Relations, and Minorities Specializations, 1976-2016.

As seen in Figure 23, the term "Minority Relations" seems to fall out of favor around 2008. This is likely the result of a change in the name of the choice option from "Race/Ethnic/Minority Relations" to "Race and Ethnic Relations," and a corresponding change in the specializations reported in *The Guide*. The "Index of Special Programs" for the 2009 *Guide* (2008 data in this dissertation) shows this change. It is possible that this reflects the term "minorities" falling out of favor among scientists in this dataset, or an increased focus on race and ethnicity to the exclusion of other social categories among the claimants of this specialization. The ASA section Racial and Ethnic Minorities was established in 1981.

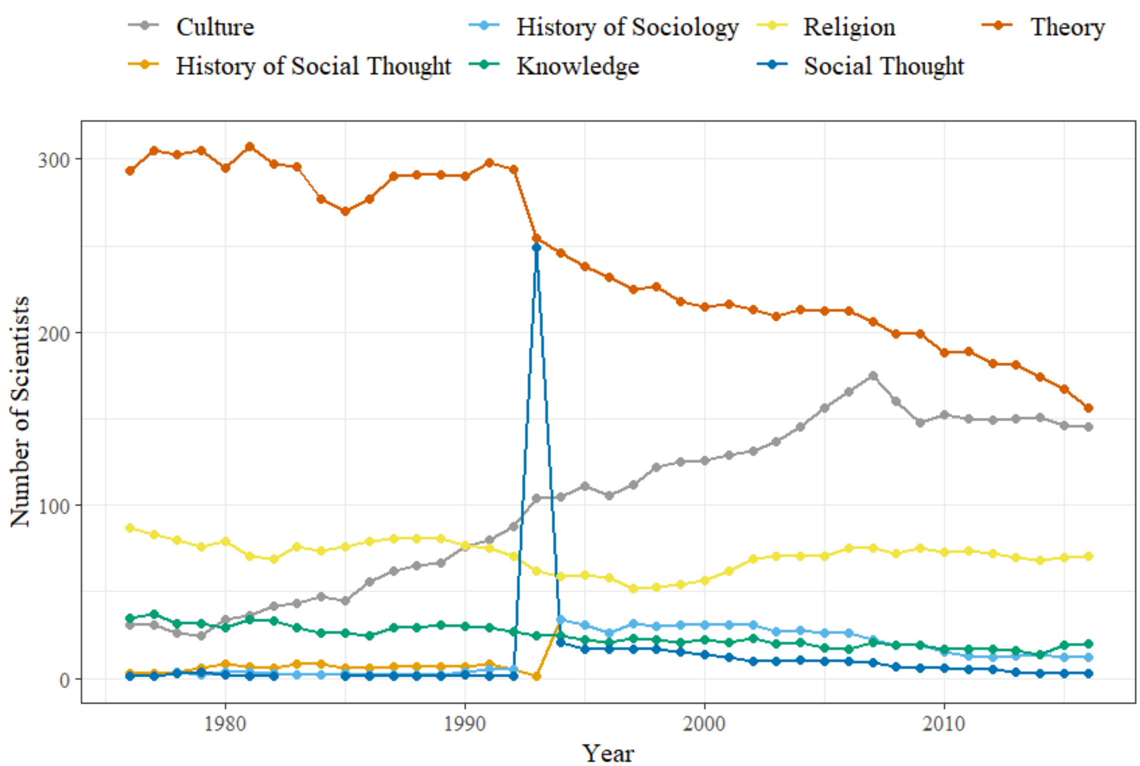

Figure 24 - Scientists Who Claimed the Culture, History of Social Thought, History of Sociology, Knowledge, Religion, Social Though, and Theory Specializations, 1976-2016.

Type 12 was the second largest of the relatively persistent specialization types. Culture was growing steadily throughout most of the time-window. The Theory Section of the ASA was established in 1968. Sociology of Culture was established in 1988. The section titled Science, Knowledge, and Technology was established in 1990. The Sociology of Religion Section was established in 1994.

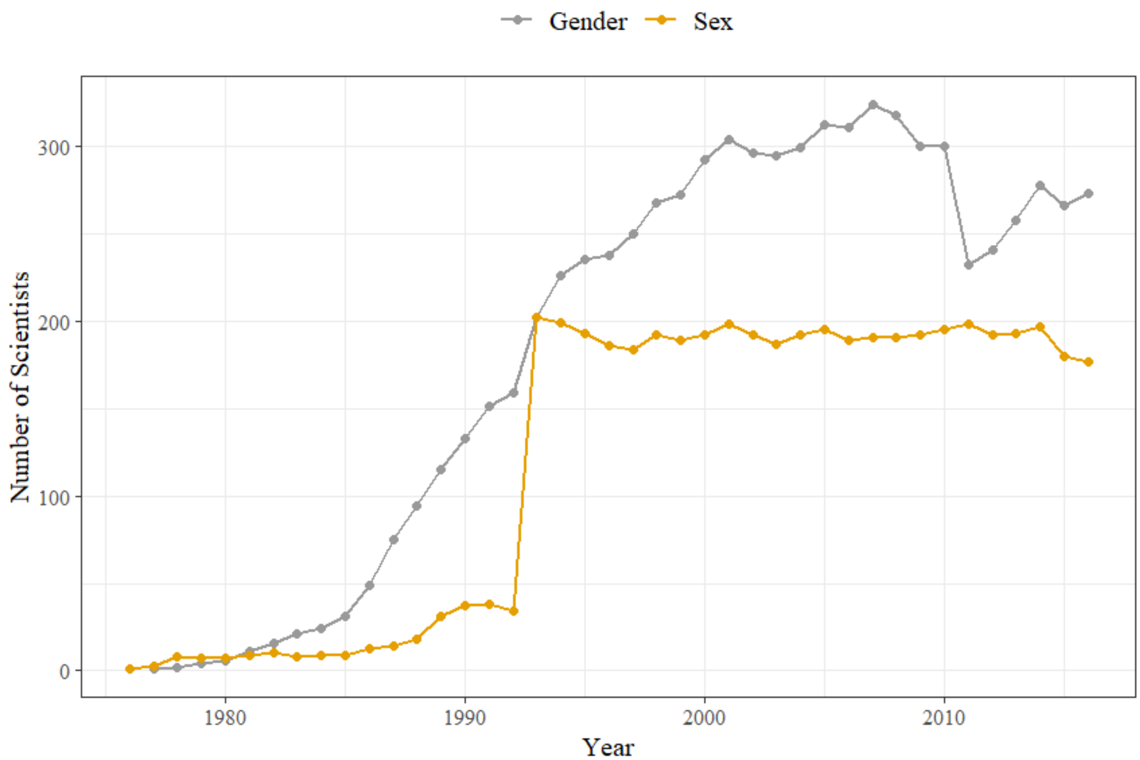

Figure 25 - Scientists Who Claimed the Gender and Sex Specializations, 1976-2016.

The ASA section Sociology titled Sex and Gender was established in 1973. As shown in Figure 25, in 1976, there are no claimants of "Gender," or "Sex" in the dataset. At that time, there was also only one claimant for "Gender Roles." The first claimant of Gender overall was in 1977, but the first claimant among the top five departments didn't come until 1983, a full ten years after the establishment of the ASA section with Gender in its name, although there were very likely scientists at those departments with an interest in the topic. "Gender" became one of the most popular specializations in later years, reaching its maximum claimants at 18.1 percent of all faculty in 2007, which is the highest percentage reached by any specialization over all waves of the dataset. It is worth noting that prior to the change in data collection, claimants for Sex may have been beginning to decline. After the data collection change, many more individuals continued to claim Gender independently of Sex.

The possible explanations for the uniquely rapid growth of “Gender” compared to other specializations in this dataset are discussed in more detail in the Results and Discussion section. However, it is worth noting here the large and rapid drop which can be seen in 2011. In Figure 16, a similar large drop in the popularity of “Race” and “Class” occurred between 2010 and 2011. It is not clear from this data what caused this drop.

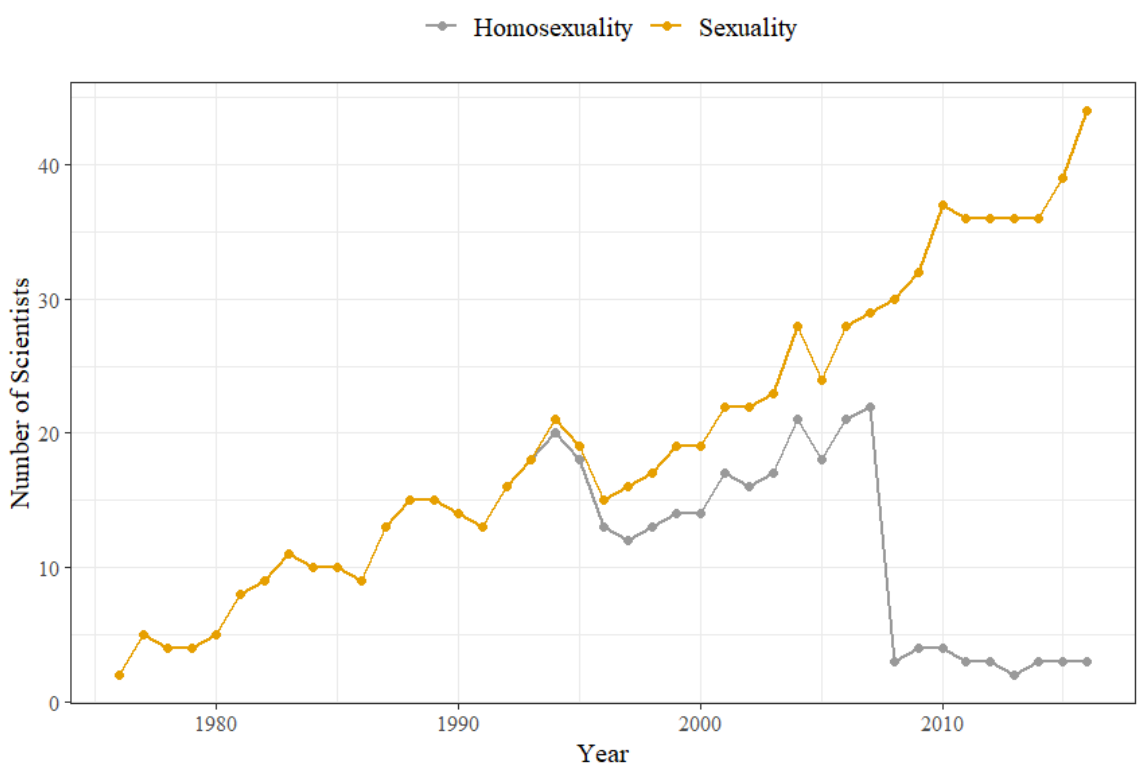

Figure 26 - Scientists Who Claimed the Homosexuality and Sexuality Specializations, 1976-2016.

The ASA section Sociology of Sexualities was established in 1997. The term Homosexuality appears to have fallen out of favor as a claimed specialization area starting in the 2000's, even as claimants of Sexuality appear to have increased.

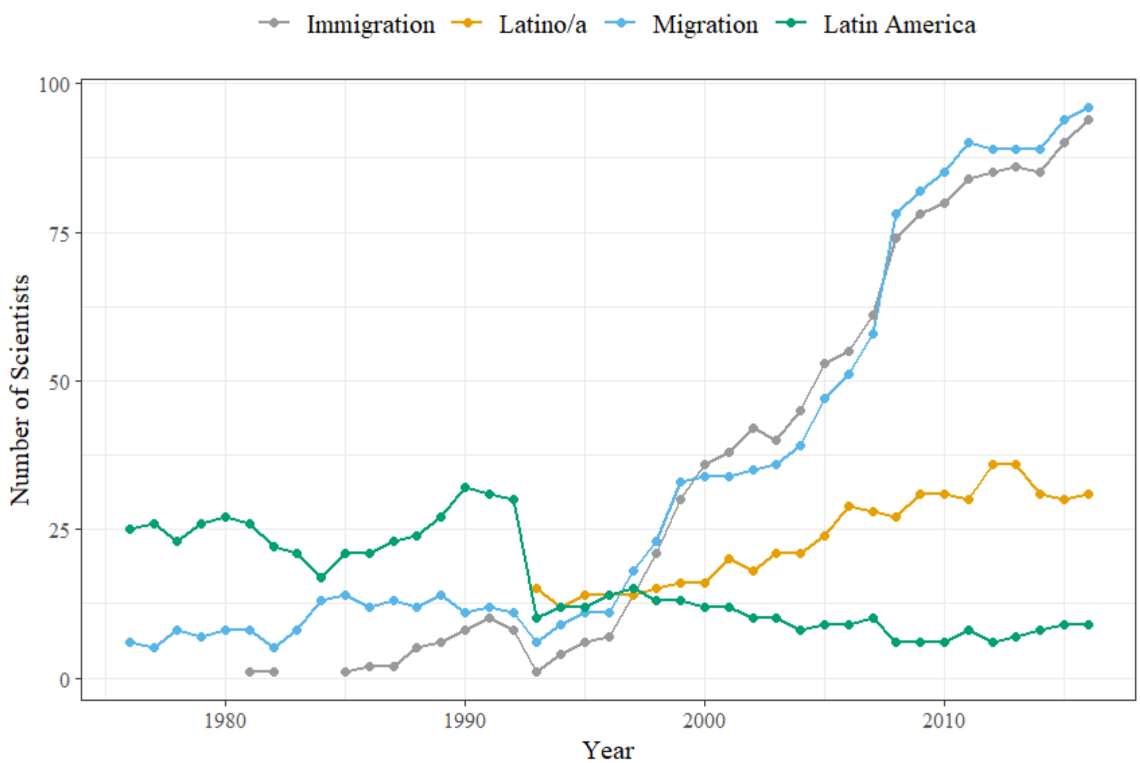

Figure 27 - Scientists Who Claimed the Immigration, Latino/a, Migration, and Latin America Specializations, 1976-2016.

The ASA section Latino/Latina Sociology was established in 1994. The section titled International Migration was established in 1995. The rapid rise of Migration and Immigration appears similar to the rapid rise in Globalization and Transnational seen in Figure 40. It is possible that the rise of all four specializations during the second half of the dataset reflects changes in society happening during that same time period.

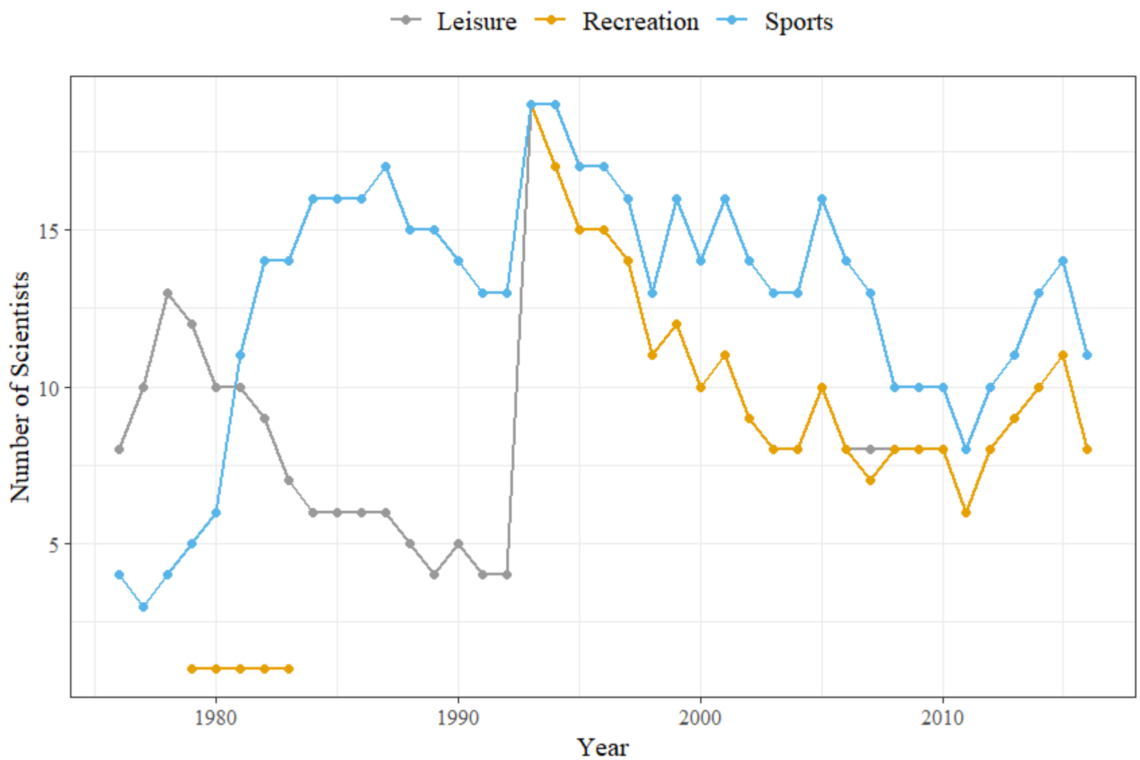

Figure 28 - Scientists Who Claimed the Leisure, Recreation, and Sports Specializations, 1976-2016.

Type 16 was Leisure, Recreation, and Sports. In the second half of the dataset, these three specializations appear to have been very closely associated.

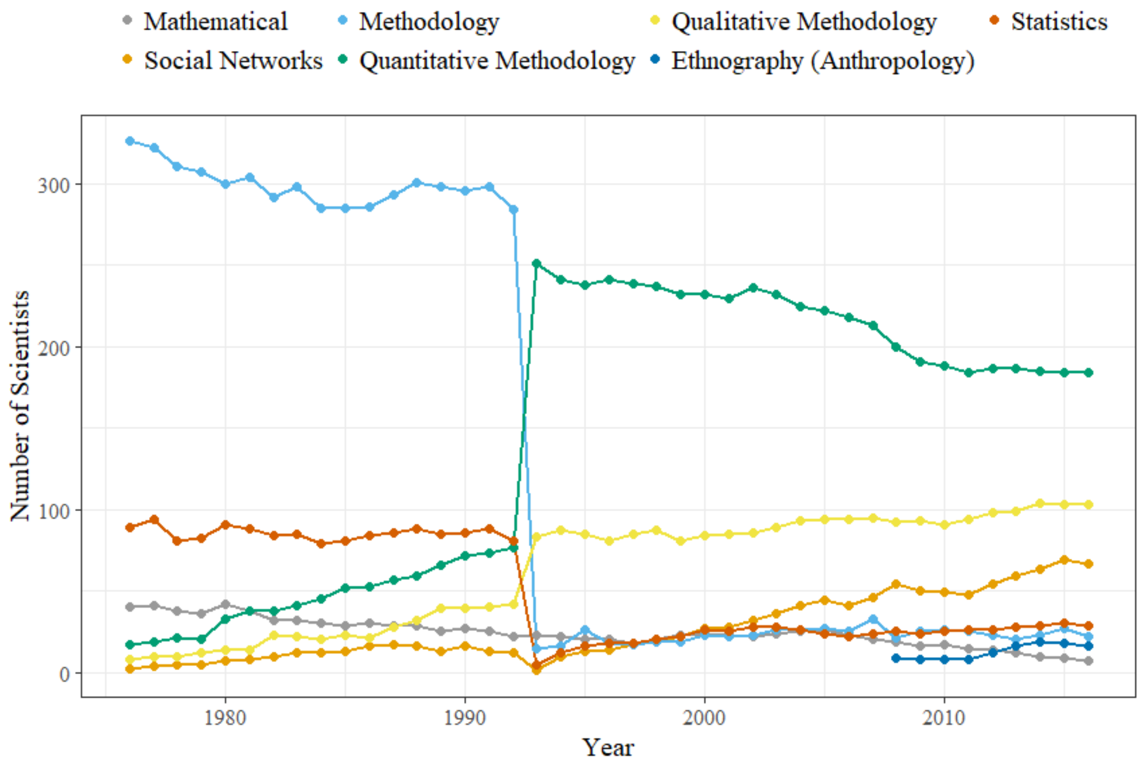

Figure 29 - Scientists Who Claimed Various Methodological Specializations, 1976-2016.

Specialization Type 17 was Mathematical, Quantitative Methodology, and Social Networks, and specialization Type 18 was Methodology and Statistics. Methodology was the second official section of the ASA, established in 1961, the same year as Social Psychology. Methodology was the most popular specialization in the dataset in 1976. Since that time, the general term “Methodology” seems to have fallen out of favor and been largely replaced by other, more specific terms. “Qualitative Methodology,” “Statistics,” and “Social Networks” (Figure 29), and “Comparative,” and “Historical” (Figure 36) are the largest which appear to have grown in its place. There were three additional methodology related ASA sections established during the time period of the study. Comparative-Historical Sociology was established in 1983. Mathematical

Sociology was established in 1997. Ethnomethodology and Conversation Analysis was established in 2004.

It is not possible to determine precisely from the data in this dataset the extent to which this change (or the other changes visible in the figures in this appendix) were driven by the change in data collection in *The Guide*, or driven by a growing refinement of the discipline with respect to tools of methodology and analysis. The divide between quantitative and qualitative methods seems deeply institutionalized today[16].

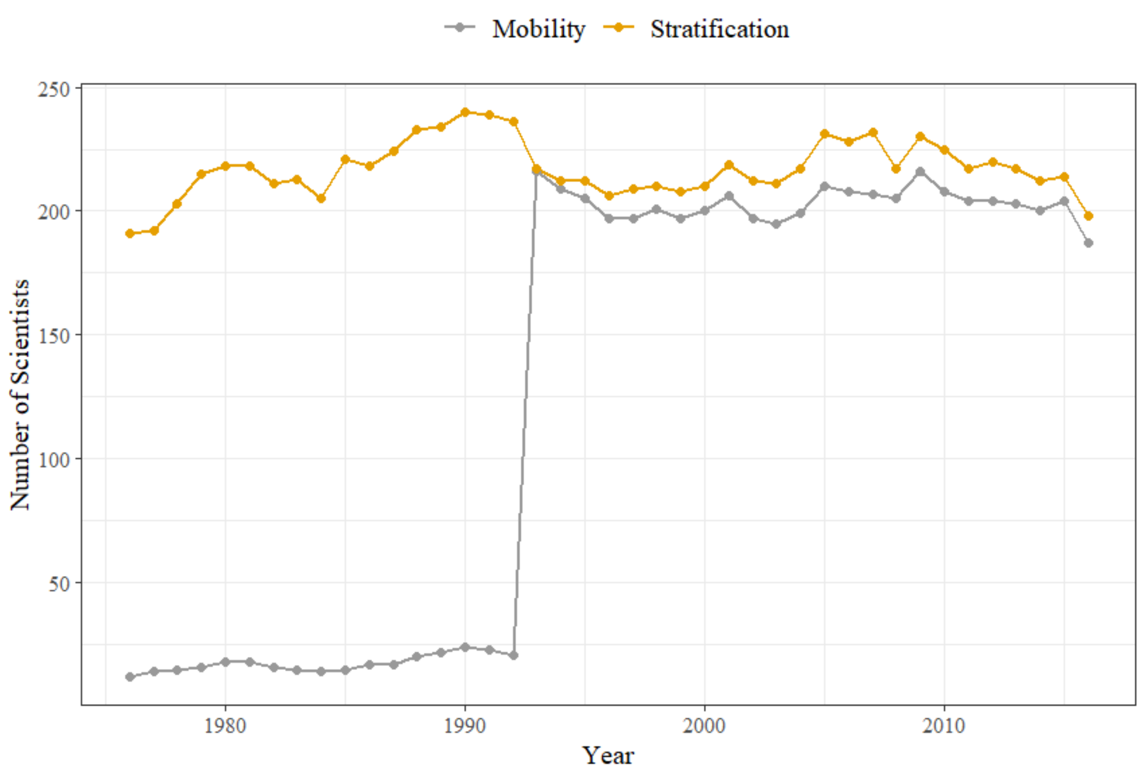

Figure 30 - Scientists Who Claimed the Mobility and Stratification Specializations, 1976-2016.

Figure 30 shows that "Mobility" and "Stratification" were combined in the data collection during the reorganization in 1993. It is possible that this change reflected a

[16] One possibility for a future research project might be to investigate the growth and institutionalization of various types of methods in sociology, using data from sociological journals.

growing identification of these two topics as related, as evidenced by the establishment of the journal *Research in Social Stratification and Mobility* in 1981. The ASA section Inequality, Poverty, and Mobility was established in 2011.

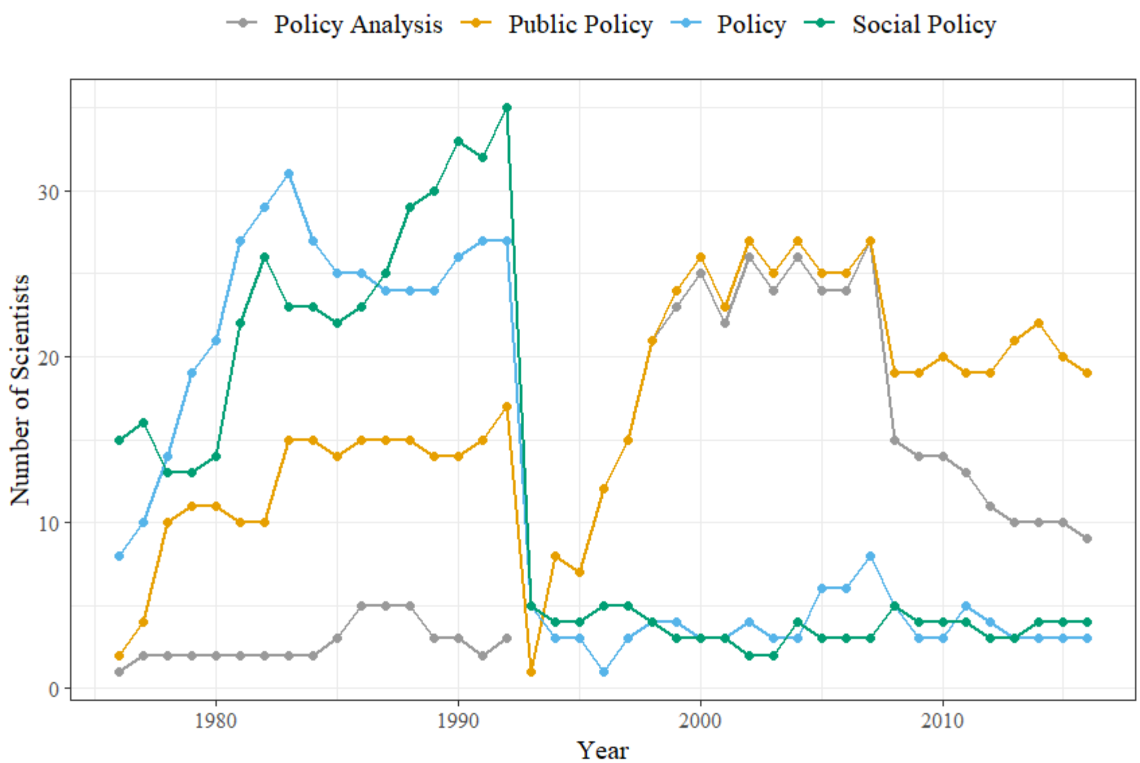

Figure 31 - Scientists Who Claimed the Policy Analysis, Public Policy, Policy, and Social Policy Specializations, 1976-2016.

Type 20 was Policy Analysis and Public Policy, which were closely associated for several years after the change in data collection, then they appear to have separated around 2008 with Public Policy becoming the more popular term.

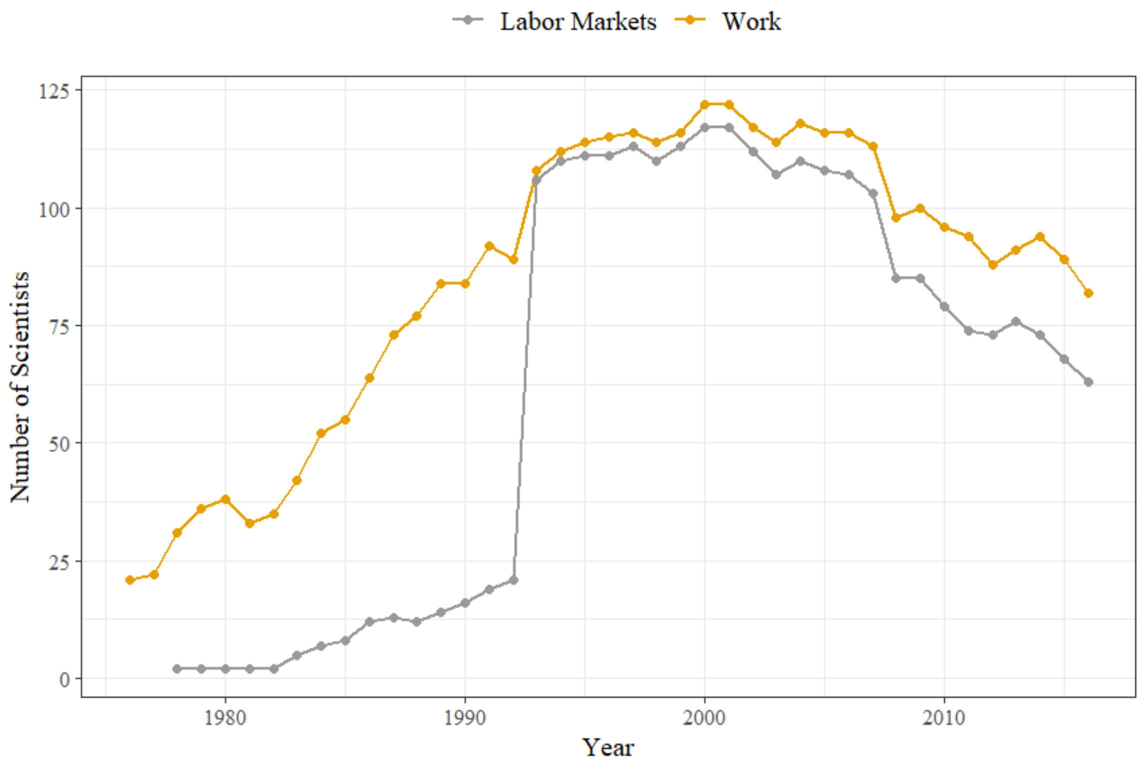

Figure 32 - Scientists Who Claimed the Labor Markets and Work Specializations, 1976-2016.

The ASA section Organizations, Occupations, and Work was established in 1970. Labor and Labor Movements was established in 2002. Labor Markets and Work were identified as specialization Type 21.

Figure 33 - Scientists Who Claimed the Occupations and Professions Specializations, 1976-2016.

The ASA section Organizations, Occupations, and Work was established in in 1970. Occupations and Professions were identified as Type 22.

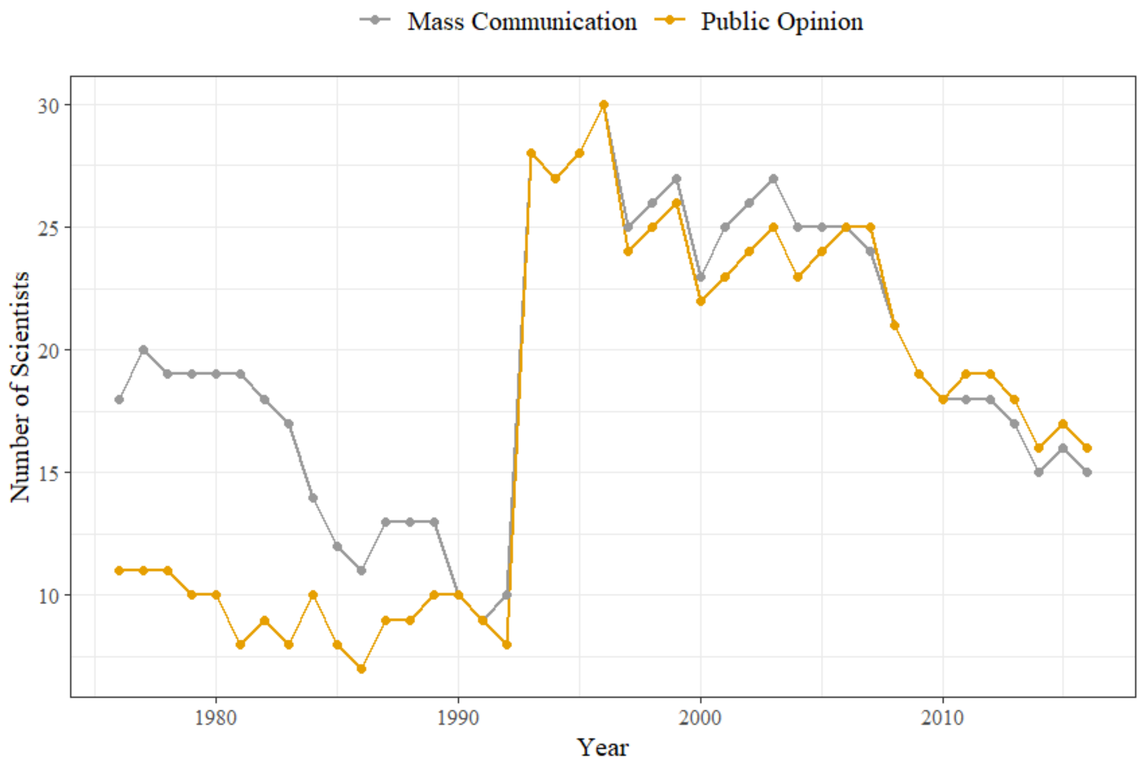

Figure 34 - Scientists Who Claimed the Mass Communication and Public Opinion Specializations, 1976-2016.

The ASA section Communication and Information Technologies was probably the closest section to the specializations Mass Communication and Public Opinion, and was established in 1990.

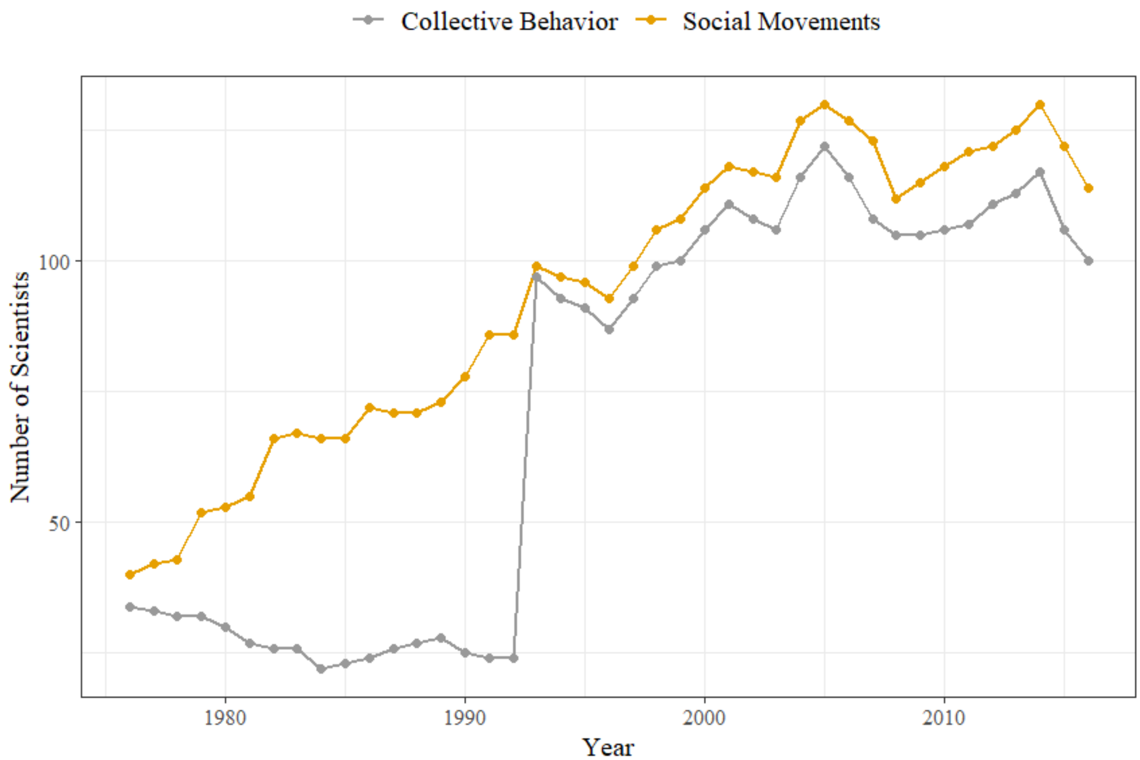

Figure 35 - Scientists Who Claimed the Collective Behavior and Social Movements Specializations, 1976-2016

Collective Behavior and Social Movements were identified as Type 24. As shown in Figure 35, prior to the change in data collection which grouped Collective Behavior and Social Movements together as a single entity, "Collective Behavior" appears to have been falling out of favor as a term used by scientists to describe their specializations, even as Social Movements appears to have been becoming more popular. The ASA section Collective Behavior and Social Movements was established in 1981.

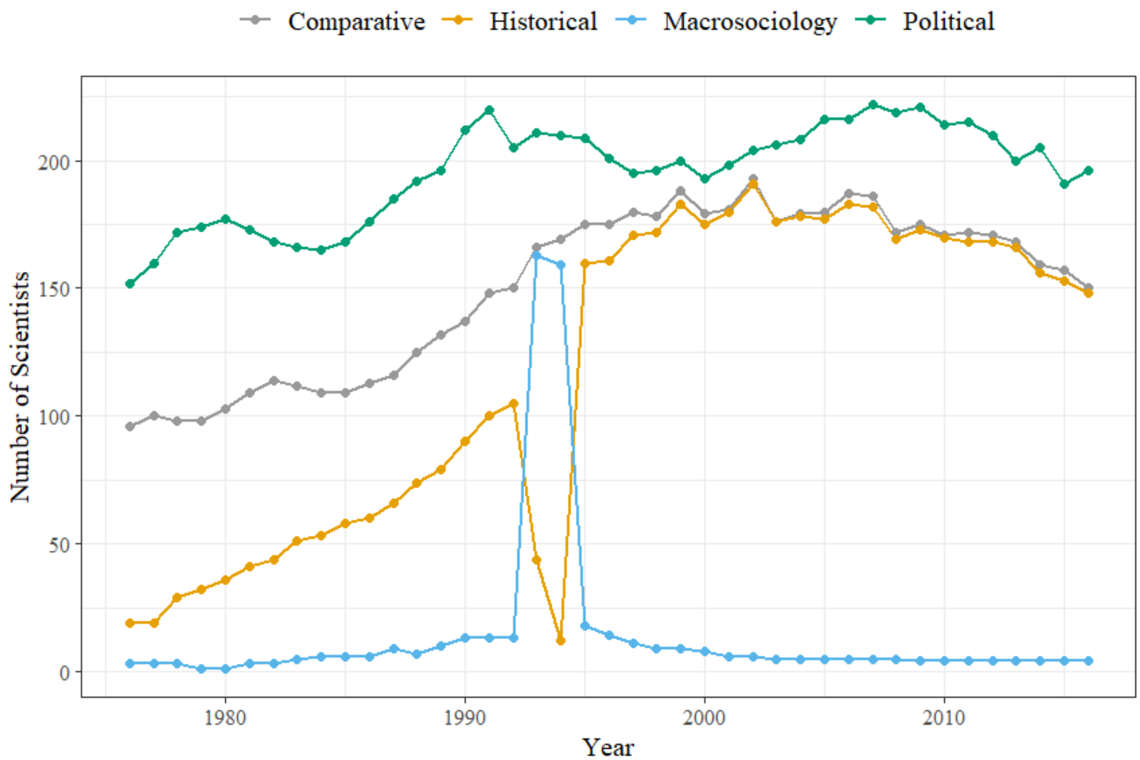

Figure 36 - Scientists Who Claimed the Comparative, Historical, Macrosociology, and Political Specializations, 1976-2016.

The ASA section Comparative-Historical Sociology was established in 1983. Political Sociology was established in 1985. Although they were quite far apart in the first half of the data, in the second half of the dataset, Comparative and Historical were very closely linked.

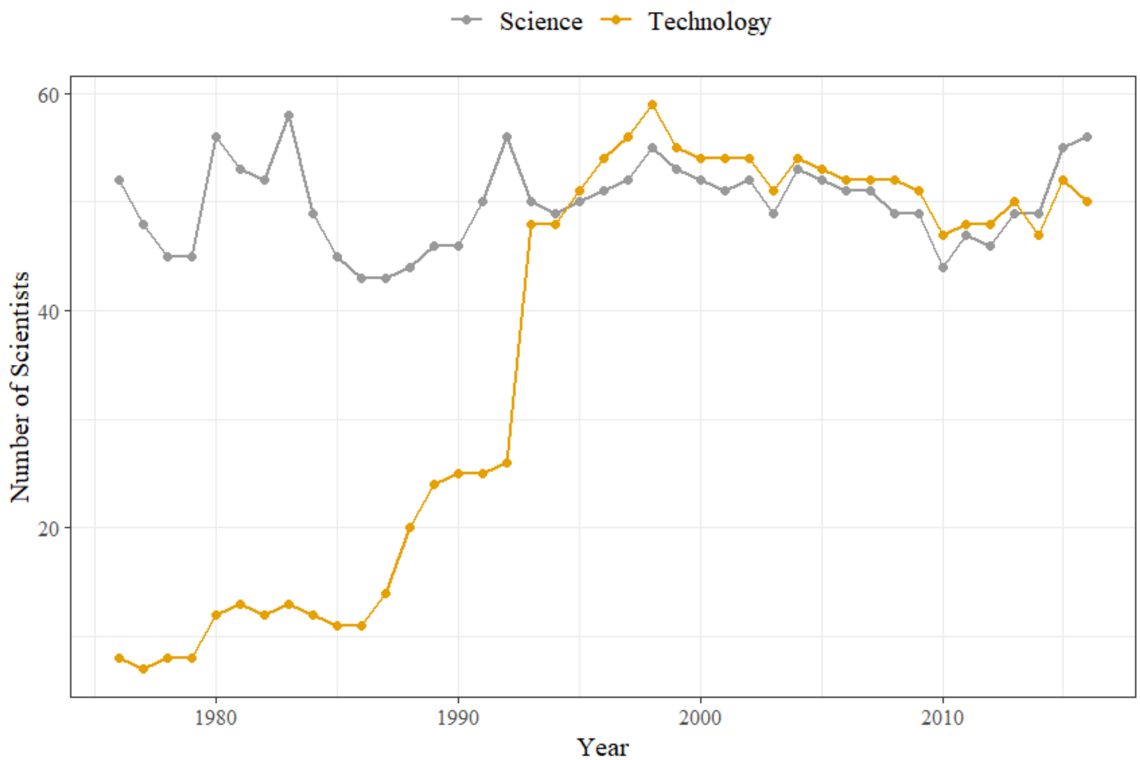

Figure 37 - Scientists Who Claimed the Science and Technology Specializations, 1976-2016.

The Science and Technology specializations were identified as Type 26. The ASA section Science, Knowledge, and Technology was established in 1990. Knowledge was one of the specializations in Type 12.

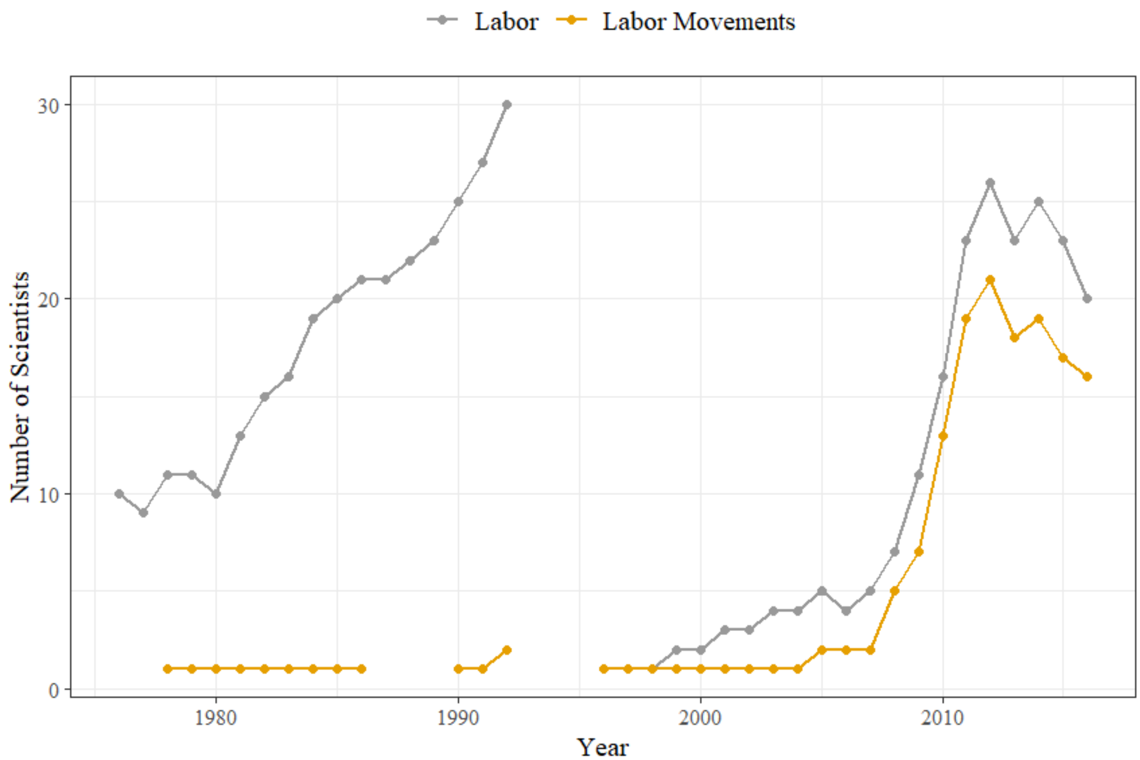

Figure 38 - Scientists Who Claimed the Labor and Labor Movement Specializations, 1976-2016.

The Labor and Labor Movements specializations were not identified as a relatively persistent type, but the ASA section Labor and Labor Movements was established in 2002. The two specializations appear to grow together during the last decade of the dataset.

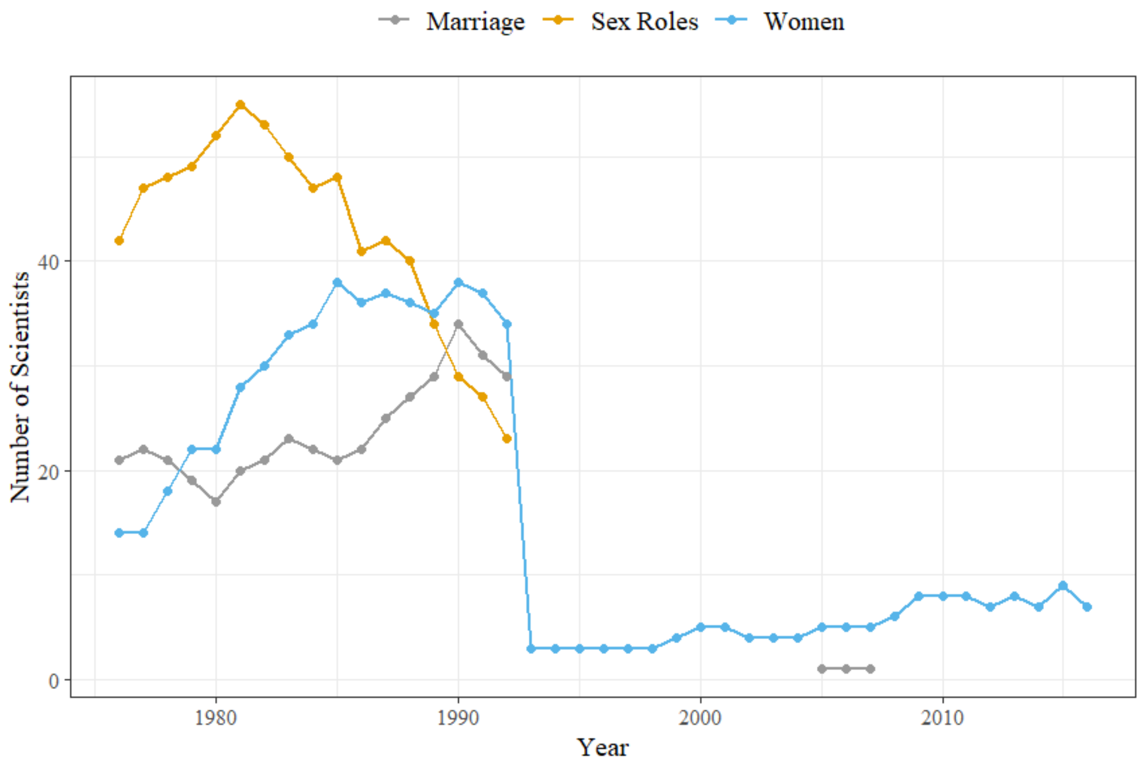

Figure 39 - Scientists Who Claimed the Marriage, Sex Roles, and Women Specializations, 1976-2016.

The Marriage, Sex Roles, and Women specializations were not identified as a type, and were also not typed with Sex or Gender. This is discussed more in the Results and Discussion sections.

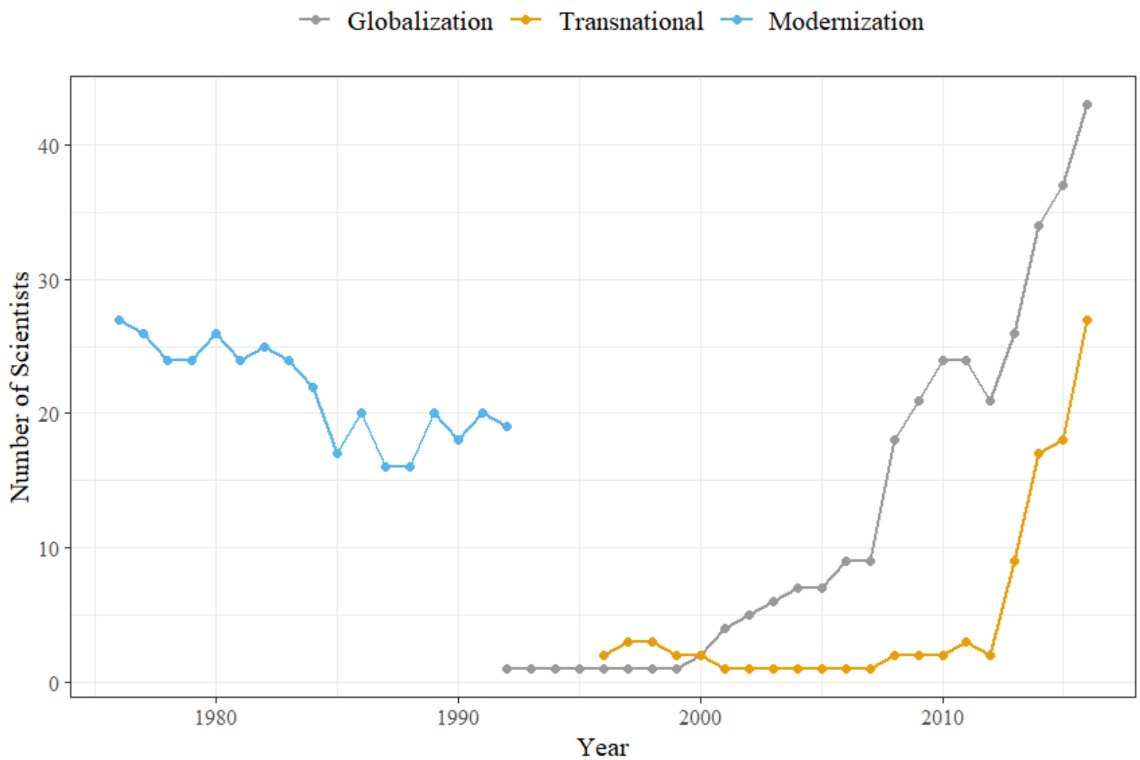

Figure 40 - Scientists Who Claimed the Globalization, Transnational, and Modernization Specializations, 1976-2016.

The Globalization, Transnational, and Modernization specializations were also not part of a type, in part because they only appear in either the first or the second half of the data. However, Globalization and Transnational grow very rapidly, and seem to share a similarly rapid growth during this period with the specializations Migration and Immigration, shown in Figure 27. Modernization appears to have fallen out of favor. The ASA section Global and Transnational Sociology was established in 2011.

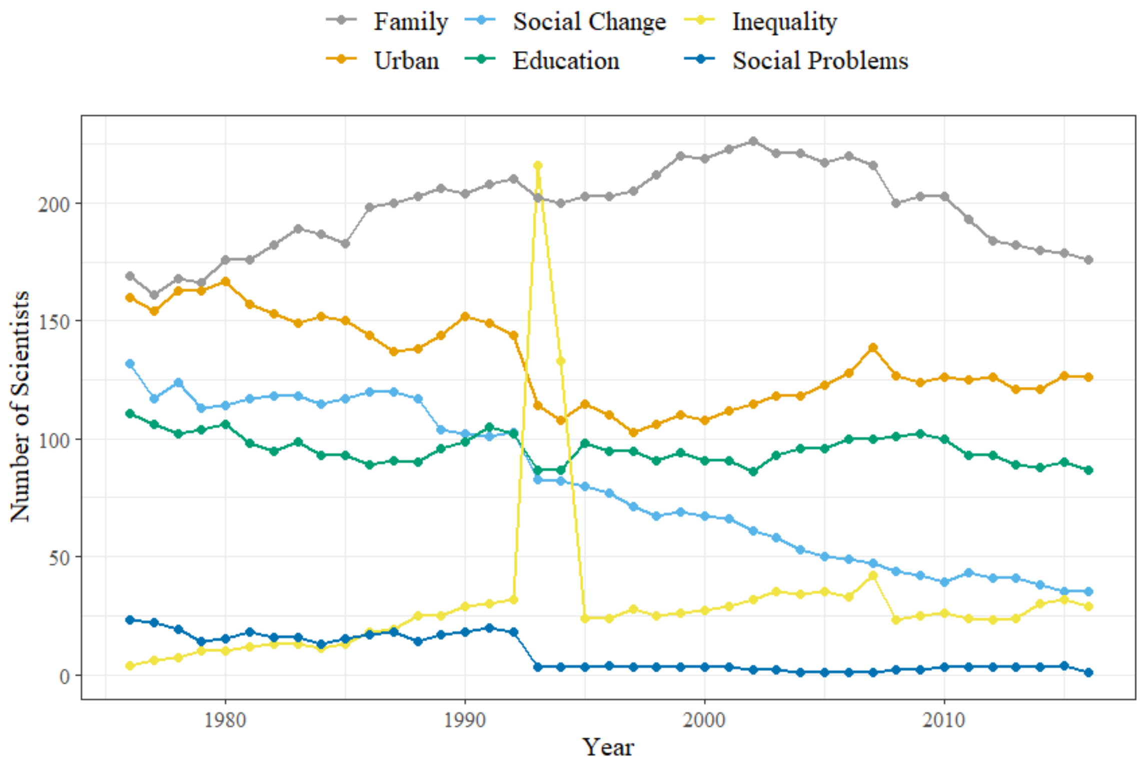

Figure 41- Scientists Who Claimed the Family, Urban, Social Change, Education, Inequality, and Social Problems Specializations, 1976-2016.

None of these specializations were persistently associated with other specializations. One reason may be that Family, Urban, and Education are all large and well-established specializations with their own ASA sections and related journals. The ASA sections Family and Education were both established in 1967. Community and Urban Sociology was established in 1973. Inequality, Poverty, and Mobility was established in 2011. The specialization Social Change appears to have been becoming steadily less popular throughout the time-window. In some sense, Social Change, Inequality, and Social Problems could be described as general topics studied in every sociological specialization.

APPENDIX E: GROWTH OF OFFICIAL ASA SECTIONS

Figure 42 shows the growth of official sections of the ASA over time. Orange lines show the time-window analyzed for this dissertation.

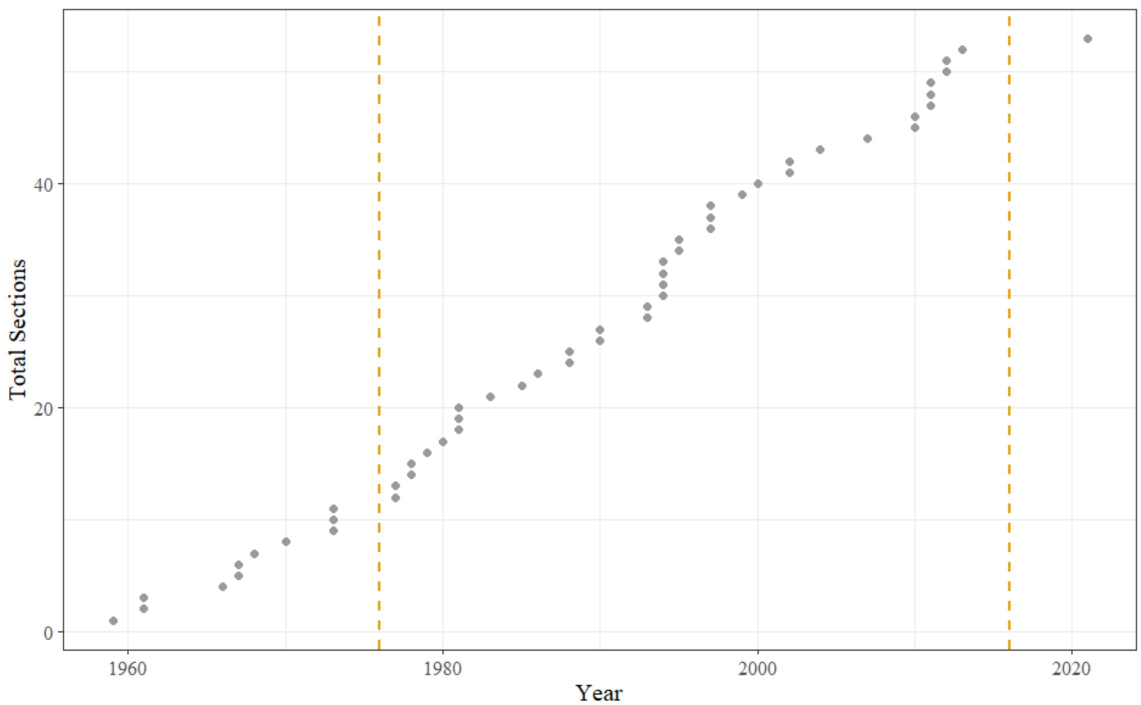

Figure 42 - Growth of Official ASA Sections, 1959 - 2021.

The ASA requires a minimum of 200 members in order to establish and maintain status as an official section. Table 13 lists the official ASA sections by starting date. Although some of the sections have changed their names, according to the ASA, sections almost never fail: "since the launch of modern Sections in 1958, only one Section has been discontinued: Visual Sociology attempted to form as a Section around 1980 but was unable to secure sufficient membership support to become a full Section of the Association" (ASA 2020g).

Table 14 - Official Sections of the American Sociological Association by Founding Date

Section Title	Founding Date
Medical Sociology	1959
Methodology	1961
Social Psychology	1961
Crime, Law and Deviance	1966
Family	1967
Sociology of Education	1967
Theory Section	1968
Organizations, Occupations, and Work	1970
Community and Urban Sociology	1973
Sociology of Sex and Gender	1973
Teaching and Learning in Sociology	1973
Environmental Sociology	1977
Marxist Sociology	1977
Peace, War, and Social Conflict	1978
Sociology of Population	1978
Sociological Practice and Public Sociology	1979
Aging and the Life Course	1980
Collective Behavior and Social Movements	1981
Political Economy of the World-System	1981
Racial and Ethnic Minorities	1981
Comparative-Historical Sociology	1983
Political Sociology	1985
Asia and Asian America	1986
Sociology of Culture	1988
Sociology of Emotions	1988
Communication and Information Technologies	1990
Science, Knowledge, and Technology	1990
Alcohol, Drugs, and Tobacco	1993
Sociology of Mental Health	1993
Children and Youth	1994
Latino/Latina Sociology	1994
Sociology of Law	1994
Sociology of Religion Section	1994
International Migration	1995
Section on Rationality and Society	1995
Mathematical Sociology	1997
Race, Gender, and Class	1997
Sociology of Sexualities	1997
History of Sociology	1999
Economic Sociology	2000
Animals and Society	2002
Labor and Labor Movements	2002
Ethnomethodology and Conversation Analysis	2004
Evolution, Biology, and Sociology	2007
Sociology of Human Rights	2010
Sociology of the Body and Embodiment	2010
Disability and Society	2011
Global and Transnational Sociology	2011
Inequality, Poverty, and Mobility	2011
Altruism, Morality, and Social Solidarity	2012

Sociology of Development	2012
Sociology of Consumers and Consumption	2013
Sociology of Indigenous Peoples and Native Nations	2021