Collaboration in Sociology and Other Scientific Disciplines: A Comparative Trend Analysis of Scholarship in the Social, Physical, and Mathematical Sciences

NICHOLAS BABCHUK, BRUCE KEITH, AND GEORGE PETERS

This inquiry examines comparative trends in collaboration among scholars, both over several decades and for several scientific disciplines. Findings suggest that in sociology specifically and science generally the trend is toward greater collaborative scholarship. At the turn of the twentieth century, better than 90 percent of the articles appearing in major periodicals in physics, biochemistry, biology, and chemistry were sole authored. Today, over 95 percent of such articles are collaboratively published. Disciplines affiliated with the social and mathematical sciences have experienced similar monotonic increases in collaborative activity, albeit, at a slower rate. A discussion of plausible explanations is offered for this observed growth in scientific collaboration.

Introduction

Scientific activity is communal in nature. Those embarking on a scientific career, irrespective of discipline, quickly learn that their work is largely predicated on the efforts of forebearers. In this regard, past is prologue. While individual effort and insight remain inviolate and integral to the scientific enterprise, increasingly most research involves collaborative endeavors. This tendency toward a joint, team effort has become pronounced during the present century, especially in the physical and biological sciences.

Many scholars of science have dealt heuristically with the significance of cooperative research and publication (e.g., Zuckerman, 1967; Crane, 1969; Lohdal and Gordon, 1972; Knorr-Cetina, 1981). While results of these studies reveal that

Nicholas Babchuk was professor emeritus at the University of Nebraska until his death in 1999. Bruce Keith is associate professor of sociology and assistant dean for academic assessment at the United States Military Academy—West Point. George Peters was professor of sociology at Kansas State University until his death in 1995.

Address correspondence to: Dr. Bruce Keith, O/Dean (MADN-AAD), United States Military Academy, West Point, NY 10996-5000; E-mail: zb9599@exmail.usma.edu.

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cooperative research has become especially apparent in the physical and biological sciences (Zuckerman, 1967), relatively little is known about trends in scientific collaboration in sociology or other social science disciplines. Although sociology and other social science disciplines share a long history of ethnographic research that may work against collaborative activity (see, e.g., Redfield, 1941; Whyte, 1943; Liebow, 1967), there is a growing tendency for scholars in these fields, particularly sociology, to work cooperatively in the search for systematic knowledge (Goode and Hatt, 1952) and causal explanations of social phenomena (Kerlinger, 1979). Moreover, improvements in the sophistication and complexity of methodologies (see, e.g., Kish, 1965; Duncan, 1975; Bollen, 1989) have led to refinements in the theoretical foundations of academic disciplines through a cyclical process of both induction and deduction (Wallace, 1971), an emphasis on falsification over verification (Popper, 1965), and the use of multi-trait, multi-method strategies for assessments of reliability and validity (Zeller and Carmines, 1980). Nonetheless, inquiries to date have not, systematically explored, either for purposes of description or explanation, the extent to which cooperation in collaborative research and publication is becoming more common in sociology or other scientific disciplines.

Toward this end, our article examines trends in the level and type of collaborative activity over time to determine the manner in which collaboration is changing temporally both within and among scientific disciplines. For the first time, comparative trend data, of a longitudinal nature, are presented for sociology and other disciplines located in the social, physical, and mathematical sciences. Moreover, and to the extent possible, competing perspectives on collaboration are examined to account for the observed disciplinary differences in this type of activity.

Data and Method

Data

Information was gathered on the content and pattern of scholarly articles published in prominent journals in nine disciplines. Those affiliated with the social sciences include sociology, psychology, political science, and anthropology. Physics, chemistry, biology, and biochemistry represent the physical and biological sciences. Also included in this analysis is the discipline of mathematics. Data for sociology come from the *American Sociological Review*, the *American Journal of Sociology*, and *Social Forces*, while psychology is represented by the *Psychological Review*, political science by the *American Political Science Review*, and anthropology by the *American Anthropologist*. The discipline of mathematics is represented by two journals, namely *The American Journal of Mathematics* and the *Journal of Mathematical Analysis and Applications*. Journals associated with disciplines in the physical and biological sciences include the *Physical Review*, *Journal of the American Chemical Society*, *Journal of Biological Chemistry*, and the *Biological Bulletin*. These journals were chosen because they are generalist periodicals representing, within their respective disciplines, that which is current and among the best work published in the field. In total, 44,560 articles were examined. For purposes of this inquiry, articles and research notes were counted...