Check for updates

Invited Article

Social Work and Science

Research on Social Work Practice
2016, Vol. 26(2) 219-224
© The Author(s) 2015
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1049731515570138
rsw.sagepub.com
SAGE

Sarah Gehlert[1]

Abstract

Interest has grown in the past few years about the place of social work in science. Questions remain, such as whether social work should be considered a science, and if so, where it fits into the constellation of sciences. This article attempts to shed light on these questions. After briefly considering past and present constructions of science and reflecting on views of science within the social work profession over time, we present an argument for how social work contributes to predominant questions facing science today through its unique ability to draw together and integrate knowledge from a variety of disciplines. Finally, we address how the profession can best prepare the coming generation of social workers to operate to their full potential in the current transdisciplinary world of science.

Keywords

science, transdisciplinarity, social work profession

Interest has grown in the past few years about the place of social work in science (Brekke, 2012, 2013). Questions persist, such as whether social work should be considered a science, and if so, exactly where it fits into the broader constellation of sciences. This article attempts to shed light on these questions by exploring some past and current constructions of science, examining views of science within the profession of social work through time, and arguing for how social work might contribute to addressing the predominant questions facing science today.

The Term "Science"

In her history of science, Fara (2009) writes that the term "science" was first used in 1833 as an umbrella to capture the diverse interests of attendees at the annual meeting of the British Association for the Advancement of Science, with a goal of generating lobbying power to foster the financing of research projects. The term became one means of obtaining prestige or "the authority to declare that their laboratories were incontrovertibly right, that the knowledge they produced in their laboratories was irrefutably correct" (Fara 2009, p. 230).

Yet, the power that comes from science can be used for social good . . . Bertrand Russell (1955, p. 12) wrote that "science gives power" and the power that it gives can be used to increase human welfare or to advance entities that compete with human welfare. In describing the potential benefits of the power of science, Russell (1955, p. 14) wrote about the need to bring science to governments, "because the authorities are ignorant and not because they are dishonest," and he expressed his belief that science had the potential "a liberator of bondage to physical nature and in time to come, a liberator from the weight of destructive passions" (p. 17).

Ways of Categorizing Science

Views of what constitutes the basic categories of science have also changed over time. Read (1955, p. 154) addressed the arbitrariness of scientific categories, saying that "nature has an essential unity; so that the various branches of science are interdependent and possessed of no rigid boundaries." Arguably, this lack of natural boundaries within the boundaries of science renders its categories vulnerable to political or ulterior motives as is their hierarchy.

Although there is agreement that the natural sciences can be divided into the physical and biological sciences, views of other categories of science are more divergent. Although almost everyone accepts social science as a category, there is little agreement about its subcategories and differing views on whether and how it should be distinguished from behavioral science. This may be due to the general amorphousness of the concepts involved (e.g., social support, aggression, and discrimination), which are less readily measureable than those of the natural sciences. Robert Chambers (Porter, 1986, p. 57), a philosopher of science who lived in the early half of the 1800s, is quoted as saying "man is seen to be an enigma only as an individual, in mass, he is a mathematical problem." This increasing complexity contributes to the general lack of consensus about how the sciences should be categorized.

[1] The George Warren Brown School of Social Work, Washington University, St. Louis, MO, USA

Corresponding Author:
Sarah Gehlert, PhD, The George Warren Brown School of Social Work, Washington University, Box 1196, One Brookings Drive, St. Louis, MO 63130, USA.
Email: sgehlert@wustl.edu

Even less agreement exists about how to distinguish science from technology or about the legitimacy of disciplines that apply knowledge from the natural and social sciences to address real-world problems. Often referred to as applied sciences, these entities have yet to be clearly defined. They may include engineering, statistics, epidemiology, or medicine. Medicine and nursing may also be called clinical sciences.

Cross-Disciplinary Collaborations

Nicolescu (2013) writes that while there were only seven disciplines when the first universities were founded in the 13th century, there are now thousands. The number of disciplines has increased with increases in knowledge. The formation of these new disciplines raises questions about integration and collaboration.

The growing awareness that forces inherent in human problems interact in complex ways has made clear the need for new modes of collaboration that optimize the input of scientists from different disciplines and enhance their ability to work together. In essence, it has focused attention away from how disciplines should be divided, instead fostering conversations on how they might work together to encourage scientific innovation. In arguing for disciplinary collaboration, the Committee on Facilitating Interdisciplinary Research of the National Academies noted in 2005 (pp. 32–33) that "how human societies evolve, make decisions, interact, and solve problems are all matters that call for diverse insights. Very fundamental questions are inherently complex."

Scientists have begun to work on cross-disciplinary teams to address the multi-level determinants of complex problems such as community violence, cancer, or addiction. Warnecke et al. (2008) published a multi-level model of health disparities that recognizes determinants at six basic levels that range from cells to society, namely, biological/genetic pathways, individual risk factors, social relationships, neighborhoods, institutions, and social norms and policies, and their interactions. Gehlert (2014) refined the model to acknowledge that these determinants interact differentially across racial/ethnic backgrounds and stages of the life cycle.

No one science or scientist can take into account all of the determinants of a complex human problem. The mathematical problem represented by humans as social beings that Chambers described in the 1800s requires teams of scientists to capture and address the multi-level determinants of complex human problems. The advantage of working on cross-disciplinary teams is that it allows investigators to address these problems holistically by including social, behavioral, and biological scientists on teams with policy makers and practitioners. Each provides a piece of the puzzle. Thus, it sets the stage for the development of implementable evidence-based approaches aimed at multiple levels of influence to solve complex problems.

Cross-disciplinary collaborations among scientists are divided into three basic types that differ in the extent to which the scientists involved operate outside the boundaries of their individual disciplines. Differences occur in the extent to which disciplinary scientists share the language of their disciplines, pool separate disciplinary bodies of knowledge and theory, and jointly develop new methods of analysis. In multidisciplinary research, investigators come together to solve a research problem, but approach it through separate disciplinary lenses. They leave the collaboration with no discernible change in their approaches to science. As an example, they might come together at the beginning of a research project with separate but related research questions, collect and analyze data independently, form independent conclusions based upon their separate research questions, and then come together at the end of the project to try to make sense of it all. This can be likened to fitting square pegs into round holes. Scientists working interdisciplinarily transfer disciplinary knowledge to one another for the purposes of research and may to some extent share research questions, yet disciplinary boundaries go back up when an answer has been found that serves the needs of the root disciplines. Interdisciplinary collaborations have, however, forged new disciplines such as neuropsychology or urban anthropology that endure through time.

Transdisciplinarity, which Rosenfield (1992) defines as research in which exchanging information, altering discipline-specific approaches, sharing resources, and integrating disciplines, achieves a common scientific goal and the highest degree of scientific collaboration. Disciplinary scientists transcend and operate outside their own boundaries and cultures to achieve synergy, mutually inform one another's work, and create new intellectual spaces in which no one discipline dominates and no way of knowing is privileged over others. Together, they are able to capture complexity.

Scientific disciplines can be mapped across the tiers of multi-level frameworks like those of Warnecke et al. (2008) and Gehlert (2014). Epigenetics, for example, would be located primarily at the Biological/Genetic Pathways tier, health psychology at the Individual Risk Factors tier, and systems dynamics at the Social Conditions and Policies tier. Although disciplinary scientists may be experts at one level, no one discipline can address all of the levels with equal ability. This further argues for the importance of working on transdisciplinary teams of scientists.

Transdisciplinarity also might occur across the more horizontal continuum, from the process of scientific discovery to the diffusion and implementation of research findings to the application of those findings to address real-world problems. Transdisciplinary functioning is important here, too, based on the argument that if those who focus on scientific discovery communicate with practitioners working in the settings in which their discoveries will be applied, it will help to focus their work. Likewise, practitioners who understand the science behind what they are applying will be better able to explain why they are doing, what they are doing.

Views of Science Within Social Work

Social work leaders have held conflicting opinions since the beginning of the last century about how the profession should

define and position itself with regard to the sciences. In an early example of this debate, Graham Taylor and Sophonisba Breckinridge and Edith Abbott disagreed publicly about where and how social workers should be educated and indeed whether they should be trained rather than educated (Abbott, 1915; Costin, 2003; Wade, 1964). Breckenridge and Abbott, influenced to some extent by the writings of Flexner (1910) that positioned social work outside the mainstream of professions like medicine, championed the education of social workers in academic institutions. The two women, both of whom held advanced degrees (Breckenridge, a doctorate in Political Science, and Abbott, a doctorate in Economics) at a time when few women did, wanted students to be exposed to the rigorous methods and scientific coursework at the University of Chicago. Graham Taylor, however, worried that theory and principles would crowd out practical ideas and jeopardize the essential spirit of the social work profession. He favored training such as that offered by the Chicago School of Civics and Philanthropy between 1903 and 1920 over that which would be afforded by a merger with the University of Chicago. Needless to say, Breckenridge and Abbott won the argument.

Yet the debate persists, albeit less intensely. Eighty years after the debate between Abbott and Breckinridge and Taylor, Davis (1985) argued that doing academic research put social work in a male voice while clinical social work practice spoke in a female voice that was truer to the profession. In a letter in response to Davis, Proctor (1985) outlined the limitations of this way of thinking, pointing out that research, which is genderless, serves the purposes of human welfare. Even today, Brekke (2013) notes that the National Association of Social Worker (NASW) Code of Ethics (NASW, 2008) mentions research only one time, and never mentions science, in contrast to language about science in the codes of other professional organizations such as the American Psychological Association or the American Psychiatric Association. This suggests a less than total acceptance of social work as science.

In their recent historical analysis of evidence-based practice in social work, Okpych and Yu (2014) write about efforts since the 1970s to move the profession from an authority-based paradigm to one that is evidence based and aimed at creating ''a service profession grounded in empirical research'' (p. 3). Similar movements have occurred in other professions, all influenced by the evidence-based movement in medicine. Although the evidence-based practice movement values research as a means of validating the effectiveness of social work practice, it fails to address the question of whether social work should be a science.

Social Work as Science

There seems to be general agreement that social work should rely on science in the form of empirical research. Exhortations have been heard since the early 1900s for social work to rely more on the scientific method to be more systematic and to generate knowledge on social conditions (Abbott, 1915; Cabot, 1911), and according to Okpych and Yu (2014), empirical clinical practice and then evidence-based practice have been the profession's prevailing paradigms since the 1970s. Yet, these themes speak more to social work's use of science than about its identity as a science.

A last way of vetting the value of social work as a science might be whether it is able to generate a unique body of knowledge. In order for social work to be considered a science, must it be able to generate this knowledge or is it sufficient for social work to implement knowledge generated by other disciplines or professions with the almost infinite variety of individuals and groups with which it works? There is less general momentum within the profession for social work to be a science than for its practice to become evidence-based and contribute to the generation of solutions to the complex problems experienced by individuals and groups. Shaw (2014) suggests that the two might actually be in conflict with one another. In responding to Brekke's argument for a science of social work, he writes that bringing ''science to bear on social work . . . sustains the linear, from above downward relationship between research and practice that so bedevils the evidence-based practice movement'' (Shaw, 2014, p. 3). He concludes that ''the quest for a science of social work seems to me far less imaginative or far-reaching'' (p. 3). Social work clearly is a profession and has become an academic discipline. But, is being an academic discipline the same as being a scientific discipline?

In arguing for a science of social work, Brekke (2013, p. 462) states that social workers '' . . . will be forced to define our uniqueness in terms of knowledge, and that will build our identity and status in the context of other social sciences.'' I would argue that social work has yet to optimize its unique ability to contextualize complex human problems and to draw from a wide range of disciplines and disciplinary theories to address them and that this will do as much to elevate the position of the profession as labeling it a science.

Social Work in a Transdisciplinarity World

Three attributes of social work position it particularly well to contribute to multi-level research and to transdisciplinary team science. The first is its deep understanding of social determinants of human problems. The importance of considering the social determinants of problems has received wide-spread attention since the publication of the first edition of Marmot and Wilkinson's (1999) *Social Determinants of Health*. Yet, it has been a major concern within social work since the beginning of the last century. Ida Cannon wrote in 1923 that psychosocial information should be used to ''remove those obstacles, either in his surroundings or in his mental attitude, that interfere with successful treatment'' (Cannon, 1923, p. 14). Thirty years later, Perlman (1957) urged social workers to consider the person, problem, place, and process in casework, drawing attention to the social context in which problems occur.

Considering social factors changes the face of problems, increasing the effectiveness of interventions designed to address them. If one considers age-adjusted mortality rates in the United States in terms of gender and race/ethnicity alone,

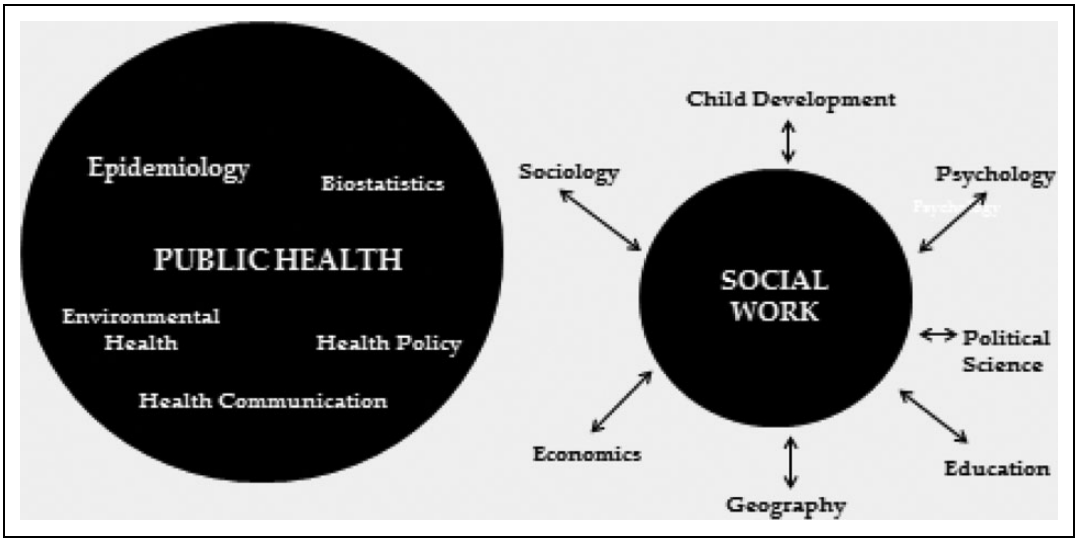

Figure 1. Scheme showing public health as made up of a number of disciplines, compared to social work as a single profession that draws knowledge and theory from a variety of disciplines.

African American males have the highest rates, followed by White males and Hispanic males (Center for Disease Control and Prevention [CDC], 2013). When education is added to the model, that is, when data are sorted according by years of education, a different picture emerges. White females in the lowest quartile of education made the fewest gains in life expectancy at age 25 between 1990 and 2000, followed by non-Hispanic White females (Meara, Richards, & Cutler, 2008). When considering gender, race/ethnicity, and years of education (<12, 12, 13–16, and >16), Ohlshansky and colleagues (2012) found that White males and females had made the highest gains in life expectancy with additional years of education, compared to Black males and females and Hispanic males and females. In other words, the benefits of more years of education for life expectancy were higher for White males and females than for other groups.

This biopsychosocial perspective bolsters social workers' potential contribution to teams by allowing them to provide expertise on social factors while actively participating in conversations about how these factors influence and are influenced by biological and genetic pathways and individual risk factors. This ability to take a bigger picture of phenomena, coupled with social workers' knowledge of group dynamics, positions them well to contribute to the functioning of transdisciplinary teams.

The second way that social work contributes to transdisciplinary science is the discipline's natural ability to draw together and integrate knowledge from a variety of other disciplines. Brekke (2013) has characterized public health and social work as integrative scientific disciplines, yet, the nature of their integration differs appreciably. Unlike public health, which is made up of a group of disciplines such as epidemiology, health communication, health policy, environmental health, and biostatistics, social work is identified as a unique discipline (see Figure 1). Although a single profession, social work has been very successful over time in its ability to draw knowledge and theory from a variety of outside disciplines, including psychology, sociology, economics, geography, education, and political science, in the pursuit of solving human problems.

Finally, social work contributes through its long-standing engagement with communities. Through partnerships with communities in need, social workers can help to develop and test interventions with populations and implement evidence-based interventions in new settings. They accomplish these objectives in part using the principles of community-based participatory research and knowledge of organizational dynamics, with multi-level interventions in mind.

Conclusion

Whether social work is a science will no doubt be argued for some time, in part because determining whether disciplines are or are not sciences is somewhat arbitrary. Yet, although there is no clear answer to whether social work is a science, there is little doubt that social work is a profession that uses science well. I would argue, too, that science is central to social work and that social work has the potential to become more central to science. VanLandingham (2014, p. 124) wrote that "if a potential collaborator is reasonably knowledgeable about other fields of science, he will be in a much stronger position to facilitate synergy than a self-proclaimed 'hard scientist,' who will more likely be a 'red herring' on an interdisciplinary team."

The challenge is how to prepare the coming generation of social workers to operate to their full potential on transdisciplinary teams. At present, social workers are not effective members of transdisciplinary teams, for two basic reasons. First, although they are adept at understanding multi-level conceptualizations of complex human problems, they too often are unable to articulate their unique contributions to teams. This is in part due to social work's broad scope practice as opposed to

being identified with a few circumscribed or easily identifiable skills (Gehlert, 2012; Lister, 1980). It also may be due to social workers' tendency to be unassuming rather than directive on teams, while assertive in pursuing services for those in need. Second, social workers are not conversant with the language and culture of science. This negatively affects their ability to operate on research teams and obtain research funding in the current funding environment.

Transdisciplinarity is not intuitive but must be learned. Yet, despite years of encouragement, universities have done little to systematically implement transdisciplinary education (Committee on Facilitating Interdisciplinary Research, 2005; Gehlert, 2012). Adding transdisciplinary content to existing research courses might entail emphasizing multi-level modeling and methods of team functioning, such as effective decision making and conflict resolution (Gehlert & Browne, 2013). For social workers to function optimally on transdisciplinary teams, or indeed to function in any cross-disciplinary environment, they must (1) learn to articulate what they do and convey the value of social work research and practice, (2) frame social work from the perspectives of other disciplines, such as economics and medicine, and learn to speak their languages, (3) find ways to partner with other disciplines, and, (4) develop cross-institutional collaborations. The payoffs are many. For example, after an initial 2-year lag, publications from the Transdisciplinary Tobacco Use Research Centers initiative soared above related single-site centers in subsequent years of funding (Hall et al., 2012). This is because transdisciplinary investigators often use writing teams to allow the results of their joint work to be disseminated in a variety of journals. Successful team science results in the generation of research questions that could not have been generated in any one discipline, the creation of new methods and analyses for answering these research questions, and the development of new approaches to intervening than would otherwise have been generated.

Definitions of science are arbitrary, and criteria for being a science have shifted over time. Whether or not social work is defined as a science, it has much to offer science, including the ability to contextualize complex human problems and to draw from a wide range of disciplines and disciplinary theories to address them. Better positioning social workers to operate on transdisciplinary teams can only elevate the discipline's position within the nexus of science. Therefore, expending resources to educate social workers about how to function on transdisciplinary teams seems an important means of maximizing the discipline's profile and bringing additional opportunities for social work in science.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

References

Abbott, E. (1915). Field-work and the training of the social worker. *Proceedings of the National Conference on Social Welfare*, Baltimore, MD, May 12-19, 1915.

Brekke, J. S. (2011, January 14). *It's not about fish and bicycles: We need a science of social work*. Paper presented at the meeting of the Society for Social Work and Research, Tampa, FL.

Brekke, J. S. (2012). Shaping a science of social work. *Research on Social Work Practice*, *22*, 455–464.

Brekke, J. S. (2013). A science of social work, and social work as an integrative scientific discipline: Have we gone too far, or not far enough? *Research on Social Work Practice*. Advance online publication. doi:10.1177/1049731513511994

Cabot, R. C. (1911). Social service work in hospitals. *Chicago Medical Recorder*, *33*, 307–321.

Cannon, I. M. (1923). *Social work in hospitals: Contribution to progressive medicine* (2nd ed.). New York, NY: Russell Sage Foundation.

Center for Disease Control and Prevention. (March 2013). *Death in the United States, 2011*. National Center for Health Statistics, Data Brief Number 115. Retrieved from http://www.cdc.gov/nchs/products/databriefs.htm

Committee on Facilitating Interdisciplinary Research, Committee on Science, Engineering and Public Policy, National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine. (2005). *Facilitating interdisciplinary research*. Washington, DC: National Academies Press.

Costin, L. B. (2003). *Two sisters of justice: A biography of Grace and Edith Abbott*. Urbana-Champaign: University of Illinois Press.

Davis, L. V. (1985). Male and female voices in social work. *Social Work*, *30*, 106–113.

Fara, P. (2009). *Science: A four thousand year history*. New York, NY: Oxford University Press.

Flexner, A. (1910). *Medical education in the United States and Canada: A report to the Carnegie Foundation on the advancement of teaching*. New York, NY: The Carnegie Foundation for the Advancement of Teaching.

Gehlert, S. (2012). Shaping education and training to advance transdisciplinary health research. *Transdisciplinary Journal of Engineering & Science*, *3*, 1–10.

Gehlert, S. (2014). Forging an integrated agenda for primary cancer prevention during midlife. *American Journal of Preventive Medicine*, *46*, S104–S109.

Gehlert, S., & Browne, T. (2013). Transdisciplinary training and education. In D. Haire-Joshu & T. McBride (Eds.), *Transdisciplinary public health: Research, education, and practice* (pp. 31–52). San Francisco, CA: Jossey-Bass.

Hall, K., Stokols, D., Stipelman, B., Vogel, A., Feng, A., Masimore, B., . . . Berrigan, D. (2012). Assessing the value of team science: A study comparing center- and investigator-initiated grants. *American Journal of Preventive Medicine*, *42*, 200–201.

Lister, L. (1980). Role expectations of social workers and other health professionals. *Health & Social Work*, *5*, 41–49.

Marmot, M., & Wilkinson, R. (1999). *Social determinants of health*. Oxford, England: Oxford University Press.

Meara, E., Richards, S., & Cutler, D. (2008). The gap gets bigger: Changes in mortality and life expectancy, by education, 1981-2000. *Health Affairs*, *27*, 350–360.

National Association of Social Workers. (2008). Code of Ethics of the National *Association of Social Workers.* Washington, DC: Author.

Nicolescu, , B. (2013). The need for transdisciplinary higher education in a globalized world. In B. Nicolescu & A. Ertas (Eds.), *Transdisciplinary theory and practice* (pp. 27–56). College Station, TX: The ATLAS Publishing,

Ohlshansky, S. J., Antonucci, T., Berkman, L., Binstock, R., Boersch-Supan, A., Caccioppo, J., . . . Rowe, J. (2012). Differences in life expectancy due to race and educational differences are widening, and many may not catch up. *Health Affairs*, *31*, 1803–1813.

Okpych, N., & Yu, J. (2014). A historical analysis of evidence-based practice in social work: The unfinished journey toward an empirically-grounded profession. *Social Service Review*, *88*, 3–58.

Perlman, H. (1957). *Social casework: A problem-solving process*. Chicago, IL: The University of Chicago Press.

Porter, T. (1986). *The rise of statistical thinking, 1820-1900*. Princeton, NJ: Princeton University Press.

Proctor, E. (1985). Gender, practice, and research. *Social Work*, *30*, 453–454.

Read, J. (1955). Chemistry. In J. R. Newman (Ed.), *What is science?* (pp. 154–194). New York, NY: Simon and Schuster.

Rosenfield, P. (1992). The potential of transdisciplinary research for sustaining and extending linkages between the health and social sciences. *Social Science & Medicine*, *35*, 1343–1357.

Russell, B. (1955). Science and human life. In J. R. Newman (Ed.), *What is science?* (pp. 6–23). New York, NY: Simon and Schuster.

Shaw, I. (2014). A science of social work? Response to John Brekke. *Research on Social Work Practice*. Advance online publication. doi:10.1177/1049731514543408.

VanLandingham, M. (2014). On the hard and soft sciences in public health. *Public Health Reports*, *129*, 124–129.

Wade, L. (1964). *Graham Taylor: Pioneer for social justice, 1851–1938*. Chicago, IL: University of Chicago Press.

Warnecke, R., Oh, A., Breen, N., Gehlert, S., Paskett, E., Tucker, K., . . . Hiatt, R. (2008). Approaching health disparities from a population perspective: The NIH centers for population health and health disparities. *American Journal of Public Health*, *98*, 1608–1615.