

Social Research in an Integrated Science of Nutrition: Future Directions

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ABSTRACT

This paper is one in a series from the American Society of Nutritional Sciences Long Range Planning Committee, in which we are attempting to map out the implications of future directions in nutritional sciences for ASNS. Here, we address the area of social nutrition research and identify a series of orientations that are now emerging and likely to shape future research in this area. As with other areas of nutrition, a key feature is the importance of an integrated approach, both across social science disciplines and between social and biological scientists.

KEY WORDS: *nutrition • social research • American Society for Nutritional Sciences • long range planning • scientific integration*

A decade ago Kazarinoff and Habicht published an opinion paper on "Future directions for the American Institute of Nutrition" ([1](#)) in which they presented a conceptual framework for nutritional sciences based on levels of organizational complexity from molecules through metabolism to populations. In their framework, these levels were related to broad classes, which they subsumed under three overlapping areas of "chemical," "biological" and "social" disciplines. In the interim, the field of nutritional sciences has progressed enormously. This progress has been particularly noteworthy in the molecular arena, where technical advances have opened previously unimagined possibilities for the field. These were outlined in an earlier paper authored by the ASNS Long Range Planning Committee ([2](#)). In the present statement, we also venture into future directions, looking specifically at one of these areas research that is concerned with the social determinants, social mechanisms and social consequences of food and nutrition at both population and individual levels. In this discussion "social" is used broadly to encompass a variety of social science perspectives and concepts (e.g., economics, anthropology, psychology, sociology, political science, demography and epidemiology). Our intent is not to review the types of research that fall into this general area, but to highlight emerging directions and explore their implications for ASNS.

Social research on food and nutrition issues is conducted by scientists from a wide variety of disciplines, ranging from anthropology, sociology and economics to nutrition, medicine, public health and epidemiology. Their research can be divided into two general types. On the one hand, there is a large and diverse body of research by social scientists, who study food as a vehicle for examining social processes. These scholars are often not occupied with the biological consequences of these processes, and usually do not relate to the professional nutrition community. Few, if any, are members of ASNS or other nutrition associations. On the other hand, there are scientists representing a diversity of disciplines, often members of ASNS, whose fundamental concern is nutrition and who apply social science methods and concepts to understand the processes that affect food intake and nutritional outcomes.

Investigators whose research is focused on social aspects of nutrition also vary in their level of concern about the applicability of their research results for short-term and/or long-term nutrition policy and programs. Although some scientists are fundamentally concerned with the description and explication of historical and contemporary conditions and processes, many direct their work to the study of nutrition interventions or intervention-related questions.

The need to incorporate social science approaches in nutrition is apparent when the limitations of an exclusive focus on biological approaches are examined. For example, despite great advances in our knowledge about the metabolic and molecular pathways that govern energy metabolism and food intake, the incidence of obesity continues to rise to epidemic proportions. Biological knowledge, alone, is inadequate to understand this phenomenon and its consequences. The fact that the prevalence of obesity has dramatically increased over a relatively short period of time, when our genetic background could not have significantly changed, suggests that although our genes may predict susceptibility, they cannot explain why so many more of us are obese now than in our parents' generation. Understanding both the causes and likely the solutions requires attention to the complex interactions between our genes and lifestyles, including changes in people's concepts of meal size and behavioral changes such as increases in the amount of food eaten outside of the home and decreases in physical exercise. A further level of complexity is added with the recognition that undernutrition exists side by side with obesity, in both developing and industrialized countries.

In this statement we take on the challenge of foretelling future directions of social research in nutrition. Rather than highlighting specific questions or issues that are likely to be important in the next decade (issues such as obesity, poverty and nutrition, food security in the age of terrorism, etc.), we have tried to identify emerging orientations that will influence social research across a range of specific topics.



Emerging orientations

1. Focus on mechanisms that link social determinants to nutrition outcomes.

To date, social research in nutrition has tended to focus on the relationship of nutritional status to distal determinants, such as level of maternal education, household income, gender or ethnicity. As a result the "pathways" or mechanisms through which these factors affect nutrition have largely remained black boxes. Just as in biology, where more effort is now being devoted to understanding signaling and feedback systems, we can expect to see an increasing effort to understand *how* social factors lead to particular nutrition outcomes. A consequence of the failure to explicate pathways is that it leads to an emphasis on distal factors as the entry points for policy intervention and to avoiding intervening on more proximal factors that may offer more immediate opportunities to improve nutritional outcomes. Similarly, the lack of attention in nutrition interventions to the intermediate steps that are involved in behavior change means that the capacity of investigators to offer sound advice for improving nutrition programs is diminished. Awareness of the need to understand intermediary mechanisms is increasing among social nutrition researchers, and we can expect to see changes in research designs and analytic strategies to enable the investigations of pathways.

Topical areas in which a focus on mechanisms is likely to lead to advances that will help in translating nutrition research to programs and policy include:

(a) Social factors in primary nutrition problems. This topic includes social research on obesity and the dietary patterns associated with chronic disease, as well as research on undernutrition, including growth faltering, low birthweight and nutrition of the elderly.

(b) Nutrition interventions. There are a range of issues in this category for which studies that explicate pathways can provide important insights for intervention planning and policy. These range from studies on how nutrition education and counseling affect food selection and preparation to tracing the effects of policies on food supply and food access.

(c) Nutritional consequences of social conditions and processes. We may expect to see research on the mechanisms through which the social processes of globalization, urbanization, impoverishment, the HIV pandemic and the changing roles and status of women influence nutrition, as well as the effects of large-scale policy shifts and programs to reduce poverty, increase women's education and social status and early childhood development and education programs.

2. Development of integrated models of social determinants of nutrition.

To date social nutrition investigations have tended to be limited to one social domain or one set of primary determinants. Because the definition of problems to investigate tends to be discipline-specific, studies are typically framed in terms of the central concepts of the disciplines in which investigators have been trained. The focus on a single domain, such as economic resources, cultural beliefs or psychological traits, has produced valuable insights and knowledge about social factors in nutrition. However, this approach has also limited understanding because human behavior and human societies do not follow disciplinary lines within the social sciences. For example, when investigators have examined cognitive-related variables (e.g., education and beliefs) and economic variables together, they find important interactions rather than simple linear relationships (3). Greater integration in the selection of determinants to investigate with more holistic models that cross-cut domains traditionally associated with specific disciplines are likely to become more common in the next decade. As investigators use analytic techniques that reveal the interactions among determinants, the necessity for measuring factors in different domains will become more apparent and the outcomes more predictive of complex behavior.

3. Increasing use of mixed-method approaches in social research in nutrition.

Much social research in nutrition employs a quantitative approach in which variables are treated numerically and analysis often includes statistical hypothesis testing. On the other hand, some investigators use nonquantitative methodologies to study their subject matter. Qualitative researchers conduct in-depth interviews, make observations and compile documents to obtain data. Analytic techniques may include coding of variables from these sources and presentation of the results in quantitative formats, but such quantitative treatment is not usual. Rather, the presentation of study results is usually in the form of case studies or comparisons across multiple cases. Often the outcomes of concern are described in terms of "patterns of food consumption" rather than indicators of nutritional status. Nonquantitative studies, which lack the support provided by statistical analysis, are often seen as less credible or "soft." The distinction between "hard" and "soft" social research is sometimes equated with a distinction between economic, sociological and demographic vs. cultural and psychological concerns. However, if one were to sort or categorize the large body of social research in nutrition on the basis of "quantitative" vs. "qualitative" methodological approaches, the resulting piles would cross-cut these domains. There is increasing recognition in social research disciplines of the value of "mixed methods." Different methods are appropriate at different stages in the research process and to address different questions. As the advantages of a mixed method approach become apparent to a larger number of social nutrition investigators, it is probable that studies that combine qualitative and quantitative data collection and analysis techniques will become the rule rather than the exception.

The application of mixed methods will also increase as the ability to acquire and analyze large amounts of quantitative data improves in parallel with electronic technologies. It is now possible to measure and record in an accessible database every step and movement made by an individual, as well as every word he or she speaks and hears. Text-mining protocols can be applied to these data sets to discern patterns of behavior and language. Although qualitative assessments of these

observations will obviously remain vital, quantitative mathematical analyses are likely to yield great insight and progress as the tools of large database bioinformatics are used to address such new forms of behavioral data.

4. Development of integrated models of biological and social interactions.

Although the dominant thrust of social research in nutrition has been to treat social factors as independent variables that lead to biological (nutritional) outcomes, there is a second line of research in which nutritional factors are treated conceptually as the independent variables and social (including psychological) characteristics are the outcomes of interest. Studies of the effects of malnutrition on psychological development and of iron deficiency on worker productivity are examples of this latter approach. A number of years ago, Allen (4) published a paper in which she outlined the importance of understanding the functional consequences of mild to moderate malnutrition, and in which she envisioned the possibility of research that would show feedbacks between nutrition and function, biological and social.

To date, much of the work that has been undertaken from an integrated biocultural or biosocial approach has examined multiple health indicators, which include nutrition but in which nutrition is not the primary focus (5). Studies such as Leatherman's research in the Andes of Peru have revealed the progressive sequential effects of nutrition, health and social/behavioral interactions, particularly in conditions of economic marginality (6). As the theoretical and analytic power of integrated models becomes more apparent to the social nutrition research community, we can expect to see an emergence of their application to contemporary nutrition issues, including, for example, examination of HIV infection, parental health, infant feeding and household food security, and to obesity, chronic disease and economic and social well-being.

Furthermore, the advances made within biological sciences have already had and will in the future make even greater impacts on social nutrition research. There are multiple ways in which this will occur. It has already become standard practice in epidemiological investigations to collect blood samples for determining the relationship between genotype and outcome variables. This molecular epidemiological approach will grow significantly as more polymorphisms are catalogued in nutritionally relevant genes and their roles in influencing nutrient requirements and disease susceptibility are discerned. Many attempts have already been made to determine genetic predictors of behavioral outcomes. These have met with mixed success, but there are clearly many instances where this will be very important, for example, in revealing polymorphisms in genes that relate to taste perceptions, which then influence food preferences and behaviors. These relationships are not likely to be simple, as illustrated by the demonstration in rats that the context in which an odor is first perceived has a significant impact on the neurological development of preference or aversion to the odorant (7). Thus, social influences overlay and interact with genetic background to determine behavioral and nutritional outcomes.

Understanding these complex areas will require the integrated efforts of investigators with a wide range of skills.

As the field of metabolomics develops, enormous quantities of data, as well as the ability to interpret them, will become available with increasingly small biological samples. Techniques will be developed to collect and store these samples in field settings. Obtaining blood samples may not be possible in many social nutrition investigations, but future advances may permit important measurements of an individual's metabolic profile using a more accessible compartment, for example, expired air. Overall, more biological data will be collected in socially relevant contexts, to the mutual benefit of biologists, social scientists and the field as a whole.

5. Focus on capacity to benefit from nutrition interventions.

The concept of "capacity to benefit" was introduced to the nutrition community more than a decade ago (8,9). This phrase refers to the fact that preexisting biological and social conditions structure the potential of individuals and communities to respond to interventions. However, this construct has been slow to affect social research on nutrition interventions. In the next decades we expect to see a move to research that is structured to identify the determinants of capacity to

benefit. Several factors are likely to drive this change. One of the most important spurs to the growth of this orientation will be changes in the basic science underpinnings of nutrition. Advances in genomics will lead to a need for innovative approaches to applying this new nutrition knowledge in society. This will occur at multiple levels—from clinical practice to public health policy. A fundamental consequence of understanding the significance of genetic factors in nutrition is that it will require attention to intrapopulation differences, and this, in turn, will lead to a focus on capacity to benefit biologically from nutritional interventions. Similarly, analysis will be directed to identify the social determinants of response across a spectrum of interventions, from behavioral interventions [including nutrition education and counseling activities, community-based activities (such as support groups), food supplementation programs, media campaigns and combined, multisector interventions] to biological interventions, ranging from micronutrient supplementation to food fortification.

An important consequence of an increased focus on capacity to benefit will be that program evaluation will become a more attractive focus for research because it will offer an opportunity to test hypotheses about how social processes affect population responses to nutrition and health interventions. For investigators who are motivated by applied concerns, an advantage of this orientation is that their results will have immediate programmatic relevance. This, in turn, may lead to a reduction in the antagonism that sometimes occurs between social investigators and those responsible for program implementation, who often see research as a distraction and a waste of scarce resources.

From the perspective of nutrition policy, an increased focus on capacity to benefit will lead to improvements in the interpretation of efficacy trials because effects will not be diluted by the influence of subjects who do not currently have the potential to benefit from the intervention as designed and delivered. There will also be more accurate interpretations of program evaluations and effectiveness studies because the new approach will permit more precise specification of beneficiaries of programs. As a result of these improvements in analysis and interpretation, nutrition researchers will be in a better position to provide stronger evidence-based information for nutrition policy and planning.

6. Studying the social process of nutrition policy formation.

Within the wide scope of research on food and nutrition, there has been a long-standing concern with food policy. This interest is so well developed that it has been institutionalized in university studies and in an international agency, the International Food Policy Research Institute (IFPRI). However, as the term food policy implies, there has been a strong emphasis on food production and availability, and less emphasis on nutrition in policy studies. At the same time, studies in the fields of political science and policy analysis and planning have produced strong evidence that moving from scientific results to programmatic action is a complex social process, which is governed by political, economic and psychological factors as well as by information. Currently, there is a small but growing interest in investigations of nutrition policy formation, including examination of the ways in which social processes shape outcomes. Because of its central importance to the goal of applying nutritional science research to improve public health and well-being, it is probable that this research focus will expand in the next decade and become an important feature of social research in nutrition.

7. Greater participation of nonacademic stakeholders in the research process.

Although most research in nutrition continues to be originated and conducted by nutritional scientists, social research, particularly research involving interventions, is increasingly becoming a subject of concern (positive and negative) for various sectors of the communities in which studies are conducted. In some situations the role of nonacademics is simply that of approving access to the communities in which research is to occur. However, in other situations community members are demanding a more active role. At the same time, the value of community participation in the research process, particularly when the goal is to use findings to design interventions, is becoming increasingly recognized by social researchers and by national and

international agencies. There is a growing literature on both the theory and practice of community involvement in the research process, which is often characterized as "participatory action research." It is probable that this orientation will become significantly more common in the next decade.



Implications of emerging orientations

The predictions made above concerning future directions for social nutrition research represent exciting opportunities for the discipline. However, actions are required to position us to take advantage of these opportunities. A principal requirement relates to training, which needs to occur at all levels of the discipline. Future research activities with the foci described above will often require multidisciplinary teams that encompass various social and biological science skills and knowledge. The achievement of effective working teams will require that team members have a much better understanding of the approaches, concepts and vocabulary of other disciplines than is now typically the case. Furthermore, within social nutrition, researchers who wish to adopt mixed-methods approaches will also need to acquire the necessary breadth of skills. These educational efforts will be assisted by the directions outlined in the recent report of the ASNS Graduate Nutrition Education Committee, which emphasized the teaching of nutrition as an integrated discipline (10).

However, ensuring that our new investigators have broad training is not sufficient. Established investigators must also be able to attain these skills. Thus, ASNS should sponsor multidisciplinary workshops that prepare investigators to work collaboratively in all phases of the research process from planning to application of results. Relevant RIS groups have a role to play here through the organizing of sessions at EB and FASEB summer conferences. For example, a conference on obesity could bring together a group of biological and social scientists in which participants are given the express charge of explaining their research approaches and techniques to investigators with different backgrounds.

There is also a great need for external advocacy on the importance and power of social approaches in nutrition research. Many of the directions outlined above require enhanced funding support to allow investigations of the appropriate scale and complexity. For example, studies that examine mechanisms linking distal social determinants with nutrition outcomes need sample sizes that are sufficiently large to permit the analysis of interactions, and this requires financial resources. Such studies should be of interest to funding agencies, such as NIH, but to engender this interest requires an advocacy and educational effort within those organizations. Individuals with the ability to appreciate and critically assess this type of research must be included on review panels. Similarly, the incorporation of a capacity to benefit component into intervention studies is likely to require an increase in study size and therefore cost. This will be possible only if reviewers understand the critical importance of this aspect of study design.

A second type of outreach would be to those investigators at the forefront of social science research who do not think of themselves as nutritionists, but whose research area encompasses nutrition. The nutrition discipline can be strengthened only by increased interaction with and involvement of these investigators. They can be invited to our meetings and we can also attend and present at theirs, to facilitate exchange of ideas and development of research approaches. Nutritional scientists often have a better understanding of how to integrate the various components of social research related to food and nutrition. Therefore, the onus for this outreach falls on us because we understand its value.

The Journal of Nutrition needs to serve as a primary forum for the publication of social nutrition research. The dissemination of this research needs to occur in the journals and meetings that reach the larger community of nutrition professionals. This larger community is much less likely

to find studies if they are published mainly in the various specialty journals of the disciplines in which many of the social nutrition investigators have been trained. Publication in *The Journal of Nutrition* will encourage the development of a cohesive, holistically oriented group of social nutrition scientists, as well as more basic scientists who have an appreciation of social science approaches.



FOOTNOTES



² The ASNS Long Range Planning Committee: Richard Allison, Dale Bauman, John Erdman, Mark Failla, Hedley Freake (Chair), Bruce German, Janet King, Sam Klein, John Milner, Gretel Peltó, Judith Storch and Steve Zeisel. [RFN1RFN1](#)
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