

Trends in Presentations of Environmental and Policy Studies Related to Physical Activity, Nutrition, and Obesity at Society of Behavioral Medicine, 1995–2010: a Commentary to Accompany the Active Living Research Supplement to *Annals of Behavioral Medicine*

James F. Sallis, Ph.D. • Jordan A. Carlson, M.A. •
Alexandra M. Mignano, B.A. • Amanda Lemes, M.P.H. •
Nicole Wagner, Ph.D., M.P.H.

Published online: 3 October 2012
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Active Living Research was funded by The Robert Wood Johnson Foundation in 2001 with a primary mission of building evidence on the role of environmental and policy factors in shaping physical activity, with the goal of contributing to new approaches to promoting physical activity that would have broad reach and sustainable effects [1]. The assumption was that little research was being done at that time on environmental and policy factors, because physical activity research was based on theories and models that emphasized psychological and social influences on behavior [e.g., 2–4], leading to interventions largely targeted to individuals and small groups. Active Living Research was explicitly based on ecological models that embody the concept of multiple levels of influence on behaviors, including built environments and policies. Though ecological models have a long history in psychology and health promotion, they had not been applied frequently in research [5, 6]. A defining principle of ecological models is that because behavior is influenced by intrapersonal (e.g., biological, psychological, and affective), interpersonal (e.g., social support and culture), built environment (e.g., access to resources), and

policy (e.g., from government and industry) variables, interventions are likely to be most effective when they change presumed mediators at all of these levels [7]. A key indicator that ecological models are being applied would be measurement or manipulation of policy and physical environment variables that are not specified by the more traditional “psychosocial” models [2–4]. During the 1990s, authors noted that ecological models were not being widely applied in health behavior research or interventions [8, 9], except for tobacco control [10].

Active Living Research is now part of The Robert Wood Johnson Foundation’s commitment to reverse the rise in childhood obesity by 2015. Several ecological models have been developed since the early 2000s that are specific to obesity, nutrition, and physical activity [11–15], and these models are guiding major initiatives in obesity prevention in the USA [16–18] and internationally [11, 19]. There appears to be a consensus reached by authoritative groups that multi-level interventions emphasizing policy and environmental changes are required to control the global obesity epidemic.

However, it is unclear as to the extent to which the evidence base to support environmental and policy interventions in obesity, nutrition, and physical activity is growing. An early indicator of scientific progress is presentations at scientific conferences. To explore recent trends in the application of ecological models to obesity-related topics, abstracts of papers presented at Society of Behavioral Medicine conferences over a 15-year period were systematically coded. Society of Behavioral Medicine is an appropriate scientific conference for such an analysis because it is a venue for leading behavioral research on obesity, physical activity, and nutrition.

Four years of Society of Behavioral Medicine conference presentations were content analyzed to illustrate 15-year

J. F. Sallis (✉) • J. A. Carlson • A. M. Mignano
Department of Family and Preventive Medicine,
University of California, San Diego,
3900 Fifth Avenue, Suite 310,
San Diego, CA 92103, USA
e-mail: jsallis@ucsd.edu

A. Lemes
Hilo, HI, USA

N. Wagner
Kaiser Permanente, Institute for Health Research,
Denver, CO, USA

Table 1 Operational definitions used to code content of abstracts in *Annals of Behavioral Medicine* conference supplements

Content category	Inclusion and exclusion criteria
Physical activity	Topics included: accelerometry, aerobic activity, exercise, fitness, pedometers, physical activity, physical inactivity, sedentary, and specific activities (e.g., walking, running, and swimming)
Nutrition	Topics included: diet, dietary intake, dietary recall, eating, food choices, food consumption, food frequency, food reinforcement, and nutrition
Obesity	Topics included: BMI, body composition, eating disorders only if related to obesity, obesity prevention, overweight, maladaptive eating, weight control, and weight management
Environment/ policy	Topics included: access, aesthetics, availability, built environment, connectivity, density, environment intervention, facilities, food environment, incivilities, infrastructure, land use, neighborhood environment, nutrition/menu labeling, policy, proximity, sidewalks, signage, walkability, and zoning Topics excluded: food choices studied but no measure or modification of environment or availability, specific setting studied but no measure or modification of environment, and social environment only (including crime)

trends in environmental and policy studies of physical activity, nutrition, and obesity: 1995, 2000, 2005, and 2010. Abstracts published in conference supplements to *Annals of Behavioral Medicine* (which do not include the late-breaking abstracts) were coded using adaptations of a published content coding system [8]. First, all abstracts in the supplements were coded for whether they included physical activity, nutrition, or obesity content. Next, abstracts that contained this content were further coded by two graduate students for whether they contained environmental or policy content (see Table 1). All discrepancies were discussed and reconciled. Abstracts were coded in multiple categories if they reported results for more than one topic (e.g., physical activity and obesity). Social environment variables (e.g., social support and socioeconomic status) were not included because psychosocial theories include social environment variables, so they did not discriminate use of ecological models.

There were 653 published abstracts in 1995, 859 in 2000, 834 in 2005, and 848 in 2010. Of these, 170 (26 %), 188 (22 %), 258 (31 %), and 199 (23 %) included physical activity, nutrition, or obesity content, respectively. The percent of abstracts covering physical activity, nutrition, or obesity that included environmental or policy content increased from 3 % (1995) to 5 % (2000), 12 % (2005) and 17 % (2010). Figure 1 presents the percent of abstracts for each year that included environmental or policy content separately for physical activity, nutrition, and obesity abstracts. The percent of physical activity abstracts covering environmental or policy content increased most from 2000 (5 %) to 2005 (12 %), and continued to increase in 2010 (17 %). The percent of nutrition abstracts covering environmental or policy content increased most from 2005 (8 %) to 2010 (20 %).

This content analysis of abstracts presented at Society of Behavioral Medicine conferences found that studies of environmental and policy factors related to physical activity, nutrition, and obesity were rare in 1995 but more than tripled since then. There was very little change from 1995 to 2000, so virtually all of the increase in environmental and

policy studies occurred since 2000. This increase in environmental and policy studies occurred while the number of abstracts covering physical activity, nutrition, or obesity remained fairly stable, indicating a shift toward the application of ecological models.

The timing of the peak periods of increase for environmental and policy research in physical activity and nutrition could be related to publication of major reports and initiation of research programs targeting these topic areas. The percent of physical activity abstracts including environmental or policy content increased most between 2000 and 2005, which included widely publicized special issues on this topic in September 2003 from the *American Journal of Health Promotion* and *American Journal of Public Health*, as well as the first dedicated funding for this type of research from Centers for Disease Control and Prevention's (CDC) Active Community Environments program [20] and Active Living Research [1]. The Institute of Medicine [18] published recommendations for a multi-level approach to childhood obesity prevention in 2004, and the Healthy Eating

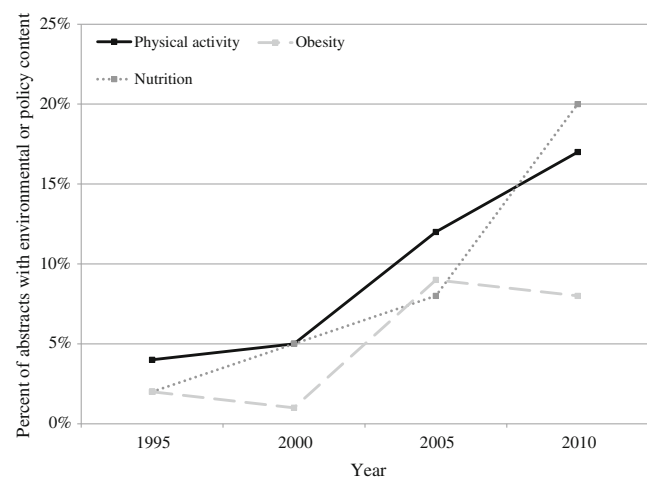


Fig. 1 Percent of nutrition, physical activity, and obesity abstracts at Society of Behavioral Medicine conferences containing environmental or policy content

Research program [21] announced its first Call for Proposals in 2005, coinciding with the 2005–2010 period of greatest increase in environment and policy research in nutrition presented at Society of Behavioral Medicine. The low rates of environmental and policy abstracts 1995–2000 support the rationale for Active Living Research's and Healthy Eating Research's missions to increase environmental and policy research in their areas.

Among study limitations, the content of abstracts was coded for only one scientific organization, so it cannot be determined whether similar trends could be found in other scientific outlets. However, Society of Behavioral Medicine is one of very few conferences that appears to be equally relevant to investigators presenting physical activity, nutrition, and obesity research, allowing comparable analyses. Another limitation is that not all research that was presented will be published and fully available to inform intervention development, and relevant research that was published was not presented at the Society of Behavioral Medicine conference.

It is clear that environmental and policy research on physical activity has become much more common in Society of Behavioral Medicine presentations. Thus, it is fitting that the present supplement to *Annals of Behavioral Medicine* is devoted to bringing some of the best new research in this field to *Annals* readers. The Society of Behavioral Medicine has supported the evolution of physical activity research as it has broadened to include more environmental and policy topics informed by ecological models. This supplement is evidence of the Society's continued support of the "new" field of active living research.

In conclusion, health behavior researchers appear to be responding to calls for more environmental and policy research that can inform multi-level intervention approaches to control obesity and improve eating and physical activity behaviors [11, 16–19]. Between 2000 and 2010, the proportion of physical activity, nutrition, and obesity presentations that included environmental or policy content presented at the Society of Behavioral Medicine conference substantially increased. These findings suggest a scientific paradigm shift, with increasing use of multi-level ecological models in the obesity, nutrition, and physical activity fields. One interpretation of the findings is that early dedicated funding for this type of research from Active Living Research, Healthy Eating Research, and CDC's Active Community Environments program may have played a role in the increase in environmental and policy research on the topics presented here. The public health significance of the increase in studies of environment and policy factors is that an evidence base is being built that can inform more comprehensive, multi-level interventions to produce sustainable population-wide improvements in physical activity, nutrition, and obesity.

Acknowledgments This work was supported by Active Living Research, a national program of The Robert Wood Johnson Foundation.

Conflicts of Interest Dr. Sallis is Director of Active Living Research. The other authors of this commentary declare no conflicts of interest.

References

1. Sallis JF, Linton LS, Kraft MK, et al. The active living research program: Six years of grantmaking. *Am J Prev Med*. 2009;36(2S2):S10–S21.
2. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. New York: Prentice-Hall; 1985.
3. Prochaska JO, Velicer WF, Rossi JS, et al. Stages of change and decisional balance for 12 problem behaviors. *Health Psychol*. 1994;13(1):39–46.
4. Fishbein M, Ajzen I. *Predicting and Changing Behavior: The Reasoned Action Approach*. New York: Psychology Press; 2009.
5. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q*. 1988;15:351–377.
6. Stokols D. Establishing and maintaining healthy environments: toward a social ecology of health promotion. *Am Psychol*. 1992;47:6–22.
7. Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K, Rimer BK, Viswanath K, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 4th ed. San Francisco: Jossey-Bass; 2008:465–486.
8. Oldenburg BO, French ML, Sallis JF. Health behavior research: The quality of the evidence base. *Am J Health Promot*. 2000;14:253–257.
9. Lucie R, Potvin L, Kishchuk N, Prlic H, Green LW. Assessment of the integration of the ecological approach in health promotion programs. *Am J Health Promot*. 1996;10:318–328.
10. Warner KE. The need for, and value of, a multi-level approach to disease prevention: the case of tobacco control. In: Smedley BD, Syme SL, eds. *Promoting Health: Intervention Strategies from Social and Behavioral Research*. Washington, DC: National Academy Press; 2000:417–449.
11. Kumanyika S, Jeffery RW, Morabia A, Ritenbaugh C, Antipatis VJ. Obesity prevention: The case for action. *Int J Obes*. 2002;26:425–436.
12. Glanz K, Sallis JF, Saelens BE, Frank LD. Healthy nutrition environments: Concepts and measures. *Am J Health Promot*. 2005;19:330–333.
13. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating healthy food and eating environments: Policy and environmental approaches. *Annu Rev Public Health*. 2008;29:253–272.
14. Booth SL, Sallis JF, Ritenbaugh C, et al. Environmental and societal factors affect food choice and physical activity: Rationale, influences, and leverage points. *Nutr Rev*. 2001;3:21–39.
15. Sallis JF, Cervero RB, Ascher W, Henderson KA, Kraft MK, Kerr J. An ecological approach to creating more physically active communities. *Annu Rev Public Health*. 2006;27:297–322.
16. U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity, 2001*. Rockville: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General; 2001.
17. Koplan JP, Dietz WH. Caloric imbalance and public health policy. *J Am Med Assoc*. 2000;282:1579–1581.

18. Koplan JP, Liverman CT, Kraak VI, eds. *Preventing Childhood Obesity: Health in the Balance*. Washington, DC: Institute of Medicine; 2004:5-19.
19. World Health Organization. Global strategy on diet, physical activity and health. www.who.int/gb/ebwha/pdf_files/WHA57/A57_R17-en.pdf Published May 2004. Accessed August 13, 2012.
20. Centers for Disease Control and Prevention. Active community environments. Available at <http://www.cdc.gov/physicalactivity/strategies/community.html>. Accessed August 10, 2012.
21. Story M, Orleans T. Building evidence for environmental and policy solutions to prevent childhood obesity: The healthy eating research program. *Am J Prev Med*. 2006;30(1):96-97.