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### Un/healthy behavior

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# 11

## UN/HEALTHY BEHAVIOR

### A bibliometric assessment of geographers' contributions to understanding the association between environment and health-related behavior

*Graham Moon and Dianna Smith*

This chapter examines the contribution of geographers to the study of health-related behavior. We aim to complement recent geographical reviews of the same subject matter (e.g., Twigg and Cooper, 2010) by providing an updated assessment, identifying contemporary themes and emerging agendas. We define “health-related behavior” as encompassing smoking, drinking, diet and physical activity, the commonly listed key health behaviors implicated collectively in 18.5% of the global mortality burden (World Health Organization, 2009).

Our chosen behaviors are significant for their relevance to themes considered elsewhere in this volume. As we shall see in the next section, variations in the prevalence of health-related behavior are one disputed element in understanding geographical health inequalities; that is, why health outcomes differ from place to place. Our behaviors are also significantly implicated in global health. The perpetuation of (un)healthy behavior on a global scale is in no small part associated with the actions of global corporations seeking to maintain market position. Additionally, ideas about risk and resilience pose questions about why certain groups (and places) are more susceptible to (un)healthy behavior, and health-related behavior is increasingly recognized as playing a role in urban planning, most notably in relation to physical activity and the notion of the walkable city.

In the next section, we examine the key theoretical concerns that have motivated the study of health-related behavior by geographers, developing a critical perspective. We then go on to examine long-standing concerns and more recent themes for each of our chosen behaviors. For each of the four selected health behaviors, we searched Scopus using relevant synonyms, limited to papers reporting geography as an author affiliation and to known geographers (see Table 11.1). We then focused on the work since 2012 and the most-cited authors before highlighting emerging themes for future research. We conclude the chapter with reflections on other health-related behaviors, thoughts on co-behavior (groupings of two or more behaviors), and a brief consideration of policy implications.

#### **Theory and critique**

Health-related behavior has long been recognized as a key explanation for health inequality, often being contrasted with explanations focusing on the impact of socioeconomic structure. In reality, both have a role to play. Since at least the publication of the influential UK *Black Report* (Whitehead, Townsend and Davidson, 1992), behavioral and structural theories about health inequality have been strongly politicized. Health-related behavior has been seen as an outcome of autonomous choice by individuals, who are personally responsible for their resultant health outcomes. In contrast, structural explanations emphasize the constraints

Table 11.1 Current research on health-related behavior involving geographers

Topic	Scopus search terms	Total papers	Post-2012 papers
Smoking	(TITLE ( <b>smok*</b> OR <b>tobacco</b> OR <b>cigarette</b> ) AND AFFIL ( <b>geogr*</b> )) AND ( LIMIT-TO ( SUBJAREA , “ <b>MEDI</b> ” ) OR LIMIT-TO ( SUBJAREA , “ <b>SOCI</b> ” ) )	187	92
Diet	(TITLE ( <b>food*</b> OR <b>diet*</b> OR <b>eat*</b> ) AND TITLE-ABS-KEY ( <b>health</b> ) AND AFFIL ( <b>geogr*</b> ) AND NOT TITLE-ABS-KEY ( <b>safety</b> OR <b>security</b> OR <b>farm*</b> OR <b>famine</b> ) ) AND ( LIMIT-TO ( SUBJAREA , “ <b>MEDI</b> ” ) OR LIMIT-TO ( SUBJAREA , “ <b>SOCI</b> ” ) )	171	87
Drinking	(TITLE ( <b>alcohol</b> OR <b>drink*</b> ) AND AFFIL ( <b>geogr*</b> )) AND NOT TITLE ( <b>water</b> ) AND ( LIMIT-TO ( SUBJAREA , “ <b>MEDI</b> ” ) OR LIMIT-TO ( SUBJAREA , “ <b>SOCI</b> ” ) )	162	95
Physical Activity	(TITLE ( “ <b>physical activit*</b> ” ) AND AFFIL ( <b>geograph*</b> OR “ <b>east anglia</b> ” )) AND ( LIMIT-TO ( SUBJAREA , “ <b>MEDI</b> ” ) OR LIMIT-TO ( SUBJAREA , “ <b>SOCI</b> ” ) )	178	121

that flow from wealth and access to power. Simplistically, the contrast is between a right-wing (behavioral) and a left-wing (structural) perspective, and this has tended to be reflected in differing governmental approaches to addressing (un)healthy behavior.

If we focus on the behavior rather than the health outcome, it quickly becomes clear that choice and constraint are both important. While individuals may choose to smoke, that choice and the way it is exercised is strongly influenced by disposable income, social attitude, group norms and a range of other factors. These factors come together to provide a geography for each behavior, a geography that reflects individual characteristics, the aggregation of people possessing similar individual characteristics, broader area-level determinants such as programs to reduce (un)healthy behavior, and the interaction of all these compositional, aggregative and contextual factors (Cummins et al., 2007).

A recognition of the complex, relational and multilayered nature of health-related behavior has led much quantitative research to multilevel modeling (Duncan, Jones and Moon, 1996). This approach is all but essential in large-scale national studies and can accommodate longitudinal studies of change and complex geographical considerations such as cross-classification where individual behavior is affected by non-nested contexts such as home and work locations. At the same time, it is important not to lose sight of more experiential, sociological and cultural perspectives (Cummins et al., 2007; Thompson, Pearce and Barnett, 2007). Unhealthy behavior can be entirely normal and understandable in some contexts, with the challenges being to effect change without demonizing people or communities where the behavior is manifest and to understand why unhealthy behavior can be a rational response to disadvantage, with, moreover, the definitions of precisely what constitutes (un)healthy behavior being much debated.

### Current concerns and future agendas

We begin this section by considering tobacco smoking. An early contribution was Heenan (1983), exploiting the unusual presence of smoking in the New Zealand census. The most prolific geographers currently working on this behavior are Moon (Southampton, UK), Pearce (Edinburgh, UK), and Barnett (Canterbury,

New Zealand), each involved in more than ten papers, often collaborative but also involving others. Duncan, Jones and Moon (1999) is the most cited paper led by a geographer, garnering over 200 citations. Also highly cited (70+ cites) is a collaborative paper involving two geographers on national variations in European tobacco-control policy and its association with smoking cessation (Schaap et al., 2008).

Papers produced over the past five years point to a range of shared concerns. Pearce, Barnett and Moon (2012) exemplify work on inequalities in smoking prevalence and develop an important distinction between place-based practices and place-based regulation. In the absence of routine data on small-area variations in smoking prevalence, a second group of studies has been developing estimation methods to fill this knowledge gap. Szatkowski et al. (2015) employ multilevel small-area estimation to predict the prevalence of smoking during pregnancy at delivery for hospital areas. A third theme is work on tobacco retail. Shareck et al. (2016) note that past studies have focused on tobacco retail in residential or school neighborhoods. Their innovation is to consider the wider activity spaces where individuals also spend time. The final current theme is rather different and is exemplified by Tan (2013), who takes a qualitative and critical lens to the experience of smoking in Singapore, portraying it as a transgressive practice that brings embodied sensations, helping us understand why some people continue to smoke. Qualitative work of this kind provides an alternative to what remains a dominantly quantitative field.

All these themes are brought together in Barnett et al. (2016), a monograph that serves as a statement of current geographical perspectives on smoking and tobacco. The authors begin with an examination of the longitudinal international evolution of the tobacco epidemic and then offer an assessment of the global development of Big Tobacco, setting out an economic geography of tobacco. These two initial chapters point to a need to consider smoking in its wider context, moving beyond the health silo to recognize entanglements with development, empire, politics, and economics. The central portion of the monograph then turns to inequality, taking both quantitative and qualitative approaches and extending the discussion to include research on smoking-attributable mortality and morbidity, as well as coverage of the notion of smoking as a gateway to other behaviors. Common themes in these chapters point to the need to focus on understanding why people smoke, how smoking communities can emerge, how smoking can be a tactic for resistance and how it also has consequences. Barnett et al. (2016) then turn to the various tactics that have been employed to bring about smoking cessation or reduce smoking initiation. Though there are exceptions, this is a theme that has been relatively neglected in health-geography work on smoking and tobacco. The authors highlight the uneven development and impact of these policies and their unintended consequences, as well as the need for innovative area-based policies.

Future directions for geographical work on smoking as a health behavior could arguably focus on extending the big picture and health-promotion themes identified by Barnett et al. (2016). These are certainly themes that have received little attention to date. In particular, though there have been some outputs, the economic geography of tobacco remains under-researched by geographers. Links between this economic geography and smoking behavior might include consideration of company tactics targeting less-developed countries and emerging economies; they might also chart the substantial consumption of smuggled tobacco and the impact on consumption of emerging internet markets. This said, there remains much to be done on smoking and inequality, particularly with regard to population sub-groups and, linking back to the health promotion theme, the differential uptake and impact of environmentally focused tobacco-control initiatives. There is also a clear case for enhanced attention to qualitative and critical perspectives on smoking, drawing out the experiences of the dwindling number of tobacco smokers. As Barnett et al. (2016) conclude, however, perhaps the most significant direction for research concerns the emergent geographies of vaping and e-cigarettes.

Turning next to research on diet, we focus explicitly on diet as a behavior: on geographical variations in eating behavior and access to healthy food. We acknowledge associations but chose not to cover broader issues such as food security and famine. Many papers cover diet as an adjunct to a main focus on obesity, and many cover diet alongside physical activity, another social determinant of obesity; we did not exclude these

papers but focused our analysis on what was being said specifically about geography and dietary behavior. With these caveats in mind, dietary behavior is of a similar size to smoking and tobacco as a research theme among geographers. The most prolific geographer is currently Cummins (London School of Hygiene and Tropical Medicine), one of the authors of the most cited paper on the topic: Cummins and Macintyre (2006). Thirteen papers have accrued more than 100 citations, a more extensive level of citation than that for smoking.

Food deserts, (frequently urban) areas where there is limited or no access to affordable good-quality nutrition, have provided an enduring theme among papers by geographers working on diet as a health-related behavior. Alongside Cummins' work, seminal early contributions were by Wrigley and colleagues (e.g., Wrigley, 2002) working on food consumption in a Leeds (UK) food desert following the opening of a new food retail outlet. The arguments (and debates) inherent in these early studies were summarized by Cummins et al. (2005), who described natural experiments in which supermarket-scale food retailing was introduced to food deserts, with diet patterns compared between intervention and comparison communities. Whereas Cummins and colleagues tended to find against significant positive effects, Wrigley and colleagues were more positive, also identifying wider community benefits associated with urban regeneration.

Replication research has seen subsequent studies of food deserts in communities worldwide (Sadler, Gilliland and Arku, 2016). These have tended to confirm the known mixed evidence, but some have sparked new directions. Three themes can be identified. First to emerge, and still popular, were studies focusing on access to food, noting how communities differ, usually on the basis of socioeconomic status, in the distance traveled to reach food-consumption opportunities. These studies have differentiated access to large supermarkets, convenience stores, full-service restaurants, fast-food outlets, farmers' markets, allotment gardens and many other forms of provision, with convenience stores and fast-food outlets generally characterized as providing poorer nutrition. Pearce et al. (2007), for example, found that residents of more affluent areas in New Zealand traveled twice as far to get to fast food compared to people from deprived areas. The impact of such findings on youth populations has been a second theme. He et al. (2012) showed how attending a school with more than three fast-food outlets within one kilometer has a negative effect on diet quality. The third recent theme has been methodological innovation using geospatial technologies to identify food outlets and develop novel access measures. In this frame, Widener and Li (2014) used Twitter data and sentiment analysis to reveal that people living in food deserts discuss healthy food less often.

Geographers working on diet have also been active on topics other than food deserts. Thompson et al. (2016) examined the performance of eating, focusing on family meals using photo elicitation and other qualitative methods. They contrasted consultative and non-consultative strategies regarding the content of meals in the everyday setting of the home. Soller et al. (2014) considered food allergy among vulnerable populations in Canada, finding no association with income or Indigenous identity but fewer allergies among immigrants and people with low education. Although future research could usefully continue this diversification, review papers have seen a productive future in continued applied work on food access, with better measurements of both diet and geographies enhancing understanding of their association. Thus, Black, Moon and Baird (2014: 229) note that "better and more nuanced measures of the food environment, including multidimensional and individualized approaches, would enhance the state of the evidence and help inform future interventions," and Pettygrove and Ghose (2016) call for the integration of critical geographic information systems (GIS) methodologies, with a stronger theorization of the urban spaces impacted by poor diet.

For our third behavior, we examine work by geographers on drinking behavior. Qualitative studies of alcohol consumption and attitudes have been led by Valentine (Sheffield), Jayne (Manchester) and Holloway (Loughborough), each authors of more than ten papers in Scopus, usually together (e.g., Jayne, Valentine and Holloway, 2011). The focus of their collective research is the spaces and gendered behaviors of drinking and drunkenness in the United Kingdom, resulting in three of the most highly cited (>50 citations) papers, published between 2006 and 2010. Herrick (King's College London) offers a different approach in a collection of eight papers, exploring the geographies of alcohol consumption in less-developed settings, in particular

South Africa. A significant body of other work addresses the spatial patterning of alcohol outlets and local deprivation (Pearce, Day and Witten, 2008) and related inequalities (Berke et al., 2010).

A crucial area of developing work is the correct assessment of drinking levels, as described in Boniface, Kneale and Shelton (2013). At present, most research depends upon self-reported alcohol consumption, and there is acknowledgment that the measures of alcohol by units can be challenging to understand and report accurately. Boniface, Kneale and Shelton asked participants to pour glasses of alcoholic drink and estimate the number of units, with results showing both under- and over-estimation; the key recommendation was to advocate for smaller glasses, to reduce underestimation. A focus on modifying individual behavior is very much in line with the move toward individual responsibility in consumption, whether the consumption is of unhealthy food, alcohol or tobacco, with less emphasis on more upstream measures to promote healthier behaviors such as taxation or reducing availability of items (e.g., regulation of outlets selling alcohol). Herrick (2016) illustrates how the role of government intervention in alcohol regulation is less explored than that in other harmful behaviors in both the Global North and the Global South.

The work on the spatial modeling of alcohol consumption has extended to small-area estimation of population-level drinking behavior. This methodological approach may allow researchers to identify neighborhoods where binge drinking, based on data from large surveys, is more common, with a view to targeting behavior-change interventions. Twigg and Moon (2013) and Riva and Smith (2012) each modeled the estimated prevalence of binge drinking across England, in an effort to identify areas where binge drinking is more common and interrogate the potential causes for these patterns. Twigg and Moon used a multilevel approach to model drinking between 2001 and 2009, finding a clear north-south divide in England with strong differences by gender and over time, with women more likely to binge drink on one day a week only. Crucially they identify the effects of measurement/definition on the results; area deprivation is less relevant over time.

Emerging work is focused on the systematic assessment of the retail environments that supply alcohol and the impacts on local populations in terms of ill health and social disorder. In the United Kingdom, researchers have drawn on routinely collected administrative data to explore these relationships, with a large study in Wales linking the alcohol-retail environment with hospital admissions (Fone et al., 2016) and other work in Scotland (Richardson et al., 2015). The next stage for this work will demand longitudinal analysis. Other challenges are to work on services for problem drinkers, where useful Canadian work has been emerging (Evans, 2012), and to improve the accuracy in reporting of drinking in the survey data so often relied upon for the research. The regulatory role of government also demands ongoing study.

Finally, we turn our attention to physical activity. Here, by far the most prolific geographer is Jones (East Anglia). He has contributed to 42 papers on the topic; three have more than 100 citations. In contrast to our other three areas, physical activity shows stronger evidence of collaboration between public-health and geography academics. Indeed, Jones has moved to Medicine at the University of East Anglia, a pattern also seen with Cummins (LSHTM) noted above for his strong contribution in diet research. The most-cited paper involving a geographer working on physical activity was Frank, Andresen and Schmid (2004), exploring the association between obesity, community design, physical activity and car use.

This interplay of physical activity, diet and obesity is a frequent focus of recent research. The relationship was outlined in the British government's 2007 report on obesity, for which Jones was the author of the evidence review on obesogenic environments (Jones et al., 2007). He described the difficulties in singling out one element of an individual's physical environment as significantly influential – a theme we will return to in our conclusion. Also worth noting from this comprehensive review is the need to define the target population for place-based interventions to promote physical activity. Is the intention to encourage more people to activity or to enhance standards for those already active?

In a recent paper (Sallis et al., 2016), three geographic aspects of a neighborhood that promote physical activity – walkability, access to parks and density of public transport – were assessed across 14 cities worldwide. Each factor has been explored by health geographers, albeit not always solely in terms of influence



on physical activity. One frequent focus is access to green space, with the assumption that good access will encourage more physical activity, though evidence is mixed. Walkability has, however, attracted the most attention. Andrews et al. (2012) call for health geographers to take a more critical perspective of the assumptions often embodied in walkability research. In particular, they point to a need to acknowledge the mobility requirements of people with chronic illness or disability. These needs are seldom addressed well in urban planning. Sallis et al. (2016) also highlight a more recent development in physical activity research: active travel. Active travel is often associated with a commute to work or school and is defined as making part of the journey without using private motorized transport. Longitudinal studies show active travel to have a positive effect on the health of English adults (Flint, Cummins and Sacker, 2014), supporting the call by Sallis et al. to consider urban design in promoting easier, safer means of active transport.

As research on physical activity expands, we are seeing greater use of technology such as Global Positioning Systems (GPS) and accelerometers to monitor physical activity and movement within environments. This will provide valuable data that will not only inform health geography's study of activity environments, but also improve our measurement of behavior in the environment more generally, moving beyond studies that focus on areas near to home or school. The scope for more informed descriptions of health-promoting environments will lead, hopefully, to a sustained level of academically rigorous input from health geography into public-policy recommendations.

## Conclusion

We have concentrated in this chapter on the role that geographers have played in the study of health-related behavior. The geographical contribution has been a significant one. It has highlighted the importance of place, location, distance and separation in understanding health-related behavior, and it has shown significant methodological innovation. In a field in which there is a strong interdisciplinary tradition, extensive collaboration with other disciplines has ensured that the geographical perspective has been a strong voice with a real-world impact. Less positively, and partly an artifact of our decision to base our assessment on bibliometric analysis, we note that the focus of the contributions reviewed above has been very largely on the Global North; there is clear potential for greater engagement with global health concerns. We conclude with three observations.

First, we have been selective in our coverage of health behavior. Geographers have also been active in other behaviors. Sexual health and sexual behavior is one such area. Lewis (2014) offers one direction in his study of migration by gay men, but many more exist. Another area is the use of illicit drugs. McCann and Temenos (2015), for example, examine the role of drug-consumption rooms as a technology for harm minimization. Less studied, but hugely important and a potential area for future research, are the behaviors evidenced when seeking and consuming health care. Here there is potential for overlap with the now vigorous research taking place under the broad heading of the geography of care: asking how people and communities go about seeking health care, how care-seeking behavior varies by category of care and by social group, and how it is impacted by new technologies of care, policy change and austerity.

Second, we have looked at each of our key behaviors in isolation. In reality, of course, they are interrelated. We have noted as much in our passing comments on obesity. Pearce and Witten (2010), in their edited collection on environmental perspectives on obesity, bring together essays on physical activity and diet, showing how both contribute to the generation of obesogenic environments through the concept of the energy balance equation. Other papers have considered access to outlets selling tobacco, alcohol and indeed fast food (Schneider and Gruber, 2013). The notion of co-behavior, the associations between behaviors, is a major area for future research – going beyond the association of diet and physical activity to examine, for example, the characteristics of communities where there is high alcohol consumption and significant residual smoking, the potential for targeting areas with multiple unhealthy behaviors, and more qualitative assessments of the experience of living in such areas.

Finally, we stress the need for geographical research on health-related behaviors to consider real-world impact. A central tenet for much policy aimed at reducing unhealthy behavior is the idea of denormalization. This can be a powerful catalyst to behavioral change, yet it can also be stigmatizing and raise new challenges. Bans on smoking in indoor public places have been widely effective in reducing exposure to harm, yet they have arguably displaced smoking to outdoor settings and to the private home. In the field of alcohol control, zones where street drinking is prohibited or sales of highly alcoholic drinks are restricted can lead to similar displacement. As geographers, we should be alert to the spatial manifestations, differential experiences, and unforeseen consequences of measures that seek to reduce unhealthy behavior.

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