



Does food environment influence food choices? A geographical analysis through “tweets”



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A B S T R A C T

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Access to nutritious food is imperative to physical well-being and quality of life. Previous food environment studies have revealed a disparity of access to healthful food on various geographical scales. An overlooked facet of this spatial perspective is the impact of the food environment at the individual level. Individuals tend to make diverse food purchasing and dining choices, including where, when, how, and which types of food to acquire. An unexplored avenue for further investigation is measuring the extent to which people's preference for food is elicited by exposure to their immediate food environment. This paper takes an innovative approach to this question by soliciting individual data about food-related activities from social media, or specifically, “tweets” (messages sent on Twitter). With spatiotemporally tagged information, tweets provide an ideal method for measuring the exposure to the food environment in real time. This measure, as a representative of individual food access, is associated with users' particular diet choices conveyed in their tweets. By comparing groups of Twitter users who shop in grocery stores to those who dine at fast food restaurants, we found that the prevalence of grocery stores that stock fresh produce within an individual's neighborhood may significantly influence him or her to make nutritious food choices. This study has a great potential to inform health professionals and stakeholders of the significance of social media in assisting with crowdsourcing human subject data that incorporate spatiotemporal dimensions and to explore individual diets in relation to their perceived food environment, which can positively impact the health of communities.

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Introduction

Access to nutritious food is imperative to physical well-being and quality of life. Failing to consume healthful food on a regular basis can lead to a series of adverse health outcomes, including obesity, diabetes and cardiovascular diseases (Shaw, 2006). Researchers have noted that access to nutritious food is influenced by both spatial and non-spatial mediators that result in inequality of access across communities. These barriers to healthful food choices include geographic, economic, informational, and cultural aspects (McEntee & Agyeman, 2010). To date, the majority of the literature simply focuses on geographic access to nutritious food in relation to socio-economic status (SES). These studies have taken a predominantly statistical approach to examining if correlations exist between SES variables and food access through regression models. Not surprisingly, many studies found a positive correlation between low SES and limited access to quality food in selected local regions

(Glanz, Sallis, Saelens, & Frank, 2007; Moore & Diez Roux, 2006) as well as in U.S. nationwide studies (Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007), and few studies failed to identify this correlation (Guy & David, 2004).

An overlooked facet in this spatial disparity of food access is the causality linked to food choices at the individual level. Individuals tend to make diverse food purchasing and dining choices, including where, when, how, and which types of food to acquire. The role of food access in shaping food choices cannot be completely understood from generalized regional studies. What must be assessed is the impact of the quality of an individual's food environment on his or her food purchasing choices. Although studies have previously identified among other factors the availability of nearby grocery stores have played a significant role in influencing food buying practices (Walker, et al. 2011; Walker, Block, & Kawachi, 2012), these studies suffer from the following limitations: (1) the sampling size is very limited due to the time-consuming process of soliciting individual samples and (2) studies of individuals' dietary choices are based on the home locations while overlooking the effects of mobility on procuring food (Kestens, Lebel, Daniel, Thériault, &

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