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Moving beyond the residential neighborhood to explore social inequalities in exposure to area-level disadvantage: Results from the Interdisciplinary Study on Inequalities in Smoking

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ABSTRACT

The focus, in place and health research, on a single, residential, context overlooks the fact that individuals are mobile and experience other settings in the course of their daily activities. Socio-economic characteristics are associated with activity patterns, as well as with the quality of places where certain groups conduct activities, i.e. their non-residential activity space. Examining how measures of exposure to resources, and inequalities thereof, compare between residential and non-residential contexts is required. Baseline data from 1890 young adults (18–25 years-old) participating in the Interdisciplinary Study of Inequalities in Smoking, Montreal, Canada (2011–2012), were analyzed. Socio-demographic and activity location data were collected using a validated, self-administered questionnaire. Area-level material deprivation was measured within 500-m road-network buffer zones around participants' residential and activity locations. Deprivation scores in the residential area and non-residential activity space were compared between social groups. Multivariate linear regression was used to estimate associations between individual- and area-level characteristics and non-residential activity space deprivation, and to explore whether these characteristics attenuated the education–deprivation association. Participants in low educational categories lived and conducted activities in more disadvantaged areas than university students/graduates. Educational inequalities in exposure to area-level deprivation were larger in the non-residential activity space than in the residential area for the least educated, but smaller for the intermediate group. Adjusting for selected covariates such as transportation resources and residential deprivation did not significantly attenuate the education–deprivation associations. Results support the existence of social isolation in residential areas and activity locations, whereby less educated individuals tend to be confined to more disadvantaged areas than their more educated counterparts. They also highlight the relevance of investigating both residential and non-residential contexts when studying inequalities in health-relevant exposures.

1. Introduction

Place and health inequality researchers have generally been concerned with documenting the variable distribution of environmental conditions, such as disadvantage or health-relevant resources, across areas, and examining their association with the health of people who live there. Most studies have investigated the residential neighborhood as the sole geographical context of interest (Chaix, 2009; Diez Roux and Mair, 2010; Pickett and Pearl, 2001; Riva et al., 2007; Shareck and Frohlich, 2013). Because of this, studies have been criticized for falling into the "residential trap" since individuals' mobility across space, and their experience of other daily life settings such as where they study, work, play, or socialize, are overlooked (Chaix et al., 2009; Kwan, 2009).

Indeed, people are not bound to their residential neighborhood: they move in and out of it in the course of their daily activities, and may encounter different types and levels of resources in their activity locations compared to their residential neighborhood (Basta et al., 2010; Hurvitz and Moudon, 2012; Inagami et al., 2007; Kestens et al., 2010; Setton, et al., 2011; Zenk, et al., 2011).

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Resources experienced in activity settings may in turn influence health (Inagami et al., 2007; Kestens et al., 2012; Mason, 2010; Setton et al., 2011; Vallee et al., 2010; Vallee et al., 2011; Vallee and Chauvin, 2012; Zenk et al., 2011). For instance, in the L.A. Fans Study, USA, Inagami et al. (2007) found that conducting activities in areas which were more affluent that one's residential neighborhood was associated with better self-rated health than experiencing activity settings of similar disadvantage than one's neighborhood (Inagami et al., 2007).

Most importantly, mobility and activity patterns may vary with personal characteristics such as age, gender, and various indicators of socio-economic status (SES) such as income or education (Camarero and Oliva, 2008; Guest and Lee, 1984; Kwan, 2000; Macintyre and Ellaway, 1998; Morency et al., 2011; Paez et al., 2010; Schönfelder and Axhausen, 2003; Wang et al., 2012). Adulthood generally comes with increasing mobility and spatial extent (Morency et al., 2011), while lower SES has been found to be associated with shorter trip distances than higher SES (Paez et al., 2010). These socially-patterned characteristics may also influence the type and quality of places one experiences in one's daily activities (Inagami et al., 2007; Krivo et al., 2013; Wang et al., 2012). All else being equal, mobility and the conduct of regular activities may allow privileged residents to "escape" their disadvantaged neighborhood, while others may be exposed to activity settings of higher disadvantage, or to resources of lower quality, than where they live. Consequently, the exclusive focus on the residential area likely provides an incomplete picture of inequalities, between social groups, in contextual exposure to area-level disadvantage or health-relevant resources.

If mobility allowed for perfect social mixing to occur across more or less affluent areas, the daily conduct of activities outside the home would contribute to flattening differentials in contextual exposures between social groups. Alternatively, it has been suggested that residential social isolation, whereby lower socio-economic groups tend to live in deprived and less well resourced areas, and higher SES groups in affluent neighborhoods, might extend to the places where they conduct daily activities (Krivo et al., 2013; Wang et al., 2012). In such a case, mobility would leave inequalities based on residential exposure to deprivation and resources untouched, or it might potentially exacerbate them (Palmer et al., 2013). In fact, while in theory mobility may give people the freedom to access all parts, disadvantaged or not, of a city, in practice, lower socio-economic groups may have a lesser capability than their higher SES counterparts to access and use resources in more advantaged areas (Fitzpatrick and La Gory, 2000; Hägerstrand, 1970). A conservative hypothesis lies in between these two, namely that accounting for mobility leads to a reduction in social inequalities in exposure, without completely eliminating the gradient (Ellis et al., 2004).

Whether inequalities in exposure measured in the residential neighborhood are reduced, left untouched or augmented when mobility is considered remains elusive. Few studies have looked at social isolation beyond the residential neighborhood (Fitzpatrick and La Gory, 2000; Krivo et al., 2013; Kwan, 2013), and those which have done so have most often been concerned with racial segregation (Ellis et al., 2004; Palmer et al., 2013; Wang et al., 2012; Wong and Shaw, 2011), rather than with social differentials in exposure to area-level disadvantage or other health-influencing environmental conditions (Krivo et al., 2013; Kwan, 2013).

2. Objectives

We explore the impact that mobility and the conduct of regular activities have on exposure to area-level disadvantage, and inequalities thereof, in a sample of young adults. We focus on area-level disadvantage since it has consistently been found to be associated with residents' health-deterring practices such as smoking (Chow et al., 2009; Ellaway and Macintyre, 2009; Frohlich et al., 2002) and with health outcomes such as poor self-rated health (Pickett and Pearl, 2001; Riva et al., 2007) and cardiovascular diseases (Chaix, 2009; Chow et al., 2009; Riva et al., 2007). We compare exposure to disadvantage measured in the more traditional, residential area, and in the non-residential activity space. The latter is operationalized as the subset of regular activity locations excluding the home. Activity spaces have been used as a proxy for spatial mobility (Sherman et al., 2005) and they have been described as being influenced by people's social position (Golledge and Stimson, 1997 p.282).

This paper's specific objectives were:

(1) To assess whether there were social inequalities in exposure to area-level deprivation measured in the residential neighborhood and non-residential activity space;
(2) To compare social inequalities observed in residential neighborhood and non-residential activity space deprivation;
(3) To assess whether selected individual- and residential-level characteristics attenuate the association between participants' SES and deprivation measured in the non-residential activity space.

We hypothesized that (1) there would be inequalities, across participants' SES, in exposure to residential and non-residential deprivation whereby lower SES individuals would live and conduct activities in more disadvantaged areas than their higher SES counterparts; (2) social inequalities would be smaller in the non-residential activity space than in the residential neighborhood; and (3) adjusting for selected characteristics (e.g. individual socio-demographics, residential deprivation) would attenuate the association between SES and non-residential activity space disadvantage.

3. Methods

3.1. Study design and data collection

Between November 2011 and August 2012, 6020 young adults living in one of the 35 health services catchment areas (CLSC) on the island of Montreal, Canada, were invited to take part in the Interdisciplinary Study on Inequalities in Smoking (ISIS). Eligibility criteria included being between 18 and 25 years-old, being fluent in French or English, and having lived for at least one year at one's current residence. 2093 young adults completed a questionnaire either online using a secured website (90%), on paper (4.2%) or over the phone with a research assistant (5.8%), in exchange for a 10$ gift certificate. The final response rate was 37.6%. Ethical approval for this study was obtained from the Research Ethics Committee of the Université de Montréal's Faculty of Medicine.

In the questionnaire, participants provided socio-demographic and health data. An activity location questionnaire was also specifically developed to collect information on respondents' regular activity locations. Participants were asked to report if they regularly conducted any of the following activities: studying, working, grocery shopping, sports or physical activity, leisure activity, and up to two other unspecified places where they regularly spent time. Participants were invited to provide information on the location where the activity usually took place (place name, address, street, closest intersection or landmark, city). The activity location questionnaire had high test-retest reliability with 86.5%