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## Neighborhood effects in depressive symptoms, social support, and mistrust: Longitudinal analysis with repeated measurements



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### ABSTRACT

While many associations between neighborhood characteristics and individual well-being have been reported, there is a lack of longitudinal studies that could provide evidence for or against causal interpretations of neighborhood effects. This study examined whether neighborhood urbanicity and socioeconomic status were associated with within-individual variation in depression, mistrust and social support when individuals were living in different neighborhoods with different levels of urbanicity and socioeconomic status. Participants were from the Young Finns prospective cohort study (N = 3074) with five repeated measurement times in 1992, 1997, 2001, 2007, and 2011. Neighborhood urbanicity and socioeconomic status were measured at the level of municipalities and zip-code areas. Within-individual variation over time was examined with multilevel regression, which adjusted the models for all stable individual differences that might confound associations between neighborhood characteristics and individual well-being. Social support from friends was higher in urban areas and in areas with higher socioeconomic status, whereas social support from the family was higher in rural areas. These associations were observed also in the within-individual analyses, and they were partly accounted for by employment and socioeconomic status of the participants. There were no associations between neighborhood characteristics and depression or mistrust. These findings suggest that people receive less support from their families and more support from their friends when living in urban compared to rural regions of Finland. These differences are partly explained by people's changing socioeconomic and employment statuses.

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### 1. Introduction

Physical and social characteristics of residential areas are considered important for people's health and well-being (Diez Roux and Mair, 2010). Several studies have reported that neighborhood differences in average socioeconomic status are related to mental health outcomes, such as depression (Kim, 2008). Other studies of "neighborhood effects" have suggested that features of the physical environment, such as presence of parks and

supermarkets, may influence people's physical activity, diet and obesity risk (Diez Roux and Mair, 2010). However, most of these studies have not been able to determine whether these associations between neighborhood characteristics and individual well-being are causal, that is, whether neighborhood characteristics influence individual well-being—the social causation hypothesis. The alternative explanation is that the neighborhood associations arise due to selective residential mobility, that is, individuals with different levels of well-being tend to select different residential locations—the social selection hypothesis (Diez Roux and Mair, 2010; Diez Roux, 2001; Pampel et al., 2010; Sampson et al., 2002). In the present study, we used longitudinal data from a prospective cohort study to examine evidence for or against the social causation

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hypothesis of neighborhood effects in mental health and well-being, including depressive symptoms, social trust, and received social support.

Several studies of neighborhood effects in mental health have used depressive symptoms as the measure of mental health (Kim, 2008; Mair et al., 2008). These studies have shown that neighborhood characteristics, such as neighborhood disorder (Cutrona et al., 2006), socioeconomic status of neighborhoods (Galea et al., 2007; Ross, 2000), neighborhood social environment (Echeverría et al., 2008; Latkin and Curry, 2003) are associated with depressive symptoms of the residents. The level of urbanicity has also been associated with depressive symptoms (Sundquist et al., 2004), although the evidence has been mixed. Some studies have reported higher rates of depression in urban than rural areas (Peen et al., 2010) while other studies have reported the reverse (Miles et al., 2012).

Neighborhood characteristics may also influence how people trust other individuals. Social capital—the informal social ties that connect people and communities—has been associated with neighborhoods characteristics, such as income inequality and crime rates (Kawachi et al., 1997; Kennedy et al., 1998). Social mistrust can be considered as part of the broader concept of social capital, especially the cognitive dimensions of social capital (Fujiwara and Kawachi, 2008; Phongsavan et al., 2006) related to people's negative and suspicious beliefs other people's behavior and intentions (Lewicki et al., 1998). Mistrust is not merely the lack of trust but a more pronounced suspiciousness of the motives of other people's actions (Wang et al., 2009). Before the concepts of social capital and neighborhood effects, the role of neighborhoods in feeding social mistrust was already discussed under the theme of *urban alienation*. However, only a few studies have examined whether and how mistrust is associated with urban/rural differences—or with neighborhood socioeconomic status, which is strongly correlated with urbanicity. In a study of residents of Chicago and rural areas of Illinois, urban residents reported more mistrust than rural residents (Ross et al., 2002). This difference was largely attributed to differences in neighborhood disadvantage and social disorder. Another study reported an association between neighborhood disorder and mistrust, and suggested that these social risk factors may be mainly an urban phenomenon (Geis and Ross, 1998).

With respect to mental health, the concepts of mistrust and social capital are closely related to concepts of hostility and social support, which have been studied in health psychology and behavioral medicine. Hostile, cynic and suspicious interpretations of other people's motives have been associated with higher morbidity, such as coronary heart disease (Smith et al., 2004) and metabolic syndrome (Niaura et al., 2000), and all-cause mortality (Chida and Steptoe, 2009). Hostility has also been associated with depressive symptoms (Stewart et al., 2010). Social support, in turn, has been shown to buffer against the development of physical and mental illnesses (Berkman, 2001; Cohen and Wills, 1985), including depression (Heponiemi et al., 2006; Klineberg et al., 2006). In the United States, some studies have reported rural residents receiving more social support than urban residents (Mickelson and Kubzansky, 2003), especially from their families (House, 1987). These differences in social support might help to explain lower risk of depression in rural regions—or mitigate elevated risk of depression.

### 1.1. Current study

While many studies have shown differences in mental health and risk factors between neighborhoods, it remains unclear whether living in more or less adverse neighborhoods causes better or poorer mental health, or whether area-level differences are due

to selective mobility (i.e. healthy people move to less adverse neighborhoods than those who are less healthy). A recent Australian study provided evidence against the social causation hypothesis (Jokela, 2014). People who moved across more and less disadvantaged neighborhoods did not have poorer self-rated health or health behaviors when they were living in the more disadvantaged neighborhood compared to another time when they were living in more advantaged neighborhood (Jokela, 2014).

The purpose of the present study was to examine whether and how depressive symptoms, social support, and mistrust are associated with neighborhood socioeconomic status and urban/rural regional differences. Following the methodological approach of the Australian study cited above (Jokela, 2014), we used longitudinal data with repeated measurements to separate the associations to (1) average differences between different individuals and (2) variation over time within the same individuals. The repeated measurements allow us to assess whether people's well-being is different when people are living in different neighborhoods. This setting provides a better test for the social causation hypothesis, as change in the exposure (i.e., neighborhood characteristics) should lead to change in the health outcome if the association is truly causal, as the within-individual analysis adjusts for all the stable individual characteristics that might confound the neighborhood effects via selective residential mobility. We focus on depressive symptoms as the main outcome. In addition, we examine social support and social trust as secondary outcomes, as they have been associated with depression risk (Cohen and Wills, 1985; Phongsavan et al., 2006; Wethington and Kessler, 1986). Furthermore, we also examine whether social support mitigates the association between depression/mistrust and neighborhood characteristics. To test the robustness of the associations against different measurement levels of neighborhoods, both neighborhood socioeconomic status and urbanicity at the level of municipalities and zip-code areas were used as exposures. Based on earlier research we hypothesized that living in deprived urban neighborhoods increases depressive symptoms, diminish social support, especially from family, and yields more distrust among residents.

## 2. Methods

### 2.1. Participants

The participants were 3074 individuals (1661 women) from the ongoing Young Finns prospective cohort study. The original sample ( $n = 3596$ ) was gathered from five Finnish university cities with a medical school (Helsinki, Kuopio, Oulu, Tampere and Turku) and their surrounding suburban and rural areas in order to be broadly representative of the Finnish population (Raitakari et al., 2008). Healthy children and adolescents in six birth cohorts (aged 3, 6, 9, 12, 15, and 18 years at baseline) were randomly selected on the basis of their social security number. The study began in 1980 and participants have been followed subsequently in eight study waves in 1983, 1986, 1989, 1992, 1997, 2001, 2007 and 2010–2012. The study was approved by local ethics committees. In the current study data from the last five (from 1992 to 2012) study waves were used. Participants with all the relevant data for at least one study wave were included.

### 2.2. Depressive symptoms

Depressive symptoms were assessed using a modified version of the self-report Beck's Depression Inventory in all study waves. The original inventory consists of 21 items with four alternative statements for each item. In the modified version, used in the present study, participants were asked 21 items, which they answered on a

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