

# 'LONESOME TOWN'? IS LONELINESS ASSOCIATED WITH THE RESIDENTIAL ENVIRONMENT, INCLUDING HOUSING AND NEIGHBORHOOD FACTORS?

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*This article considers whether feelings of loneliness are associated with aspects of the home and neighborhood of residence. Multinomial logistic regression models were used to explore associations between residential environment and loneliness in 4,000 residents across deprived areas of Glasgow. People who rated their neighborhood environment of higher quality and who used more local amenities were less likely to report loneliness. Respondents who knew more people within the local area were less likely to report loneliness. Those who reported more antisocial behavior problems, who had a weak perception of collective efficacy, and who felt unsafe walking alone at nighttime were more likely to report loneliness. Length of residence and dwelling type were not associated with reported loneliness. The findings indicate the potential importance of several dimensions of the neighborhood physical, service, and social environment, including aspects of both quality and trust, in protecting against or reducing loneliness in deprived areas. © 2014 Wiley Periodicals, Inc.*

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## INTRODUCTION

There have been recently expressed concerns that societies are getting lonelier and that the emphasis placed on individualism within contemporary culture increases peoples' sense of insecurity (Hanlon, Carlisle, Hannah, & Lyon, 2012). This is also related to a more general observation that increased wealth has not brought greater happiness to Western societies, but rather an artificial maintenance of happiness through prescription drugs (Layard, 2005; Dworkin, 2007). Interest in loneliness also stems from its health consequences, which have been compared to the effects of smoking and ageing (Hawkey & Cacioppo, 2007). Loneliness can result in unhealthy behaviors, such as overeating and reliance on alcohol, which cause stress and sleep deprivation and affect the immune and cardiovascular system (Cacioppo & Patrick, 2008; Capiocco et al., 2002).

Two recent studies have reported high, and increasing, levels of loneliness in industrialised countries. A survey by the U.K. Mental Health Foundation (MHF) conducted in 2010 reported that very few U.K. adults were unaffected by loneliness and that the number of people reporting loneliness "often" or "sometimes" was higher among those in their 30s and 40s than among those in their 50s or older. Moreover, nearly half the sample (48%) considered that "society is becoming lonelier in general" (Griffin, 2010, p. 22). Similarly, Australian research, using a national survey over a 10-year period, reported that the number of people moving in and out of loneliness had increased over the first decade of the 21<sup>st</sup> century (Baker, 2012), and that the incidence of episodes of loneliness over time, affecting one-in-three people, was far higher than the prevalence of loneliness at any point in time.

Although the research and policy interest in loneliness among older people continues (Donaldson & Watson, 1996; Cattán, White, Bond, & Learmouth, 2005; Victor & Bowling, 2012; Beaumont, 2013), and there is a growing interest in loneliness among other groups, such as students (Ebesutani et al., 2012; Salami & Bozorgpour, 2012; Binder, Roberts, & Sutcliffe, 2012; Pamukcu & Meydan, 2010) and Internet users (Amichai-Hamburger & Ben-Artzi, 2003; Stepanikova, Nie, & Xiaobin, 2010), there has been little research into loneliness among deprived communities, despite evidence that mental health and well-being, variously measured, are worse in poorer populations (McManus, 2011). This may be an important gap given that many of the health consequences of loneliness are also of major concern in deprived areas in particular (Audit Scotland, 2012). Thus, if contextual factors are associated with loneliness among deprived populations, this may be an important addition to our understanding of the constellation of factors that contribute to poor health and unhealthy behaviors in poorer communities.

In their study concerning the question of *how* the quality of people's neighborhood affect their feelings of loneliness, Prieto-Flores, Fernandez-Mayoralas, Forjaz, Rojo-Perez, and Martinez-Martin (2011) said that "the influence of residential satisfaction on the experience of loneliness has received little attention" (p. 1184). This is surprising given the extensive research on the relationships between place and health. Macintyre and others have shown how the characteristics of places can affect both health and health behaviors in several ways: (a) by providing (or not) "opportunity structures" through material infrastructure and resources (Macintyre, Ellaway & Cummins, 2002, p.132); (b) through psychosocial characteristics such as area reputations; and (c) through collective social and cultural practices (Macintyre 1997).

Kawachi and Berkman (2003) explain that there are complex interdependencies between compositional and contextual explanations for neighborhood effects on health because the characteristics of individuals and places are partly, and simultaneously, a

function of each other; it is, therefore, hard to maintain “that poor people freely choose to behave poorly” (p. 12). The same might be said about loneliness, especially if one adopts what Cummins, Curtis, Diez-Roux, and Macintyre (2007) call a “relational perspective” on place and health (p. 1835), not only to examine physical health and health behaviors as they do, but also to consider psychological health.

We have examined loneliness among the general adult population in several deprived areas of Glasgow and have distinguished between different domains of the residential environment—namely, housing, neighborhood physical and service environment, and neighborhood social environment—which might have a bearing upon feelings of loneliness. Further, within these three domains of the residential environment, we have explored which particular aspects were most strongly associated with feelings of loneliness among residents.

Before discussing our own study, we briefly review the research evidence that residential circumstances can affect mental health and well-being, including the limited evidence regarding loneliness. Looking at the evidence around mental health and well-being is useful both because we know that loneliness can contribute to mental health problems such as depression (Olds & Schwartz, 2008) and anxiety (Cacioppo & Patrick, 2008), and because many of the commonly used measures of mental health include questions about social functioning and connections to other people. Thus, the evidence about mental health and well-being may indicate what aspects of the residential environment may also be worth investigating in relation to loneliness.

### ***Housing, Neighborhoods, Mental Health, and Well-being***

In terms of housing, past research has shown poor social and mental health outcomes for occupants of high-rise flats in particular (Evans, 2003), including feelings of isolation and loneliness (Moore, 1975). The social effects of high-rise living, including low familiarity with neighbors, have been attributed to the way blocks are managed, often with more transient occupants and a high turnover of residents (McDonald & Brownlee, 1993). In our consideration of housing type and feelings of loneliness, we therefore assessed whether the potential negative effect of high-rise is ameliorated by length of residence, as well as whether a longer length of residence in the home and neighborhood are themselves associated with lesser feelings of loneliness for individuals.

Associations between neighborhood sociodemographic characteristics and mental health have been studied in the United Kingdom using the British Household Panel Survey. Weich, Twigg, Holt, Lewis, and Jones (2003) found significant associations between neighborhood deprivation, density, urbanity, and mental health for the economically inactive. Similarly, Propper et al. (2005) found associations between neighborhood-level disadvantage, urbanity, ethnicity, and mobility on the one hand, and mental health on the other, again for particular groups—women, non-Whites, and the less educated. In both cases, mental health was assessed using the General Health Questionnaire (GHQ-12)<sup>1</sup> instrument. Neighborhood characteristics were measured mostly using sociodemographic compositional variables from the official UK Census.

Weich et al. (2003) noted that measures of the neighborhood physical environment were missing from their study. However, a later U.K. study using the GHQ-12 scale found no association between independently rated neighborhood quality and residents’ mental

<sup>1</sup>The GHQ-12 is a widely used survey instrument for measuring mental health and psychiatric morbidity (Goldberg & Williams, 1988).

health (Thomas et al., 2007). Less robust evidence has been found for an association between access to green space and mental health, including two U.K. studies (Lewis & Booth, 1994; Macintyre, Ellaway, Hiscock, & Kearns, 2003). These studies used a number of mental health measures, including anxiety and depression and mental fatigue.

Regarding the neighborhood social environment, an international systematic review of studies of neighborhood environments and mental health found strong evidence of links between adult mental health and neighborhood violence, neighborhood disorder (including particularly vandalism), and neighborhood quality improvements through regeneration (Clark, Myron, Stansfeld, & Candy, 2008). Two Australian studies have looked at the relationship between sense of belonging, or community, and mental health and well-being. In one study of older women (Young, Russell, & Powers, 2004), a “sense of neighborhood” score (p. 2632), which combined aspects of belonging and trust, was positively but weakly associated with mental health (measured by the Short Form Health Survey [SF-12]<sup>2</sup>), but more strongly associated with social support (sometimes used as a proxy for a measure of loneliness). In another study, feeling less a part of one’s community than before was found to be significantly associated with a transition into loneliness (Baker, 2012).

Prieto et al. (2011), in a study in Spain, showed that residential satisfaction had both direct and indirect effects upon loneliness among older people, with relationships being stronger among those living in the community than among those living in care homes. Sense of belonging to the place of residence has also been shown to be associated with loneliness by both the same authors and others (Hagerty & Williams, 1999), as has sense of community (Prezza, Amici, Roberti, & Tedeschi, 2001). One study that utilized a measure of mental and emotional well-being among residents of a deprived peripheral housing estate in the United Kingdom found that, for women, perceiving their neighborhood to be “inhospitable” or “unfriendly” was predictive of poor well-being (Tulle-Winton, 1997, p. 167).

Much of the existing research on loneliness has been conducted with the elderly, or with other specific population groups, e.g., students or mental health patients. Furthermore, neighborhood satisfaction is usually treated in an undifferentiated way in such studies with one or two *overall satisfaction* variables utilized, thus precluding the identification of key neighborhood and community characteristics relevant to loneliness outcomes.

Few studies have included measures of all three aspects of the residential environment—housing, neighborhood physical and service environment, and neighborhood social environment. Indeed, the authors of the U.K. study that found no significant association between neighborhood quality and mental health noted, as a limitation, that “the quality of the environment . . . also reflect[s] something about the psychosocial environment” (Thomas et al., 2007, p. 505), which they had not measured, such as aspects of social cohesion and social capital. Thus, we are interested in measuring residents’ perceptions of not only neighborhood physical quality but also their assessment of the neighborhood social environment, including aspects of belonging and dimensions of trust in their neighbors.

Furthermore, few studies of neighborhoods and mental health have used measures of mental health such as loneliness, which are often below the level considered for clinical intervention. Rogers et al. (2001) argued that in studying urban regeneration and mental health, analysis was too constrained by “a restricted set of easily quantifiable measurable

<sup>2</sup>The SF-12 is a general purpose survey instrument for measuring health status and health-related quality of life, which produces both physical and mental health component scores (Ware, Kosinski, & Keller, 1996).

indicators” (p. 51) and that the subjective meaning and experience of mental health and sense of place should be explored. Aligned with this point, we are interested in both how people perceive the quality of their neighborhood (rather than simply whether it is changed through a regeneration intervention) and their use of the neighborhood as factors that may influence loneliness.

## METHODS

### *Data Source and Study Location*

The data in our study come from a survey of adult householders carried out in 15 communities across the city of Glasgow in 2011; this was the third wave of a long-term study of the effects of housing improvements and regeneration on communities and individuals (Egan et al., 2010). At the time of the survey, the majority of the housing improvement works to existing homes across all the areas had been completed but the redevelopment projects for six of the areas had yet to reach their midpoint. The study communities are relatively deprived, all but one falling within the 15% most deprived areas of Scotland, using the government’s measure of income deprivation based on receipt of out-of-work benefits (Walsh, 2008).

In nine areas, random stratified sample of addresses was selected, and in six regeneration areas that were undergoing extensive redevelopment, all existing addresses were selected. The survey achieved a 45% response rate, with 4,302 completed interviews. Although we might have expected a lower response rate in areas of regeneration activity, this was not the case, with nonresponse and refusal rates similar between these areas and others. Across the entire sample, the survey overrepresents those in their 60s and 70s, women, and those living in social rented housing, and underrepresents adults in their 20s and 30s and owner occupiers.

### *Loneliness*

Respondents were asked about their recent feelings of loneliness, specifically, how often they had been feeling lonely over the last 2 weeks: all of the time; often; some of the time; rarely; or never. This is similar to the question asked in the U.K. Mental Health Foundation (MHF) survey (Griffin, 2010) and to that used previously in a survey in the West of Scotland (Ellaway et al., 1999). This measure covers both types of emotional and social isolation identified by Weiss (1975). For ease of interpretation, the responses were grouped into three categories for analysis: all of the time or often; sometimes; rarely or never. This gave three groupings (frequent, occasional, and no loneliness) of comparable size to those found in the recent MHF survey.

We considered three domains of residential factors that might have an influence upon feelings of loneliness. Wherever possible, we endeavoured to construct three categories for the independent variables ranging from good to bad to give a logical progression and to enable us to compare their relative effect upon loneliness. For some variables, this was straightforward based on the language used in the survey, e.g., combining two “agree” responses, or two “disagree” responses; for others, we made decisions as to where to place divisions across a quantitative range to produce a sensible progression of categories (e.g., number of years lived in the neighborhood; or number of days walked in the neighborhood). Where feasible, we used tertiles; otherwise, we aimed to make the categories as equally sized as possible.

### ***Housing Factors***

The first domain concerned the housing that people lived in, based on three variables: houses; other flats ( $\leq$  four storeys); and high-rise flats (five storeys or more). Length of residence was recorded as both “years in home” and “years in area,” and divided into approximate tertiles, from longest to shortest duration, in each case.

### ***Neighborhood Physical and Service Environment***

The broadly conceived neighborhood can include physical, service/amenity, and social components (Kearns & Parkinson, 2001). We focus here on the first two aspects, i.e., physical and service/amenity components, and deal separately with social components in the following community domain. We asked people about their perception and use of the local area, defining this as a 5–10-minute walk around their home.

Perceived quality of the neighborhood environment was based on six items from the survey: attractiveness of buildings; attractiveness of the environment; the quiet and peacefulness of the area; parks and open spaces; street lighting; and paths and pavements. Respondents were asked to rate the quality of each aspect in their local area using a 5-point Likert scale ranging from 1 (*very good*) to 5 (*very poor*). We counted the number of items rated as very good or good and divided the sample into approximate tertiles on this basis: all aspects good, most (4 or 5) aspects good, half or fewer (0 to 3) aspects good.

Regular use of the neighborhood was measured in four ways. Respondents were asked on how many days in the last week they had walked around their neighborhood for at least 20 minutes at a time, coded as most days (5+), some days (1 to 4), or never. Respondents were asked if they participated in clubs (including social clubs, associations, church groups, or similar), producing a binary “participation in clubs” variable (any vs. none). Respondents were asked how many of a list of 11 everyday amenities they had used in the past 7 days, both within their local area (10-minute walk from the home) and outside the area, with a view to identifying those who predominately used local amenities.

The amenities were as follows: sports facility, pool, or gym; sporting event; social venue, e.g., pub, bingo, social club; park or play area; post office; small grocers; supermarket; shopping center; library; community center. We counted how many of these amenities respondents had used and created two variables, based on tertiles: use of local amenities (3+ vs. 2 vs. 0 or 1) and use of amenities outside the area (none vs. 1 vs. .2+).

### ***Neighborhood Social Environment***

The third domain was the social dimension of the local environment, including aspects of belonging and trust. Connection to the community was measured in two ways. Respondents were asked to what extent they “feel part of the community”: a great deal; a fair amount; and not very much or not at all. They were also asked if they know people in their neighborhood: most or many; some; and very few or no one.

Aspects of crime and safety were assessed by asking respondents the number of antisocial behaviors they considered to be a problem in their neighborhood: vandalism and graffiti; violence including assaults; insults and intimidation in the street; harassment due to skin color or ethnic origin; drug use or dealing; drunk or rowdy behavior in public; gang activity; teenagers hanging around; nuisance neighbors or problem families; and burglary. Almost two thirds of respondents reported no problems and the remaining third were split into one or two versus three or more problems. Trust in neighbors, manifest as

collective efficacy, was assessed by asking respondents to what extent they agreed with the statement: “It is likely that someone would intervene if a group of youths were harassing someone in the local area,” coded as agree (including strongly agree or agree responses), neutral (neither or don’t know), and disagree (disagree or strongly disagree).

Finally, respondents were asked how safe they would feel walking alone in their neighborhood after dark. “Feel safe at night” was divided into four groups: safe (including the very safe and fairly safe responses); never walk alone; neutral (neither safe nor unsafe); and unsafe (including the a bit unsafe and very unsafe responses).

### *Confounders*

A number of individual-level, confounding variables that may affect both loneliness and residential factors, and that have been routinely used as controls in other studies, were included: sex; age (< 40 years, 40–64 years, and ≥ 65 years); household type (single adults, cohabiting adults, older singles, older cohabiting, single parent families, and two parent families); employment status (working or in education or training, unemployed, long-term sick, looking after the home, retired); education (with or without qualifications); long-standing illness, disability or infirmity (yes or no); and migrant status (British citizen or not). The last of these was included because some of the study communities had served as reception areas for asylum seekers, and previous research indicates that being a migrant is predictive of loneliness (Hawthorne, 2008).

### *Analyses*

We used multinomial (polytomous) logistic regression to explore the association(s) of loneliness with housing, neighborhood, and community variables. Respondents who reported being rarely or never lonely formed the baseline comparison group, and separate odds ratios (OR) and 95% confidence intervals (CIs) were calculated for respondents who reported being sometimes lonely and often or always lonely. All analyses were adjusted for the individual-level confounding variables listed above.

The analyses were carried out as follows. First, univariable analyses were conducted within each of the three domains (housing and residential, neighborhood, and community factors). Only variables that were strongly associated with loneliness ( $p < 0.05$ ) were considered for inclusion in subsequent multivariable models. Pairwise adjustment was then conducted within each domain, and where the association of a residential variable with loneliness was completely attenuated by the inclusion of all of the other individual factors, the variable in question was dropped from the multivariable models.

Last, we performed a series of multivariable models in which different combinations of residential factors were included; if any factor was consistently attenuated by other variables in the model, then this variable was dropped from the analysis. Final multivariable models were constructed that considered the simultaneous effect on loneliness of all remaining variables within the same domain, again controlling for individual confounders.

## **RESULTS**

Because of missing values in some variables, our analyses were based on between 3,662 (85%) and 4,080 (95%) of a possible 4,302 respondents. Compared with the Scottish population (Scottish Government, 2013), our study population living in deprived areas

**Table 1. Loneliness by Sociodemographic Characteristics of Deprived Area Residents**

	<i>n</i>	<i>Prevalence of reported loneliness (%)</i>			<i>P</i>
		<i>Rarely/never</i>	<i>Sometimes</i>	<i>Often/always</i>	
Sex					
Male	1,728	61.2	21.8	17.0	
Female	2,474	59.9	25.2	14.9	0.02
Age group					
< 40 years	1,450	65.3	21.2	13.5	
40–64 years	1,782	56.2	26.0	17.8	
≥ 65 years	951	60.8	23.7	15.6	< 0.001
Household type					
Adult, single	998	44.6	31.0	24.5	
Adult, cohabiting	861	66.7	20.8	12.5	
Older, single	582	52.8	28.2	19.1	
Older, cohabiting	400	75.0	15.3	9.8	
Single parent family	677	58.5	28.2	13.3	
Two parent family	610	77.5	12.8	9.7	< 0.001
Employment status					
Work, training, education	1,170	72.1	17.7	10.2	
Unemployed	887	56.0	28.2	15.8	
Long-term sick	587	38.0	30.5	31.5	
Looking after home	409	64.6	21.8	13.7	
Retired	1,108	62.6	23.7	13.8	< 0.001
Education					
No qualifications	2,278	58.3	25.1	16.6	
Any qualifications	1,926	62.9	22.3	14.8	0.01
Long-standing illness, disability, or infirmity					
No	2,699	66.0	21.3	12.7	
Yes	1,487	50.6	28.2	21.2	< 0.001
Migrant status					
British	3,570	59.8	24.2	16.0	
Non-British	634	64.4	21.5	14.2	0.09

has several notable characteristics. Our study communities contained more single adults and especially more single parent families than in Scotland (at 16% of households this is three times the national average). Non-British adults, at 15% of the sample, are also much more common than across Scotland (around 4%). Over a third of our respondents had a long-term illness or disability, although this is not dissimilar to the national rate of a third of households containing someone with this need. Around three in five of our nonretired respondents were not in work, education, or training, which is three times the national rate of nonemployment. This may reflect the fact that 54% of our respondents had no qualifications, again, over three times the national average.

### ***Sociodemographic Patterns of Loneliness***

Table 1 shows the rates of loneliness reported in the sample according to sociodemographic characteristics. In our sample, the ratio between those reporting no or rare loneliness and those reporting occasional or frequent loneliness, at 60:40, is slightly higher than found in the recent U.K.-wide MHF Survey, at 55:45 (Griffin, 2010), i.e., loneliness was slightly less common in our survey. Loneliness was highest among adults in the 40 to 64 years of age group, those who were living alone, and among working-age adults who



**Table 2. Odds ratios (95% CI) for Loneliness According to Housing Factors**

	<i>n</i>	<i>Loneliness (%)</i>		<i>Adjusted for demographics<sup>a</sup></i>	
		<i>Sometimes</i>	<i>Often/always</i>	<i>Sometimes</i>	<i>Often/always</i>
Dwelling type					
House	1,120	21.5	12.7	1.00	1.00
Other flat	1,236	24.5	16.9	1.12 (0.91, 1.38)	1.25 (0.97, 1.61)
High-rise flat	1,306	25.3	17.0	1.14 (0.91, 1.44)	1.16 (0.88, 1.53)
<i>P (trend)</i>					0.39
Years in home					
≥ 11	1,395	23.9	14.4	1.00	1.00
4–10	1,177	24.7	17.1	1.11 (0.90, 1.38)	1.32 (1.02, 1.69)
< 4	1,090	22.9	15.7	0.97 (0.75, 1.26)	1.18 (0.87, 1.60)
<i>P (trend)</i>					0.44
Years in area					
≥ 21	1,548	24.2	14.3	1.00	1.00
6–20	1,014	24.1	18.0	1.12 (0.91, 1.38)	1.46 (1.14, 1.87)
< 6	1,100	23.3	15.5	1.09 (0.85, 1.39)	1.26 (0.94, 1.70)
<i>P (trend)</i>					0.16

<sup>a</sup>Sex, age, household type, employment, education, long-standing illness, and migrant status

were long-term sick or disabled. One in four adult respondents who lived alone and one in three working-age adults who were sick or disabled reported being often or always lonely. Loneliness was least common among cohabiting older people, respondents in two-parent family households, and adults in work or education.

### **Housing Factors**

Rates of reported loneliness were somewhat higher among those living in flats, or who had lived in their home or area for shorter periods (Table 2). However, in models adjusting for sociodemographic characteristics, there were no marked differences in the likelihood of reporting loneliness according to these residential characteristics.

### **Neighborhood Physical and Service Environment**

Respondents who rated their neighborhood as being of lower quality were more likely than other respondents to report feelings of loneliness (Table 3). People who rated only three or fewer of the six neighborhood environment items as good were approximately 50% more likely to report both occasional (OR, 1.50; 95% CI [1.23, 1.84]) or frequent loneliness (OR, 1.48; 95% CI [1.16, 1.88]) compared with those who rated all of the items as good.

With regard to use of the neighborhood (Table 3), although slightly fewer people who walked frequently in the neighborhood and who took part in local clubs and associations reported feelings of loneliness, the differences were not great, and there was little difference in the likelihood of reporting loneliness according to these factors once sociodemographic characteristics were taken into account. These variables were therefore not included in the final multivariable model.

However, use of local amenities was more strongly associated with loneliness, with respondents who made little use of local amenities reporting more loneliness: 44% of

**Table 3. Odds ratios (95% CI) for Loneliness According to Neighborhood Physical and Service Environment**

	<i>n</i>	Loneliness (%)			Adjusted for demographics <sup>a</sup>			Adjusted for demographics and other factors <sup>b</sup>		
		Sometimes	Often/always		Sometimes	Often/always		Sometimes	Often/always	
Perceived quality of neighborhood: number of items rated as "good" or "very good"										
All (6)	1,087	21.6	14.3	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4 or 5	1,557	22.0	15.5	1.03 (0.85, 1.26)	1.12 (0.89, 1.42)	1.10 (0.87, 1.39)	1.03 (0.84, 1.25)	1.10 (0.87, 1.39)	1.10 (0.87, 1.39)	1.10 (0.87, 1.39)
0 to 3	1,387	27.1	17.2	1.50 (1.23, 1.84)	1.48 (1.16, 1.88)	1.42 (1.11, 1.81)	1.48 (1.21, 1.82)	1.42 (1.11, 1.81)	1.42 (1.11, 1.81)	1.42 (1.11, 1.81)
<i>P (trend)</i>					<0.001	<0.001				<0.001
Days walked round neighborhood										
5 or more	1,474	22.4	14.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1 to 4	1,188	24.4	15.9	1.13 (0.93, 1.37)	1.13 (0.90, 1.43)	1.13 (0.90, 1.43)	1.13 (0.90, 1.43)	1.13 (0.90, 1.43)	1.13 (0.90, 1.43)	1.13 (0.90, 1.43)
None	1,369	24.4	17.3	1.05 (0.87, 1.27)	1.10 (0.87, 1.37)	1.10 (0.87, 1.37)	1.10 (0.87, 1.37)	1.10 (0.87, 1.37)	1.10 (0.87, 1.37)	1.10 (0.87, 1.37)
<i>P (trend)</i>					0.68	0.68				
Participation in clubs										
Yes	649	21.9	14.3	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	3,382	24.0	16.0	1.10 (0.89, 1.37)	1.13 (0.87, 1.46)	1.13 (0.87, 1.46)	1.13 (0.87, 1.46)	1.13 (0.87, 1.46)	1.13 (0.87, 1.46)	1.13 (0.87, 1.46)
<i>P (trend)</i>					0.52	0.52				
Use of local amenities										
3 or more	1,581	22.2	12.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1,059	24.4	17.1	1.19 (0.98, 1.45)	1.45 (1.14, 1.84)	1.42 (1.12, 1.81)	1.16 (0.95, 1.42)	1.42 (1.12, 1.81)	1.42 (1.12, 1.81)	1.42 (1.12, 1.81)
0 or 1	1,391	24.8	18.8	1.19 (0.99, 1.43)	1.59 (1.28, 1.99)	1.56 (1.25, 1.94)	1.16 (0.96, 1.39)	1.56 (1.25, 1.94)	1.56 (1.25, 1.94)	1.56 (1.25, 1.94)
<i>P (trend)</i>					<0.001	<0.001				<0.001
Use of amenities outside the area										
None	1,580	24.9	16.9	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	1,148	24.0	15.3	0.98 (0.81, 1.19)	0.95 (0.76, 1.20)	0.95 (0.76, 1.20)	0.95 (0.76, 1.20)	0.95 (0.76, 1.20)	0.95 (0.76, 1.20)	0.95 (0.76, 1.20)
2 or more	1,303	21.9	14.7	0.93 (0.77, 1.12)	0.98 (0.79, 1.23)	0.98 (0.79, 1.23)	0.98 (0.79, 1.23)	0.98 (0.79, 1.23)	0.98 (0.79, 1.23)	0.98 (0.79, 1.23)
<i>P (trend)</i>					0.76	0.76				

<sup>a</sup>Sex, age, household type, employment, education, long-standing illness, and migrant status.

<sup>b</sup>Impact of each neighborhood factor adjusted for demographics and all other neighborhood factors in this column.

those who used the fewest local amenities reported loneliness, compared with 34% of those who used the most local amenities. After taking sociodemographic characteristics into account, people who had used only two (OR, 1.45; 95% CI [1.14, 1.84]) or one/no (OR, 1.59; 95% CI [1.28, 1.99]) local amenities in the past week were more likely to report frequent loneliness than those who made use of more local amenities. Use of nonlocal amenities had little effect on loneliness. The final multivariable model included perceived neighborhood quality and use of local amenities. Reciprocally adjusted associations with loneliness were almost identical to those presented in univariable models.

### *Neighborhood Social Environment*

Several aspects of the community were associated with feelings of loneliness (Table 4). Being connected to the community was important. Adjusting for sociodemographics, those people who did not feel part of their community were more likely to report occasional (OR, 1.40; 95% CI [1.13, 1.72]) or frequent (OR, 1.83; 95% CI [1.44, 2.32]) loneliness than those who had a strong feeling of community. Similarly, respondents who knew few people in the neighborhood were more likely to report occasional (OR, 1.38; 95% CI [1.13, 1.68]) or frequent (OR, 1.75; 95% CI [1.40, 2.20]) loneliness than those who knew many or most people locally.

Perceptions of the behavior of members of the community were also associated with feelings of loneliness. People who reported more antisocial behavior problems in their area were more likely to report both occasional (OR, 1.37; 95% CI [1.11, 1.69] in the case of three or more problems) and frequent loneliness (OR, 1.88; 95% CI [1.49, 2.38]). Similarly, those people who did not feel they could rely upon the intervention of their neighbors in the case of antisocial behavior were also more likely to report occasional (OR, 1.22; 95% CI [1.01, 1.47]) or frequent loneliness (OR, 1.67; 95% CI [1.34, 2.07]). Finally, respondents who felt unsafe walking alone at night were more likely to report feeling occasional (OR, 1.39; 95% CI [1.12, 1.71]) or frequent loneliness (OR, 1.91; 95% CI [1.50, 2.43]).

Results from multivariable models indicated that the association of loneliness with feeling part of the community was explained by the other four factors, and this variable was therefore omitted from the final model in Table 4. Results from the multivariable model that included the other four variables suggested that there was some attenuation of associations with loneliness. However, even after attenuation, loneliness was more common in respondents who knew few or no people in the neighborhood, who reported three or more antisocial behaviors, who did not believe their neighbors would intervene if they witnessed antisocial behaviors, and who did not feel safe walking alone at night.

## **DISCUSSION**

We have studied feelings of loneliness among residents of deprived areas and found that the prevalence of loneliness is quite common among this population group: Approximately two in five adults reported feelings of loneliness in the previous 2 weeks, and one in six reported being “often” or “always” lonely. These rates are consistent with other recent U.K. findings in which the argument has been made that society is getting lonelier (Griffin, 2010). It is hard to tell what effect our sample characteristics have had on our estimates of loneliness, as the recent U.K.-wide research (Griffin, 2010) indicates that women, whom we have oversampled, suffer loneliness more than men, but so too, to a greater degree, do younger adults, whom we have undersampled. On the other hand,

**Table 4. Odds Ratios for Loneliness According to Neighborhood Social Environment**

	<i>n</i>	Loneliness (%)			Adjusted for demographics <sup>a</sup>			Adjusted for demographics and other factors <sup>b</sup>		
		Sometimes	Often/always	Sometimes	Often/always	Sometimes	Often/always			
Feel part of community										
A great deal	1,423	21.7	14.5	1.00	1.00					
A fair amount	1,477	25.4	13.6	1.33 (1.10, 1.60)	1.07 (0.85, 1.34)					
Not much/at all	1,131	24.2	19.9	1.40 (1.13, 1.72)	1.83 (1.44, 2.32)					
<i>P</i> (trend)					<0.001					
Know people in neighborhood										
Most/many	1,702	22.4	13.5	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Some	1,137	23.8	15.0	1.13 (0.93, 1.37)	1.17 (0.93, 1.47)	1.09 (0.90, 1.33)	1.10 (0.87, 1.39)	1.10 (0.87, 1.39)	1.10 (0.87, 1.39)	1.10 (0.87, 1.39)
Few/no one	1,192	25.6	19.6	1.38 (1.13, 1.68)	1.75 (1.40, 2.20)	1.29 (1.05, 1.58)	1.52 (1.20, 1.93)	1.52 (1.20, 1.93)	1.52 (1.20, 1.93)	1.52 (1.20, 1.93)
<i>P</i> (trend)					<0.001					0.001
Number of antisocial behaviors										
None	2,510	22.6	13.5	1.00	1.00	1.00	1.00	1.00	1.00	1.00
One or two	740	25.0	17.8	1.33 (1.08, 1.64)	1.65 (1.29, 2.09)	1.28 (1.04, 1.58)	1.49 (1.16, 1.90)	1.49 (1.16, 1.90)	1.49 (1.16, 1.90)	1.49 (1.16, 1.90)
Three or more	781	26.4	20.7	1.37 (1.11, 1.69)	1.88 (1.49, 2.38)	1.25 (1.00, 1.56)	1.49 (1.15, 1.92)	1.49 (1.15, 1.92)	1.49 (1.15, 1.92)	1.49 (1.15, 1.92)
<i>P</i> (trend)					<0.001					0.001
Neighbors would intervene (collective efficacy)										
Agree	1,750	22.4	13.5	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Neither/don't know	1,060	25.4	14.8	1.17 (0.96, 1.41)	1.15 (0.91, 1.46)	1.10 (0.90, 1.34)	1.04 (0.81, 1.33)	1.04 (0.81, 1.33)	1.04 (0.81, 1.33)	1.04 (0.81, 1.33)
Disagree	1,221	24.3	19.6	1.22 (1.01, 1.47)	1.67 (1.34, 2.07)	1.07 (0.88, 1.30)	1.32 (1.05, 1.66)	1.32 (1.05, 1.66)	1.32 (1.05, 1.66)	1.32 (1.05, 1.66)
<i>P</i> (trend)					<0.001					0.06
Feel safe walking alone at night										
Safe	2,002	22.1	13.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Never walk alone	953	23.7	17.0	0.94 (0.76, 1.17)	1.18 (0.92, 1.52)	0.89 (0.72, 1.11)	1.07 (0.83, 1.38)	1.07 (0.83, 1.38)	1.07 (0.83, 1.38)	1.07 (0.83, 1.38)
Neither	277	28.9	14.1	1.48 (1.09, 2.00)	1.21 (0.81, 1.79)	1.39 (1.02, 1.89)	1.10 (0.74, 1.63)	1.10 (0.74, 1.63)	1.10 (0.74, 1.63)	1.10 (0.74, 1.63)
Unsafe	799	26.2	20.8	1.39 (1.12, 1.71)	1.91 (1.50, 2.43)	1.22 (0.97, 1.52)	1.47 (1.13, 1.90)	1.47 (1.13, 1.90)	1.47 (1.13, 1.90)	1.47 (1.13, 1.90)
<i>P</i> (trend)					<0.001					0.01

<sup>a</sup>Sex, age, household type, employment, education, long-standing illness, and migrant status.

<sup>b</sup>Effect of each community factor adjusted for demographics and all other community factors in this column

women, especially those with dependent children, are more likely to be more sensitive than others and therefore influence of some of the main factors we have investigated, such as neighborhood conditions and sense of community.

Our study sheds new light on the fact that loneliness is not only high among older people living alone, but highest, in deprived areas, among two other groups: adults below retirement age living alone, and adults of working age who are classified as long-term sick or disabled. The latter finding chimes with other recent research that showed that the effect upon mental health of being permanently sick or disabled was greater for people living in areas with high levels of inactivity, i.e., deprived areas (Fone, Dunstan, Williams, Lloyd, & Palmer, 2007). We have reported a related finding for loneliness, specifically that it is a much more prevalent problem for long-term sick and disabled people in deprived areas.

On the basis of past research evidence about the links between neighborhoods and mental health, we examined the relationships between aspects of the residential environment and loneliness. Despite past evidence and recent research on the negative social and well-being effects of living in high-rise accommodation (Kearns, Whitley, Mason, & Bond, 2012), we did not find dwelling type to be significantly associated with loneliness after adjustment for all of our sociodemographic variables of interest. One explanation for this might be that because we have a full set of controls for some of the personal characteristics strongly associated with loneliness (e.g., employment status, long-term illness), we have removed some of the confounding effects resulting from placing such at-risk groups in tower blocks. This possibility is consistent with the notion of a “vicious circle” or “spiral of decline” operating on mass housing estates (predominantly high-rise), whereby insecurity rises as housing allocation difficulties lead to the increasing letting of dwellings to “vulnerable households” (see Power, 1997, figure 5.3, p. 103).

Contrary to expectations about how people form relationships with their neighbors or coresidents, we did not find a consistent linear trend of declining loneliness with increasing length of residence in the home or neighborhood. However, there is some evidence of a nonlinear relationship between length of residence and loneliness, with the prevalence of frequent loneliness being slightly higher among those in the middle of the residence range. This echoes other recent research that showed a similar nonlinear relationship between length of residence and place attachment, also in deprived areas (in England; Bailey, Livingston, & Kearns, 2011). The findings highlight the salience of the question raised by Somerville (2011) as to whether there is any evidence that the desired end state for a community would include all the elements identified by Clarke (2009), including “sociality.” Or rather, we might ask whether the important elements of a community are things that we should expect to achieve only after some length of residence.

We found two aspects of the neighborhood to be associated with residents’ feelings of loneliness. First, perceived quality of the neighborhood physical environment was negatively associated with both occasional and frequent loneliness, i.e., those people who rated fewer aspects of their neighborhood environment as of good quality were more likely to report feelings of loneliness. This is consistent with an earlier finding from the current study, using data from a previous survey wave: Those people who rated their neighborhood of lower quality also had lower mental well-being, with the biggest single effect being for the attractiveness of the environment (Bond et al., 2012). The relationship between neighborhood quality and reported loneliness could reflect an effect of the neighborhood environment upon residents’ mood, or it may be the case that poor quality environments have lower rates of activity such as pedestrian traffic and that this in turn has effects upon how lonely people feel.

The second aspect of the neighborhood that was found to be important was the extent to which respondents used local amenities: People who used more amenities reported less loneliness. Again, our findings from an earlier wave of the present study are relevant. We found that the frequency with which people walked around their neighborhood each week was most affected by their use of local amenities, particularly parks and play areas and general shops (Mason, Kearns, & Bond, 2011). Our finding that the use of local amenities was associated with loneliness is contrary to that of a previous study also conducted in deprived areas. However, the previous study was very small (65 respondents), confined to older adults, and with a high number of missing responses on the amenities variables (Beech & Murray, 2013), and thus our finding is an important addition to the evidence.

Our findings on the relationships between the neighborhood social environment and loneliness confirm the understanding that “generally cohesive communities do tend to bring [health] benefits” (Halpern, 2005, p. 95). But rather than combine a range of questions into an aggregate measure of neighborhood social capital, which has been found to be associated with mental health in the United Kingdom (McCulloch, 2001), our results (particularly the eclipsing of a general “belonging” variable by more specific measures in a multivariable model) indicate the importance of teasing out which aspects of belonging and community really matter, and suggest that all three elements of social capital—networks, norms, and trust (Putnam, 1993)—are relevant to feelings of loneliness.

First, the more people someone knew in their wider neighborhood, the less likely they were to report loneliness. It seems that loose and broad networks of acquaintance are important. Such networks differ from, but may also be in addition to, the more direct social relationships often measured in studies of loneliness. Second, local norms of behavior are important. People who report antisocial behavior problems in their neighborhood are also more likely to report loneliness than those who do not identify antisocial behavior. Of course the measure here is of perceptions of antisocial behavior rather than actual reported incidents or crimes, and thus may relate also to the third element of social capital, trust.

Here we found that the less confident people were about their ability to rely on their neighbors to exercise control over antisocial behaviors, the more likely they were to report frequent loneliness. People were also more likely to feel lonely if they felt unsafe walking alone in the area at nighttime. These three factors may all reflect an underlying level of trust (or lack thereof) in one’s neighbors. Thus, our results suggest that trust in those who live around you in deprived areas is associated with feelings of loneliness: You are lonely if you feel you cannot trust people.

It may also be the case that loneliness can be the product of an interplay between social conditions and the vulnerability of individuals in deprived areas. This understanding concurs with other recent research that compared populations in deprived and affluent areas and found an interaction between location, personality, and mental well-being. Specifically, in deprived areas, individuals with high neuroticism and low extraversion reported lower mental well-being, measured using several scales (Packard et al., 2012). Thus, individuals with certain personality traits, living in deprived areas, may be more likely to identify social problems as serious issues, be less trustful of others, and as a result of both these things, also feel more lonely.

### ***Strengths and Limitations***

We have examined the associations between loneliness and the residential environment for people living in deprived areas. The focus on these particular areas can be seen as

both a strength and a limitation of our study. On the one hand, this is a section of the population with limited resources whose quality of life is greatly affected by where they live, and our findings suggest that feelings of loneliness might be averted or lessened in neighborhoods with better amenities and community infrastructure. On the other hand, the findings are not generalizable to those living in other places, who may have greater mobility and resources to enrich their lives beyond where they live and may not be so affected by their immediate surroundings.

Our data are cross sectional, and so it is theoretically possible that our analysis has merely picked up an underlying negative response set, i.e., a tendency to report everything negatively, including health and residential factors, or that the findings reflect a reverse causality, i.e., preexisting loneliness has driven people's perceptions of their housing, neighborhood, and community. However, the fact that we found some factors to be associated with loneliness, and not others, makes these things less likely to be the case.

### **Conclusion**

Public policy has become interested in happiness and well-being, with the U.K. Prime Minister saying, "It's time we admitted that there's more to life than money and it's time we focused not just on GDP but on *GWB* – general well-being" (Stratton, 2010). This pledge has produced a program for measuring well-being within the U.K. Office for National Statistics, and a recognition that "where we live can have a significant impact on our sense of well-being" (Randall, 2012, p. 1). Our findings contribute to the further development of this policy objective by showing in detail how aspects of "where we live" can have effects upon feelings of loneliness for people living in deprived areas. The research provides indications of where action might be taken within deprived neighborhoods and communities, for example, as part of the preventative approach adopted within the Scottish Government's mental health strategy (Scottish Government, 2012a). This is important because loneliness "plays a role in mental disorders such as anxiety and paranoia" (Griffin 2010, p. 4).

Our results may also help address the question posed by a major U.K. social policy charity as an objective for one of its action research programs, namely, What can neighborhoods do to support people living with loneliness? (Robbins, 2011). Our findings suggest that improving neighborhood quality in deprived areas, for example, through improved environmental services to remove signs of antisocial behavior (Hastings, 2009), should help tackle loneliness, as will the provision of more or better quality amenities (Macintyre, McDonald, & Ellaway, 2008), so that people have more opportunity and are more encouraged to use such amenities, as this can prevent loneliness. Although the potential of other forms of social contact, such as use of the Internet, to prevent loneliness have been suggested (McCausland & Falk, 2012), many people in deprived areas, 41% in Scotland, do not have Internet access in their home (Scottish Government, 2012b). A commitment such as that by the Scottish Government to develop a national neighborhood quality framework to underpin action to improve neighborhood quality is therefore a step in the right direction (Good Places Better Health Evaluation Group, 2011).

Our findings also support the notion that social regeneration, in the form of community support and development interventions, should comprise a more integral and better specified element of regeneration strategy and programs than at present (Beck et al., 2010), because a lack of familiarity and trust in others who live nearby is an issue underlying feelings of loneliness for people living in deprived areas. The answer to the rhetorical-sounding but nonetheless realistic query raised by the Japanese novelist and

critical observer of urban life, Haruki Murakami, namely, “Why do people have to be this lonely?” (Murakami, 2002), should be that with research-informed policy and practice, they do not have to be.

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