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The Effects of Mobility on Neighbourhood Social Ties

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The Effects of Mobility on Neighbourhood Social Ties[1]

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Abstract

This research examines the strength of people's ties with close neighbours and the sensitivity thereof to changes in residential mobility, access to modes of public and private transport, and changes in the availability of modern communications technologies using the German Socio-economic Panel Study (SOEP). All forms of mobility have increased over time and are negatively associated with visiting neighbours. With further increases in mobility, close neighbours may become less relevant. Nevertheless, presently the incidence of visits with neighbours is sizeable; in contrast to the frequent assertion in the literature that the neighbourhood is of no importance.

JEL Classification: J19, R29, Y8, Z13

Keywords: Neighbourhood, Social interactions, Mobility, Transport, Internet, Family ties

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1. Introduction

The concern that the local community may disappear due to increases in mobility has been prevalent for many decades. In the work of Tönnies (1887), Durkheim (1893) and Simmel (1908) we already find the argument that urbanization, specialization, and bureaucratization lead to socially more heterogeneous and physically more mobile societies in which the sense of community and solidarity is lost.[1] A few decades later, Wirth (1938) predicted that with larger shares of the population living in metropolitan than in rural areas and with rural lifestyles increasingly mirroring urban lifestyles, the larger and more heterogeneous urban populations will make it possible for people to choose their social contacts based on common interests rather than common locality, undermining social interactions among neighbours. More recently, access to public transportation and telecommunications have been argued to make distance less of a constraint in maintaining contacts to like minded people who may not live next door (Aronson, 1971; Wellman, 1979, 2001a). This amplifies the original prediction that the sense of community will disappear (Wellman and Leighton 1979), suggesting that social contacts overall will remain important in the future, but neighbours will not.

The erosion of the importance of place is also picked up in the debate about the effects of globalization (Bauman, 2000; Beck, 1986; Giddens, 1991; Sennett, 1998). People are increasingly expected to move to where the jobs

are and often have to leave their familiar environment which means it becomes more difficult to establish social ties in the neighborhood because of these frequent moves and the high likelihood of having to move yet again. Looked at the matter from a different angle, close ties to particular places may represent an obstacle to employment as not all locations offer the same opportunities. Moreover, a fast growing body of literature suggests that it is not only employment but also education, health and deviant behaviours that may be affected detrimentally by the neighbourhood context (for reviews see, e.g., Dietz, 2002; Durlauf, 2003; Friedrichs et al., 2003; Sampson et al., 2002). This may lead us to conclude that breaking neighbourhood ties is something positive, lowering the disincentive for people to move to more promising neighbourhoods. However, being embedded in the community has positive effects on well-being (Argyle, 1999; Diener et al., 1999; Layard, 2005) and as such deserves our attention, even if we question the quality of the local network. Moving from distressed neighbourhoods may improve the lot of those who move, but the fluctuation in the neighbourhood population – if the theory is right – may mean net reductions in the population well-being because neighbourhood social ties are being undermined.

Given the long history of claims that residential mobility and access to transport and modern communication technologies have a negative effect on neighbourhood social ties, the agenda of this research is to provide some

empirical evidence on the relative importance of each of these. There is in fact a long and rich tradition of research in the social sciences devoted to describing and explaining social participation. Studies have looked at the effects on social participation of residential mobility (e.g., Kasarda and Janowitz, 1974; Sampson, 2001), physical mobility—i.e., the effects of access to private or public transport—(e.g., Kenyon et al., 2003), and virtual mobility—i.e., the effects of modern communication technologies (e.g., Shklovski et al., 2004). Much less is known, however, about the joint impact of these aspects on people's ties with their local community, and the relative importance of each. While we may expect that residential mobility and physical mobility increased gradually, communication technology use can be expected to have produced the most marked and sudden effect on social interactions—mainly because of the speed with which the Internet entered peoples' lives. Has the Internet affected people's social relations with their neighbours over and above other changes in mobility that may have occurred? Furthermore, are there differential impacts of mobility on the social relations with neighbours than on relationships with other people as suggested by (Wellman, 2001a)?

The structure of this article is as follows. We will first review empirical studies that have looked at the predictors of neighbouring in general and at its associations with residential, physical and virtual mobility more specifically (Section 2). Section 3 describes that data used and Section 4

details the methodology employed. Empirical results are presented in Section 5. The article concludes with a discussion of the results.

2. Literature Review

Neighbourhood social ties have been studied extensively for their role in shaping the social structure of societies (e.g., Mayntz, 1958; Park and Burgess, 1925; Warner et al., 1963) and also for their potential role in delivering support (e.g., Etzioni, 1993; Jacobson, 1986; Sampson et al., 1999; Schmitt, 2005; Unger and Wandersman, 1985). Common indicators of social ties with neighbours in the quantitative literature are the prevalence of support provided by neighbours and of visits between neighbours. Lee and Campbell (1999, p.127) for instance, find that neighbours sometimes "(borrow) something small like a cup of sugar", "(receive) assistance in a minor emergency", "(get) a hand with home repairs", or "(obtain) needed information". Visits with neighbours are less common (Schmitt, 2005), but may be regarded as an indicator that neighbourhood ties may be strong enough to function even in (emotionally/financially) more difficult situations than these. Among the characteristics that have been shown to influence visiting are the size of the local community, population density, social class, and stage in the lifecycle (Kasarda and Janowitz, 1974; Sampson, 2001; Vierecke, 1972).

2.1 Residential Mobility and Neighbourhood Social Ties

A number of studies have examined the effects of both micro- and macro-level residential mobility on neighbourhood social ties (Kasarda and Janowitz, 1974; Sampson, 2001; Vierecke, 1972). They operationalise residential mobility as length of residence and homeownership status. If communities form naturally as a by-product of daily routines (Logan and Spitze, 1994, p. 458), the argument goes, people who have lived in the neighbourhood for longer have invested more in local ties and this lowers the probability to be residentially mobile (Belot and Ermisch, 2006). Recent (and frequent) movers not only have had little time to get to know their neighbours but they maintain ties to friends and family living elsewhere (Kling and Liebman, 2004; Pelizäus-Hoffmeister, 2001; Shklovski, 2007). Homeowners, due to the expected length of residence, may be willing to invest more in nurturing contacts with new neighbours (Tobey et al., 1990). Already existing ties to a particular neighbourhood (for instance, family, relatives or friends living in the area) as well as the perceived density of social ties in the neighbourhood may also play a role in the choice process. A person willing to buy a house may, for instance, take the homeownership rate in the neighbourhood as an indicator of neighbours' willingness to invest in neighbourhood social ties .

2.2 Physical Mobility and Neighbourhood Social Ties

Of the three mobility-related aspects that are analysed here in their impact on social interactions between neighbours, people's access to public transport and/or to a private mode of transportation (such as an own car) is the least-researched subject. Kenyon, Rafferty and Lyons (2003) tackle the subject indirectly when they look at the effects of transportation inaccessibility on social exclusion. Lack of access prevents people from a wide range of activities and allows them to engage in activities less frequently and with a greater likelihood in their neighbourhood. People with good access to private or public transport – such as individuals in higher professions (Mayntz, 1958) - will travel greater distances, other things being equal, and thus be away from their immediate neighbourhoods more often.[2] The risks of social exclusion due to lack of access to transportation is particularly marked for the elderly, low-wage workers, children and teenagers in low-income families (Pickup and Giuliano, 2005).

2.3 Virtual Mobility and Neighbourhood Social Ties

There has been a plethora of research into the social repercussions of Internet use but without providing stringent results (for a review of this literature see Nie, 2001; Shklovski et al., 2004). In particular, there is little empirical evidence on the effects of Internet use on social interactions between neighbours. Wellman (2001b; 2001a), for instance, investigates

whether communities have disappeared due to Internet use (which is not confirmed by the empirical evidence) but relaxes the definition of 'community' to include a non-physical dimension. The effects of virtual mobility may be quite complex. Internet use may benefit the establishment and nurturing of social contacts with neighbours (as suggested by Matei and Ball-Rokeach, 2001). However, there is the risk that online social ties substitute for face-to-face interactions with people who are principally within physical reach. We might not expect any effect of Internet use on social interactions with neighbours. If anything, we might expect (heavy) Internet users to simply have less time for personal contact.

3. Data

This research is based on data derived of the German Socio-Economic Panel Study (SOEP), a continuing longitudinal general topic social survey of the population living in Germany. The salient features of the survey include household composition, employment, well-being and living standards. The survey started in 1984 and individuals and their households were followed annually.

This analysis focuses on information on social visits with neighbours which was collected in 1994, 1999 and 2004. The question reads "Do you have neighbours with whom you get on so well that you visit each other?" If answered affirmatively, the response to the question "How often do you visit each other usually?" is also recorded. The four answer categories are almost daily, at least once a week, at least once a month, and less than once

a month. Some other key information required for this analysis - including information about access to Internet at home and access to a number of modes of transport - is not available for the same waves (see Table 1) so I pooled data of consecutive waves (1994 & 1995, 1998 & 1999, and 2003 & 2004). To assure that the information on visiting neighbours and the mobility portfolios refer to the same location I include in my sample only those individuals who lived in the same place at the month of the interviews for the respective pooled waves.

Sample members in 1999 and 2004 have lived in the neighbourhood for at least a year when they provide information on visiting neighbours (because this information is collected in the second of the two consecutive waves). In contrast, sample members in 1994 may have moved to the neighbourhood very recently. If there is a correlation between the visiting propensity and the length of residence, we may observe a decline in visiting neighbours from 1994 to 1999 because of the different sample and not because of greater mobility. We can ignore this potential problem for two reasons: First, the problem can only be marginal because the overall number of moves within any year is low in Germany. Second, because SOEP does not provide information on all kinds of mobility in 1994 I can only use data for 1999 and 2004 for multivariate analyses. In these later two years the problem does not exist.

Table 1
Availability of data on social interactions with neighbours and of mobility indicators in the SOEP 1994-2004

Indicator	1994		1999		2004	
	1994	*1995*	*1998*	*1999*	*2003*	*2004*
Visiting neighbours	X	n.a.	n.a.	x	n.a.	x
Visiting family	X	n.a.	n.a.	x	n.a.	x
Residential mobility	X	(x)	(x)	x	(x)	x
Physical mobility - private	n.a.	x	x	n.a.	x	n.a.
Physical mobility - public	n.a.	n.a.	x	n.a.	x	n.a.
Virtual mobility	n.a.	n.a.	n.a.	x*	x	n.a.
Neighbourhood characteristics	X	n.a.	n.a.	x	n.a.	x
Individual characteristics	X	(x)	(x)	x	(x)	x

Notes: The denotation is as follows: x = indicators that are available. (x)= available but not used; n.a. = not available in the respective year; * Constructed on the basis of data collected in 2001.

Pooling of data from two consecutive waves of the panel study also implies that only individuals who have provided information in those two years will be included in the analysis. Finally, between 1999 and 2004 the SOEP introduced two new samples (Sample F and Sample G, respectively). To keep the 1999 and 2004 samples comparable I exclude these samples from the 2004 sample.

Further descriptions and summary statistics of all variables used in this analysis can be provided by the author on request.

3.1 Setting the Scene: The Prevalence of Visiting and Mobility

The data indicate that the prevalence of visiting neighbours is sizeable (Table 2). 57 percent of the population visits with neighbours at least occasionally and the share of visitors has remained fairly constant over time. The share of people claiming to visit neighbours more than once a month has significantly fallen. This implies that people may still visit neighbours as they become more mobile but that this activity features in their diaries less often. This idea is supported by the distribution of the frequency of visits for only those people who do visit neighbours (bottom part of Table 2).

Table 2
Percent of the population that visits neighbours, by frequency of visits 1994, 1999 and 2004

All	***1994***	***1999***	***2004***
Never	42.0	43.2	43.5
less than once a month	13.2	13.5	15.4
at least once a month	16.6	15.6	17.0
at least once a week	20.2	21.5	19.3
almost daily	8.0	6.2	4.8
Visitors only	***1994***	***1999***	***2004***
less than once a month	22.8	23.8	27.2
at least once a month	28.6	27.4	30.2
at least once a week	34.9	37.9	34.1
almost daily	13.7	10.9	8.5

Source: SOEP 21. Author's calculations.

With respect to changes in mobility, the data indicate that the population has become more residentially, physically and virtually mobile (Table 3). The share of the population that lived in the neighbourhood for at least 5 or 10 years has declined by 4 percentage points. Parallel to this, more people had good access to transportation in 2004 than in 1994 – on most measures of physical mobility there have been increases of at least 3 percentage points.[3] Yet the greatest rise has occurred in terms of virtual mobility. In 1999, 16 percent of the population had access to the Internet at home. In 2004 this figure was 42 percent. This represents an increase of 260 percent.

Table 3
Residential, physical and virtual mobility, 1994, 1999 and 2004.

			Percent of the population		
			1994	**1999**	**2004**
Residential Mobility	Lives in rented accommodation		54.9	52.8	51.6
	Lived in the neighbourhood for	*at least two years*	92.5	89.5	91.5
		at least five years	76.2	70.8	72.3
		at least ten years	57.0	55.2	53.3
Physical Mobility[2]	Car	*not available*	31.3	31.9	28.0
		occasionally available	11.1	10.3	9.5
		always available	57.6	57.7	62.4
	Bus	*available*	-	86.3	87.8
	Metro	*available*	-	18.7	21.9
	Train	*available*	-	36.2	41.1
	Taxi	*available*	-	11.0	18.2
Virtual Mobility	Internet	*users*	-	15.9	42.1

Source: SOEP 21. Author's calculations.

Table 4
Percentage of the population that frequently visits neighbours by residential, virtual and physical mobility

		Visits Neighbours		
		1994	**1999**	**2004**
Residential Mobility				
Homeownership	*non-owner*	27.5	25.7	22.1
	owner	29.1	29.8	25.9
Length of stay in the neighbourhood	*Less than two years*	20.2	21.7	20.6
	at least two years	29.0	28.5	24.4
	less than five years	26.6	24.7	21.0
	at least five years	28.8	29.0	25.3
	less than ten years	26.3	25.7	22.1
	at least ten years	29.8	29.4	25.8
Physical Mobility				
Car	*not available*	32.9	31.4	25.7
	occasionally available	27.1	26.7	24.4
	always available	25.9	25.9	23.3
Bus	*not available*	-	25.1	26.6
	available	-	28.1	23.8
Metro	*not available*	-	28.5	25.7
	available	-	23.6	18.6
Train	*not available*	-	28.5	25.8
	available	-	26.2	21.6
Taxi	*not available*	-	27.7	24.0
	available	-	27.6	24.9
Virtual Mobility				
Internet	*non- users*	-	29.9	25.3
	users	-	21.8	22.3
Entire Population				
		28.2	27.4	24.0

Source: SOEP 21. Author's calculations.

Table 4 shows how these changes in mobility are associated with changes in the visiting behaviour. For all types of mobility the data suggest that individuals who may be regarded more mobile are systematically less likely to be frequent visitors with their neighbours. The share of visitors has

declined among both residentially more mobile and less mobile people, but more among the former. Among physically mobile people we also observe an over-proportionate decline in visiting people compared to the entire sample. Finally, the results for virtual mobility suggest that a lower share of Internet users visits with neighbours than non-users. In contrast to the general trend there is no decline in visiting neighbours for Internet users, while the share of non-users that visit neighbours has fallen by four percentage points. In other words, it may not be the virtually mobile people who changed their visiting behaviour, but the others.

4. Methodology

This research investigates whether mobility-related aspects of life have a negative impact on social visits with neighbours and to what extent. I estimate multivariate models to examine the influence of residential, physical and virtual mobility while at the same time controlling for other things associated with visiting. In the absence of any formally stated theoretical model that could indicate which additional socio-economic and demographic characteristics have to be in the model, my strategy is to first estimate models with as few explanatory variables as possible. I then add more controls in order to absorb as much heterogeneity as possible.

Along the lines of empirical findings and theoretical arguments reviewed in Section 2, the hypotheses regarding the effects of mobility on visiting neighbours are as follows. *Residentially mobile* individuals visit less with

neighbours because their past investment into the neighbourhood community is lower and the perceived costs of future investments are higher. *Physically mobile* individuals visit less with neighbours because higher mobility allows greater independence from the local environment. *Virtually mobile* individuals have less face-to-face contact with neighbours because Internet use takes time away from the individual that could be spent visiting.

The statistical approach is as follows. The dependent variable is dummy variable which equal one if an individual visits with his/her neighbours frequently and zero otherwise. Appropriate model choices are the logit or the probit model where the dependent variable y_i can take two values, here

$$y_i \begin{cases} 0 = does\ not\ visit\ with\ neighbours\ \ frequently \\ 1 = does\ visit\ with\ neighbours\ \ frequently \end{cases}$$

The logit model can be derived as a latent variable model, a linear probability model or as a discrete choice model (Long and Freese, 2003, p.110f.). In the terminology of the latent variable model, we assume that there is an unobserved propensity of an individual to visit frequently with neighbours, denoted y_i^*, which takes any value between -∞ and +∞. Let y_i^* be defined as a function of a set of characteristics that stand for an individual's residential, physical and virtual mobility, denoted $Z_{1i} - Z_{3i}$, other characteristics of the individual, denoted X_i, and characteristics of the

neighbourhood, denoted N_i , that have been suggested to be determinants of social interactions between neighbours.

$$y_i^* = \alpha + \beta' X_i + \gamma' Z_{1i} + \delta' Z_{2i} + \varsigma' Z_{3i} + \eta' \mathrm{N}_i + \varepsilon_i$$

Apart from y_i^* and the error term, all variables are observed. The model can be estimated when we link the latent variable y_i^* with the observed binary outcomes in our dataset. We hereby assume that cases with positive values of y_i^* are observed as y_i=1 and cases with non-positive values of y_i^* are observed as y_i=0. Put mathematically

$$y_i = \begin{cases} 0 \; if \; y_i^* \leq 0 \\ 1 \; if \; y_i^* > 0 \end{cases}$$

The probability of observing a positive outcome therefore equals:

$$\Pr(y_i = 1 \mid X_i, Z_{1i}, Z_{2i}, Z_{3i}, N_i)$$

$$= \Pr(y_i^* > 0 \mid X_i, Z_{1i}, Z_{2i}, Z_{3i}, N_i)$$

Long and Freese (2003) show that the probability of a positive outcome is the cumulative density function of the error terms given the values of the independent variables:

$$\Pr(y_i = 1 \mid X_i, Z_{1i}, Z_{2i}, Z_{3i}, N_i)$$

$$= F(\alpha + \beta' X_i + \gamma' Z_{1i} + \delta' Z_{2i} + \varsigma' Z_{3i} + \eta' \mathrm{N}_i)$$

The cumulative density function can be specified as following the normal (probit model) or the logistic (logit model). We employ the logistic cumulative density function.

Estimation of these models then is straightforward, and we hypothesize that if increases in mobility prevent social interactions with neighbours, the γ, δ and ς-coefficients should be negative and statistically significant.

4.1 Endogeneity Problems

The results may be problematic because of endogeneity problems with the mobility measures. If individuals have chosen to live in a neighbourhood with good access to public transportation in order to be able to 'get away' from the neighbourhood, it may not be access to public transport per se that causes less contact with neighbours but the individual's location preference. People may also have chosen to move away from a neighbourhood in which they did not make friends among the neighbours and may then have moved to a neighbourhood in which they think the chances of making friends are higher (because the neighbours appear to be available for social interactions). Conversely, people who prefer to have their privacy may have consciously chosen to live in a neighbourhood in which the neighbours appear to be particularly mobile and not interested in socialising.

To isolate some of these selection effects I test the hypothesis that physical and residential mobility effects in models for individuals, who may not have

chosen the neighbourhood in which they live, mirror that of the entire sample. I will assume that this is the case for individuals that are aged 16-29 and who are still living in their parent's household.

The problem of selection may also exist for virtual mobility. Early users of the Internet may be systematically different from the rest of the population which is problematic if these differences also determine the visiting behaviour. In Germany, early adopters of the Internet mainly live in West Germany, are male (ARD/ZDF-Arbeitsgruppe Multimedia, 1999), 'young', i.e., aged 16-29 (van Eimeren and Gerhard, 2000), and have an upper secondary school-leaving degree (ECIN, 2002). The effects of Internet use of the particular user type can be separated from the effect of Internet use per se by interacting Internet use with those characteristics that are over-represented in the online community at 1999. If selection is driving the virtual mobility effect, the effect of Internet use on visiting neighbours will change substantially.

4.2 Unobserved Heterogeneity

The longitudinal structure of the dataset permits controlling for some of those unobserved characteristics of the individual that do not change over time. I estimate random effects models which use both the cross-sectional and the longitudinal information in the data. For a statistical representation

of the models see (Frees, 2004). We expect that the mobility-related effects on visiting neighbours remain negative in the panel models.

4.3 Effects of Mobility on Visiting Family

A particular feature of this study is that we directly compare the effects of mobility on visiting neighbours with that on visiting family. This comparison is valuable because theory predicts that the effects of residential and physical mobility work in opposite directions (as long as the relevant family member does not live in the same neighbourhood as is the case for the vast majority of the population in Germany). Frequent and recent movers have been shown to maintain close links to their families (by phone, email and post) rather than establishing contacts to new neighbours (e.g., Pelizäus-Hoffmeister, 2001), and poor access to public transport prohibits face-to-face interactions with family members that live outside the neighbourhood (e.g., Kenyon et al., 2003). The effects of virtual mobility, on the other hand, should be in the same direction, that is, Internet use takes away time from the individual to engage in face-to-face interactions with both neighbours and family. Thus, unless the results of our baseline models are confounded due to some unobserved characteristic that affect visiting neighbours and not visiting family, we can be more confident with the identified mobility effects if these effects turn to the opposite sign when we switch the dependent variable from visiting neighbours to visiting family.

4.4 Extension: The Impact of Having Mobile Neighbours

The decision over how much time to allocate to visiting also depends on how much time the others are willing to allocate to this activity (see Sampson, 1988; 2001). To allow for this heterogeneity, I augmented SOEP with indicators of the fluctuation in the neighbourhood population (residential mobility), the neighbourhood-level car ownership rate (physical mobility), and the neighbours' affinity for Internet use (virtual mobility). Each of these indicators has nine categories ranging from "far below (German) average" to "far above (German) average", and has been provided by Microm GmbH for the year 2004. We expect that having more mobile neighbours has an additional, albeit small, negative effect on peoples' propensity to visit neighbours.

5. Findings

5.1 Associations between Mobility and Visiting Behaviour

Table 5 shows the results of multivariate logit models for the outcome 'frequently visiting neighbours' in 1999 and 2004. The first set of models only control for mobility indicators, showing that eight out of nine relevant coefficients that we expect to be negative are indeed negative. The only effect that goes in the opposite direction from what theory suggests is the positive effect of having good access to shared taxis (in both years). As argued above, this may be because shared taxis may actually stand for poor access to more flexible modes of transportation. Note that the effects of having access to modes of public transport on visiting in these parsimonious models are not just confounded effects of living in a city (easy access to the

Table 5
Mobility effects on visiting neighbours, 1999 and 2004.

	All persons		Aged 16-29 living with parents	
	1999	**2004**	**1999**	**2004**
Rented accommodation	-0.01	-0.01	-0.09	0.12
Length of stay in flat (comparison group: more than 10 years)				
less than 3 years	-0.45**	-0.38**	-0.95*	-0.63
3-5 years	-0.1	-0.18*	-0.46	-0.62*
6-10 years	-0.17*	-0.08	-0.13	0.01
Always access to own car	-0.14**	-0.05	*n.a.*	*n.a.*
Easy access to bus	-0.01	-0.06	0.11	-0.1
Easy access to metro	-0.29**	-0.25**	0.03	-0.34
Easy access to trains	-0.14**	-0.08	-0.01	0.16
Easy access to shared taxis	0.04	0.03	-0.11	-0.2
Uses the Internet at home	-0.44**	-0.05	-0.51**	-0.13
Constant	-0.55**	-0.83**	-0.68*	-0.87**
Log Likelihood	-4319.4	-4635.3	-490.5	-517.5
Observations	7,250	8,280	824	942

Notes: * significant at the 0.05 level. ** Significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

metro) or in a village (easy access to shared taxis). There is an effect of living in larger communities but controlling for it does not change the direction of the effects of access to transportation.

As shown in Table 5, the effect of access to transportation disappears when we restrict the sample to individuals aged 16-29 and living with parent(s). The results for residential mobility are also inconclusive for this sample, which suggests that some of the negative associations observed in the whole sample might be driven by neighbourhood selection. The effects of virtual mobility, on the other hand, are more marked and remain statistically significant in the sub-sample of individuals who may not have chosen the particular neighbourhood they live in. However, this sample is very small and also quite different from the entire population in terms of key socio-economic and demographic characteristics that may influence both visiting and being mobile.

5.2 Controlling for more Heterogeneity

Among the characteristics that have been suggested in the empirical and theoretical literature to have an impact on people's visiting behaviour are age, income, employment status and education, and the household context. Table 6 reports the results of cross-sectional models for 1999 and 2004 that include controls for all of these alongside people's mobility portfolio.

Table 6
Logistic regression of mobility on visiting neighbours, 1999 and 2004.

	1999	2004
Rented accommodation	-0.08	-0.07
Length of stay in flat (comparison group: more than 10 years)		
less than 3 years	-0.48**	-0.50**
3-5 years	-0.14	-0.28**
6-10 years	-0.23**	-0.16*
Always access to own car	-0.03	0.01
Easy access to bus	0.02	-0.03
Easy access to metro	-0.22**	-0.19*
Easy access to trains	-0.08	-0.02
Easy access to shared taxis	0.05	0.05
Uses the Internet at home	-0.29**	0.03
Size of township (comparison group: village/small town)		
mid-sized town	-0.20**	-0.28**
city	-0.18*	-0.16*
Age	-0.02*	-0.02
Age²/100	0.02*	0.02
Annual equivalised household income (log)	-0.30**	-0.23**
Male head/spouse employed	0.03	0.03
Female head/spouse employed	-0.06	-0.08
Highest school-leaving degree (comparison group: lower secondary school)		
Intermediate school (Realschulabschluss.)	-0.09	-0.09
technical school (Fachabitur)	-0.17	-0.22
upper secondary school (Abitur)	-0.26**	-0.25**
none of the above	-0.01	-0.33**
German	-0.36**	-0.35**
Baby in household	-0.14	0.28
Kindergarten child in household	0.11	0.37**
Primary school child in household	0.14	0.23**
West Germany	0.18**	0.13
Constant	2.84**	2.01**
Log Likelihood	-4264.2	-4575.8
Observations	7,250	8,280

Notes: * significant at the 0.05 level. ** Significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

The results confirm that older people and families with young children are more likely to visit neighbours (e.g., Feiring and Lewis, 1991). The same is true for less affluent people for who visiting neighbours at home may substitute for more expensive activities like eating out, travelling or going to the cinema. The assertion that unemployed people visit more because they have more time (see, e.g., Paugam and Russel, 2000) finds no support. Cultural socialization within the school (degree), the family (nationality) and the political system (East Germany), however, appears to strongly influence people's visiting behaviour. Compared to those individuals who have a lower secondary school degree, graduates of more advanced school tracks have a lower probability of frequently visiting neighbours. Germans also visit neighbours much less than others.

Finally, people living in the former East Germany were less likely to visit with neighbours in the earlier period. A possible explanation may be that people in East Germany trusted their neighbours less and a culture of visiting could not be established under the GDR regime which sanctioned people that got organized socially or politically. This effect disappeared over time, which is an interesting fact about the process of social assimilation between East and West Germany.

The leading hypothesis that greater mobility is associated with less visiting is still supported when socio-economic characteristics are controlled for.

Table 7
Coefficients on Internet use interacted with individual characteristics that are associated with a high Internet affinity, 1999 and 2004.

1999	**A**	**B**	**C**	**D**	**E**	**F**
Uses Internet at home	-0.30**	-0.45*	-0.26	-0.35**	-0.31**	-0.31**
West Germany		0.16*				
Internet user in West Germany		0.19				
Male			0.06			
Male Internet user			-0.07			
Upper secondary school				-0.34**		
Internet user with upper secondary school degree				0.21		
Young					-0.04	
Young Internet user					0.03	
Young male with upper secondary school degree in West Germany						-0.22
Young male Internet user with upper secondary school degree in West Germany						0.51
Constant	2.86**	2.89**	2.86**	2.84**	2.86**	2.86**
Log Likelihood	-4,265.5	-4,265.0	-4,265.4	-4,264.9	-4,265.5	-4,265.2
Observations	7,250	7,250	7,250	7,250	7,250	7,250
2004	**A**	**B**	**C**	**D**	**E**	**F**
Uses Internet at home	0.03	-0.13	0.03	0.02	0	0.03
West Germany		0.02				
Internet user in West Germany		0.21				
Male			-0.05			
Male Internet user			0			
Upper secondary school				-0.28		
Internet user with upper secondary school degree				0.02		
Young					-0.52**	
Young Internet user					0.21	
Young male with upper secondary school degree in West Germany						0.48
Young male Internet user with upper secondary school degree in West Germany						-0.28
Constant	2.87**	2.99**	2.87**	2.86**	2.87**	2.87**
Log Likelihood	-4,572.7	-4,571.2	-4,572.7	-4,572.7	-4,571.9	-4,572.6
Observations	8,280	8,280	8,280	8,280	8,280	8,280

Notes: * significant at the 0.05 level. ** Significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

The effect of residential mobility is in the hypothesized negative direction and the effects of how long individuals have lived in their accommodation are highly significant in both years. The effects of physical mobility on visiting are ambiguous (like they were in the parsimonious models) and do not systematically support the hypothesis that higher mobility leads to less visiting neighbours. The effect of virtual mobility drops substantially from 0.51 to 0.29 when we control for socio-economic characteristics. The effect also changes over time. In the first period there is a statistically significant negative effect, but this effect disappeared in 2004. A possible explanation for this may be that the more people use the Internet, the less negative implications this has for their frequency of visiting others.

It may also be that the community of Internet users looks different in terms of socio-economic characteristics in these two years and that the effects may be the result of selection. The selection hypothesis finds no support from models including interaction terms for characteristics of early-users and Internet use (Table 7). Dropping 'typical' early users from the sample also does not change the results (results not reported).

5.3 Unobserved Heterogeneity

Table 8 reports the results of random-effects panel models with controls for only mobility-related variables and – given its high significance in the cross-sectional models – community size. In addition, I fitted models that include

controls for socio-economic and demographic characteristics of the individual and his/her household. It can be seen that the majority of the mobility-related effects are negative and statistically significant, which lends strong support for the hypothesis that residential, physical and virtual mobility lead to less visiting neighbours. The associations between Internet use and visiting, which were highly significant and negative in 1999, are also highly significant and negative in the panel models for 1999.

Table 8
Random effects panel models for visiting neighbours.

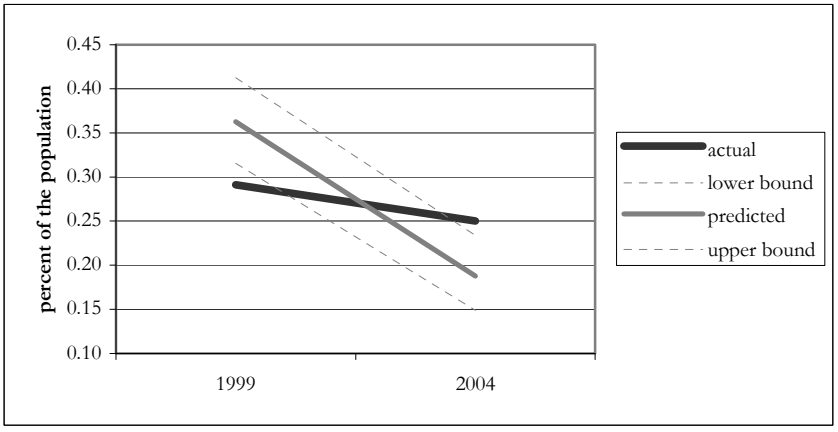
	Mobility + Community size controls	Full set of controls
Rented accommodation	0.08	-0.03
Length of stay in flat (comparison group: more than 10 years)		
less than 3 years	-0.58**	-0.70**
3-5 years	-0.15	-0.27**
6-10 years	-0.20**	-0.30**
Always access to own car	-0.17**	-0.08
Easy access to bus	-0.06	-0.05
Easy access to metro	-0.32**	-0.29**
Easy access to trains	-0.19**	-0.14*
Easy access to shared taxis	0.07	0.07
Uses the Internet at home	-0.38**	-0.30**
Size of township (comparison group: village/small town)		
mid-sized town	-0.22**	-0.24**
city	-0.19*	-0.19*
Constant	-0.87**	3.84**
Observations	7,250	7,250

Notes: * Significant at the 0.05 level. ** Significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

5.4 Illustrations of the Effects

Figure 1 illustrates how substantive the changes in mobility are relative to the aggregate change in visiting by comparing the actual observed change in visiting with that we would observe if the completely immobile persons we observe in 1999 had become completely mobile in 2004. The actual proportion of persons visiting neighbours in 1999 and 2004 are 29 percent and 25 percent, respectively. The predicted decline is much higher than these 4 percentage points - from 32 percent to 15 percent. [4]

Figure 1
Difference between actual change in visiting neighbours from 1999 to 2004 and predicted change due to increases in mobility



The results obtained in the multivariate models can also be used to calculate visiting probabilities for any number of stylized individuals. The predictions for six cases are presented in Table 9. Case 1 has the characteristics of an average sample member in 1999, and Cases 2 to 6 are as Case 1 but have a different mobility portfolio, ranging from being "completely immobile"

(Case 5) to "completely mobile" (Case 6). The differences between the visiting probabilities of Case 5 and each of the other cases can be interpreted as the effects of increases in the respective mobility.

Table 9
Predicted probabilities for visiting neighbours for six stylized individuals*

	Visiting probability	Mobility "Effect"
Case 1: Average person	0.20	-0.08
Case 2: Highly residentially mobile, no other mobility	0.16	-0.12
Case 3: Highly physically mobile, no other mobility	0.19	-0.09
Case 4: Virtually mobile, no other mobility	0.22	-0.06
Case 5: Entirely immobile	0.28	(baseline)
Case 6: Entirely mobile	0.08	-0.20

Notes: * Case 1: Mean characteristics of sample members in 1999, i.e., homeowner, lived in the flat for more than 10 years, has a car, has good access to bus lines but to no other public transportation, lives in a village/small town, the male head/spouse of the household is employed, the female head/spouse of the household is not employed, has no child of kindergarten age, has no child of primary school age, lives in West Germany, is 48 years old, his/her logged equivalent household income is 9.4979. Other cases have the same characteristics as Case 1 but their mobility portfolio varies. For Case 2, mobility related variables are set to 'least mobile', characteristics of residential mobility to 'most mobile'; for Case 3, mobility related variables are set to 'least mobile', characteristics of physical mobility to 'most mobile'; for Case 4, mobility related variables are set to 'least mobile', virtual mobility to 'mobile'; for Case 5, all mobility related variables are set to 'least mobile'; for Case 6, all mobility related variables are set to 'most mobile'.
Source: SOEP 21. Author's calculations.

The average individual has a 20 percent probability of visiting neighbours frequently. The respective probability for a completely mobile individual (Case 5) is 8 percent, which is more than 50 percent lower than that for a completely immobile individual (Case 6: 28 percent). While all stylized

individuals that are more mobile than Case 5 have a lower probability of visiting neighbours, of the three different kinds of mobility, it is residential mobility that is associated with the biggest fall in the probability of visiting (12 percentage points). Physical mobility is associated with a fall of nine percentage points in visiting (note that physical mobility was not statistically significant in the model underlying this prediction). Virtual mobility leads to a decline of six percentage points in the probability of visiting neighbours.

5.5 The Effects of Mobility on Visiting Family

All models were also fitted for the outcome 'visiting family' (for selected results see Table 10). Coefficients on socio-economic characteristics are very similar to those on visiting neighbours, so we do not report them here. Notable differences are that there is no effect of community size, and family visits are about twice as likely as visits with neighbours when a child of kindergarten age lives in the household. Moreover, there is a negative effect on family visits of the male head of the household being employed. As to the effects of mobility on visiting family, there is a positive association with being more residentially mobile, and this is statistically highly significant.

Table 10
Effects of mobility and socio-economic characteristics on visiting family

	1999		2004		Random Effects	
	Mobility + Community size controls	Full set of controls	Mobility + Community size controls	Full set of controls	Mobility + Community size controls	Full set of controls
Rented accommodation	0.11*	-0.05	0.18**	0.1	0.22**	0.14*
Length of residence (comp. group: more than 10 years)						
less than 3 years	0.30**	0.27**	0.43**	0.28**	0.46**	0.34**
3-5 years	0.24**	0.21**	0.13*	-0.02	0.33**	0.20*
6-10 years	0.17**	0.11	0.15**	0.07	0.23**	0.13
Always access to own car	-0.14**	0	0.03	0.14**	-0.08	0.01
Easy access to bus	0.17	0.20*	0.14	0.16	0.24*	0.27**
Easy access to metro	-0.26**	-0.26**	-0.22**	-0.24**	-0.31**	-0.28**
Easy access to trains	-0.05	0.03	-0.01	0.05	-0.02	0.05
Easy access to shared taxis	-0.11	-0.12	-0.01	-0.01	-0.06	-0.06
Uses the Internet at home	-0.54**	-0.34**	-0.22**	-0.13*	-0.47**	-0.38**
Constant	0.09	2.23**	-0.02	1.65**	-0.28*	2.93**
Observations	7,248	7,248	8,290	8,290	7,248	7,248

Notes: * significant at the 0.05 level. ** significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

The results on access to different modes of transportation are inconclusive and statistically not significant. Finally, there is a strong and statistically significant negative effect of having Internet access at home. In sum, our hypothesis finds support.

The opposite direction of the mobility effects implies that an increase in all forms of mobility may not increase the probability to visit family. Using the random effects equation to predict visiting for stylised individuals, we find that the completely immobile individual (Case 5) has a visiting probability of 44 percent and this happens to be the same for the completely mobile individual (Case 6: 45 percent). Physical mobility (Case 3) does not alter the prediction either (43 percent). In contrast, residential mobility (Case 2) increases it by 12 percentage points to 55 percent, and virtual mobility (Case 4) lowers it to 35 percent.

It may be a coincidence that the effects of residential mobility on the two outcomes cancel out each other perfectly. However, this result would also be in line with the hypothesis that the two outcomes predict each other (if only because time spent visiting one group cannot be spent visiting the other). If that is so, omitting one decision from the equation of the other may lead to biased estimation results.

Given the two outcomes are not strictly exogenous, a formal way to investigate the substitution hypothesis is by estimating the two equations simultaneously. The bivariate probit model handles endogeneity problems

by allowing the error terms of the equations to be correlated. A significant ancillary parameter *Rho* will indicate that the two equations are interdependent, and its sign will show in which way.

Table 11
Bivariate probit regression of the effects of mobility on visiting.

	Visiting Neighbours	Visiting Family
Rented accommodation	-0.01	0.04
Length of stay in flat (comparison group: more than 10 years)		
less than 3 years	-0.32**	0.13**
3-5 years	-0.13**	0.08*
6-10 years	-0.14**	0.05
Always access to own car	-0.03	0.01
Easy access to bus	-0.02	0.12**
Easy access to metro	-0.14**	-0.13**
Easy access to trains	-0.07**	0.01
Easy access to shared taxis	0.02	-0.04
Uses the Internet at home	-0.12**	-0.21**
Size of township (comparison group: village/small town)		
mid-sized town	-0.11**	0.04
city	-0.09*	0.04
Age	-0.01*	-0.01*
Age²/100	0.01*	0.01*
Annual equivalised household income (log)	-0.20**	-0.12**
Male head/spouse employed	0.03	-0.09**
Female head/spouse employed	-0.06*	-0.02
Kindergarten child in household	0.1	0.34**
Primary school child in household	0.12**	0.10**
West Germany	0.11**	0.16**
Constant	1.67**	1.24**
Log Likelihood	-16098.0	
Observations	12,831	
Rho	0.12**	

Notes: * Significant at the 0.05 level. ** Significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

The results presented in Table 11 suggest, in sum, that characteristics which lead to more visiting with neighbours also lead to more visiting with family: the highly significant ancillary indicator *Rho* (Chi^2 =60.36, df=1, p=0.00) is positive. In contrast to this, the associations of the mobility-related indicators continue to point in opposite directions in the two equations, which is in support of our leading hypothesis, i.e. that - all other things held constant -people visit with neighbours when they are less mobile and with family when they are more mobile. Note that the bivariate probit model also yields consistent and efficient estimates of the effects of residential and physical mobility: people's inclination towards moving if they cannot realise their desired level of visiting with family and neighbours, and their choice of residence, will be captured by *Rho*.

5.6 Extension: The Impact of Having Mobile Neighbours

Finally, we may ask how much of an effect on visiting neighbours and family there is of having more residentially, physically and virtually mobile neighbours (Table 12). The results suggest that one's neighbours' mobility (as measured here) makes very little difference. The only two mobility indicators that appear to affect whether or not people visit neighbours frequently are how long they have lived in the neighbourhood and how much their neighbours are orientated towards using the Internet (note that the personal Internet effect disappears). In contrast, the associations between own mobility and visiting family are all in the hypothesized direction and

statistically significant. We do not observe statistically significant effects of neighbourhood mobility, which is not unexpected. Ultimately, if the family lives outside the neighbourhood it is the family's mobility that may affect family visits, not the neighbours'.

Overall, the neighbourhood effects are very weak and it is not possible to control for unobserved heterogeneity in these models because the proxies for neighbourhood-level mobility are only available for the year 2004. The results of a bivariate probit model for the two equations are very similar to this (and therefore not reported).

Table 12
Effects of own mobility and neighbours' mobility on visiting neighbours and family, 2004.

	Visiting Neighbours	Visiting Family
Rented accommodation	-0.04	0.13*
Length of stay in flat (comparison group: more than 10 years)		
less than 3 years	-0.49**	0.24*
3-5 years	-0.30**	-0.03
6-10 years	-0.19**	0.07
Always access to own car	0.01	0.14**
Uses the Internet at home	0.03	-0.13*
Neighbours' Mobility		
Has residentially more mobile neighbours	-0.01	0.01
Has physically more mobile neighbours	0	0.02
Has virtually more mobile neighbours	-0.03**	-0.02
Size of township (comparison group: village/small town)		
mid-sized town	-0.27**	-0.04
city	-0.19*	-0.05
Constant	2.03**	1.56**
Log Likelihood	164.1	296.4
Observations	7,985	7,993

Notes: * Significant at the 0.05 level. ** Significant at the 0.01 level.
Source: SOEP 21. Author's calculations.

6. Discussion

Mobility has been suggested to undermine the importance of peoples' local circumstances for their social lives and personal well-being for many decades. By combining data for Germany from a number of different sources the analyses presented in this paper show that social contacts with neighbours have indeed deteriorated over the last decade in response to people becoming more mobile, albeit less dramatically than might have been anticipated.

The last decade may not appear to be one that is characterised by a great deal of social change compared to the early 19th century when in the light of industrialisation and urbanisation, scholars cautioned that residential mobility will have a negative impact on local ties, or indeed compared to the 1940s and 50s when great shares of the population migrated after the war. The late 1990s and early 2000s may also not appear particularly eventful with respect to access to modes of transportation. Public transport became accessible to greater shares of the population through the introduction of integrated transport networks in the early 1970s, and at the same time companies such as Volkswagen in Germany started producing cars which everyman could afford. Last but not least, it was in the 1960s that access to telecommunication became a mass phenomenon, allowing many people to maintain contacts to people living afar.

It would have been interesting to undertake this research on the basis of data stretching over a greater number decades, but such data do to the knowledge of the author not exist. Moreover, the late 1990s *are* characterised by notable changes in the three types of mobility which we analyse here in their impact on neighbourhood social ties. After German reunification residential mobility, mainly from East to West Germany, has substantially increased in response to economic restructuring (see, e.g., Uhlig, 2006). In addition, changes in the legislation regulating the provision of public transport took effect in the 1990s, which may have had impacts on accessibility, thus physical mobility. The so-called Regionalisierungsgesetz of 27 December 1993 acknowledges for the first time that access to public transport constitutes part of people's constitutional right to services of general interest. This in effect means that since 1994 local authorities had to make sure to offer affordable public transport to everybody. The law also stipulates the liberalisation of transport in Germany, which may have led to more competitive pricing, thus better access for all. Last but not least, it was not until the mid to late 1990s that prices for personal computers fell significantly and the Internet started entering the homes of much greater shares of the population.

Given the speed with which the Internet entered into people's lives, we may have expected the greatest change in neighbourhood social ties in response to changes in virtual mobility. The results presented in this paper suggest

that of the three types of mobility, residential mobility is associated with the biggest decline in visiting neighbours: If a person that is not mobile became residentially mobile, this is associated with a 12 percentage point lower probability of visiting neighbours. In contrast, receiving better access to a number of different modes of transportation is associated with the second biggest decline in the probability of visiting neighbours, but this is not statistically significant. A sizeable share of the decline in social visits with neighbours, however, is attributable to access to the Internet (9 percentage points). This is alarming given that connecting everyone in Germany to the Internet is an expressed political goal. Since 2001, every school in Germany has been connected to the Internet, which means that in the future, every young person will use the Internet at some point during their education. Furthermore, as Internet access expands and prices for the connection and technical equipment drop, more people will likely have access at home. In 2006, 60 percent of the population is already using the Internet, and this percentage can be expected to increase in the future. Hence, there might be scope for further declines in visiting neighbours.

Determining whether a person is more mobile because s/he could not visit neighbours or whether s/he could not visit neighbours because she was more mobile is an empirical challenge. We addressed this issue in a number of different ways. We exploited, for example, the fact that most people care about seeing family, hence choose their place of residence on the basis of

whether they can visit not only neighbours but also family as often as they wish. By simultaneously modelling visiting family and visiting neighbours we could isolate selection effects and get unbiased estimates of the effects of residential, physical and virtual mobility on visiting. The results confirm that all forms of mobility are associated with a decline in visiting neighbours (the effect of physical mobility is not statistically significant though). The negative effects of residential and, to a lesser extent, physical mobility on visiting neighbours are, however, counteracted by their positive effects on visiting family. In contrast, Internet use has a negative effect on both outcomes. Since Internet effects have become less significant over time, this effect may not persist.

Overall, this analysis shows that neighbourhood social ties are challenged more by people's greater residential mobility than by their use of modern communication technologies. It also shows that neighbourhood ties are more at risk than family ties when people become more residentially, physically and virtually mobile. This may be due to the social norm that people should be on good terms with their family and make a visit every now and then. Such norms do not exist, at least in Germany, for neighbourhood social relations. On the contrary, our literature review of community studies in Germany has shown that the social norm is *not* to have close contacts to neighbours but, rather, to keep them distant.

Notes

1. These classic examples did not refer specifically to local communities but included all social networks. Given that social interactions at that time were predominantly among people in a common locality, however, the loss of a sense of community at the local level is implicit in the critique.
2. At least when the attractiveness of the more distant destination outweighs the disutility of the additional time and money spent to reach it. A more distant place might be more attractive, for instance, because family and friends, to whom close social ties exist, live there.
3. Note that in contrast to the other modes of public transportation, increased access to shared taxis may actually reflect a reduction in physical mobility and not an increase therein. Shared taxis may have replaced a formerly underused bus line, and to use this service, people have to call to book well in advance of the planned journey.
4. In fact, we predict the likelihood to visit for people that do neither exist in our sample nor in the real world as we fix all individual characteristics that do not relate to mobility at the sample mean in 1999. This implies, for instance, that people's gender is not male or female but the proportion of females observed in the 1999 sample.

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