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Ethnic Diversity and Social Trust: The Role of Exposure in the Micro-Context

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Abstract

In this paper we argue that residential exposure to ethnic diversity reduces social trust. Previous within-country analyses of the relationship between contextual ethnic diversity and trust have been conducted at higher levels of aggregation, concealing substantial variation in actual exposure to ethnic diversity. In contrast, we analyze how ethnic diversity of the immediate micro-context – where interethnic exposure is inevitable – affects trust. We do this using Danish survey data linked with register-based data, which enables us to obtain precise measures of the ethnic diversity of each individual's residential surroundings. We focus on contextual diversity within a radius of 80 meters of a given individual, but compare the effect in the micro-context to the impact of diversity in more aggregate contexts. The results show that ethnic diversity in the micro-context affects trust negatively, while the effect vanishes in larger contextual units. This supports the idea that interethnic exposure underlies the relationship.

Keywords: Social trust; ethnic diversity; micro-context; interethnic exposure; national registers; Denmark.

Over the past decades, Western societies have grown increasingly ethnically diverse as a result of increased immigration. Following this development, a heated debate about the consequences of increased ethnic diversity in the immigrant-receiving societies has taken place. One of the key themes of this debate is the question as to whether social trust – and social cohesion more generally – can be maintained in the face of an increasingly ethnically diverse populace (Putnam 2007). Social trust reflects a positive expectation about the trustworthiness of the generalized, abstract other and a person's level of social trust is thus a standard estimate of the trustworthiness of an unknown other (Robinson and Jackson 2001).[1] The concerns over the potential erosion of this form of trust relate to its multiple positive consequences for collective action, democratic governance and economic performance. At the individual level, social trust has been associated with volunteering, donating to charity, tolerance, and other forms of pro-social behavior (Sønderskov 2011; Uslaner 2002) and in the aggregate, societies with higher densities of high-trusters are characterized by more efficient collective decision-making and better democratic government more generally, as well as higher economic growth (Bjørnskov 2009; Knack and Keefer 1997; Knack 2002). Consequently, answering the question about whether ethnic diversity has an adverse effect on trust is of utmost importance for understanding the challenges that increasingly ethnically diverse Western societies are facing.

While rarely stated explicitly, it is fair to conclude that the main mechanism expected to underlie the relationship between ethnic diversity and trust is that of exposure to people of different ethnic background. That is, being in physical proximity to people of different ethnic background is expected to affect people's overall estimate of the trustworthiness of the generalized other. While multiple contexts – including schools, workplaces and religious institutions – may serve as arenas for exposure to people of different ethnic background, residential areas have been the main contextual domain in which the impact of interethnic exposure on trust has been analyzed in the literature. This focus probably reflects that the residential context is a context in which almost

everyone is being exposed to other people on a regular basis. Following the debate about the consequences of increased ethnic diversity, the last decade has seen a surge in within-country studies scrutinizing the relationship between trust and residential ethnic diversity at various contextual levels (Alesina and Ferrara 2002; Dincer 2011; Dinesen and Sønderskov 2012a; Fieldhouse and Cutts 2010; Gijsberts, van der Meer, and Dagevos 2012; Laurence 2011; Leigh 2006; Letki 2008; Marschall and Stolle 2004; Phan 2008; Putnam 2007; Stolle, Soroka, and Johnston 2008; Sturgis et al. 2011; Uslaner 2012). The results vary, but generally point toward a moderate negative – although sometimes statistically insignificant – relationship.

However, given that the previous intra-country studies have examined the relationship between ethnic diversity and trust in geographically vast residential areas (with municipalities or census-tracts being the smallest contextual units), they are of limited value in examining whether interethnic exposure actually underlies the negative impact of ethnic diversity on trust. In the words of Stolle et al. (2008, p. 60) "diversity measured at the level of country, state, city or even census tract might not accurately reflect the actual experiences (or perceptions) of heterogeneity in people's daily lives." The point is that measures of ethnic diversity in more aggregate contextual units will inevitably be imprecise, concealing substantial variation in ethnic diversity experienced in the immediate surroundings of the residential context. This makes it impossible to infer whether the suggested mechanism, interethnic exposure in residential areas, is in fact what underlies the negative relationship between ethnic diversity and trust in other people found in the literature, or if other mechanisms account for this relationship, e.g. decreasing trust in response to political conflict over immigration-related issues (Dinesen and Sønderskov 2012a).

Against the backdrop of the problems of previous studies examining the relationship between ethnic diversity and trust at high levels of aggregation, the main contribution of this paper is to examine, as the first study, how ethnic diversity in the immediate micro-context affects people's level of trust in others, and thus scrutinize the role of interethnic exposure in driving this

relationship. We analyze the relationship between ethnic diversity in the micro-context and trust using nationally representative survey data merged with detailed micro-data from the national Danish registers. This approach provides us with precise measures of actual exposure to residential ethnic diversity because we have information about the ethnic background of all residents living in close proximity to the respondents (here operationalized as down to within 80 meters of a respondent's address).

Theoretical background

The notion that contextual ethnic diversity affects individuals' trust in other people can be said to reflect an *experiential* perspective on the formation of trust, which posits that people's trust in the generalized other reflects experiences in their social environment (Dinesen 2011a; Glanville and Paxton 2007). That is, people's beliefs about the trustworthiness of other people in general is to some extent flexible and informed by cues from their social surroundings acquired through social learning (see Huckfeldt and Sprague [1995] for a related argument).[2] From this perspective, the central mechanism underlying the diversity-trust nexus is experiences gained from exposure to people of different ethnic background in our daily life. In this regard, the neighborhood environment provides social cues informing our assessment of the trustworthiness of others through regular exposure to other people; what Cho and Rudolph (2008) have termed "casual observation" (see also Baybeck and McClurg 2005; Huckfeldt and Sprague 1995: p. 10).

In the literature, the negative relationship between residential ethnic diversity and trust is often explained with reference to well-known social psychological models, most notably (realistic) *conflict theory* or the closely related *group threat* theory (Blumer 1958; Bobo and Hutchings 1996; Quillian 1995), which essentially posit that exposure to out-groups – especially those with other ethnic background – spurs conflict and competition over scarce resources.[3] While this model originally predicts that conflicts leads to out-group prejudice and mistrust, the negative

consequences are assumed to extend to trust in the generalized other when applied to the social trust literature (e.g. Gijsberts et al. 2012; Putnam 2007). However, the tenability of this extension is questionable. First of all, the empirical evidence for a relationship between residential ethnic diversity and interethnic prejudice is mixed (Oliver and Wong 2003; Pettigrew and Tropp 2006), which questions the validity of the original argument and hence also the extension made with regard to social trust. Second, the theoretical justification for the extension is also questionable. While conflict theory predicts that ethnic diversity leads to negative attitudes towards out-group members, it also predicts more positive in-group attitudes in the face of ethnic diversity (cf. Putnam 2007; see also Tajfel [1981] for a similar point from a related perspective). As both in-group and out-group trust are positively correlated with social trust (Bahry et al. 2005), it is unclear whether the result of increased ethnic diversity in residential areas would be a net increase or decrease in trust in the generalized other.[4] The general point is that the adaptation of conflict theory to the relationship between residential ethnic diversity and social trust is problematic.

While conflict theory arguably suffers from the noted shortcomings in accounting for the negative relationship between ethnic diversity and trust, the relationship can alternatively be explained with reference to insights from social psychology and related fields. Several studies report a general human tendency to evaluate members of other ethnic groups as less trustworthy compared to in-group members. Evidence from experimental economics shows lower levels of *initial* trust in trust games when the trustee has a different ethnic background from that of the truster (e.g. Fershtman and Gneezy 2001). Similar results are obtained in studies using cardiovascular or skin conductance responses as measures of fear and perceived threat. The results from these studies show higher levels of perceived threat in encounters with opponents from a different ethnic background than the subject (Mendes et al. 2002; Olsson et al. 2005). Socially learned prejudice or implicit ethnic and racial attitudes probably explain part of this tendency (Stanley et. al. 2011), but recent studies also point to evolutionary causes. These studies show humans are better at inferring

other humans' thoughts, intentions and feelings if the object belongs to their own ethnic group as opposed to other ethnic groups (Adams et al. 2010). The ability to infer the other's intentions is a crucial component in building trust in specific others, and it is also likely to increase empathy (Chaio and Mathur 2010), which again increases trust in specific others (Barraza and Zak 2009). Importantly, this also spills over to social trust as positive experiences with and trust in specific others have been shown to affect evaluations of the generalized other positively (Glanville and Paxton 2007; see also Freitag and Traunmüller 2009).

Based on the above observations, we argue that a likely explanation for a connection between residential exposure to ethnic diversity and social trust originates in a general disposition to evaluate individuals with different ethnic backgrounds as less trustworthy. This disposition is present regardless of the level of residential ethnic diversity. However, since ethnic background functions as a social cue about the trustworthiness of specific others, which in turn affect the overall assessment of the generalized other, being more heavily exposed to people of different ethnic background leads to lower levels of social trust. Hence, people living in ethnically diverse areas will, *ceteris paribus*, display lower levels of social trust. The crux of this argument is thus that an evolved and/or learned out-group bias affects social trust based on residential exposure to people of different ethnic background because more diverse contexts provide cues that lead individuals to believe that the generalized other is less trustworthy, compared to less diverse contexts.

Distinguishing exposure from contact

As explained above, the purpose of this paper is to examine whether exposure to people of different ethnic background is a plausible mechanism linking ethnic diversity in residential surroundings to trust in others. In this regard, it is important to distinguish the concept of *exposure* to people of different ethnic background from the related concept of interethnic *contact*, which has been introduced to research on the consequences of ethnic diversity for trust by scholars drawing on

contact theory from research on prejudice within social psychology (Allport 1954; Pettigrew 1998). This line of research emphasizes how intimate interethnic contact – by reducing ethnic stereotypes – furthers social trust and potentially moderates the negative impact of contextual ethnic diversity (Stolle et al., 2008; Uslaner, 2012). Distinguishing between contact and exposure, we take interethnic contact to denote more intimate forms of social interactions such as talking to (i.e. having a meaningful conversation with) people of different ethnic background, whereas interethnic exposure implies simply "being around" and casually observing people of different ethnic background. One key difference between interethnic contact and exposure relates to the extent to which they are subject to self-selection. That is, whether individuals themselves self-select into contact with or exposure to people of different ethnic background. In this regard, interethnic exposure is essentially unavoidable in ethnically diverse neighborhoods, while actual interethnic contact is arguably more of a deliberate decision. Consequently, interethnic exposure in the neighborhood is likely to have greater implications for social trust in the aggregate than interethnic contact because it is pertinent to everyone living in a diverse neighborhood. Moreover, while self-selection into neighborhoods of various degrees of ethnic diversity based on prior levels of trust is likely (we address this below), a similar self-selection into actual contact with people of different ethnic background is arguably more pronounced. In other words, the relationship between interethnic exposure and trust is likely to be less plagued by endogeneity than that between contact and trust.[5]

While it is important to distinguish interethnic contact from interethnic exposure to gauge their separate effect on social trust, it should be noted that the two may operate in conjunction as suggested by scholars drawing on contact theory (Stolle et al., 2008; Uslaner, 2012). Illustratively, Stolle et al. (2008) show that the extent to which ethnic diversity in the neighborhood undermines trust is moderated by actual contact in the US. To test this idea, we examine the possibility that the potential effect of interethnic exposure on trust may be contingent on interethnic contact.

Research design: The advantages of measuring ethnic diversity using register data

To test the hypothesis that exposure to people of different ethnic background influences trust, we combine representative survey data on social trust from the Danish version of the European Social Survey (ESS) with contextual data on ethnic diversity from the national Danish registers maintained by Statistics Denmark. The registers contain very detailed information about all individuals with permanent residency in Denmark, including their ethnic background and the geographical location of their residence as well as a range of other characteristics. Hence, it is possible to locate all individuals by their address in the registers and to identify exactly how far apart everyone lives. Using these data, we have calculated the distance between each respondent in the ESS and all permanent residents living in the 20,000 nearest households.[6] By drawing a circle with a given radius around each respondent and subsequently calculating contextual measures of ethnic diversity based on the ethnic background of the other individuals living within that context, we obtained an individualized contextual measure of diversity for each respondent. In principle, the radius of these contextual units could be as small as 10 meters. However, we decided to create contexts with radiuses of 80 meters (and higher) to avoid basing the contextual information on very few neighbors.[7]

Our measure of contextual ethnic diversity represents an important improvement over previously employed measures for several reasons. Most importantly, because this measure captures ethnic diversity in the very micro-context, it taps actual exposure to ethnic diversity as individuals can hardly refrain from being exposed to their (diverse) neighbors in their immediate residential surroundings. Hence, analyzing the impact of ethnic diversity in the micro-context on trust constitutes a direct test of the proposition that interethnic exposure is the mechanism linking contextual ethnic diversity and trust. This stands in contrast to previous studies of the diversity-trust nexus that have relied on highly aggregate contextual data on diversity, which are likely to be poor reflections of the diversity actually experienced in residential areas and therefore of limited use in

testing whether exposure is what drives the relationship. Specifically, previous studies have all used aggregate data from administrative entities (e.g. municipalities or census tracts) when assigning contextual diversity to a given respondent. The problem with this approach is that it is not possible to locate each respondent within a large contextual unit and one therefore remains agnostic about whether the aggregate level of diversity in this unit corresponds to what individuals experience in their immediate surroundings. For example, within ethnically diverse municipalities or census tracts, ethnically homogenous enclaves consisting almost exclusively of people with the same ethnic background often exist. Residents in such enclaves are hardly exposed to ethnic diversity in their neighborhood, although the aggregate measure suggests otherwise. Another related problem in gauging exposure to ethnic diversity based on highly aggregate administrative data is that we cannot know from these data whether an individual lives in the center of a given contextual unit or on the border of this unit and another one. This is especially problematic in more heavily populated areas, where the boundaries of administrative units are likely to be somewhat arbitrary, because for individuals living on the border between two (or more) contextual units, the level of ethnic diversity of the administrative unit in which they reside may over- or underestimate the exposure to ethnic diversity that they actually experience. The general point is that the existing measures of ethnic diversity in rather aggregate contextual units constitute inaccurate portraits of the diversity individuals experience in their immediate surroundings and are therefore ill-suited for examining whether interethnic exposure is the mechanism explaining the impact of diversity on trust. By employing data on the ethnic diversity of the immediate residential surroundings of individuals we can test this mechanism directly because individuals are inevitably exposed to people of different ethnicity in ethnically diverse micro-contexts. If exposure is the actual mechanism driving the relationship between ethnic diversity and trust, the fact that interethnic exposure is more precisely captured in micro-context than in more aggregate contexts will also provide an estimate of the effect of ethnic diversity on trust that is more efficient and less biased towards finding no effect (i.e.

it is free of attenuation bias) due to lower random measurement error in the independent variable (King, Keohane, and Verba 1993).

Another great advantage of the register-based data is the fact that we can freely vary the level of contextual aggregation (here, from contexts with radii from 80 to 2,500 meters[8]). As a consequence, we can validate whether interethnic exposure is in fact the mechanism linking diversity to trust by comparing the impact of ethnic diversity on trust at various levels of aggregation. If exposure drives the relationship, we would expect the impact of diversity on trust to be found only in the immediate surroundings, where interethnic exposure takes place. At higher levels of aggregation, ethnic diversity becomes an inaccurate measure of actual exposure, which would lead to both a larger standard error of the estimated effect of diversity on trust and to the estimate being biased towards zero due to attenuation bias (given that exposure is the mechanism underlying the relationship). Conversely, if other mechanisms, operating in more aggregate contexts, explain the relationship, we should not see higher standard errors or attenuation bias at higher levels of aggregation. A few previous studies have pursued the idea of differential effects at different levels of aggregation by including multiple measures of ethnic diversity measured at different contextual levels (Phan 2008; Putnam 2007). Interestingly, Putnam (2007) reports findings from the US substantiating the idea that the impact of ethnic diversity on trust is more likely to emerge when measured in less aggregate contextual units (census-tracts rather than counties). However, compared to the earlier studies, which analyze contexts of different size at quite aggregate levels, we can systematically vary the context size from the micro-context to more aggregate surroundings.

Differentiating between different forms of ethnic diversity

Another advantage of the detailed Danish registers is that they allow for making fine-grained ethnic distinctions and thus differentiating between different forms of ethnic diversity, which has often not

been possible in previous studies. We can therefore assess whether any effect of ethnic diversity on trust holds up in the face of employing different diversity measures.

Within the literature, the most frequently used indicator of ethnic diversity is a Herfindahl-type index, which measures how ethnically fragmented a given contextual entity is in terms of the relative size of various ethnic groups within that unit. Using *ethnic fragmentation* as an indicator of diversity implies that it is the presence of many different – mutually distrusting – ethnic groups that undermines trust in the general person. However, in countries that have only recently experienced large-scale immigration, such as Denmark, there may be only one salient dividing line, namely that between immigrants and natives (Dinesen and Sønderskov 2012a). This reflects the notion that the immigrant-native distinction is the salient cue influencing trust in others, which suggests using the *concentration of immigrants* as indicator of ethnic diversity. However, immigrants are not a homogenous group and therefore it may be suggested that it is only those immigrant groups, which differ significantly from that of the majority, which provide salient cues that influence social trust negatively. In this regard, non-Western immigrants are particularly relevant as this is the group differing most from the native population (ethnically as well as culturally) and over which most contention has occurred in Denmark. Consequently, we also employ a measure of the *concentration of non-Western immigrants*.

The survey data, measures and specifications

We utilize the first four rounds of the Danish version of the European Social Survey (ESS) conducted in 2002/3, 2004/5, 2006/7 and 2008/9. The ESS is generally held to be a highly valid and reliable data source for comparative survey data on political and social values in Europe (Stoop et al. 2002), including the dependent variable of this study, social trust, as well as its most important correlates at the individual level (see below). The respondents in the Danish version of the ESS were randomly sampled from the national civil registry and their civil registration numbers were

retained by the data collection agency. This allows us to link individual level and contextual socio-demographic information from the Danish national registers to each respondent in the survey. The registers are updated on a yearly basis (or more frequently), which ensures reliable data.

The dependent variable: Social trust

The dependent variable, social trust, is measured using the widely used and validated three-item scale (Dinesen 2011b; Reeskens and Hooghe 2008; Zmerli and Newton 2008) (see coding in Table A1 in the Appendix). In the Danish data, the three items offer a reliable scale of social trust with reasonably strong internal coherence across the four surveys (Cronbach's alpha = 0.71). The mean score on the trust scale is 6.79 (std. dev. =1.58) across the four ESS waves, which testifies to Denmark being one of the countries in the world with the highest levels of trust (Dinesen and Sønderskov 2012b; Hooghe et al. 2009).

The independent variable: Three measures of ethnic diversity

As noted earlier, the national registers contain information about addresses and the ethnic background of everyone with permanent residency in Denmark and therefore allow us to generate flexible contextual measures of our independent variable, ethnic diversity. In the registers, each individual is classified as either native Danish, immigrant (i.e. first generation immigrants) or descendants of immigrants (i.e. second generation immigrants) according to the definition by Statistics Denmark (2009). A person having at least one parent who was born in Denmark and holds Danish citizenship is classified as being *native Danish* regardless of whether he or she was actually born in Denmark and/or holds Danish citizenship. For people who do not meet these criteria, individuals born outside of Denmark are considered (first generation) *immigrants*, whereas individuals with parents born outside of Denmark are classified as *descendants* (second generation immigrants).[9] Furthermore, the registers also contain information about the country of origin of immigrants and the parents of descendants (i.e. Turkey is indicated as the country of origin for

individuals born in Turkey and the country of descent for descendants of parents born in Turkey). Hence, the registers enable us to distinguish not only between the general categories of native Danes, immigrants and descendants, but also to differentiate between the specific countries of origin of immigrants and descendants. Consequently, we can examine how specific ethnic compositions of the environment of respondents in the survey influence their level of trust in other people.

As noted earlier, we employ three distinct measures of ethnic diversity, which are operationalized as follows:

- *Ethnic fragmentation*: Operationalized as 1 - the Herfindahl-index:

  $$\text{Ethnic fragmentation}_j = 1 - \sum_{i=1}^{N} s_{ij}^2$$

  where s_{ij} is the concentration of the ethnic group (immigrants and descendants) i (i = 1…N) in context j.
- *Concentration of immigrants*: The share of immigrants and descendants.
- *Concentration of non-Western immigrants*: The share of immigrants and descendants *not* originating from the EU-15, Iceland, Norway, Switzerland, the European micro-states, North America, Australia, and New Zealand.

Figure 1 shows the distribution of ethnic diversity in the micro-context (within a radius of 80 meters) of the respondents.

[Figure 1 about here]

Generally speaking, the distributions of the three measures of ethnic diversity look fairly similar, all showing that most respondents live in micro-contexts that are not particularly diverse. To take an example, 75% of the respondents live in a micro-context with less than 10% immigrants. At the

same time, however, there is large variation in ethnic diversity across the micro-contexts and a number of respondents live in highly ethnically diverse settings, e.g. in contexts with a majority of immigrants.

Control variables

In addition to our main independent variable of interest, contextual ethnic diversity, we include several variables that allow us to control for individual as well as contextual characteristics in order to rule out confounding of the relationship between contextual ethnic diversity and trust.[10] As emphasized in recent studies (Letki 2008; Phan 2008; Sturgis et al. 2011), ethnic diversity and social trust co-vary with the broader social – and especially socioeconomic – environment. Consequently, controlling for contextual factors capturing these aspects of the neighborhood environment is paramount in order to isolate the impact of ethnic diversity on trust. Specifically, we include contextual measures of income, unemployment and single-parent homes in order to examine whether it is socioeconomic deprivation rather than ethnic diversity (or both) that shapes trust. Similarly, we control for economic inequality of the contextual unit as it is generally regarded as an important predictor of trust (Rothstein and Uslaner 2005; Uslaner 2002). We also include a measure of contextual crime, as unsafe neighborhoods may affect residential choice (and hence diversity of the context) as well as trust (Sturgis et al. 2011). Finally, we also included the population density of a given contextual unit. As immigrants generally live in larger cities with higher population density, we include this variable to ascertain that any observed effect of ethnic diversity on trust cannot be attributed to ethnically diverse contexts being more populous than less diverse contexts. In a similar way to the ethnic diversity measure, all other contextual variables were derived from the national registers based on information about the people living within a given radius (the same as the diversity measure) of a respondent in the survey.

In addition to the contextual control variables, we also include a range of individual-level variables that are standard predictors of trust (see e.g. Alesina and Ferrara 2002; Delhey and Newton 2003; Li, Pickles, and Savage 2005). Specifically, we include gender, age, place of birth[11], education, personal disposable income, unemployment, cohabitation status, being a victim of crime, institutional trust and life satisfaction. Although some of these predictors, especially the attitudinal variables of institutional trust and life satisfaction, may be endogenous to trust, we opted for including them in the model to provide a conservative test of the impact of ethnic diversity on trust (i.e. to avoid confounding by any individual-level variables). Finally, we also include dummies to indicate in which waves of the ESS a given respondent participated, in order to remove autocorrelation and take into account any differences between the four waves not captured by the other variables in the model.

Analysis

We report the results from the empirical analysis in two steps. First, in Table 1, we report results regarding how social trust is affected by the three measures of ethnic diversity in the micro-context, defined as within 80 meters of the individual. Second, we provide a graphic presentation of the impact of the three measures of ethnic diversity at contextual levels ranging from the least aggregate (within 80 meters of the individual) to the most aggregate (within 2500 meters of the individual) in our data. This serves the purpose of illustrating how the impact of ethnic diversity varies with different levels of aggregation and thus tests the notion that interethnic exposure underlies the relationship between diversity and trust.

The results displayed in Table 1 provide clear evidence that diversity in the micro-context affects social trust negatively, as we observe a significant negative relationship for all three measures of diversity. The predicted level of trust is – all else being equal – slightly less than half a point lower on the trust scale among individuals living in a micro-context with 50 percent

immigrants or non-Western immigrants than among individuals living in a context with no immigrants. As the trust measure runs between 0 and 10, this difference suggests a substantial effect of concentration of (non-Western) immigrants in the micro-context. A change in the level of ethnic fragmentation from 0 to 0.5 leads to a decline in trust of 0.26 on the trust scale, but because ethnic fragmentation is measured differently than the concentration measures, the effects are not directly comparable. While these effects are arguably substantial, it is important to note that they are based on very sizable changes in the ethnic composition of the micro-context. Focusing instead on a change over the interquartile range – the middle of the distribution – the effects are less pronounced. Such a change in the concentration of immigrants or ethnic fragmentation is predicted to lead to a decrease in social trust of around 0.10 points on the eleven-point scale, whereas the effect is somewhat smaller when looking at the concentration of non-Western immigrants. Nevertheless, the effect of the former two measures of diversity corresponds to the partial effect of around two and a half years of education (one of the most important correlates of trust at the individual level), which is far from trivial.

Looking at the control variables at the contextual level, we note that aggregate mean income is the only variable having a significant effect on trust. As expected, living in more affluent contexts furthers trust in others, but the effect is quite weak, as a one standard deviation change in this variable only leads to an increase in trust of about 0.05 units, which is between half and two-thirds of an equivalent change in the three diversity measures. The remaining contextual variables are all insignificant. Most surprising in this regard is probably the fact that income inequality is insignificant, which runs counter to findings in studies across countries (Rothstein and Uslaner 2005) and within the US over time (Uslaner 2002). It should be noted that the estimated coefficients for the diversity measures are not an artifact of multicollinearity as the variance inflation factor (VIF) for the diversity variables in our models is 2.02 or less. Hence, contrary to a number of analyses focusing on trust and related aspects of social cohesion in more aggregate contexts

(Laurence 2011; Letki 2008; Phan 2008; Sturgis et al. 2011), our results suggest that ethnic diversity is the most important micro-contextual factor shaping trust in others.

Turning to the individual-level control variables, we mostly see a confirmation of well-known patterns from previous research. Being female, older, native and higher educated furthers trust. Having experienced victimization decreases trust, whereas the potentially endogenous factors, institutional trust and life satisfaction, are both strongly, positively associated with trust. Employment status, income and cohabitation status do not significantly affect trust. In conclusion, the fact that our three measures of ethnic diversity emerge as significant predictors of trust in rich models including measures of other common explanations is clear evidence that ethnic diversity in the micro-context has an independent negative impact on trust, which cannot be explained by either contextual socioeconomic deprivation or crime nor by individual-level characteristics.

[Table 1 about here]

At this point we have shown that ethnic diversity of the micro-context shapes trust negatively. While the effect of ethnic diversity in the immediate surroundings may suggest that this effect stems from interethnic exposure, this is difficult to judge solely based on results from the micro-context. In order to test exposure as the underlying mechanism explaining the negative effect of ethnic diversity on trust, we compare the impact of ethnic diversity across contextual units of varying size. If exposure is the driver of the negative relationship, we would expect the negative impact of ethnic diversity on trust to be strongest in the more immediate surroundings, where interethnic exposure is inevitable, and to be diluted at more aggregate contextual levels, where exposure is captured much less accurately. In Figure 2 we have illustrated the effect of ethnic diversity on trust across different levels of aggregation. The figure displays the effect of a given measure of ethnic diversity based on

regressions with similar specifications as in Table 1 with contextual variables measured in contexts of the same size as the diversity variables.

[Figure 2 about here]

The figure shows that the effect of ethnic diversity differs markedly when measured at the lowest (80 meters) and the highest levels (2,500 meters) of aggregation in our data. For all three measures of ethnic diversity we see the same consistent pattern: ethnic diversity has a significant negative impact on trust at low levels of aggregation (up to 250 meters), after which the estimate goes towards zero and becomes less precise (as indicated by the increasing standard errors). In other words, in the micro-context, where interethnic exposure is captured more accurately, ethnic diversity has a substantial negative impact on trust, whereas this effect is diluted in contexts of higher aggregation, where exposure is measured more crudely. This clearly supports the notion that interethnic exposure is the mechanism accounting for the negative impact of ethnic diversity on trust. As for the context size consequential for trust, it is interesting to observe that a radius of 250 meters seems to be the cut-off point after which the effect of interethnic exposure wanes. This is an important result as it shows that we need to have measures of ethnic diversity in quite disaggregate contexts in order to detect an effect on trust, which may also explain some of the insignificant effects found in previous studies at higher levels of aggregation.

Do the results reflect self-selection?

The inherent problem in all cross-sectional analyses of the relationship between residential contextual characteristics and individual-level attitudes using observational data is that it is not possible to rule out that a correlation to some extent reflects self-selection of individuals into certain contexts based on these attitudes, rather than a causal effect of living in the contexts. In other words, the estimated association may be biased because of self-selection, in our case most likely towards a

stronger negative relationship between diversity and trust stemming from individuals with higher levels of trust self-selecting out of more ethnically diverse contexts, thereby rendering trust lower in these areas.

While no perfect fix to the problem of self-selection exists given our data, a number of approaches for assessing the magnitude of this problem – and hence the extent to which the estimated relationship may be biased – have been put forward in the literature. At a theoretical level, Putnam (2007) and Rudolph and Popp (2010) argue that self-selection seems *prima facie* implausible as an explanation for an observed negative relationship between diversity and trust as this would imply that the least trusting individuals would locate themselves in the most diverse environments. They argue that the opposite is indeed more plausible, namely that the least trusting would choose to live in the least diverse environments.[12] This in turn implies that, if biased, the impact of contextual ethnic diversity on trust is likely underestimated (i.e. more negative than our results suggest). However, while self-selection based on trust may be an implausible explanation of the negative relationship between diversity and trust, it seems more likely that unobserved factors simultaneously affecting both residential choice and trust (e.g. a deeply held preference for living in homogenous surroundings or fundamental dispositions towards out-groups) would potentially confound the relationship, although this potential form of self-selection is arguably reduced by the inclusion of a rich set of controls in our models. Therefore, in an attempt to assess the magnitude of the potential problem of self-selection, we have conducted a number of empirical tests comparable to those employed in previous studies addressing this problem for related research questions.[13]

First, equivalent to the strategy employed by Oliver and Wong (2003), we tried including a variable tapping respondents' preferences for the ethnic mix of the ideal living area (see coding in Table A1 in the Appendix). This variable was only measured in the first round of the ESS and thus we had to limit the analysis to this subset of the sample. By including preference for ethnic mix of the ideal living area we take into account the fact that this inclination may affect both residential

choice and trust and thus address whether this form of self-selection confounds the relationship between the two. The results of the analysis show this is not the case, however, as the estimated impact of ethnic diversity on trust is unaffected by including the measure of preferred living area. In other words, the negative impact of ethnic diversity on trust does not appear to reflect a preference for living in homogenous surroundings.

As a second strategy for assessing self-selection, we followed the approach of Putnam (2007) and Rudolph and Popp (2010) in examining how patterns of relocating and staying put in residential areas correlate with trust. We examined whether trusting individuals are more likely to self-select out of ethnically diverse micro-contexts, as this would imply that the lower levels of trust found in more diverse areas would be the result of this selection process. This was assessed by means of estimating a model of the propensity to change residence within three years after being interviewed in the ESS (based on residential data from the registers) in which we included individual-level trust and an interaction term between trust and contextual ethnic diversity along with the other covariates in the trust models. The results showed no higher propensity for trusting individuals to relocate from ethnically diverse areas and hence there is no evidence indicating that this form of self-selection is driving our results. We also looked at whether the impact of ethnic diversity on trust is stronger for those who have lived in an area for a longer period of time. While we cannot know why people have stayed in the area, this may reflect not having the resources for moving, and hence we may expect self-selection to be less pronounced among this group compared to those who have lived in the area for a shorter period of time. This implies that we would expect to find a stronger negative effect of ethnic diversity on trust for those having stayed put for a longer period of time, given that selection should be less pronounced for these people. Including length of residence (taken from the registers) and its interaction with ethnic diversity in our models for trust shows no such differential effect and this indicates that this form of self-selection cannot explain the negative impact of ethnic diversity on trust either.[14]

In sum, while we cannot rule out self-election as a potential explanation for the observed negative relationship between ethnic diversity in the micro-context and trust in others given the observational nature of our data, empirical tests comparable to those conducted in a number of previous studies provide no indication that this is a likely interpretation of the results. This strengthens our faith that exposure to ethnic diversity in the micro-context is in fact the mechanism affecting trust in others negatively.

Is the negative impact of exposure to ethnic diversity moderated by contact?

As noted earlier, a recent line of research has focused on how the impact of contextual ethnic exposure on trust may be moderated by intense contact with people of different ethnic background. If there is a cushioning effect of interethnic contact, this would suggest that the negative consequences of interethnic exposure does not reflect deep-held negative dispositions towards ethnic out-groups, but instead seem to be more malleable – at least to the extent that interethnic contact can be stimulated. Our data allow us to gain some purchase on the notion that interethnic contact moderates the impact of interethnic exposure on trust as the first wave of ESS holds measures of being friends with and having colleagues, who came to live in Denmark "from a different country" (see the Table A1 in the Appendix for question wording and descriptive statistics). Admittedly, these measures may not reflect interethnic contact *per se*, but they would arguably tend to tap this form of contact. The two measures also complement each other fairly well in the sense that friendship is an intense form of personal contact, which is less common (more than 50% of the respondents indicate having no friends coming from other countries) and arguably more self-selected, whereas contact in the workplace is more pronounced and less self-selected, but also less intense. Ideally, one would also have a measure of actual interethnic contact in the neighborhood, but this does not exist in the survey.

To test the idea that interethnic contact moderates interethnic exposure we followed the approach of Stolle et al. (2008) and included the measures of contact (measured as dummy variables for each category of the variable with "no friends/colleagues" being the reference category) as well as interactions between these variables and each of the measures of ethnic diversity in the micro-context (measured within a radius of 80 meters of the respondent) in turn. None of the interaction terms were significant, nor were they jointly significant, which suggests that interethnic contact – at least not as measured in the ESS – has a moderating effect on the negative impact of ethnic diversity of the micro-context on social trust. It is also worth noting that including only the constitutive terms of the two contact measures, our estimate of the impact of contextual ethnic diversity on trust remain unaffected. This suggests that the effect of interethnic exposure is not mediated by interethnic contact as one might have expected, and it also underlines that interethnic exposure and contact are empirically different phenomena. In conclusion, while we cannot assess the possibility of moderation by interethnic contact in full detail, the data at hand suggest that there is an unmoderated negative impact of interethnic exposure in the micro-context on trust in others.

Conclusion and discussion

In this paper we have tested whether ethnic diversity of the immediate residential surroundings has an impact on trust in others using survey data merged with data from the national Danish registers. The results show that ethnic diversity of the micro-context – measured within a radius of 80 meters of a person – has a statistically significant negative impact on social trust, controlling for a large number of potentially confounding variables. When expanding the size of the context, the effect of ethnic diversity is diluted, and we take that as an indication that interethnic exposure – which is inevitable in the micro-context, but not in more aggregate contexts – is the mechanism underlying the negative relationship between residential ethnic diversity and trust.

Our results suggest that coupling survey data on trust with rich contextual data on ethnic diversity in individualized contexts of small size is indeed a fruitful avenue for further research, not least because this allows for a more direct assessment of the mechanism – interethnic exposure – expected to underlie this relationship. Not doing so, and continuing to build on measures of ethnic diversity within administrative units at rather aggregate contextual levels, is likely to lead to erroneous inference about the impact of ethnic diversity on trust, as our results regarding the differential impact in contexts of different levels of aggregation clearly suggest. The consequences of not analyzing appropriate contextual-level data extend far beyond that of the specific research question regarding the impact of ethnic diversity on trust. Dating back more than a century, there has been a massive interest in the question of how the residential context affects social and political attitudes and behavior within political science and related fields. Scholars have examined how living among others with certain characteristics affects an individual's propensity to participate in politics (Cho and Rudolph 2008), attitudes towards out-groups (Bobo and Hutchings 1996) and opinions about redistribution (Luttmer 2001), to take but a few examples. In this regard, our results imply that scrutinizing these questions utilizing individualized contextual data at low levels of aggregation would be a highly fruitful avenue for further research, which is likely to provide important new insights about the social contingency of political behavior and attitudes.

In this paper we have shown that interethnic exposure is a likely mechanism underlying the relationship between ethnic diversity and social trust. However, in order to gain a fuller understanding of the diversity-trust nexus, we still need to know in more detail what it is exactly about interethnic exposure that lowers trust. As noted, the prevalent explanation in the literature, conflict theory, provides a somewhat incoherent interpretation of this relationship, but as we have suggested, one could also conceive an alternative mechanism emphasizing how the interaction between dispositional out-group mistrust and social cues, in terms of exposure to people of different ethnic background in residential contexts, inform our trust in the generalized other. A logical next

step in the literature would be to test this and other models as explanations for the negative relationship between ethnic diversity in residential contexts and trust.

Finally, our results have substantial implications for the discussion about the consequences of immigration for social cohesion in the destination countries, and which policy alternatives may be effective in addressing the suggested negative consequences. In this regard, it is important not to overstate the impact of ethnic diversity, when compared to other factors shaping social trust. The Danish experience is illustrative in this regard. Over the past 30 years the level of ethnic diversity (measured as share of non-Western immigrants) has increased about six-fold in Denmark, while trust in the same period has increased from just about 50 percent having faith in others in 1979 to almost 80 percent in 2009 – a level of trust unparalleled anywhere in the world but in the other Nordic countries (Dinesen and Sønderskov 2012a). However, at the same time, the increased ethnic diversity has been found to be associated with lower level of trust in Danish municipalities (Dinesen and Sønderskov 2012a). Hence, ethnic diversity has a negative impact on trust, but this is clearly overshadowed by other forces driving trust to unseen heights in the Danish context. This means that while we should obviously take the negative consequences of ethnic diversity for trust seriously, we should not lose sight of other factors – most importantly education at the individual level and institutional quality and income inequality at the society level (Helliwell and Putnam 2007; Dinesen and Sønderskov 2012b; Dinesen 2013; Rothstein and Uslaner 2005; Rohtstein and Stolle 2008) – which matter more for people's trust in others. By strengthening these factors, governments would most likely counterbalance the negative impact of ethnic diversity on trust.

Notes

[1] We keep in line with most of the literature by using the term "social trust" although the more precise term is arguably *generalized* social trust, which underlines that this is the specific type of social trust associated with trust in other people in general and not trust in well-known, specific others or trust in specific groups.

[2] This stands in contrast to the *cultural* perspective on trust, which argues that trust is a stable trait formed early on in life by cultural transmission, primarily from parents to children, and largely immune to experiences later in life (Uslaner 2002).

[3] More broadly conceived, resources may also contain cultural identities over which intergroup conflict may also take place (Tajfel and Turner 1986)).

[4] Moreover, it may also be argued that members of the in-group are likely to constitute a "larger share" of the generalized other for majority members, which would make in-group trust more important for social trust (Sønderskov 2008: 42).

[5] There is also a methodological aspect of the distinction between exposure and contact relating to their measurement. Measuring contact one generally has to rely on self-reported survey measures (Stolle et al. 2008; Uslaner 2012)), whereas exposure can be measured by objective contextual characteristics of residential areas drawn from official registers. Self-reported survey measures of contact taken from the same survey as the measure of trust, will most likely result in an upward bias in the relationship between the two because of common method bias (Podsakoff et al. 2003). That is, to some extent reflect e.g. a common mood state or differential inclination to act on perceived social desirability among respondents when responding to the survey (Podsakoff et al. 2003). Conversely, an association between trust and exposure cannot reflect common method bias because the two are measured through two different sources. The point is that focusing on exposure is also attractive from a methodological point of view as it allows us to sidestep problems of contamination by the measurement instrument.

[6] The distance between individuals is the geodesic distance (bee lining) and it is measured in intervals of 10 meters.

[7] Even in contexts with a radius of 80 meters, the context may consist of very few people in remote areas, which may induce some measurement error. Therefore, we have only included respondents whose context consists of at least 20 people. However, including all respondents in the analysis, the results remain substantially unchanged, which is evident from Table A2 in the Appendix.

[8] The upper limit of 2,500 meters is the largest context for which we have contextual data for all respondents. This is a consequence of knowing the distance between the respondents and the 20,000 nearest households as the most densely populated areas have 20,000 households within 2,500 meters of a respondent.

[9] It should be noted that the definition of immigrants and descendants employed by Statistics Denmark also includes refugees and asylum seekers with permanent residency in Denmark. Hence, throughout this paper, the term "immigrant" also refers to the latter two groups.

[10] The coding of all control variables (including descriptive statistics) can be found in Table A1 in Appendix.

[11] Because the effect of diversity may differ between natives and immigrants, we tried including an interaction term between place of birth and diversity in our models. However, this term is insignificant in all models and consequently we only report models without the interaction.

[12] This is also backed empirically by the study by Herreros and Criado (2009) showing that social trust is related to positive perceptions of immigrants, which suggests that more trusting individuals would self-select into more diverse areas.

[13] All the empirical analyses addressing self-selection are carried out on the three indicators of ethnic diversity measured in the micro-context (i.e. within a radius of 80 meters of the respondents).

[14] Following a similar reasoning, we also examined whether there is a differential impact of diversity on trust for wealthy respondents (measured by personal disposable income), who are more prone to self-select into residential areas due to being less economically restricted (see Putnam [2007] for a similar argument). This is not the case, again pointing to self-selection not driving our results.

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Tables

Table 1: The impact of ethnic diversity of the micro-context on social trust

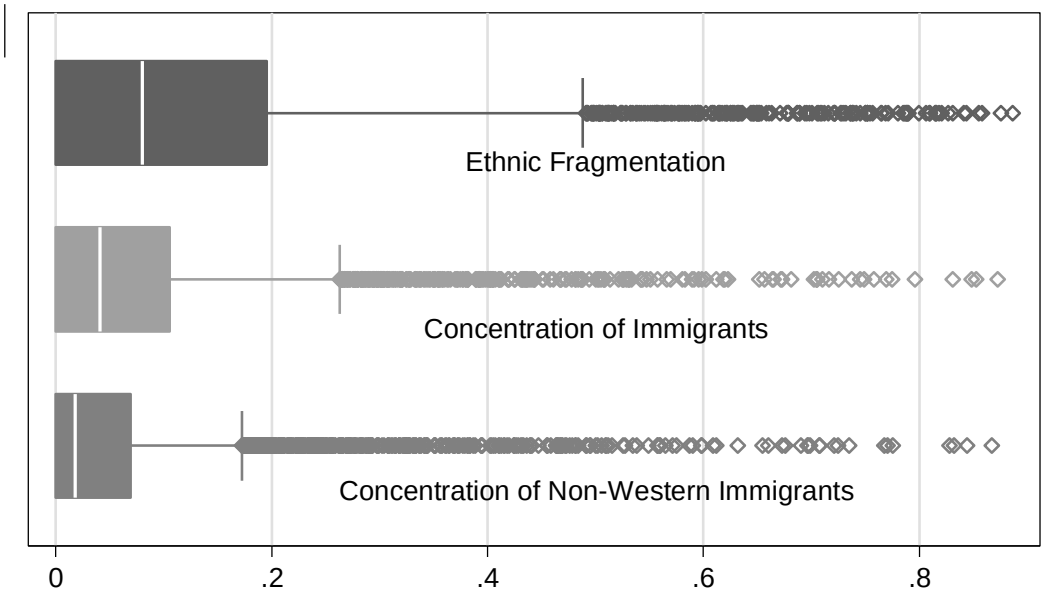
Model	I	II	III
Measure of diversity	Ethnic Fragmentation	Concentration of Immigrants	Concentration of Non-Western imm.
Individual characteristics			
Gender (male)	-0.44***	-0.44***	-0.44***
	(0.04)	(0.04)	(0.04)
Age (years)	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
Place of birth (native)	0.36***	0.34***	0.35***
	(0.10)	(0.10)	(0.10)
Education (years)	0.04***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)
Disposable yearly income	-0.06	-0.05	-0.06
(mill. Danish kroner)	(0.25)	(0.25)	(0.25)
Unemployed (yes)	0.08	0.08	0.08
	(0.10)	(0.10)	(0.10)
Cohabitation (yes)	-0.09	-0.09	-0.08
	(0.05)	(0.05)	(0.05)
Victimization (yes)	-0.11*	-0.11*	-0.11*
	(0.05)	0.05	0.05
Institutional trust (0-10)	0.36***	0.36***	0.36***
	(0.02)	(0.02)	(0.02)
Life satisfaction (0-10)	0.17***	0.17***	0.17***
	(0.02)	(0.02)	(0.02)
Contextual characteristics			
Ethnic diversity	-0.52**	-0.97***	-0.95**
	(0.19)	(0.29)	(0.30)
Mean disposable yearly income	1.33*	1.29*	1.29*
(mill. Danish Kroner)	(0.58)	(0.58)	(0.58)
Unemployment rate	0.09	0.29	0.18
	(0.45)	(0.46)	(0.44)
Single-parent households	-0.04	-0.06	-0.05
	(0.11)	(0.11)	(0.11)
Income inequality	0.41	0.41	0.34
(Gini coefficient)	(0.30)	(0.30)	(0.30)
Crime incidents (100s)	-0.09	-0.01	0.04
	(0.34)	(0.34)	(0.34)
Population density (number of	0.00	0.00	0.00

residents within context)	(0.00)	(0.00)	(0.00)
ESS round			
2002/3		Reference	
2004/5	-0.21***	-0.21***	-0.21***
	(0.06)	(0.06)	(0.06)
2006/7	-0.09	-0.09	-0.09
	(0.06)	(0.06)	(0.06)
2008/9	-0.06	-0.05	-0.06
	(0.06)	(0.06)	(0.06)
Constant	2.16***	2.16***	2.18***
	(0.19)	(0.19)	(0.19)
N	4,738	4,738	4,738
R-square	0.25	0.25	0.25

Notes: The table reports unstandardized OLS-regression coefficients with White-corrected standard errors in parentheses. ***; **; *: $p < 0.001$; 0.01; 0.05 (two-sided test). The dependent variable, social trust, is scaled from 0 to 10.

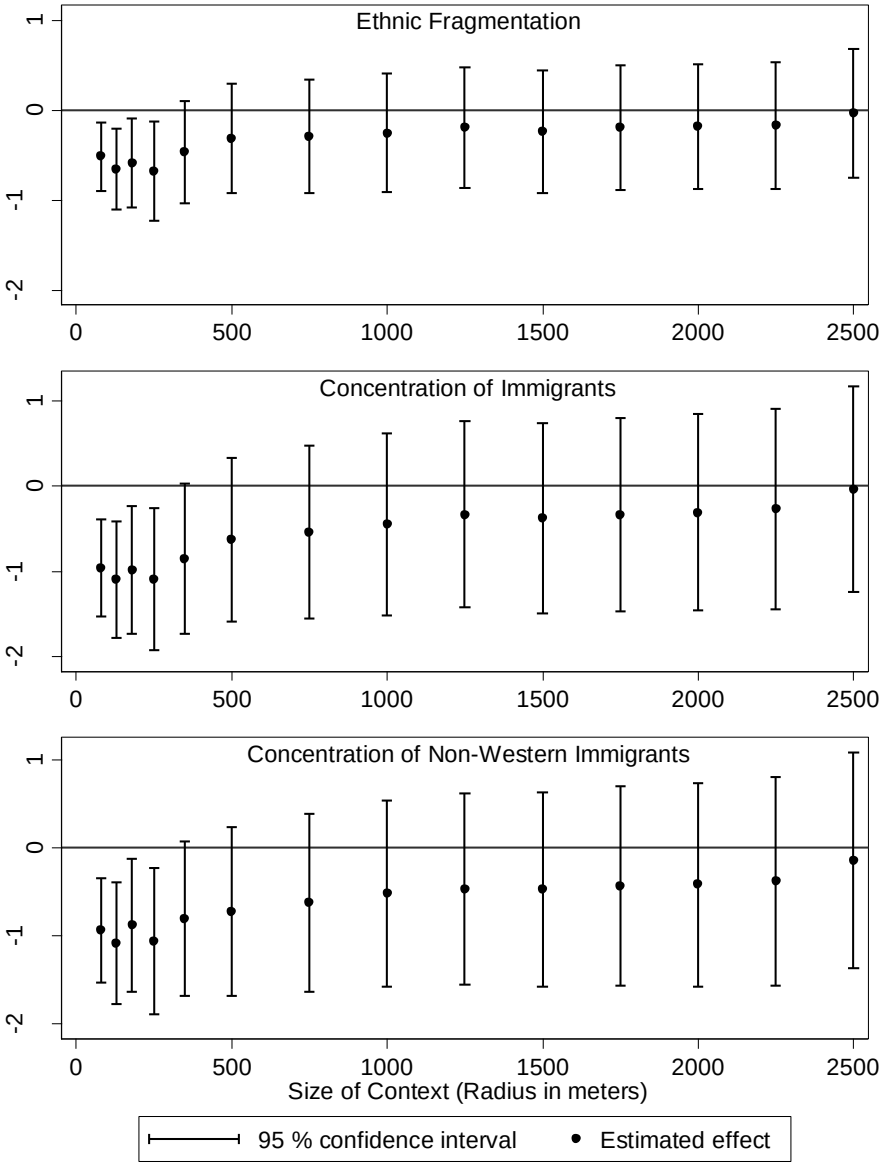
Figures

Figure 1: The distribution of the three measures of ethnic diversity in contexts with a radius of 80 meters



Note: The distribution is based on the 4,738 respondents included in the analyses reported in Table 1. The white vertical lines show the median, whereas the right hinges and the adjacent lines specify the 75. percentiles and the upper adjacent values, respectively.

Figure 2: The effect of ethnic diversity estimated at different contextual sizes



Note: The estimates are obtained based on models with corresponding specifications as the models reported in Table 1.

Appendix

Table A1: Information about variables

Variable	Coding/remarks	Mean/Std.dev[a]	Source[b]
Individual characteristics			
Social trust	Scale consisting of the following three questions: - "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people" - "Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?" - "Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?" All questions were measured on an eleven-point scale ranging from 0 ("You can't be too careful"/"Most people would try to take advantage of me"/"People mostly look out for themselves") to 10 ("Most people can be trusted"/"Most people would try to be fair "/ "People mostly try to be helpful"). The final scale is calculated as the mean of the three items thus running between 0 and 10. It only includes respondents having validly answered at least two of the three questions. The composite scale has a Cronbach's alpha of 0.71 for the four ESS waves.	6.79/1.58	ESS (ppltrst, pplfair, pplhlp)
Gender (male)	0 = Female, 1 = Male	0.49/-	Register data (koen)
Age (years)	Age in years when interviewed.	47.77/17.94	Register data (FOED_DAG)/ ESS (inwyr/inwyys)
Place of birth (native)	0 = Immigrant/descendant; 1 = Native Danish Using the same definition of immigrants as in the ethnic diversity measures (see below).	0.95/-	Register data (ietype)
Education (years)	Years of full time education completed.	13.23/4.31	ESS (eduyrs)
Disposable yearly income (mill. Danish Kroner)	Disposable yearly income measured in million Danish kroner (indexed at 2000 level) in year 2002, 2004, 2006 or 2008[b]. We have also tried using disposable yearly household income as an alternative measure and the results were unaffected.	0.16/0.11	Register data (DISPON_NY)

Variable	Coding/remarks	Mean/Std.dev[a]	Source[b]
Unemployed (yes)	Dummy variable indicating whether the respondent was unemployed for more than half a year in 2002, 2004, 2006 or 2008[c].	0.05/-	Register data (SOCIO02)
Cohabitation (yes)	0 = Single; 1 = Living with partner.	0.68/-	ESS (lvgptn/lvgptna)
Victimization (yes)	A dummy variable tapping whether the respondent or other members of their household have been a victim of burglary or an assault within the last five years.	0.25/-	ESS (crmvct)
Institutional trust (0-10)	A scale consisting of four items about trust in parliament, politicians, the legal system and the police. The scale has a reliability-coefficient of 0.78 and is calculated as the mean of the four items, thus running between 0 (lowest trust) – 10 (highest trust). It only includes respondents having validly answered at least two of the four questions.	6.75/1.58	ESS (trstprl, trstlgl, trstplc, trstplt)
Life satisfaction (0-10)	Response to the question "All things considered, how satisfied are you with your life as a whole nowadays?" Scaled from 0 (Extremely dissatisfied) – 10 (Extremely satisfied).	8.46/1.49	ESS (stflife)
ESS round	Dummies for each round with round 1 as reference.	-	ESS (essround)
Interethnic friendship[f]	Response to the question "Do you have any friends who have come to live in Denmark from another country?" with the following possible responses:		ESS (Round 1) (imgfrnd)
	- "Yes, several"	0.09/-	
	- "Yes, a few"	0.40/-	
	- "No, none at all"	0.51/-	
Workplace colleagues[f]	Response to the question "Do you have any colleagues at work who have come to live in Denmark from another country?" with the following response categories:		ESS (Round 1) (imgclg)
	- "Yes, several"	0.07/-	
	- "Yes, a few"	0.34/-	
	- "No, none at all"	0.36/-	
	- Not currently working	0.23/-	

Variable	Coding/remarks	Mean/Std.dev[a]	Source[b]
Preferred ethnic mix of residential area[g]	The respondents were asked to indicate the preferred ethnic mix, choosing between the following alternatives:		ESS (Round 1) (idetalv)
	- "an area where almost nobody was of different race or ethnic group from most Danish people"	0.36/-	
	- "some people were of different race or ethnic group from most Danish people"	0.35/-	
	- "Many people were of a different race or ethnic group".	0.02/-	
	- "It would make no difference"	0.27/-	
Days lived at current address[g]	Number of days lived at current address.	4,994.93/ 5,989.93	Register data (BOP_VFRA)/ ESS (inwyr/inwyys)
Moved[g]	Dummy variable indicating whether the respondent moved to another location within three years after being surveyed.	0.26/-	(BOP_VFRA)/ ESS (inwyr/inwyys)
Contextual Characteristics	All contextual data are calculated using information about residence on January 1 in 2003, 2005, 2007 or 2009[d]. The descriptive information is for contexts with a radius of 80 meters.		
Ethnic diversity	See description in the text. See also Figure 1 for additional descriptive information.		Register data (ietype, ieland)
	- Ethnic fragmentation:	0.13/0.16	
	- Concentration of immigrants	0.08/0.11	
	- Concentration of non-Western immigrants	0.06/0.10	
Mean disposable yearly income (mill. Danish Kroner)	Mean disposable yearly income (in million Danish kroner) in 2002, 2004, 2006, or 2008[c]. Indexed at 2000-level to adjust for inflation. Only based on data about adults.	0.15/0.04	Register data (DISPON_NY, SOCIO02)
Unemployment rate	Fraction of the adult population in the workforce who were unemployed for more than half a year in 2002, 2004, 2006, or 2008[c].	0.07/0.06	Register data (SOCIO02)
Single-parent households	Fraction of single-parent households	0.21/0.22	Register data (FAMILIE_TYPE, plads)

Variable	Coding/remarks	Mean/Std.dev[a]	Source[b]
Income inequality (Gini coefficient)	Gini coefficient calculated using disposable income and the *ineqdec0* routine in Stata[h]. Three respondents had invalid values on the variable and were dropped from the analysis.	0.28/0.08	Register data (DISPON_NY)
Crime incidents (100's)	The number of criminal verdicts (in 100s) of residents in the context plus the number of crime victims in the context. Data are summed up over two years (either 2002+2003, 2004+2005, 2006+2007, or 2008+2009)[e].	9.22/14.33	Register data (AFG_GER7, AFG_AFGTYP3, OFR_GER7)
Population density	Number of permanent residents within the context	102.20/123.73	Register data

Notes: [a]: All descriptives are based on the 4,738 respondents included in the main analyses (or a subsample of respondents from ESS 1; see notes f and g below).
[b]: Further information about the ESS variables, sampling and fieldwork can be found at http://ess.nsd.uib.no/. Information about the register data can be found at http://www.dst.dk/en/TilSalg/Forskningsservice.aspx.
[c]: Depending on which year the respondent was surveyed: 2002 for respondents surveyed in 2002 or 2003, 2004 for respondents surveyed in 2004 or 2005, 2006 for respondents surveyed in 2006 or 2007, 2008 for respondents surveyed in 2008 or 2009. [d]: Depending on which year the respondent was surveyed; 2003 for respondents surveyed in 2002 or 2003 and so on. [e]: depending on which year the respondent was surveyed; 2002+2003 for respondents surveyed in 2002 or 2003 and so on. [f]: This variable is only used in the analysis reported in the section on the potential moderating effect of interethnic contact on interethnic exposure. [g]: This variable is only used in the analysis reported in the section on self-selection. [h]: Jenkins, S.P. (1999). 'sg104: Analysis of income distributions'. Stata Technical Bulletin, vol. 48.

Table A2: The impact of ethnic diversity of the micro-context on social trust (sample including respondents with contextual information based on fewer than 20 respondents)

Model	I	II	III
Measure of diversity	Ethnic Fragmentation	Concentration of Immigrants	Concentration of Non-Western imm.
Individual characteristics			
Gender (male)	-0.44***	-0.44***	-0.44***
	(0.04)	(0.04)	(0.04)
Age (years)	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
Place of birth (native)	0.33***	0.31**	0.31**
	(0.10)	(0.10)	(0.10)
Education (years)	0.04***	0.04***	0.04***
	(0.00)	(0.00)	(0.00)
Disposable yearly income	-0.09	-0.09	-0.09
(mill. Danish kroner)	(0.13)	(0.14)	(0.13)
Unemployed (yes)	0.08	0.08	0.08
	(0.09)	(0.09)	(0.09)
Cohabitation (yes)	-0.06	-0.06	-0.06
	(0.04)	(0.04)	(0.04)
Victimization (yes)	-0.12**	-0.12**	-0.12**
	(0.04)	(0.04)	(0.04)
Institutional trust (0-10)	0.35***	0.35***	0.35***
	(0.01)	(0.01)	(0.01)
Life satisfaction (0-10)	0.18***	0.18***	0.18***
	(0.01)	(0.01)	(0.01)
Contextual characteristics			
Ethnic diversity	-0.41*	-0.68**	-0.87**
	(0.17)	(0.25)	(0.28)
Mean disposable yearly income	0.95*	0.90*	0.90*
(mill. Danish Kroner)	(0.42)	(0.42)	(0.42)
Unemployment rate	-0.08	-0.04	-0.01
	(0.31)	(0.31)	(0.31)
Single-parent households	-0.03	-0.04	-0.04
	(0.10)	(0.10)	(0.10)
Income inequality	0.28	0.28	0.25
(Gini coefficient)	(0.20)	(0.20)	(0.20)
Crime incidents (100's)	-0.15	-0.10	-0.01
	(0.34)	(0.34)	(0.34)

Population density (number of residents within context)	0.00*	0.00	0.00
	(0.00)	(0.00)	(0.00)
ESS round			
2002/3		Reference	
2004/5	-0.20***	-0.20***	-0.20***
	(0.05)	(0.05)	(0.05)
2006/7	-0.08	-0.08	-0.08
	(0.05)	(0.05)	(0.05)
2008/9	-0.07	-0.07	-0.07
	(0.05)	(0.05)	(0.05)
Constant	2.22***	2.22***	2.23***
	(0.17)	(0.17)	(0.17)
N	5,911	5,911	5,911
R-square	0.23	0.23	0.23

Notes: The table reports unstandardized OLS-regression coefficients with White-corrected standard errors in parentheses. ***; **; *: $p < 0.001$; 0.01; 0.05 (two-sided). The dependent variable, social trust, is scaled from 0 to 10.