



ETHNIC DIVERSITY AND ITS IMPACT ON COMMUNITY SOCIAL COHESION AND NEIGHBORLY EXCHANGE

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ABSTRACT: *Putnam's "constrict theory" suggests that ethnic diversity creates challenges for developing and sustaining social capital in urban settings. He argues that diversity decreases social cohesion and reduces social interactions among community residents. While Putnam's thesis is the subject of much debate in North America, the United Kingdom, and Europe, there is a limited focus on how ethnic diversity impacts upon social cohesion and neighborly exchange behaviors in Australia. Employing multilevel modeling and utilizing administrative and survey data from 4,000 residents living in 148 Brisbane suburbs, we assess whether ethnic diversity lowers social cohesion and increases "hunkering." Our findings indicate that social cohesion and neighborly exchange are attenuated in ethnically diverse suburbs. However, diversity is less consequential for neighborly exchange among immigrants when compared to the general population. Our results provide at least partial support for Putnam's thesis.*

Increasing diversity and immigration is viewed as a serious global challenge. Media and political rhetoric in many western countries report that immigration, be it legal or illegal, is something that needs to be "controlled" or "reduced" (Money, 1997; Stutchbury, 2010). Two mutually reinforcing positions typify this discourse: that immigration puts a strain on finite material and economic resources; and increased diversity leads to conflicting identities and values which can reduce social trust (Coenders, Lubbers, Scheepers, & Verkuyten, 2008). Yet the concern with the consequences of increased diversity is not limited to the political sphere. Most famously, Putnam (2007) claims that ethnic diversity, at least in the short term, has deleterious effects on social capital.

Putnam's (2007) "constrict theory" suggests that ethnic diversity reduces social cohesion, trust, and the development of networks in the contemporary neighborhood. His core argument is that ethnic diversity reduces "both ingroup and outgroup solidarity" (Putnam, 2007, p. 144, emphasis in original) and encourages social withdrawal or "hunkering." The evidence provided by Putnam (2007) offers strong support for his thesis. Drawing on a range of data sets from across the United States, he finds that individuals living in heterogeneous areas report low levels of both inter-racial and intra-racial trust when compared to others living in more homogenous areas. Further, not only do people

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in heterogeneous communities trust less, but many indicators of social capital are “constricted” in ethnically diverse neighborhoods. For example in ethnically diverse areas, people have less confidence in government, vote less, have fewer friends, and spend less time engaged in charity or volunteering work (Putnam, 2007, p. 150).

While studies in North America, the United Kingdom, and Europe provide some support for Putnam’s constrict theory, the relationship between ethnic diversity and social capital is not as straightforward as Putnam would suggest. Further, there is limited consensus in the literature that ethnic diversity is the most influential mechanism predicting lower social capital. Three reasons are given to explain the contradictory findings in this growing body of work. First, scholars contend that the relationships proposed in Putnam’s thesis are largely explained by disadvantage (Letki, 2008; Tolsma, van der Meer, & Gesthuizen, 2009). Although there is evidence that individuals report lower trust and hold negative attitudes towards neighbors in diverse communities, many studies in Britain and the Netherlands find that this relationship is a consequence of ethnic minorities living in socially disadvantaged neighborhoods (Letki, 2008; Tolsma et al., 2009; Twigg, Taylor, & Mohan, 2010).

Second, studies indicate that ethnic diversity may have a differential impact on the cognitive (e.g., perceptions) and behavioral (e.g., interactions and actions like neighboring behavior) elements of social capital (Alesina & La Ferrara, 2000, 2002; Costa & Kahn, 2003; Gijsberts, van der Meer, & Dagevos, 2011; Lancee & Dronkers, 2008; Stolle, Soroka, & Johnston, 2008). For example, Stolle et al. (2008) find that while White majorities in the United States and Canada report lower interpersonal trust when they live in ethnically diverse neighborhoods, diversity has only a limited impact on their neighborly exchange.

Finally, the lack of consensus found in the literature may be due to the differential effects of ethnic concentration and ethnic diversity on social capital. While some studies focus on ethnic concentration (see Gijsberts & Dagevos, 2007; Vervoort, Flap, & Dagevos, 2010), Gijsberts and colleagues (2011) argue that ethnic diversity is more consequential for social cohesion and trust. If Putnam is correct, then they suggest “it is better for both Indigenous and immigrant residents to live in a homogenous neighborhood than in an ethnically diverse neighborhood” (Gijsberts et al., 2011, p. 2).

Our article explores the relationship between diversity and social capital in an Australian setting. Drawing on a survey of residents using a nested sample of over 4,000 respondents living in 148 urban suburbs¹ in Brisbane, Australia, we contribute to the current literature in three ways. First we assess whether it is disadvantage or diversity that impacts cognitive (perceived social cohesion) and behavioral (the frequency of neighborly exchange) social capital. Second, we consider the independent effects of ethnic diversity and the concentration of new immigrants and Indigenous residents on these elements of social capital. Third, we explore who “hunkers” in ethnically diverse neighborhoods. Although Putnam (2007) suggests that ethnic diversity may be more consequential for native born residents, studies in non-U.S. settings show mixed results for this claim (Gijsberts et al., 2011).

Our article starts by examining the mechanisms that help explain why social capital is attenuated in diverse communities, with a focus on the central theories employed in the literature. We then provide a brief overview of current immigration patterns in Australia. Next we describe the Australian Community Capacity Study (ACCS) and present the results of our analysis. We conclude with a discussion of the implications of our study for Putnam’s constrict theory. We find that social cohesion and neighborly exchange are attenuated in ethnically diverse suburbs and that diversity is significantly less consequential for “hunkering” among immigrants when compared to the general population.

EXPLAINING THE DIVERSITY–DISTRUST ASSOCIATION

The relationship between ethnic diversity and social capital proposed by Putnam (2007) has sparked a rapidly expanding literature concerned with identifying how the social context might influence a range of social capital indicators like cohesion and trust, social networks, and social interactions

(Lancee & Dronkers, 2011; Ross, Mirowsky, & Pribesh, 2001; Stolle et al., 2008; Sturgis, Brunton-Smith, Read, & Allum, 2010). Central to this scholarship are two theoretical frameworks: the “contact hypothesis” and conflict or threat theories. While these approaches are distinct, they both originate from a similar premise: that “the racial makeup of contextual environments is a critical determinant of individuals’ attitudes towards racial and ethnic outgroups” (Tam Cho & Baer, 2011, p. 415).

The “contact hypothesis” was originally developed by Allport (1954) and states that automatic assumptions and related prejudice against members of a minority group are reduced by equal status contact between majority and minority group members. From this perspective, greater contact with an outgroup leads to more positive feelings towards the outgroup. In the social sciences, studies tend to measure “contact” not as direct interpersonal contact, but as a “casual exposure to minority groups” (Oliver & Wong, 2003, p. 570). Here scholars assume that those living in close proximity to minority outgroups will be *less* biased towards such groups and express more positive attitudes towards minority group members. Thus residing in communities with large outgroup populations provides greater opportunities for intergroup experience which in turn dispels stereotypes and reduces prejudice (Tam Cho & Baer, 2011). Put another way, individuals living in neighborhoods with high proportions of ethnic residents have a greater likelihood of “everyday” inter-ethnic contact which reduces levels of ethnocentrism and increases both cognitive and behavioral social capital. For example, Gilliam, Valentino, and Beckmann (2002) examined whether living in close proximity to minorities mitigated the influence of negative stereotypes in the U.S. context. They claimed that when people lack first-hand experience with minorities, they base opinions and attitudes on the information that they have available to them through the media. Gilliam and colleagues therefore hypothesized that when people live in areas where intergroup contact is likely, negative minority stereotypes will be less pervasive. Their findings support this because those who lived in more diverse areas where regular contact with minority group members was likely reported more positive attitudes towards outgroup residents (Gilliam et al., 2002).

Others argue that the relationship between diversity and trust is more strongly mediated by the actual contact that occurs between majority and minority group members. Stolle et al. (2008) find that residents living in diverse communities in both the United States and Canada who also talk more to neighbors from diverse backgrounds are impacted less by the racial/ethnic composition of the neighborhood and report higher levels of trust. Drawing on the European Social Survey of 23,754 respondents living across 126 regions in Europe, Savelkoul, Gesthuizen, and Scheepers (2011) find that intergroup contact mediates the relationship between ethnic diversity and social capital.

Yet research does not always reveal a positive relationship between the amount of intergroup contact and attitudes towards ethnic minority groups. In a study of over 4,000 residents living in 260 neighborhoods in The Netherlands, for example, native-born residents living in ethnically diverse areas reported higher interethnic trust but this was not associated with greater neighborly exchange (Lancee & Dronkers, 2011). Natives and nonnatives living in diverse areas reported less contact, and, importantly, less quality contact with neighbors. This led Lancee and Dronkers (2011) to conclude that when cultural values and norms are very different, conditions for optimal contact, as purported by Allport (1954), are diminished, which then discourages intergroup interaction. This finding is consistent with other studies that show that a greater presence of minority residents in a locality may not be related to positive attributions towards—or interactions with—minority groups (see Abernethy, Shoemaker, & Tomolillo, 2004; Walker & Hewstone, 2008).

Conflict or threat theories are also used to explain the diversity–distrust association proposed by Putnam (2007). These approaches suggest that competition for scarce resources or cultural values can have negative implications for perceptions of minority groups. Several studies provide support for this proposition as increases in ethnic minorities at the country, state, city, or neighborhood level are associated with negative views on immigration, affirmative action, and racial/ethnic integration (see Ha, 2010; Lancee & Dronkers, 2008; Vervoort et al., 2010). In the United States, for example, Whites report that they would leave an area if it was 20% Black (Krysan, 2002); and racial tolerance exists only when there are low proportions of Blacks in the neighborhood (Taylor, 1998). In Europe, research suggests that higher proportions of non-Western immigrants predict negative perceptions of neighborhood reputation and lower neighborhood

satisfaction (Permentier, Bolt, & van Ham, 2011), though Savelkoul et al. (2011) find no relationship between ethnic diversity and perceived ethnic threat at either the country or regional level in Europe.

The key factor underpinning conflict (or threat theories more broadly) is disadvantage. Disadvantage and ethnic diversity are familiar bedfellows and both are extensively linked to lower social cohesion in the literature (Gijsberts et al., 2011; Letki, 2008; Ross et al., 2001; Sampson & Groves, 1989; Shaw & McKay, 1942). However, as Sampson and Morenoff (2006) suggest, diversity is only consequential for social cohesion when valued resources are scarce. Several studies provide support for this assertion. Twigg et al. (2010) examined the independent impact of diversity and disadvantage on neighborhood trust and informal social control in Britain. They found that economic deprivation was strongly and negatively associated with social cohesion and informal social control, as was neighborhood ethnic diversity. But disadvantage was by far the most powerful predictor explaining substantially more variability in both measures (Twigg et al., 2010). Similarly, Letki's (2008, p. 120) study of 839 British neighborhoods highlighted both the direct and indirect effects of deprivation on trust and reciprocity. This is also reflected in Lolle and Torpe's (2011) study of 24 European countries. They find limited evidence that increased heterogeneity is accompanied by a decline in social trust and argue that variation in neighborhood trust is due to the clustering of ethnic minorities in disadvantaged neighborhoods, where resources are few, residential stability is low, and crime is high (see also Gesthuizen, van der Meer, & Scheepers, 2009).

ETHNIC DIVERSITY IN AUSTRALIA AND ITS IMPACT ON SOCIAL COHESION

Much scholarship explores the efficacy of Putnam's constrict theory in the United States, the United Kingdom, and Europe, yet there is limited understanding of how diversity influences social capital in Australia. Australia provides a unique and interesting context in which to examine the merit of Putnam's constrict theory, because it is a nation built on the immigrant experience and is one of the most ethnically diverse populations in the world (ABS, 2010). In 2010, there were approximately 22 million Australians, speaking 400 languages, identifying with more than 270 ancestries, and observing a variety of cultural and religious traditions. While Australia is a typical Western nation with established political and economic infrastructure (Otto, Voss, & Willard, 2001), immigrant settlement is somewhat distinct from other OECD nations like the United States or the United Kingdom. For example, although Australia accepts approximately the same number of immigrants each year as Britain (despite the overall population size in Australia being half that of the latter), income inequality between ethnic groups is much lower when compared to other countries (Leigh, 2006). Moreover, unlike North American and European cities, Australian cities do not have "ethnic ghettos" with homogeneous ethnic groupings (Jupp, York, & McRobbie, 1990). This is not to say that the geographic clustering of immigrants is without consequence; the spatial concentration of immigrants is associated with poorer levels of language acquisition, which in turn impacts the ability of new arrivals to participate in the community, labor force, and education system (Chiswick, Lee, & Miller, 2001; Turner, 2008). However, currently there is little evidence of immigrant segregation characterized by race-based poverty as is found in other countries, particularly the United States. Further, whilst in the United States policies encourage integration through assimilation, since the 1970s, policies in Australia have advocated multiculturalism.²

At the last census, immigrants comprised approximately 23% of the Australian population, with 16% speaking a language other than English at home (Australian Government Department of Foreign Affairs and Trade, 2008; Department of Immigration and Citizenship, 2008). The greatest proportions of Australian immigrants come from England, New Zealand, China, Italy, and Vietnam. Not surprisingly, the main metropolitan areas report higher proportions of overseas-born residents than other Australian statistical divisions (Department of Immigration and Citizenship, 2008). As is the case in other countries, areas where immigrants tend to settle are colloquially (but loosely) identified by the ethnic composition, for example "Little Italy" or "Chinatown" (Birrell & Rapson, 2002; Chiswick et al., 2001; Jupp, 1995).

Immigrants have arrived in Australia in distinct waves. Eastern European refugees were followed by immigrants from Western Europe, the Mediterranean Basin, and finally by Asians, initially coming from the Indian subcontinent, followed respectively by immigrants from Lebanon and Indo-China (Australian Department of Immigration and Multicultural and Indigenous Affairs, 2010b; Birrell & Rapson, 2002; Krupinski, 1984). More recently, Australia and other developed countries (including Germany, the United States, France, and Canada) have become home to many refugees from war-torn countries, specifically Afghanistan and Iraq (United Nations High Commissioner for Refugees, 2010). The average age of this group is younger than previous waves of immigration, and families comprised of extended kin are often headed by females (Department of Immigration and Citizenship, n.d.). Further, many refugees arrive in Australia with multiple and complex needs (Coventry, Guerra, MacKenzie, & Pinkney, 2002). Over the last ten years, Australia has hosted approximately 14,000 humanitarian placements from countries such as Afghanistan, Congo, Somalia, Iran, and Sudan. This makes Australia one of the largest resettlement countries in the developed world, along with the United States and Canada (Hugo, 2011).

The extent to which increasing diversity influences indicators of social capital across urban communities is not yet well understood in the Australian context. One study that does consider this relationship was conducted by Leigh in 2006. Leigh argues that ethnic diversity has a negative influence on trust due to differing values and beliefs and an underlying fear of what is different or unknown, which in turn results in an inability of people to work together to enact informal social control. Leigh's (2006) study shows that trust is strongly influenced by ethnolinguistic diversity such that a one standard deviation increase in ethnolinguistic heterogeneity decreases localized trust in Australian communities by 5%.

THE PRESENT RESEARCH

In the international literature, the impact of ethnic diversity on the cognitive (perceived social cohesion) and behavioral (neighborly exchange) elements of a community's social capital is unclear. While there is some support for Putnam's constrict thesis, there is no consensus as to whether or not it is community disadvantage or diversity that matters most for social capital. Surprisingly few studies test the independent effects of ethnic composition and diversity on social capital (see Gijsberts et al., 2011; Laurence, 2011), let alone consider who "hunkers" in ethnically diverse communities (Fieldhouse & Cutts, 2010; Vervoort et al., 2010). In the Australian context, there is almost no research that considers the impact of a community's ethnic context on cognitive and behavioral social capital (the only exception at the time of writing is Leigh, 2006).

To this end, our research seeks to address the following questions: First, does diversity reduce social capital once we control for household and community level disadvantage? Second, are there differential contextual effects of ethnic diversity, the concentration of new immigrants, and the concentration of Indigenous residents on cognitive social capital (perceived community social cohesion) and behavioral social capital (the frequency of neighborly exchange)? Third, who "hunkers" in ethnically diverse communities? Are there differences in cognitive and behavioral social capital for native-born and immigrants?

METHOD

The Australian Community Capacity Study

This article draws on survey data from the second wave of the Australian Community Capacity Study (ACCS). The ACCS is a longitudinal panel study of geographical communities that is supported by funding from the Australian Research Council (Mazerolle et al., 2007; Wickes, Homel, McBroom, Sargeant, & Zahnow, 2011). The overarching goal of the ACCS is to understand and analyze the key social processes associated with the spatial variation of crime and victimization across urban communities over time. Wave 2 of the ACCS was carried out in the Brisbane Statistical

Division (BSD) located in Queensland, Australia. Brisbane is the state's capital and is the largest metropolitan area in Queensland and the third largest in Australia, with a population of approximately 1.9 million people. The BSD comprises several statistical subdivisions including established inner city and periurban areas experiencing large increases in population growth. Further, of the 114,910 immigrants who settled in Australia between July and December, 2008, approximately 20% took up permanent residence in Queensland, with the majority living in suburbs located in the BSD. African refugees settling in Queensland under the federal government's humanitarian program have located predominantly in Brisbane's southern corridor (Australian Department of Immigration and Citizenship, 2010).

The ACCS survey sample is comprised of 148³ randomly drawn suburbs with populations ranging from 245 to 20,999 residents, with an average of 5,683 residents (the total number of suburbs in the BSD is 429). Many of the most ethnically diverse suburbs fall into the ACCS sample. For the ACCS Wave 2, the total number of participants randomly selected from within these suburbs ranged from 12 to 54, with a total sample size of 4,093 participants. Using random digit dialing (RDD), the in-scope survey population was comprised of all people aged 18 years or over who were usually resident in private dwellings with telephones in the selected suburbs. The survey was conducted from September 20th, 2007, to May 21st, 2008. Trained interviewers administered the survey using computer-assisted telephone interviewing (CATI). The overall consent rate was 47% (for further information see Wickes et al., 2011).

Measures of Interest

In this study we utilize three sources of data. To assess contextual effects at the community level, we employ ABS census data and violent crime incident data from the Queensland Police Service (QPS). To examine individual and household characteristics that may influence community social cohesion and neighborly exchange (or what we refer to as "neighboring"), we employ the Wave 2 ACCS survey data (see Appendix 1 for summary statistics).

Dependent Variables

The current research examines two separate but related dependent variables: community social cohesion and neighborly exchange. Both variables are obtained from the ACCS survey data (see Appendix 2 for the items that comprise each dependent variable).

Community social cohesion. This measure represents our indicator of cognitive social capital. It is comprised of a 5-item scale (see Appendix 2) and captures the perceived closeness of the community, the willingness of community members to work together, and the degree to which residents share similar values. This scale is reliable at $\alpha = 0.75$. All five items are strongly correlated with each other and the removal of any item does not increase the reliability of the scale. Factor analyses reveal that all items load on one factor (loadings of all items are above 0.620). Approximately 11% of the variation in this scale is attributed to differences between suburbs.

Neighborly exchange scale. In this article we examine the frequency of neighborly exchange as our indicator of behavioral social capital. This scale is comprised of six items that measure the frequency of informal interactions among neighbors such as doing favors for each other, spending leisure time together, and watching over each other's properties. This scale has a sound reliability, with a Cronbach's alpha of 0.82. All six items are strongly correlated with each other and the reliability of the scale does not improve with the removal of any item. Factor analyses indicate that all items load on one factor (all loadings above 0.601). Additionally, 6% of the variation in this scale is attributed to differences between suburbs.

Individual/Household Variables

In line with other research in this area, we included several individual/household socio-demographic variables from the ACCS (Gijssberts et al., 2011; Putnam, 2007; Savelkoul et al., 2011; Tolsma et al., 2009). Many were dichotomous or categorical variables and were treated as such in the analyses. At the individual/household level the variables employed were: *approximate gross household income* (less than \$20,000, \$20,000 to less than \$40,000, \$40,000 to less than \$60,000, \$60,000 to less than \$80,000, \$80,000 or more, income not reported; \$80,000 or more is the reference category); *employment* (working, unemployed or on a pension, not on a pension and not in the workforce; working is the reference category); *highest level of education* (primary school or less, high school equivalent, university or college degree, trade/technical certificate or diploma; high school is the reference category); *language spoken at home* (English only or speaks other language at home; English is the reference category); *place of birth* (Australia or overseas born; Australia is the reference category); *religion* (Christian religion, other religion, and no religion; Christian religion is the reference category); *marital status* (married, not married; married is the reference category); *age* (continuous); and *gender* (female, male; female is the reference category). See Appendix 1 for summary statistics of all individual level variables.

Neighborhood Variables

We use past research to guide our selection of neighborhood-level variables (see Gijssberts et al., 2011; Putnam, 2007; Tolsma et al., 2009). These variables are detailed below. Summary statistics for all community level variables are noted in Appendix 1. Correlations of the community level variables are noted in Appendix 3.

Neighborhood disadvantage. To measure disadvantage we include two measures derived from the ABS Census. The first is the median weekly household income and the other is the total proportion of unemployed persons looking for work.

Residential mobility. Residential stability is measured by a single variable from the ABS 2006 census data: the proportion of people living at a different address 5 years prior. This measure captures the degree of out-migration evident in a particular suburb over a 5-year census period.

Population density. The ACCS sample includes densely populated inner city suburbs and those that are located some distance from the city center, which have lower population density. We therefore include a population density measure which indicates total persons by square kilometer.

Ethnic diversity. Like Leigh (2006), we employ two measures of ethnic diversity (country of birth and language diversity) which are modeled separately due to their strong correlation (0.93). In Australia many immigrants come from English-speaking countries where the majority population is Anglo-Saxon (Price, 1999). Using place of birth or ancestry indicators alone would not get at immigrant groups coming from non-English-speaking countries (see also Tolsma et al., 2009). Moreover, ancestry variables do not account for Australian-born residents who identify with the cultural practices (like language) of the country of their parents' (or even grandparents') birth (Johnston, Forrest, & Poulsen, 2001). Language diversity therefore provides an alternate yet important indicator of diversity. As Anderson (1991) claims, language is tied up with ethnicity and brings about a sense of nationhood (see also Calhoun, 1992), so some languages may foster a greater sense of "otherness" in that they may be perceived as more "foreign" to native ears. For both measures of diversity we use the Blau index:

$$1 - \sum p_i^2, \quad (1)$$

TABLE 1

Correlations Between Dependent Variables Suburb Level

Dependent variables	Correlations
Social Cohesion and Trust & Neighborly Exchange	0.44
Frequency of Neighborly Exchange & Civic Participation	0.48

where p is the proportion of group members in a given category and i is the number of different categories. This index captures the amount of variation, on a specific characteristic, among a group of individuals. A perfectly homogenous group would receive a score of 0 while a completely heterogeneous group would receive a score of 1.

Ethnic concentration. To capture the effects of ethnic concentration we employ two variables drawn from the ABS Census data. The first is the proportion of immigrants arriving between 2001 and 2006. As we want to separate the effects of immigrant concentration from ethnic diversity, we include a proportion of new immigrants in the model. The second variable we employ is the proportion of Indigenous Australians resident in the suburb. Many urban Indigenous residents speak English at home and as the political and social history of Indigenous Australians differ considerably from those of the immigrant population (Australian Government Department of Foreign Affairs and Trade, 2008), we include the proportion of Indigenous residents as a compositional measure of ethnicity.

Violent crime rate. Research demonstrates the deleterious effects of serious crime on neighborhood cohesion and trust (Kawachi, Kennedy, & Wilkinson, 1999; Rosenfeld, Messner, & Baumer, 2001), and thus we include the average annual rate of all violent incidents from 2005 to 2007 as provided by the QPS. Violent incidents include homicide, total assaults (excluding sexual assaults), and robbery (armed and unarmed).

Cross-Level Interactions

We also include cross-level interaction terms in our models to assess whether Australian-born or overseas-born residents, or those speaking English or another language living in an ethnically diverse neighborhood, differ in reports of community social cohesion and neighborly exchange.

Analytic Approach

In our analyses we examine two dependent variables: community social cohesion and neighborly exchange. We employ a multivariate, multilevel regression model to account for correlation between individual responses in the same neighborhood and to control for or explore neighborhood characteristics. As our dependent variables are drawn from the same data set, the responses recorded for each individual across these items are correlated (see Table 1) and require us to jointly model multiple outcomes. Community social cohesion and neighborly exchange are treated as continuous variables. These are well modeled with Gaussian errors. The fitting of multivariate linear regression, or even mixed models, is relatively tractable, with closed-form solutions easily derived. In this case we use a Bayesian methodology to evaluate the model.

Multivariate Response Models

The multivariate regression model is similar to the more familiar univariate or multiple regression model. To illustrate we first give the multilevel model for one of the responses, written out as:

$$y_{ij} = X\beta + Zb_{ij} + Wb_j + \varepsilon_{ij},$$

where y_{ij} is the response vector for individuals i in the j th suburb. X , Z , and W are covariate matrices for the fixed, random individual, and random suburb effects. β represents the fixed effects, b_{ij} is a vector of random individual effects, b_j is a vector of random suburb effects, and ε is the error term. In matrix-vector notation the multiple regression model is written as

$$y = X\beta + \varepsilon,$$

where the vector y is the set of all observations for the dependent variable, the matrix X is the design matrix based on the independent variables for both the individual level and the suburb level, and the vector β is the set of model coefficients. The errors ε are assumed to be normally distributed, with a mean of 0. In the multivariate regression case we assume that the responses for an individual are paired and may be correlated. The multivariate model allows for this covariance to be modeled, much like the error variance is modeled in the univariate case. The model in this case is most clearly written out in matrix-vector notation:

$$Y = XB + E.$$

In this case the matrix Y is the matrix of dependent variables, with each column corresponding a specific dependent variable and rows to each paired response. The design matrix X is the same as in the univariate case, but the matrix B has columns of coefficients corresponding to each dependent variable. In this case the errors E are assumed to follow a multivariate normal distribution with a mean of 0 and a covariance Σ .

We employ Bayesian methods to determine the posterior distribution, the probability distribution of the parameters given the data, $\pi(\theta|Y)$ where θ represents the set of all model parameters including β and Σ (for more information on Bayesian methods and computational techniques see Browne, 2006; Gueorguieva & Agresti, 2001). Using MCMC to draw samples from the posterior distribution using the R statistical software (R Development Core Team, 2011) and the MCMC glmm package (Hadfield, 2009), estimates are derived from the distribution's properties analogous to the most frequent case of point estimators and estimation intervals. Evaluating this model we use flat noninformative priors for the covariate coefficients and the latent variable, and a vague Wishart prior for the covariance.

RESULTS

Based on the findings from Leigh (2006), we start first with a multilevel model that examines the effect of language diversity on each of the dependent variables (Tables 2 and 3). We then proceed to examine the relationship between country of birth diversity and our measures of social capital (see Tables 4 and 5). For the analyses where country of birth diversity is the focus, we only report the impact of individual and community level indicators of disadvantage and ethnicity on social capital (full models are available upon request).

For each analysis we construct several models. Model 1 examines the influence of the individual and household level variables on measures of social capital. In Model 2, we add two community level variables (median household income and percent unemployed) to assess the importance of living in a disadvantaged community on cohesion and neighborly exchange. In Model 3, we add all other structural variables. Model 4 contains all measures of ethnicity. Finally, Models 5 and 6 include our cross level interaction terms.

Language Diversity and Community Social Cohesion

In Model 1, several individual and household level variables are strongly predictive of perceived social cohesion. For example, males ($\beta = -0.112$, $p < 0.001$), singles ($\beta = -0.083$, $p < 0.001$) and nonreligious individuals ($\beta = -0.096$, $p < 0.001$) report lower social cohesion. Compared to employed people, individuals who are unemployed perceive lower social cohesion ($\beta = -0.147$,

TABLE 2
The Impact of Language Diversity on Social Cohesion

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Intercept	1.029	(0.852, 1.207)	1.275	(1.027, 1.526)	1.264	(1.001, 1.527)	1.381	(1.109, 1.654)	1.384	(1.113, 1.659)	1.376	(1.100, 1.648)
Individual level												
Individual income:												
Less than \$20,000	-0.106	(-0.199, -0.011)	-0.018	(-0.109, 0.075)	-0.023	(-0.116, 0.068)	-0.105	(-0.149, 0.061)	-0.011	(-0.103, 0.081)	-0.011	(-0.103, 0.081)
Individual income: \$20,000-\$39,999	-0.086	(-0.156, -0.016)	-0.010	(-0.079, 0.058)	-0.019	(-0.087, 0.050)	-0.012	(-0.103, 0.080)	-0.014	(-0.083, 0.054)	-0.013	(-0.082, 0.055)
Individual income: \$40,000-\$59,999	-0.113	(-0.175, -0.050)	-0.067	(-0.128, -0.006)	-0.073	(-0.134, -0.012)	-0.014	(-0.082, 0.055)	-0.069	(-0.129, -0.007)	-0.068	(-0.128, -0.006)
Individual income: \$60,000-\$79,999	-0.042	(-0.105, 0.021)	0.001	(-0.060, 0.062)	-0.005	(-0.066, 0.056)	-0.069	(-0.130, -0.008)	-0.008	(-0.070, 0.052)	-0.008	(-0.069, -0.059)
Individual income: No income reported	-0.113	(-0.187, -0.042)	-0.092	(-0.161, -0.021)	-0.098	(-0.168, -0.028)	-0.009	(-0.069, -0.052)	-0.094	(-0.164, -0.025)	-0.094	(-0.163, -0.023)
Unemployed or on a pension	-0.147	(-0.219, -0.075)	-0.103	(-0.174, -0.034)	-0.102	(-0.171, -0.032)	-0.094	(-0.163, -0.024)	-0.098	(-0.168, -0.029)	-0.098	(-0.168, -0.029)
Not on a pension and not in the workforce	-0.016	(-0.069, 0.037)	-0.017	(-0.068, 0.035)	-0.018	(-0.068, 0.034)	-0.098	(-0.169, 0.030)	-0.022	(-0.073, 0.029)	-0.022	(-0.073, 0.029)
Speaks a language other than English at home	-0.081	(-0.168, 0.006)	-0.056	(-0.140, 0.029)	-0.053	(-0.138, 0.031)	-0.045	(-0.127, 0.041)	-0.072	(-0.246, 0.105)	-0.043	(-0.0129, 0.041)
Male	-0.112	(-0.153, -0.070)	-0.099	(-0.140, -0.060)	-0.100	(-0.140, -0.060)	-0.101	(-0.140, -0.061)	-0.101	(-0.141, -0.061)	-0.101	(-0.141, -0.061)
Age	0.002	(0.001, 0.003)	0.001	(-0.001, 0.003)	0.001	(-0.001, 0.003)	0.001	(-0.001, 0.002)	0.001	(-0.001, 0.002)	0.001	(-0.001, 0.002)

Continued

TABLE 2
Continued

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6			
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI		
Not married	-0.083	(-0.131, -0.037)	***	-0.062	(-0.107, -0.016)	**	-0.050	(-0.095, -0.004)	*	-0.046	(-0.093, -0.001)	*	-0.046	(-0.092, -0.001)
Religion: Other	-0.068	(-0.198, 0.066)		-0.025	(-0.155, 0.102)		-0.023	(-0.150, 0.106)		-0.020	(-0.135, 0.097)		-0.028	(-0.155, 0.101)
Religion: None	-0.096	(-0.141, -0.051)	***	-0.100	(-0.143, -0.056)	***	-0.100	(-0.143, -0.056)	***	-0.025	(-0.157, -0.008)	***	-0.105	(-0.149, -0.062)
Education: Bachelor degree or above	0.117	(0.067, 0.167)	***	0.080	(0.032, 0.129)	**	0.091	(0.043, 0.140)	***	0.000	(-0.001, 0.001)	**	0.086	(0.038, 0.134)
Education: Trade or certificate	0.026	(-0.026, 0.077)		0.016	(-0.034, 0.066)		0.017	(-0.033, 0.067)		0.086	(0.037, 0.134)	**	0.020	(-0.029, 0.070)
Education: Primary school or less	-0.042	(-0.163, 0.078)		-0.019	(-0.135, 0.098)		-0.025	(-0.142, 0.092)		0.020	(-0.130, 0.070)		-0.020	(-0.136, 0.096)
Overseas-born	-0.034	(-0.083, 0.015)		-0.033	(-0.081, 0.014)		-0.039	(-0.086, 0.009)		-0.032	(-0.080, 0.015)		-0.032	(-0.079, 0.016)
Community level														
Median household income	-	-	-	0.001	(-0.068, 0.035)		0.001	(-0.001, 0.001)		-0.022	(-0.073, 0.029)		0.000	(-0.001, 0.001)
% Unemployed	-	-	-	-17.642	(-21.317, -13.998)	***	-14.653	(-18.531, -10.758)	***	-9.467	(-13.641, -5.026)	***	-9.479	(-13.741, -5.173)
% Different address 5 years ago	-	-	-	-	-	-	0.001	(-0.001, 0.003)		0.001	(-0.001, 0.003)		0.001	(-0.001, 0.003)
Population density	-	-	-	-	-	-	-0.00006	(-0.00009, -0.00003)	***	-0.00006	(-0.00008, -0.00003)	***	-0.00006	(-0.00009, -0.00002)
Violent crime rate	-	-	-	-	-	-	-0.00007	(-0.00007, -0.00001)	*	-0.00007	(-0.00007, -0.00006)	*	-0.00007	(-0.00007, -0.00006)
Language diversity	-	-	-	-	-	-	-	-	-	-0.240	(-0.481, -0.004)	*	-0.247	(-0.485, -0.006)
% Indigenous	-	-	-	-	-	-	-	-	-	-5.712	(-7.517, -3.911)	***	-5.701	(-7.490, -3.943)

Continued

TABLE 2
Continued

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
% Recent immigrant other than English at home \times Language diversity	—	—	—	—	—	—	0.471	(-1.687, 2.527)	0.447	(-1.678, 2.531)	0.527	(-1.572, 2.636)
Overseas-born \times Language diversity	—	—	—	—	—	—	—	—	0.079	(-0.389, 0.544)	—	—
	—	—	—	—	—	—	—	—	—	—	-0.067	(-0.360, 0.226)

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 3
The Impact of Language Diversity on Frequency of Neighborly Exchange

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Intercept	2.992	(2.801, 3.181)	3.418	(3.144, 3.692)	3.377	(3.087, 3.666)	3.411	(3.116, 3.715)	3.406	(3.106, 3.708)	3.387	(3.086, 3.690)
Individual level												
Individual income: Less than \$20,000	-0.021	(-0.121, 0.081)	0.004	(-0.098, 0.105)	-0.001	(-0.103, 0.101)	0.073	(-0.120, -0.024)	-0.010	(-0.090, 0.112)	0.012	(-0.089, 0.112)
Individual income: \$20,000–\$39,999	-0.002	(-0.077, 0.073)	0.015	(-0.061, 0.091)	0.008	(-0.067, 0.084)	0.010	(-0.089, 0.112)	0.015	(-0.060, 0.090)	0.018	(-0.058, 0.093)
Individual income: \$40,000–\$59,999	-0.029	(-0.096, 0.038)	-0.020	(-0.087, 0.048)	-0.024	(-0.092, 0.043)	0.015	(-0.061, 0.089)	-0.022	(-0.090, 0.044)	-0.019	(-0.086, 0.048)
Individual income: \$60,000–\$79,999	0.044	(-0.023, 0.112)	0.054	(-0.014, 0.121)	0.050	(-0.017, 0.118)	-0.022	(-0.088, 0.046)	0.044	(-0.023, 0.111)	0.046	(-0.021, 0.113)
Individual income: No income reported	-0.080	(-0.157, -0.001)	-0.075	(-0.153, 0.002)	-0.081	(-0.158, -0.003)	0.045	(-0.021, 0.113)	-0.075	(-0.153, 0.001)	-0.075	(-0.153, 0.001)
Unemployed or on a pension	-0.067	(-0.145, 0.010)	-0.055	(-0.133, 0.021)	-0.055	(-0.131, 0.023)	-0.076	(-0.152, 0.01)	-0.056	(-0.134, 0.020)	-0.057	(-0.134, 0.019)
Not on a pension and not in the workforce	0.036	(-0.020, 0.094)	0.037	(-0.020, 0.093)	0.036	(-0.021, 0.092)	-0.057	(-0.133, 0.022)	0.028	(-0.029, 0.084)	0.027	(-0.030, 0.083)
Speaks a language other than English at home	-0.078	(-0.171, 0.016)	-0.063	(-0.155, 0.031)	-0.060	(-0.154, 0.033)	-0.037	(-0.130, 0.056)	0.036	(-0.157, 0.231)	-0.028	(-0.121, 0.066)
Male	-0.021	(-0.065, 0.023)	-0.016	(-0.059, 0.029)	-0.017	(-0.061, 0.027)	-0.018	(-0.062, 0.026)	-0.018	(-0.062, 0.026)	-0.019	(-0.062, 0.025)
Age	-0.000	(-0.002, 0.001)	-0.001	(-0.002, 0.001)	-0.001	(-0.002, 0.001)	-0.001	(-0.003, 0.001)	-0.001	(-0.003, 0.001)	-0.001	(-0.003, 0.001)

Continued

TABLE 3

Continued

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Not married	-0.156	(-0.205, -0.104)	-0.148	(-0.198, -0.098)	-0.140	(-0.190, -0.089)	-0.137	(-0.187, -0.087)	-0.137	(-0.187, -0.087)	-0.138	(-0.188, -0.088)
Religion: Other	-0.079	(-0.221, 0.062)	-0.061	(-0.203, 0.078)	-0.060	(-0.201, 0.080)	0.012	(-0.15, 0.141)	-0.042	(-0.184, 0.099)	-0.040	(-0.179, 0.102)
Religion: None	-0.063	(-0.111, -0.015)	-0.065	(-0.113, -0.018)	-0.065	(-0.113, -0.017)	-0.049	(-0.190, -0.091)	-0.072	(-0.120, -0.025)	-0.073	(-0.121, -0.026)
Education: Bachelor degree or above	0.061	(0.008, 0.115)	0.051	(-0.002, 0.104)	0.058	(0.005, 0.111)	0.001	(-0.003, -0.000)	0.057	(0.004, 0.110)	0.056	(0.003, 0.109)
Education: Trade or certificate	0.024	(-0.032, 0.079)	0.020	(-0.035, 0.075)	0.020	(-0.035, 0.075)	0.057	(0.002, 0.108)	0.020	(-0.035, 0.075)	0.021	(-0.034, 0.076)
Education: Primary school or less	0.004	(-0.125, 0.135)	0.017	(-0.113, 0.144)	0.013	(-0.117, 0.140)	0.020	(-0.034, 0.075)	0.014	(-0.115, 0.141)	0.013	(-0.114, 0.142)
Overseas-born	-0.074	(-0.127, -0.022)	-0.070	(-0.122, -0.017)	-0.075	(-0.126, -0.021)	-0.062	(-0.115, -0.011)	-0.062	(-0.115, -0.009)	0.025	(-0.075, 0.126)
Community level												
Median household income	-	-	-0.001	(-0.002, -0.000)	-0.001	(-0.002, -0.000)	0.028	(-0.028, 0.085)	-0.001	(-0.003, -0.000)	-0.001	(-0.003, 0.000)
% Unemployed	-	-	-12.394	(-16.438, -8.408)	-10.714	(-14.999, -6.433)	-4.852	(-9.527, -0.178)	-4.841	(-9.512, -0.053)	-4.683	(-9.382, 0.054)
% Different address 5 years ago	-	-	-	-	0.001	(-0.001, 0.003)	0.001	(-0.001, 0.004)	0.001	(-0.001, 0.003)	0.001	(-0.001, 0.003)
Population density	-	-	-	-	-0.00005	(-0.00008, -0.00002)	-0.00002	(-0.00005, -0.00001)	-0.00002	(-0.00005, -0.00001)	-0.00002	(-0.00005, -0.00001)
Violent crime rate	-	-	-	-	-0.00002	(-0.00009, -0.00005)	0.00004	(-0.00003, 0.0001)	0.00004	(-0.00003, 0.0001)	4.0e-5	(-0.00003, 0.0001)
Language diversity	-	-	-	-	-	-	-0.515	(-0.777, -0.254)	-0.500	(-0.764, -0.235)	-0.433	(-0.708, -0.160)
% Indigenous	-	-	-	-	-	-	-3.643	(-5.678, -1.696)	-3.700	(-5.697, -1.714)	-3.820	(-5.786, -1.795)

Continued

TABLE 3
Continued

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
% Recent immigrant other than English at home × Language diversity	—	—	—	—	—	—	-0.131	(-2.482, 2.147)	-0.033	(-2.342, 2.292)	0.122	(-2.191, 2.450)
Overseas-born × Language diversity	—	—	—	—	—	—	—	—	-0.222	(-0.733, 0.297)	—	—
											-0.328	(-0.650, -0.006)

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 4
The Impact of Country of Birth Diversity on Social Cohesion

	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Intercept	1.029	(0.852, 1.207)	1.275	(1.027, 1.526)	1.264	(1.001, 1.527)	1.419	(1.125, 1.716)	1.415	(1.119, 1.717)
Individual level										
Individual income: Less than \$20,000	-0.106	(-0.199, -0.011)	-0.018	(-0.109, 0.075)	-0.023	(-0.116, 0.068)	-0.012	(-0.104, 0.080)	-0.012	(-0.102, 0.081)
Individual income: \$20,000-\$39,999	-0.086	(-0.156, -0.016)	-0.010	(-0.079, 0.058)	-0.019	(-0.087, 0.050)	-0.014	(-0.084, 0.053)	-0.014	(-0.083, 0.054)
Individual income: \$40,000-\$59,999	-0.113	(-0.175, -0.050)	-0.067	(-0.128, -0.006)	-0.073	(-0.134, -0.012)	-0.069	(-0.129, -0.008)	-0.068	(-0.129, -0.008)
Individual income: \$60,000-\$79,999	-0.042	(-0.105, 0.021)	0.001	(-0.060, 0.062)	-0.005	(-0.066, 0.056)	-0.007	(-0.068, 0.054)	-0.007	(-0.068, 0.053)
Individual income: No income reported	-0.113	(-0.187, -0.042)	-0.092	(-0.161, -0.021)	-0.098	(-0.168, -0.028)	-0.094	(-0.164, -0.024)	-0.094	(-0.164, -0.024)
Speaks a language other than English at home	-0.081	(-0.168, 0.006)	-0.056	(-0.140, 0.029)	-0.053	(-0.138, 0.031)	-0.048	(-0.132, 0.037)	-0.047	(-0.132, 0.038)
Overseas-Born	-0.034	(-0.083, 0.015)	-0.033	(-0.081, 0.014)	-0.039	(-0.086, 0.009)	-0.030	(-0.078, 0.017)	-0.012	(-0.213, 0.188)
Community level										
Median household income	—	—	0.001	(-0.068, 0.035)	0.001	(-0.001, 0.001)	0.000	(-0.001, 0.001)	0.000	(-0.001, 0.001)
% Unemployed	—	—	-17.642	(-21.317, -13.998)	-14.653	(-18.531, -10.758)	-9.522	(-13.848, -5.258)	-9.504	(-13.796, -5.214)
Country of birth diversity	—	—	—	—	—	—	-0.243	(-0.608, 0.126)	-0.235	(-0.617, 0.136)
% Indigenous	—	—	—	—	—	—	-5.780	(-7.591, -3.974)	-5.796	(-7.602, -3.970)
% Recent immigrant	—	—	—	—	—	—	0.123	(-2.198, 2.409)	0.154	(-2.187, 2.417)
Overseas-born x overseas-born diversity	—	—	—	—	—	—	—	—	-0.040	(-0.463, 0.376)

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 5

The Impact of Country of Birth Diversity on Neighborhood Exchange

	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Intercept	2.992	(2.801, 3.181)	3.418	(3.144, 3.692)	3.377	(3.087, 3.666)	3.440	(3.110, 3.763)	3.407	(3.078, 3.738)
Individual level										
Individual income: Less than \$20,000	-0.021	(-0.121, 0.081)	0.004	(-0.098, 0.105)	-0.001	(-0.103, 0.101)	0.010	(0.092, 0.111)	0.011	(-0.090, 0.112)
Individual income: \$20,000-\$39,999	-0.002	(-0.077, 0.073)	0.015	(-0.061, 0.091)	0.008	(-0.067, 0.084)	0.014	(-0.062, 0.089)	0.015	(-0.060, 0.091)
Individual income: \$40,000-\$59,999	-0.029	(-0.096, 0.038)	-0.020	(-0.087, 0.048)	-0.024	(-0.092, 0.043)	-0.022	(-0.088, 0.045)	-0.020	(-0.087, 0.047)
Individual income: \$60,000-\$79,999	0.044	(0.023, 0.112)	0.054	(0.014, 0.121)	0.050	(0.017, 0.118)	0.048	(0.019, 0.116)	0.048	(0.019, 0.116)
Individual income: No income reported	-0.080	(-0.157, -0.001)	-0.075	(-0.153, 0.002)	-0.081	(-0.158, -0.003)	-0.075	(-0.153, 0.001)	-0.076	(-0.153, 0.001)
Speaks a language other than English at home	-0.078	(-0.171, 0.016)	-0.063	(-0.155, 0.031)	-0.060	(-0.154, 0.033)	-0.043	(-0.136, 0.050)	-0.037	(-0.131, 0.057)
Overseas-born	-0.074	(-0.127, -0.022)	-0.070	(-0.122, -0.017)	-0.075	(-0.126, -0.021)	-0.059	(-0.112, -0.006)	0.090	(-0.130, 0.312)
Community level										
Median household income	-	-	-0.001	(-0.002, -0.000)	-0.001	(-0.002, -0.000)	-0.001	(-0.002, -0.000)	-0.001	(-0.002, -0.000)
% Unemployed	-	-	-12.394	(-16.438, -8.408)	-10.714	(-14.999, -6.433)	-4.916	(-9.712, -0.230)	-4.796	(-9.583, -0.117)
Country of birth diversity	-	-	-	-	-	-	-0.355	(-0.761, 0.048)	-0.292	(-0.707, 0.123)
% Indigenous	-	-	-	-	-	-	-3.712	(-5.693, -1.692)	-3.841	(-5.868, -1.858)
% Recent immigrant	-	-	-	-	-	-	-1.683	(-4.255, 0.826)	-1.444	(-3.994, 1.147)
Overseas-born x overseas-born diversity	-	-	-	-	-	-	-	-	-0.322	(-0.784, 0.140)

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

$p < 0.001$). Older people report higher social cohesion ($\hat{\beta} = 0.002, p < 0.05$) and compared to individuals with high school level education, those with a bachelor degree or above ($\hat{\beta} = 0.117, p < 0.001$) perceive greater cohesion. Household income is also important. When compared to high income earners, those in the three lowest brackets ($\hat{\beta} = -0.106, p < 0.05$; $-0.186, p < 0.05$; and $-0.113, p < 0.001$) report significantly lower social cohesion and trust as do people who did not report their income ($\hat{\beta} = -0.113, p < 0.01$). Interestingly, individuals speaking another language or who were born overseas do not differ from English speakers or Australian-born residents.

In Model 2, we add two community level measures of disadvantage: median household income and unemployment rate. Only unemployment is significant. On average, living in a community with high levels of unemployment predicts lower social cohesion ($\hat{\beta} = -17.642, p < 0.001$). The addition of these indicators of community disadvantage does partially reduce the individual/household level predictors. For example, in Model 2 age is no longer significant and only individuals in the \$40,000–\$59,999 income bracket and those who do not report their income report lower cohesion compared to those in higher income brackets. Further, coefficients for individual unemployment and educational achievement are reduced. This result implies that disadvantage at the community level not only mediates some of the variation attributable to individual characteristics but directly predicts lower social cohesion and trust. Model 3 provides the full complement of community structural characteristics. Population density and the average prior violence rate both predict lower social cohesion ($\hat{\beta} = -5.98e^{-5}, p < 0.001$ and $-7.3e^{-5}, p < 0.05$, respectively). The coefficient for community level unemployment is reduced in Model 3 but remains highly significant. There are no real changes in any of the individual level variables with the addition of the community level predictors. In Model 4, our measure of language diversity, the proportion of Indigenous residents and the proportion of recent immigrants are entered into the model. Only language diversity and the proportion of Indigenous residents significantly predict lower social cohesion and trust ($\hat{\beta} = -0.240, p < 0.05$ and $-5.712, p < 0.001$, respectively). Again, the coefficient for community unemployment drops but remains highly significant. The addition of these measures of ethnicity also reduces the impact of prior violent crime to a nonsignificant level. All individual level variables are reasonably similar. Finally, we add our interaction terms in Models 5 and 6. Here we test if residents who were born overseas but live in a linguistically diverse community or those who do not speak English but live in a linguistically diverse community report lower social cohesion and trust. These interactions terms are not significant.

Language Diversity and Neighborly Exchange

In Model 1 of Table 3, several individual and household level variables are associated with neighborly exchange. Those who did not report their income (compared with those in the highest earning bracket), singles and nonreligious people report lower neighborly exchange ($\hat{\beta} = -0.080, p < 0.05$; $\hat{\beta} = -0.156, p < 0.001$; and $\hat{\beta} = -0.063, p < 0.05$, respectively). Compared to Australian-born residents, individuals born overseas report significantly lower levels of neighborly exchange ($\hat{\beta} = -0.074, p < 0.01$). In Model 2 we add the community disadvantage measures. Both median household income and the proportion of people unemployed ($\hat{\beta} = -0.001, p < 0.01$ and $\hat{\beta} = -12.294, p < 0.001$, respectively) significantly predict lower levels of neighborly exchange. In Model 2, individual level characteristics remain relatively unchanged. In Model 3, all structural characteristics are entered. Only population density significantly predicts lower neighborly exchange ($\hat{\beta} = -4.6e^{-5}, p < 0.01$). Model 4 provides the result for all main effects including the diversity measures. As per the results for social cohesion and trust, language diversity and the proportion of Indigenous residents significantly predict lower neighborly exchange ($\hat{\beta} = -0.515, p < 0.001$ and $-3.643, p < 0.001$, respectively). Next we add our interaction terms (see Models 5 and 6). We find that compared to the overall sample, overseas-born individuals living in linguistically diverse areas engage in more neighborly interaction (see Figure 1). Contrary to Putnam's (2000) suggestion that ethnic diversity encourages residents of all racial and ethnic groups to "hunker," our results indicate that in the Brisbane context diversity does reduce neighborly exchange but this is less consequential for immigrants. Additionally, when we

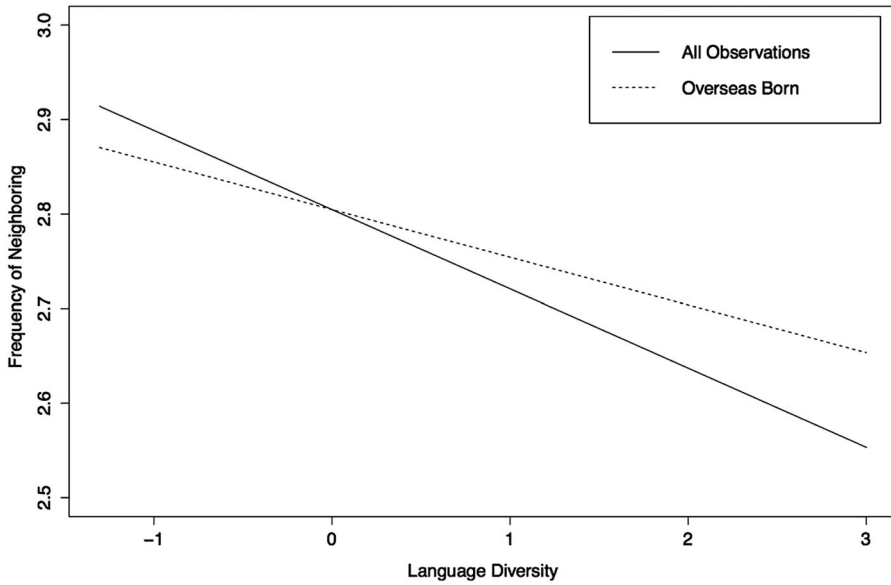


FIGURE 1

The Effect of Language Diversity on Neighborly Exchange for Overseas-Born Participants

add this interaction term to the model, the percent of unemployed people in the suburbs is no longer significantly associated with neighborly exchange.

Country of Birth Diversity and Community Social Cohesion

Our next set of analyses considers whether or not country of birth diversity has a differential impact on social cohesion when compared to linguistic diversity. The relationship between the individual level variables and social cohesion (not shown but available upon request) are very similar to previous models. Being born overseas or speaking a language other than English does not predict social cohesion and trust. In Model 2, we add the community level indicators of disadvantage. Only the proportion of unemployed people in a community predicts lower social cohesion and trust ($\hat{\beta} = -17.642, p < 0.001$). With the additional structural characteristics entered in Model 3, only population density and violent crime are significant (results not shown). In Model 4 we include our ethnicity measures. Country of birth diversity has no impact on social cohesion and trust, but the proportion of Indigenous residents in a community has a significant and negative relationship with perceived social cohesion ($\hat{\beta} = -5.780, p < 0.001$). Notably, the coefficient for community unemployment drops to $\hat{\beta} = -9.522 (p < 0.001)$ when these ethnicity measures are included. The interaction term is not significant in this analysis (see Model 5).

Country of Birth Diversity and Neighborly Exchange

In Model 1 of Table 5, we enter all individual-level variables. Here the individual and household characteristics that significantly predict neighborly exchange are not dissimilar from those reported in Table 3. Compared to Australian born residents, those born overseas report significantly less neighborly exchange ($\hat{\beta} = -0.074, p < 0.01$). In Model 2, both measures of community disadvantage are significantly related to lower neighborly exchange ($\hat{\beta} = -0.001, p < 0.01$ and $-12.394, p < 0.001$, respectively). In Model 3, all other community-level structural variables are entered and as per our earlier findings (see Table 3), and only population density has an effect on neighborly exchange. In areas where there is greater population density, individuals engage in less neighborly exchange

(results not shown). In Models 4 and 5 all ethnicity variables are included. Again, the proportion of indigenous people in a community predicts less frequent neighborly exchange ($\beta = -3.712, p < 0.001$). However, country of birth diversity and the proportion of recent immigrants have no impact on neighborly exchange. Moreover, the interaction term is not significant. Thus, unlike our previous findings (see Table 3), people born overseas are not different from Australian-born residents in their level of neighborly interaction.

DISCUSSION AND CONCLUSION

Putnam's constrict theory offers new insight into the relationship between ethnic diversity and social capital. In the contemporary literature, some studies show that ethnicity negatively impacts social cohesion and trust (see Fieldhouse & Cutts, 2010; Putnam, 2007; Sturgis et al., 2010), while others find limited evidence of "hunkering" or social withdrawal in ethnically diverse neighborhoods (see Gijsberts et al., 2011; Lolle & Torpe, 2011; Savelkoul et al., 2011; Tolsma et al., 2009). In this article, we considered the efficacy of Putnam's (2007) constrict theory in the Australian context, exploring the impact of ethnic diversity on perceptions of social cohesion and self-reported levels of neighborly exchange. We did this by examining the independent influence of disadvantage, compositional, and diversity effects on perceived community social cohesion and the frequency of neighborly exchange. Further, we explored if there were differences in the impact of diversity on these specific elements of social capital for native-born and immigrants. Our study provides some support for Putnam's thesis: we find that the community context has differential effects on perceptions of social cohesion and neighborly exchange. Moreover, our results suggest that compositional and diversity effects independently contribute to the indicators of social capital studied here, but that diversity may be less consequential for immigrants when compared to the Australian population more broadly.

Our first research question explored whether or not diversity reduces social capital, controlling for household and community level disadvantage. In short, we find that linguistic diversity reduces social capital, but country of birth diversity has no impact. Further, unlike other studies that find poverty to be the critical driver in reducing social capital (see Fieldhouse & Cutts, 2010; Laurence, 2011; Mohan, Twigg, & Taylor, 2011; Twigg, Taylor, & Mohan, 2010), after controlling for individual and community disadvantage, we find the ethnic context of a community remains consequential for perceived community cohesion and the frequency of neighborly exchange. The "diversity effect" remains in our analysis, even after accounting for a full complement of person, household, and community characteristics. While we do not dispute that disadvantage matters, our article suggests that, in the Australian context, living in a linguistically heterogeneous community or one with a higher proportion of Indigenous residents also shapes perceptions of social cohesion and the frequency of neighborly exchange.

Our article also considered whether or not ethnic diversity, the concentration of new immigrants, and the concentration of Indigenous residents differentially impacted social cohesion and neighborly exchange. We find that these indicators of ethnic composition have different effects on cognitive and behavioral aspects of social capital. In linguistically diverse communities and those with more Indigenous residents, perceptions of social cohesion were eroded, and the frequency of neighborly exchange was attenuated. On average, social cohesion was diminished for both natives and immigrants; however, at the individual level, the frequency of neighborly exchange was significantly lower for immigrants when compared to their Australian counterparts. We found no effect of country of birth diversity. This is not surprising. As we have argued earlier in this article, the majority of individuals migrating to Australia come from English-speaking countries with large Anglo-Saxon populations and similar cultural norms. Thus, Australian-born residents in communities with immigrants from the United States, the United Kingdom, Canada, or New Zealand may not feel that their neighbors are different from them and thus perceive less diversity.

From these analyses, the diversity measures that matter most for social capital are the proportion of Indigenous residents and language diversity. We suggest that both contextual effects are strong signals of "social distance." In the Australian context, when people recognize others as culturally different,

they are more likely to hunker (or in our example, report lower levels of neighborly exchange). One reason for this might be due to language barriers. People living in areas where there are many languages spoken may not feel they are able to communicate with others effectively. But our results indicate that it is more than just language barriers at work. For example, the Indigeneity of an area might signal an inability of residents to work together to solve local problems. Australia's history is marred by poor Indigenous relations (Baldry & Green, 2002; Halloran, 2004). As a consequence, Indigenous Australians not only experience disadvantage across a range of social and economic indicators (ABS, 2006, 2010), but their mere presence in a community conjures associations with crime, disorder, and disadvantage (Dunn, Forrest, Burnley, & McDonald, 2004; Griffiths & Pedersen, 2009; Shaw, 2000). Thus, we suggest that when residents "see" more Indigenous people, they may be more likely to hunker because of the strong cultural divide between Anglo-Australians and Aboriginal people.

The final research question explored in this article examined "who hunkers?" in diverse communities. Our results showed that in linguistically diverse communities (including those with more Indigenous residents) perceptions of social cohesion were lower and neighborly exchange was attenuated when compared to less linguistically diverse communities. On average, social cohesion was diminished for both native-born and immigrant residents. However, when we examined who "neighbors" in diverse communities, we found that language diversity is more consequential for the general population when compared to immigrants. Although immigrants, on average, neighbor less frequently than Australian-born residents, in more diverse neighborhoods immigrant residents report higher neighborly exchange when compared to the general population. Contrary to Putnam's claim that diversity affects both native and immigrant residents similarly, we find that in the Australian context the general population is much more likely to "hunker" when faced with diversity than new arrivals. These findings concur with Fieldhouse and Cutts's (2010) study. Drawing on data from the U.K. Citizenship Survey, they found that the negative effect of ethnic diversity was restricted to the White population and suggested that in diverse U.K. neighborhoods "minority groups respond to diversity in a very different way than the White majority" (Fieldhouse & Cutts, 2010, p. 308). Thus it is possible that in our sample immigrants may be considerably more comfortable living in diverse areas when compared to native-born residents.

A counter-argument is also possible. Perhaps the hunkering we find in our study has more to do with language barriers than it has to do with diversity. Australian-born residents might find it hard to communicate with people from diverse linguistic backgrounds because they are typically monolingual English speakers. Yet the nonsignificance of our other cross-level interaction terms suggests this is not the case. In linguistically diverse communities, at the individual level those who speak only English at home do not differ from those who speak a language other than English in their levels of social cohesion and trust and neighborly exchange. Hunkering only occurs for Australian-born residents when they live in a linguistically diverse community. Thus if language barriers created an environment that made it difficult for people to interact, we would find that English-only language speakers would be as likely to hunker as native-born residents. But this is not the case. Instead, we argue that language, as a cultural practice, may provide a stronger symbol of diversity than country of birth for Australian-born people.

In the literature diversity is largely understood as a function of race or nationality. In the U.S. context, diversity reflects racial groups, like African Americans, Latinos, and Asians (Oliver & Wong, 2003; Stolle et al., 2008). In non-U.S. settings, scholars consider the birthplace of immigrants as an indicator of diversity. In some settings one's racial or ethnic membership can be clear, yet this is not always the case. For example, in the United States racial demarcations such as Black and White were often obvious in the past, but this is not the case presently in more multicultural societies. Therefore, race and country of birth are ambiguous cues of diversity, and the reliance on these measures of diversity may partly explain why there are differences in "hunkering" across national contexts. We contend that examining the impact of other cues of ethnicity like language, or indeed religion, on indicators of social capital is a necessary step forward in the investigation of the "diversity-distrust" relationship.

Overall, our results provide some support for Putnam's thesis, though there are several caveats to consider. First, in our article we draw on cross-sectional survey data using census data at one time point. As such, we cannot say that *increasing* diversity is associated with a decrease in community ties or social cohesion and trust. Second, as with many telephone surveys, the participants in the ACCS sample tended to be older, with higher levels of education and born in Australia than the general population (see Mazerolle et al., 2007). The patterns reflected in this study (and other survey research more broadly) may represent the views of English-speaking residents. The diversity–distrust association may therefore hold more strongly for the Australian-born population than for the immigrant population. This is not a limitation of our study per se, but is suggestive that attenuated ties in ethnically diverse settings may have greater consequences for minorities, who may not be able to develop the inter-ethnic networks essential for the development of bridging social capital as effectively as nonminority people. Thus, hunkering among Whites in ethnically diverse settings may accentuate the disadvantage experienced by particular minority groups and in turn further impact the ability of new arrivals to fully participate in society (Chiswick et al., 2001; Turner, 2008). Finally, we note that our study does not capture the “quality” of contact with neighbors of various ethnic backgrounds but instead focuses on the general frequency of neighborly exchange. As Lancee and Dronkers (2011) point out, the quality of inter-ethnic contact may be important when considering the impact of ethnic diversity on neighborly exchange.

In summary, our article demonstrates that there are subtle differences in the way disadvantage and diversity influence people's perceptions of social cohesion and neighborly exchange across different types of communities in Australia. We find that residents “hunker” when neighbors look and sound “different” to the majority of people in a community. This is a concern for two reasons. First, as Stolle et al. (2008, p. 71) point out, diversity is only a problem when contact is attenuated as “contact with diverse others makes racial and ethnic differences less threatening to majorities.” Second, it is possible that hunkering and withdrawal might serve to reinforce disadvantage and disinvestment in the community. This would not only lead to a higher probability of crime and disorder, but the racial, ethnic, and class compositions of an area could become aligned with particular “kinds” of places, inhabited by certain “types” of people (see Sampson, 2009; Sampson & Raudenbush, 2004; Wacquant, 2010). While the current levels of segregation and disadvantage in Australia are less than those found in the United States, we argue that the long-term effects of hunkering could encourage the development of disadvantaged ethnic enclaves.

APPENDIX 1: SUMMARY STATISTICS FOR VARIABLES USED IN ANALYSES

Variables	N	Mean/Mode/%	SD	Min	Max
Individual-level variables					
Individual income	3584	\$80, 000 or above (5) (<i>modal response</i>)	1.41	1.00	5.00
Employment status	4067	Working full time or part time (1) (<i>modal response</i>)	0.83	1.00	3.00
Speaks language other than English at home	4093	6.6%	0.25	0.00	1.00
Male	4093	39.8%	0.49	0.00	1.00
Age	4071	49.92	15.11	18.00	94.00
Not married	4093	29.7%	0.46	0.00	1.00
Religion	4093	Christian (2) (<i>modal response</i>)	2.28	1.00	7.00
Education	4076	High School (3) (<i>modal response</i>)	0.91	1.00	4.00
Overseas-born	4081	24.4%	0.43	0.00	1.00
Community-level variables					
Violent crime rate	147	375.59	399.50	0.00	2636.63
Median household income	147	1225.17	613.00	2323.00	331.00
% At diff address 5 years ago	147	40.50	10.41	7.85	77.00
Population density	147	944.89	803.72	10.00	3372.60
% Unemployed	147	2151.71	857.43	0.00	4931.51
Language diversity	147	0.2603	0.15	0.07	0.70
Country of birth diversity	147	0.4540	0.10	0.25	0.75
% Indigenous	147	0.0160	0.012	0.00	0.09
% Recent immigrant	147	0.0400	0.02	0.00	0.13
Social cohesion and trust	147	0.7946	0.65	-2.00	2.00
Neighborly exchange	147	2.7464	0.69	1.00	4.00

APPENDIX 2: ACCS ITEMS

Social Cohesion Scale	<ol style="list-style-type: none"> 1. People around here are willing to help their neighbors. Would you say you strongly agree, agree, disagree, or strongly disagree? 2. This is a close-knit neighborhood. Would you say you strongly agree, agree, disagree, or strongly disagree? 3. People in this neighborhood can be trusted. Would you say you strongly agree, agree, disagree, or strongly disagree? 4. People in this neighborhood generally don't get along with each other. Would you say you strongly agree, agree, disagree, or strongly disagree? 5. People in this neighborhood do not share the same values. Would you say you strongly agree, agree, disagree, or strongly disagree?
Neighborhoodly Exchange	<ol style="list-style-type: none"> 1. About how often do you and people in your community do favors for each other? 2. When a neighbor is not at home how often do you and other neighbors watch over their property? 3. About how often do you and people in your community ask each other advice about things such as child-rearing? 4. About how often do you and people in your community visit in each other's homes or on the street? 5. About how often do you and people in your community have parties or get together? 6. About how often do you and people in your community spend leisure time together going out for dinner, to the movies, to a sporting event?

APPENDIX 3: CORRELATIONS OF COMMUNITY STRUCTURAL VARIABLES

Variables	1	2	3	4	5	6	7	8	9
1- % Different address 5 years ago	1	0.294**	0.178**	0.102**	-0.097**	-0.030	0.236**	0.527**	0.060**
2- Country of birth diversity	0.294**	1	0.926**	0.380**	-0.214**	0.211**	0.459**	0.745**	0.336**
3- Language diversity	0.178**	0.926**	1	0.421**	-0.268**	0.266**	0.478**	0.655**	0.341**
4- % Unemployed	0.102**	0.380**	0.421**	1	-0.757**	0.672**	0.269**	0.137**	0.610**
5- Median household income	-0.097**	-0.214**	-0.268**	-0.757**	1	-0.635**	-0.185**	0.015	-0.600**
6- % Indigenous	-0.030	0.211**	0.266**	0.672**	-0.635**	1	0.084**	-0.064**	0.592**
7- Population density	0.236**	0.459**	0.478**	0.269**	-0.185**	0.084**	1	0.492**	0.179**
8- % Recent immigrant	0.527**	0.745**	0.655**	0.137**	0.015	-0.064**	0.492**	1	0.131**
9- Violent crime rate	0.060**	0.336**	0.341**	0.610**	-0.600**	0.592**	0.179**	0.131**	1

**Correlation is significant at the 0.01 level (2-tailed).

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ENDNOTES

- 1 Suburbs are a meaningful unit of analysis in the Australian context, geographically and symbolically. Geographically, data are collected at the level of the state suburb from the Australian Bureau of Statistics and can be easily combined with nested survey data, such as the ACCS. Symbolically, suburbs have an intrinsic meaning in the Australian context (Davison, 1994; Ferber, Healy, & McAuliffe, 1994) and are readily definable by residents. This was further evidenced in a pilot test of the original ACCS instrument which explored what the term *community* meant to residents. Results of the pilot indicated residents primarily interpret *community* as corresponding to the suburb in which they live (Mazerolle et al., 2007; Wickes et al., 2011).
- 2 It is important to note here that Australia's immigration history is not a happy melting pot. Immigration in this country has been shaped by controversial government policies from the White Australia Policy (1901–1970) to the more recent "Pacific Solution" (2001–2007) (Australian Department of Immigration and Multicultural and Indigenous Affairs, 2010a).
- 3 For the present study 147 suburbs are employed, as these were the suburbs with fully available administrative data.

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