

## Segregation in social networks based on acquaintanceship and trust

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*WZB Discussion Paper*

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**Segregation in Social Networks based on  
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## Abstract

Using newly collected data from the General Social Survey, we compare levels of segregation by race and along other potential dimensions of social cleavage for ties defined in terms of trust and acquaintanceship. We further estimate the size of the trust network and compare its size and structure to recent estimates obtained from the 2004 General Social Survey by McPherson et al. Americans are less disconnected than other recent evidence suggests. However, if racial segregation is the standard, then America is highly segregated across class and values dimensions as well as race and ethnicity. We further find that segregation is insensitive to tie strength. Scholars have long found homophily in close ties, while scholars such as Putnam have looked to weak ties for socially integrative “bridging” social capital. However, “bridging” social capital does not appear to be more plentiful for weak ties than it is for strong ties.



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## 1 Introduction

Scholars have long recognized that patterns of social interaction are segregated along multiple dimensions, and it is generally believed that interaction is most highly segregated along racial lines. However, other forms of segregation have received increased attention in the past decade. Research on social participation from scholars such as Skocpol and Fiorina (1999) argue that patterns of civic engagement have become more polarized by class while other scholars such as Evans (2003) and Rosenthal (2004) argue that Americans have become more polarized by political ideology, while it is common knowledge that American politics became an arena where conflict between proponents of secular and religiously orthodox values became commonplace (e.g. Green 1996; Brooks 2002). But while many studies have been done on the “core” social networks of Americans, little is known about how religion, political ideology, or social class structure the broader acquaintanceship networks of Americans. Do these dimensions rival race in shaping the everyday patterns of social interaction among acquaintances in America? Do Americans have more integrated social networks at their workplace and in voluntary associations than they do in their families or neighborhoods? The answers to these questions are the focus of much speculation, but little hard knowledge.

Using newly collected data from the 2006 GSS, we compare levels of segregation by race and across the principal dimensions of potential social cleavage in contemporary America. We study both the relatively small networks based on trusting relationships and the much larger acquaintanceship networks of Americans in order to answer three major questions. First, how socially integrated are Americans? Second, how segregated are their social ties across boundaries of potential social cleavage in contemporary America? Third, how does the pattern of segregation vary with the strength of the network tie? We find high levels of segregation on dimensions of religion, politics, sexual behavior and class at levels that in some cases rival segregation by race. We find that Americans are not as isolated as suggested by recent estimates obtained from the 2004 GSS by McPherson et al. (2006). However, hopes that “bridging” social capital is more common in broader acquaintanceship networks than in core networks are not supported by the 2006 GSS data. Instead, the entire acquaintanceship network appears to be just as segregated as the more restricted and much smaller network based on trust. Indirect evidence suggests that racial segregation in social interaction has not been growing over time, but segregation on other dimensions is very high. Social polarization rather than social isolation appears to be the greater impediment to social integration in the U.S. today.

## 2 Social Integration and Interpersonal Association

It has long been known that people associate with others who are similar to themselves (i.e., “homophilous”), which produces segregation in people’s social networks along a variety of core demographic statuses, including race/ethnicity, age, education and income (Billy et al. 1984; Coleman 1961; Blau 1977; McPherson and Smith-Lovin 1987; McPherson et al. 2001). Most observers see two different and somewhat overlapping prin-



principles at work. The first concerns the opportunities for forming relationships with people who are similar or different from oneself, which is often referred to as “propinquity” (Blau 1974) or “mixing opportunity” (Moody 2001). The second is the preferences for associating with people like oneself, which is often referred to as the “homophily principle” (McPherson et al. 2001). The homophily principle is so powerful that its existence is taken as given in the social capital literature. Two other issues, however, are considered to be highly problematic in the contemporary U.S., and arise from the recent and growing literature on social integration in modern Western societies. One issue concerns social isolation. The second issue concerns the extent to which people have ties with people who are different from themselves, and are exposed to attitudes, beliefs and opinions that are different from the ones that they hold.

Social isolation is theoretically linked in the contemporary literature to the issue of social inclusion or exclusion, which especially in the European context has been closely tied to concerns about social inequality and poverty. Poverty has been officially defined in the U.S. in somewhat arbitrary “absolute” terms as a multiple of the U.S. Department of Agriculture’s economy food plan (Fisher 1992). In the European Union, in contrast, poverty is connected to inequality through its definition as a specific percentage of a country’s median standard of living. Both poverty and inequality, moreover, are directly linked to the issue of social integration through the organizing concept of social inclusion, which is defined by the European Social Fund as the ability “to participate fully in economic, social and cultural life and to enjoy a standard of living and well-being that is considered normal in the society in which they live” (European Union 2004). People who have ties to the community are included in what Sen has referred to as the “life of the community” (Sen 1992: 39) through their social capital as well as through consumption of goods and services made possible by an adequate income. Social isolation, like poverty, produces social exclusion from this community life.

Much of the recent American literature on social capital follows Bourdieu (1980) and Coleman (1988) in placing primary emphasis on social capital as an instrumental resource for individuals in arenas such as educational attainment, labor markets, business, and politics. Putnam (Putnam 1993, 1996, 2000) and Portes in particular (Portes and Sensenbrenner 1993; Portes 1998, 2000) have argued that social capital is a macro as well as a micro-level concept, a resource for communities and nations as well as for individuals. Portes, however, has placed primary emphasis on homophilous social capital, particularly within the context of ethnic communities, which he refers to as “bounded solidarity” (Portes 1998), and which corresponds to what Gittell and Vidal (1998) refer to as “bonding” social capital. As Portes (1998) and Waldinger (1995) have argued, this form of bounded solidarity can be a resource for an immigrant community, but it also can be a source of deprivation when practiced by more privileged groups (e.g. white ethnic workers in the construction trades) to exclude new ethnic groups from jobs. Contrasting to “bounded solidarity” or “bonding” social capital is what Gittell and Vidal (1998) called “bridging” social capital, which concerns extra-community ties, and which fosters integration in the larger society.

As many scholars have argued (Woolcock 1998; Fukuyama 1995; Gambetta 1988; Putnam 2000), social capital also has a moral dimension that is related to trust. When

trust is low, social isolation is high. When trust is high towards one's own group but low towards other groups, one has a situation of high "bonding" social capital but low "bridging" social capital, which, Putnam argues, "bolsters narrow identities" and "may create strong out-group antagonism." In contrast, "bridging" social capital involves connections that "are outward looking and encompass people across diverse social cleavages" (Putnam 2000). The combination of "bonding" and "bridging" social capital arguably correspond to the condition of "generalized trust" (Putnam 2000) where one thinks that "people in general can be trusted" because one actually has extensive social contact with people who are both similar to and different from oneself. Paxton (2007) has found that generalized trust is higher among people who belong to "connected associations," which she defined as associations that are linked to other voluntary associations through the multiple memberships of their members. In other words, being connected to different kinds of people, whether directly, or indirectly through the ties that one's immediate ties have, appears to increase generalized trust.

Low levels of social capital challenge the extent to which one is included in what Amartya Sen referred to as "the life of the community," and is therefore "socially included." One important question for those concerned about social integration, therefore, concerns isolation; whether a significant fraction of Americans experience social exclusion by virtue of their low levels of connection to others in their family or local community, particularly within their own social group. The second major question concerns the extent to which one's stock of social capital bridges to people unlike oneself and thus promotes social integration. An absence of "bridging" social capital would generally have more negative implications for lower status groups, both because it deprives them of access to high-status resources, and because it exposes them to heightened prejudice from high status groups. As a theoretical proposition, it seems reasonable to argue that system-level social exclusion is lowest and system-level social integration is highest when high levels of "bridging" social capital are present in a society.<sup>1</sup>

In contemporary American society, there are some grounds for optimism but also evidence that raises concerns about social fragmentation as well. American scholars have observed reductions in the economic distance between the genders or between blacks and whites, but other indicators suggest polarizing trends. Families have become more heterogeneous, and marriage rates in particular have fallen even as interracial marriages have increased though remain relatively rare (Ellwood and Jencks 2004; Gullickson 2006). Residential segregation between blacks and whites declined between 1970 and 1990 and declined further between 1990 and 2000 (Massey and Denton 1993; Frey and Myers 2005), though not to a large extent and not uniformly.

American politics have clearly become more polarized. Poole and Rosenthal (2000), for example, documented a growing distance between the political positions of the median Democrat and the median Republican since roughly the middle 1970s. Some analysts have

1 The distinction between system-level and individual-level integration is important; a high-status individual from a majority social group may feel well integrated into a society without knowing anyone in a lower class or a minority social group. However, the society would not be well integrated and would have higher levels of social exclusion if this description applied to all members of the higher classes or the majority social group.

asserted that there is a growing “values divide” among Americans (Green 1996; Brooks 2002; Frank 2004). While DiMaggio, Evans and Bryson (1997) found no such divide as of the middle 1990s (but see Mouw and Sobel 2001), analyses of more current trend data by Evans (2003) show growing evidence that “partisan” Americans (those who label themselves as liberals or conservatives) were becoming polarized around moral issues such as abortion, sexuality, school prayer. In this respect, partisan Americans were moving further apart just as were partisan legislators.

Meanwhile, abundant evidence has emerged concerning the growing correlation of statuses in American society. The association between income and family type increased (Burtless 1999). The association between wife’s education and husband’s education increased (Schwartz and Mare 2005). The association between income and political partisanship increased (McCarty et al. 2006). Our own calculations from the General Social Surveys have established that the association between being married with children and frequent church attender increased, the association between being married with children and being politically conservative increased, and the association between being a frequent church attender and being politically conservative increased.

Various scholars claim to have found dis-integrationist trends in American patterns of association. Lee (2007) recently showed that generalized trust has been declining in the U.S. for the past 30 years. Putnam (2000) provided numerous sources of evidence that declining civic engagement, and concluded his book by arguing that “the evidence from our inquiry shows that this longing is not simply nostalgia or ‘false consciousness.’ Americans are right that the bonds of our communities have withered, and we are right to fear that this transformation has very real costs.” Skocpol and Fiorina (1999) reached somewhat similar conclusions, namely that Americans were increasingly detached from the kinds of cross-class membership organizations that had once defined the landscape of voluntary association in America, to be replaced by nominal memberships (what Putnam called “mailing list” memberships) that were primarily defined by the paying of dues rather than actual social interaction.<sup>2</sup> Putnam argued that increased TV watching and the aging of the “civic generation” born between 1910 and 1940 were the primary culprits followed by a rise in commuter time and the demands of dual career families as secondary factors. Bianchi et al. (2006) report that the decline in civic engagement has primarily occurred among women; they associate this trend with the rising hours of work of women. Costa and Kahn (2003) find that the largest declines in social capital involve interactions that take place in the home either with family, relatives or friends, which –like Bianchi et al. –

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2 Not all scholars agree with Putnam that social capital has declined, including Ladd (1996) and Wuthnow (1998). Costa and Kahn (2003) analyzed trend data on social capital in multiple datasets including the DDB Life Style Surveys, the Current Population Surveys, the General Social Surveys, the National Election Studies and time diary studies conducted at multiple points in time. Costa and Khan reported that some measures of social capital declined over time, while others did not. There was no strong trend in rates of volunteering across the multiple datasets that they studied. GSS data show the strongest trend in membership organizations involved religious organizations. Membership in professional organizations actually rose considerably, while in other nonchurch organizations, membership rates changed very little. Costa and Khan’s analysis of time-trend data agrees with Bianchi et al. (2006) in finding declines in socializing time with friends and relatives, though much of this decline appears to involve the frequency of interaction rather than the existence of ties per se.

they associate with the rise in women's work. Costa and Kahn find that the most important factor explaining the decline in social capital that is centered in the community is the level of inequality in the community, which is consistent with the arguments of scholars such as Skocpol (1996) and Portes (1998).

The most salient recent evidence on disconnectedness stems from the 2004 General Social Survey (GSS). In 2004, McPherson and Smith-Lovin replicated the 1985 module on the core social networks of Americans. In both the 1985 and the 2004 surveys, the GSS interviewer used the following prompt:

“From time to time, most people discuss important matters with other people. Looking back over the last six months—who are the people with whom you discussed matters important to you. Just tell me their first names or initials.” [*if less than 5 names mentioned, probe: “Anyone else?”*] (NORC interviewer writes down just the first five names and then asks further questions about these names).

McPherson et al. (2006) report that the GSS-defined core network in the U.S. has shrunk dramatically between 1985 and 2004. In 1985, the mean respondent reported that he/she had discussed important matters during the past six months with 2.94 individuals out of a maximum of five. In 2004, in contrast, the mean was only 2.08. In 1985, 10% of GSS respondents could not think of anyone they had discussed important matters with in the past six months. In contrast, fully one quarter of 2004 respondents offered no names in response to this question. The 2004 GSS respondents also reported fewer nonkin contacts and fewer contacts operating through neighborhoods or voluntary associations. Other recent evidence is consistent with this 2004 GSS though not necessarily with a social isolation interpretation of its meaning. Bearman and Parigi (2004) analyzed data from the 1997 North Carolina poll and found that 20% of a random sample of North Carolinians reported that they had not discussed important matters with anyone during the past six months, but that 56% of these 20% gave as the reason for their silence that they had nothing important to talk about. As McPherson et al. (2006) note, it is possible that social isolation has increased in the U.S. during the past twenty years, but it is also possible that Americans have reinterpreted what “discuss important matters” means over this period. Not discussed by them is an additional alternative interpretation, namely that the decline in generalized trust found by Lee (2007) may have reduced the willingness of GSS respondents to name individuals (or even the initials of these individuals) that they know well, because they did not want to provide additional information about these people. Finally, it is possible that the decline in available time reported by Bianchi et al. (2006) made respondents eager to find ways to shorten the interview, one of which would be to respond that they do not discuss important matters with anyone. In sum, the trend evidence from the GSS is suggestive but not conclusive about heightened risks in American society for social isolation.

### 3 Empirical Evidence about Strong and Weak Social Ties across “Diverse Social Cleavages”

Putnam argued in *Bowling Alone* that the “bonding”/“bridging” distinction is “perhaps the most important” dimension along which social capital could vary, but that he could find “no reliable, comprehensive, nationwide measures of social capital that neatly distinguish ‘bridgingness’ and ‘bondingness,’ ” which caused him to de-emphasize this distinction in his empirical analysis and focus instead on the simpler question of whether social capital in general has declined (Putnam 2000). Despite the large empirical literature on social networks, his conclusion about the state of available evidence remains accurate for two reasons. First, more attention has been paid in homophily studies to some statuses than to others, which leaves gaps in our understanding about potential barriers to social interaction. The second and more fundamental reason is the lack of good data about the structure of complete social networks –including the weak ties as well as the strong ones.

As McPherson et al. (2001) discuss, studies of association range from marriage (Kalmijn 1998), confidants and friends (Marsden 1988; Verbrugge 1977, 1983) to mere contact (Wellman 1996), knowing about someone (Hampton and Wellman 2001) or appearing with them in a public place (Mayhew et al. 1995). This literature documents multiple dimensions of homophily, including age, gender, race, and socioeconomic status. However, much of what is known about the level of homophily in social networks concerns close relationships (Moody 2001), largely because of the methodological difficulty of gathering information about people to whom one has relatively weak ties. Position generators (Lin et al. 2001) and resource generators (Van der Gaag and Snijders 2005) probe more deeply into the structure of weak ties, but they still provide an incomplete picture of the characteristics of individuals to whom ego has a weak-tie connection.

Much of the literature on homophily concerns race, and it is typically identified as the dimension along which social networks are most segregated, though most of the evidence for this assertion comes from the study of close ties of marriage, kinship, and friendship, especially school friendships or core-network designs such as the 1985 and 2004 GSS (Marsden 1988; McPherson et al. 2001). Marsden’s (1987) study of the 1985 GSS questions about core social networks found that only 8% of adults with networks of size two or more reported being tied to someone of a different race. Marsden estimated this frequency as only one-seventh as high as one would expect if people sorted themselves at random. Many studies have similarly found strong evidence of segregation in racial friendships (e.g., Quillian and Campbell 2003; Moody 2001; Mouw and Entwisle 2006). But little is known about inter-racial acquaintanceships made at work, in the neighborhood, or in voluntary associations.

Even less is known about ties among Americans with different religious practices or political preferences. McPherson et al. (2001) argued that marriage, friendship, and confiding relations are homophilous with respect to religion, though religious homophily is not typically as strong as race or ethnicity (Laumann 1973; Marsden 1988; Fischer 1982; Louch 2000), and Kalmijn (1998) argued that marital homophily with respect to religion appears to be declining. McPherson et al. (2001) note that some religious groups

(e.g., Jews) clearly display homophily in their choice of friends and spouses. In contrast, they argue that religion “may not matter much at all” in relationships that are not close. According to McPherson et al. (2001), the main exception concerns fundamentalists and members of sects, for whom religion has become something of a total environment.<sup>3</sup> Similarly, McPherson et al. (2001) report that homophily generally applies to values as well as to social statuses, but the extent to which this applies to contacts outside friendship groups or core social networks is an open question.

The strength of the tie arguably affects the level of homophily, though the empirical evidence even on this important issue is slim. Putnam argued that close ties were more likely to be with people like oneself, while weak ties were more likely to be with people who are different from oneself. The principle underlying Granovetter’s “strength of weak ties” hypothesis was that weak ties provided connections to people who were more occupationally and socioeconomically dissimilar from oneself than did strong ties (Granovetter 1973; see also Lin 1999). On the other hand, McPherson et al. (2001) report that “in general, the patterns of homophily are remarkably robust over...widely varying types of relations.” (p. 418). The only generalization they offer with respect to tie strength is that, based on Fischer’s 1982 data, homogamy may be greater when it involves people who are connected to each other by more than one type of relationship (so-called “multiplex” ties). Similarly, Smith-Lovin (2007), following Blau (1977), argued that homophily is likely to be greater when socio-demographic dimensions are more correlated. She further argued that close ties are more likely to be multiplex than are distant ties and that Granovetter (1973, 1974) used multiplexity as one definition of close ties. Based on the 2004 GSS, however, multiplex ties are uncommon even within core social networks.<sup>4</sup> The sparseness of multiplex ties between individuals whose tie is “close” raises a question about the basis for the argument that close ties should be more homophilous than are weak ties.<sup>5</sup>

A principal reason for the uncertainty about whether weaker ties are less likely to be homophilous than strong ties is that research on weak ties has focused more on the specific issue of instrumental ties in the labor market than on the broader question of social integration (Lin et al. 2001; Van der Gaag and Snijders 2004). In particular, so called “complete network” designs are very rare outside the pioneering work of Killworth and

3 Wuthnow (2002, 2003) also finds that religious involvement does not have a net effect on having friends with lower status or with higher status people. Ties to higher status people, in contrast do tend to be higher for those who are members of religious congregations or who have leadership positions in these congregations.

4 McPherson et al. (2006) report that only 6% of nonkin close ties measured in the 2004 GSS were “multiplex,” and that even among spouses, only 42% shared one other type of relation and only 13% shared more than two types of social relations with their spouse.

5 Even the thesis that multiplex ties are more homophilous is not obviously true. Consider a world which had only two relevant status variables: class and race, where whites were generally of higher class than blacks. If associations were made exclusively on race, then class homogamy would clearly be higher if race and class were strongly associated than if they were weakly associated. However, if associations were made jointly on the basis of class and race, then homophily on either class or race might be unaffected by the level of correlation between class and race so long as the number of individuals in each class x race combination were sufficient to find individuals who were homophilous with respect to both statuses. Alternatively, individuals might engage in “status exchange,” which would indeed reduce levels of homophily on both class and race.

McCarty (McCarty et al. 1997; Killworth et al. 1990), and these studies have focused most of their attention on estimating the total size of networks and on the specific issue of estimating ties to relatively rare population groups such as women who adopted a child in the past year, the homeless, or someone who committed suicide last year. Barry Wellman's Toronto study interviewed 29 people at length in order to obtain information about roughly 300 of their acquaintanceships (Wellman 1996). Add Health obtained data for school-based friendships of all adolescents in a set of sample high schools, but even the friendship data connecting adolescents in these schools was not truly complete (Bearman et al. 2004). Demographers at the University of North Carolina, Chapel Hill collected data on the complete household networks among 51 villages (7337 households total) in Nang Rong, Thailand (Rindfuss et al. 2004). But these efforts do not scale well to the social worlds of adult Americans (Marsden 2005). As a consequence, relatively little is currently known about the level of segregation of acquaintanceship networks, including how it compares to the much more heavily studied patterns of homophily in relationships among friends and intimates. The 2006 GSS data, therefore, offers the potential to fill an important gap in scientific knowledge both about the structure of segregation and homophily in complete social networks.

## 4 Data and Methods

The data for this study was collected as a special topical module in the 2006 General Social Survey. The basic design was similar to McCarty et al's 1998 and 1999 surveys that employed a "how many X's do you know?" methodology in order to estimate the distribution of individuals' network size, and also to estimate the sizes of special subpopulations that tend to be hard to count with standard survey methodologies (McCarty et al. 2001). Our survey differed from McCarty et al's surveys in its focus on ties to highly salient groups that define important sources of heterogeneity among Americans and potentially important sources of social cleavage. Our survey also differed from McCarty et al in the type of relationships that we measured and in the several subsets of a person's full network that our questions pertained to.

We asked about two types of relationships. Our prompt concerning acquaintanceship was as follows:

I'm going to ask you some questions about all the people that you are acquainted with (meaning that you know their name and would stop and talk at least for a moment if you ran into the person on the street or in a shopping mall). Again, please answer the questions as best you can.

The second type of relationship that we studied concerned trust. Coleman defined trust as the willingness to place intellectual, financial, physical or other resources at the disposal of another party (Coleman 1990).<sup>6</sup> An individual usually trusts her friends, but there are

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<sup>6</sup> Tilly's recent definition of trust is similar; according to Tilly: "Trust consists of placing valued outcomes at risk to others" malfeasance, mistakes or failures (Tilly 2005: 12).

other people one may trust who do not qualify as friends, such as kin, or mentors, or people that one has a service or business relationship with. The extent of one's trusting relationships may in turn be related to one's level of "generalized trust", i.e., one's belief about the trustworthiness of the average person or of the "benevolence of human nature in general" (Yamagishi and Yamagishi 1994). Our trust question is about the respondent's specific trusting relationships as opposed to generalized trust, and was elicited with the following prompt:

Now I'm going to ask you some questions about people that you trust, for example good friends, people you discuss important matters with, or trust for advice, or trust with money. Some of these questions may seem unusual but they are an important way to help us understand more about social networks in America. Please answer the questions as best you can.

Following the prompts concerning acquaintanceship or trust, the GSS interviewers asked respondents a series of "how many of the people that you are acquainted with/that you trust who was named [one of a set of names]" in order to estimate the respondent's network degree.<sup>7</sup> The interviewers then asked about specific ties with people at various socioeconomic levels, people who were members of various race and ethnic groups, and people with various religious behaviors, various family types and sexual orientation, and people with various political orientations. The specific objects of our inquiry are listed in Table 1.

In the McCarty et al surveys, the groups being asked about were relatively rare, and the questions asked respondents to list the exact number of individuals they knew in each of these groups. In contrast, our interest includes large as well as small groups, and it is infeasible to ask respondents to recall the exact number of people they know in groups that are not rare. Consequently, we asked respondents to indicate whether the number of people they knew in these groups fell within specific numerical ranges, specifically zero, one, two to five, six to ten, or more than ten.

We asked questions about the number of persons known or trusted in the respondent's entire social network. In addition, we asked these questions with respect to four specified subnetworks: (1) family, relatives, or in laws, (2) neighbors, (3) people at work or customers or clients, and (4) people from associations, clubs, preschool, school, or places of worship. We asked about each of these subnetworks both because of our substantive interest in how segregation with respect to specific groups varied across networks, and because it would create additional variance in the level of contact with relatively large groups such as racial or ethnic groups or people classified by their level of religiosity.

Our overall sample size was about 1500. In order to accomplish the project's objectives, we subdivided our sample in complex ways. Fifty percent of the sample were asked the questions about acquaintanceship and trust concerning their entire social network. The other fifty percent was divided into four subsamples, and each of these subsamples was

<sup>7</sup> We used the following names: Karen, Brenda, Kevin, Shawn, Keith, Rachel, Mark, Linda, Jose, and Maria.



Table 1: Groups Included in the 2006 GSS Queries about Social Ties based on Acquaintanceship and Trust

<i>“How many people are you acquainted with ...” / “Do you trust who ...”</i>	
Occupations	Social groups
<ul style="list-style-type: none"> <li>- are police officers</li> <li>- are lawyers</li> <li>- are social workers</li> <li>- are janitors or building cleaners</li> <li>- are child care workers</li> <li>- are electricians</li> <li>- are currently serving in the armed forces</li> </ul>	<ul style="list-style-type: none"> <li>- are currently unemployed</li> <li>- own a second home</li> <li>- are currently in state/federal prison</li> <li>- are Asian or Asian-American</li> <li>- are black or African-American</li> <li>- are Hispanic men or women</li> <li>- are gay men or women</li> <li>- are unmarried women living with men in a romantic relationship</li> <li>- are attend religious services on a regular basis</li> <li>- are attend religious services rarely or never</li> <li>- are people who are very liberal</li> <li>- are people who are very conservative.</li> </ul>

asked about ties within three of the four subnetworks listed above. Restrictions on total module length caused us to exclude questions about contact with the opposite gender because men and women make up such large shares of the population that it would be difficult, given our methods, to measure variation with accuracy.<sup>8</sup> We also omitted questions about contact with groups defined by age or education in order to focus on the cleavages most salient to the current debate on social integration, namely race/ethnicity, class, religion, political ideology, and relationship/family.

Our basic model is described in detail in Zheng, Salganik and Gelman (2006). We assume that the probability of individual  $i$  knowing  $y$  individuals in group  $k$  follows a Poisson model, i.e.

$$y_{ik} \sim \text{Poisson}(\lambda_{ik})$$

where  $\lambda_{ik}$  is the expected number of individuals that individual  $i$  knows in group  $k$ . The main task therefore is to model  $\lambda_{ik}$ .

In a world where associations were made at random, it would be straightforward to model  $\lambda_{ik}$ ; for every individual  $i$ , the expected number of people in group  $k$  that he knows would equal the product of the size (degree) of his network multiplied by the fraction of all acquaintanceship ties that involve group  $k$ . For example, if 12% of all acquaintanceship ties involved African-Americans, an individual who know 500 people would be expected

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<sup>8</sup> Social networks tend to be relatively gender-integrated, which is another reason for our excluding gender as a potential dimension of segregation (McPherson et al. 2001).

to know 60 African-Americans.

More formally, let  $a_i$  equal the estimated degree of individual  $i$ 's acquaintanceship network, and  $b_k$  equal the proportion of all ties that involve group  $k$ . Then we could write

$$y_{ik} \sim \text{Poisson}(e^{\alpha_i + \beta_k}) \quad (1)$$

where

$\alpha_i = \log(a_i)$ , and  $a_i$  is the estimated degree (network size),

$\beta_k = \log(b_k)$ , and  $b_k$  is the estimated proportion of total links that involve group  $k$ .

Model 1 is unrealistic because individuals differ in their propensity to know members of any particular social group. We take this overdispersion into account by allowing the relative propensity of individuals to know members of group  $k$  to differ. We define  $g_{ik}$  as the relative propensity of individual  $i$  to know someone in group  $k$ , where  $g$  is the ratio of the expected number of ties for individual  $i$  to the number of ties he would be expected to have if acquaintanceship ties were made at random, i.e.,

$$g_{ik} = \frac{\lambda_{ik}}{a_i b_k}$$

and we elaborate the basic model such that

$$y_{ik} \sim \text{Poisson}\left(e^{\alpha_i + \beta_k + \gamma_{ik}}\right) \quad (2)$$

where

$$\gamma_{ik} = \log(g_{ik}).$$

We cannot directly estimate the parameters in model 2 because the number of parameters exceeds the number of data points. Instead, we integrate out the  $\gamma_{ik}$  and thereby obtain the negative binomial model

$$y_{ik} \sim \text{Negative Binomial}\left(\text{mean} = e^{\alpha_i + \beta_k}, \text{overdispersion} = \omega_k\right)$$

where  $\omega_k$  scales the variance of the number of acquaintanceship ties between individuals in the population and members of group  $k$ , i.e.,

$$V(y_{ik}) = \omega_k E(y_{ik})$$

Higher values of  $\omega_k$  imply greater overdispersion. When  $\omega_k$  is unity, the negative binomial model reduces to the Poisson model where the variance equals the mean. For further details, please consult Zheng et al. (2006).

Three further issues need to be briefly summarized. One concerns the issue of normalization. Note that in model 2 the predicted  $y_{ik}$  depends on the sum of  $\alpha_i$  and  $\beta_k$ . There is no way from the data alone to determine whether a certain  $y_{ik}$  arises from a larger network with a smaller proportion of overall ties involving group  $k$  or from a smaller network with a larger number of overall ties involving group  $k$ . In order to identify  $\alpha$  and  $\beta$  separately, we borrow information about the size of the groups from other sources. Thus, we could

constrain the  $\beta_k$  parameters such that the sum of the estimated proportion of ties involving each of the names is equal to the proportion of all members of the population that have these names.<sup>9</sup>

A second issue concerns recall errors. Prior research demonstrates that individuals find it easier to accurately count the number of individuals they know from rare groups than from common groups. Put concretely, it is easier to recall the number of females that one knows who are named Bethany than it is to recall the number of males one knows who are named Michael.<sup>10</sup> To ease respondent burden, we used intervals to ask respondents about people they know (zero, one, 2-5, 6-10, or greater than 10), but this does not by itself solve the problem of under-reporting. McCormick and Zheng (2007) show that for rare names, people have accurate recall, but that as the group becomes more common, the recall shortfall becomes larger. Killworth et al. (2003) and McCormick and Zheng (2007) find that the fraction recalled rises with the square root of the actual fraction in the population as the group becomes a larger fraction of the total population. This research suggests a further modification of model 2 to incorporate recall error, i.e.,

$$y_{ik} \sim \text{negative binomial} \left( \text{mean} = e^{\alpha_i + \beta'_k}, \text{overdispersion} = \omega_k \right) \quad (3)$$

where  $e^{\beta'_k}$  is the proportion of ties in the *recalled* social network that involve group  $k$ , and where  $\beta'_k$  is linked with  $\beta_k$  via a recall function that is fitted from the data (McCormick and Zeng 2007). We use the recall function to transform the known proportion of group  $k$  in the population into an estimate of the fraction of network ties that will be recalled to connect with group  $k$ , and this then gives our estimate of degree size. An alternative normalization strategy assumes the the proportion of ties involving racial groups equals their collective proportion in the population. We use the latter normalization strategy in our analysis of the network of people that one trusts.

The third issue concerns masking. Statuses involving skin color are often readily observable. Other characteristics such as political ideology or sexual orientation are not as readily observed, and it might often be true that a respondent would recall a particular acquaintance but not necessarily know that the acquaintance was politically conservative, gay, in a cohabiting relationship, or someone who goes to church on a regular basis. Killworth et al. (2003) refer to the situation where information about one's status is not transmitted with equal probability to all people that one knows as a "transmission effect". We use the term masking to emphasize that the lack of transmission occurs not simply because the information has less salience for some than for others, but also because the information is often hidden on purpose from acquaintances who would be put off by this knowledge. Thus conservatives may be less likely to make their political ideology readily apparent to an acquaintance who is a liberal, someone who is gay may hide this fact from

9 This approach assumes that individuals with these names are collectively no more or less likely than other individuals to be recipients of acquaintanceship ties. For further details, see McCormick and Zheng (2007).

10 The average person in the McCarty et al. data reported knowing 600 persons (McCormick and Zheng, 2007). Someone with a personal network of 600 would be expected to know about 11 persons named Michael. However, respondents reported knowing an average of just under 5 Michaels.

someone else who may have low tolerance for homosexuality, etc. Generally speaking, we expect the phenomenon of masking will make networks appear to be more segregated than they actually are on those social dimensions where one's status can be hidden. The fact that our estimates will overstate segregation on certain dimensions is not simple error, however; it instead provides an accurate estimate of the level of segregation and the extent of "bridging social capital" that ego perceives in his network.

## 5 Results

### 5.1 The Size and Segregation in Acquaintanceship Networks

The size of acquaintanceship networks varies substantially in the adult population. Figure 5.1 shows the distribution of the recall adjusted acquaintanceship network. The median person is acquainted with 543 people, with an interquartile range of 390 to 777. Our estimate from the 2006 GSS data is similar to previous estimates made by Zheng et al. (2006) based on the 2000/2001 Kilworth and McCarty data (see also Marsden 2005). We regressed degree size on a set of sociodemographic characteristics, and Table 2 is consistent with other research (e.g. Zheng et al. 2006) in showing systematic variation. The strongest predictors of acquaintanceship degree in our data are education, race, and church attendance. Each year of education is associated with an increase of 21 people, or about 3%, in one's acquaintanceship network. Net of education, income also has a small effect, with \$10,000 more family income predicting an increase of 10 in one's network. Race and church attendance have large effects on the size of social networks. GSS respondents who identify their race as neither white nor black have 26% smaller networks than do whites, while those who attend church on a weekly basis have a 26% larger network (about 142 people) than do those who rarely or never attend church. The added network members of frequent church members are presumably the people that they know from their participation in religious services and other activities at their places of worship. That there is no significant difference between the size of the network of whites and blacks (controlling for other characteristics) demonstrates that the national imbalance in the size of racial population groups has little impact on the size of their acquaintanceship networks, despite predictions that flow from Blau's work. Members of "other" races (which is largely Hispanic) are more likely to be recent immigrants and more likely to speak a language other than English, and these factors may depress the size of their networks; unfortunately, the GSS does not allow direct measures of these characteristics.

Estimated overdispersions in acquaintanceship social networks are presented in Table 3. The statistics in this table are estimates of the extent to which acquaintanceship ties towards people in particular groups vary from the ties that would be predicted based on random interaction. The overdispersion parameter provides an estimate of the ratio of the true variance to the variance from the null model of random mixing. In the case of people named Kevin, the estimated overdispersion is 1.69. So for example, if ego knows 900 people, and if 1% of all people are named Kevin, then ego would be expected to know 9 people named Kevin under the null model with a standard deviation of 3. An

Figure 1: Estimated distribution of Acquaintanceship Degree

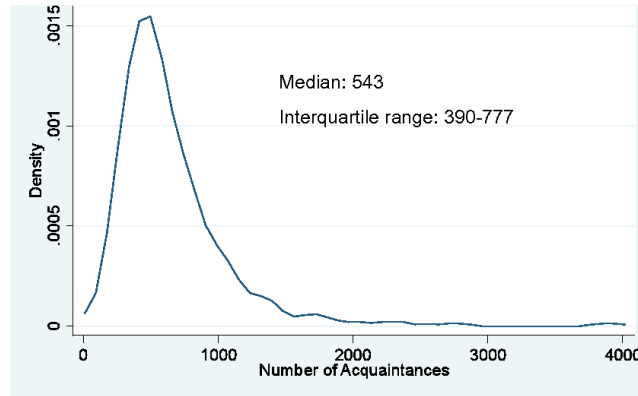


Table 2: Regression of Acquaintanceship Degree on Selected Covariates

	Acquaintanceship Degree		Log of Degree	
	Coefficient	S.E.	Coefficient	S.E.
Age 30-64	13.186	45.434	0.02	0.064
Age 66+	-59.275	57.212	-0.083	0.081
Highest year of school completed	21.413**	5.245	0.033**	0.007
Total family income (thousands)	0.971*	0.408	0.002**	0.001
Income is missing	61.257	47.043	0.074	0.067
Female	-39.671	29.433	-0.051	0.042
Black	-55.805	44.085	-0.063	0.063
Other race	-141.517**	51.034	-0.258**	0.072
Attend church sometimes	51.210	34.816	0.098*	0.049
Attend church weekly or more	153.680**	39.326	0.265**	0.056
Moderate political views	-3.518	43.112	-0.028	0.061
Conservative political views	-79.878	51.557	-0.115	0.073
Widowed	-17.668	60.092	-0.073	0.085
Divorced	55.810	42.794	0.087	0.061
Separated	-30.906	95.205	0.051	0.135
Never married	4.363	41.745	0.014	0.059
constant	284.065**	95.869	5.757**	0.136
N		661		661
R <sup>2</sup>		.11		.14

\* p < .05; \*\*p < .01

Table 3: Estimated Level of Overdispersion in Acquaintanceship Networks

	Median	S.E.
<i>Persons who are named</i>		
Kevin	1.694	0.107
Karen	1.635	0.117
Shawn	1.605	0.131
Brenda	1.450	0.104
Keith	1.210	0.088
Rachel	1.476	0.125
Mark	1.685	0.118
Linda	1.272	0.098
Jose	3.382	0.341
Maria	2.48	0.200
<i>Persons who (are)</i>		
Unemployed	9.126	0.916
Own second homes	3.716	0.361
In prison	3.793	0.603
Asians	7.859	0.897
Nlacks	10.547	1.152
Hispanics	8.483	0.759
Whites	51.608	22.481
Gay men or women	5.112	0.510
Women who are cohabiting	5.350	0.494
Attend church regularly	9.270	1.279
Attend church rarely/never	8.257	0.934
Strongly liberal	5.114	0.482
Strongly conservative	5.566	0.576

overdispersion of 1.7 implies that the standard deviation of the number of Kevins known to people with 900 acquaintances grows only slightly, from 3 to 3.9 people. In general, the overdispersions for groups defined by names was low, which supports our using these names to estimate the distribution of network degree in the GSS sample. In contrast, overdispersion is much greater for ties with groups defined by or related to class, race, political orientation or religion. For example if 5% of social ties involved the unemployed, then a person who knew 500 people would be expected (based on random assignment) to know 25 unemployed people with a standard deviation of 5. In actual contemporary American society, we estimate the standard deviation to be 15, implying an approximate 95% confidence interval of 0 to 50 as opposed to the 15-35 confidence interval in a world of random mixing.

The existing literature, which is largely based on information collected about a few close ties, reports that segregation on the basis of race outstrips by far segregation on other social

variables. Our data clearly support earlier findings showing a high degree of segregation on the basis of race. Because whites are numerically dominant, we cannot accurately estimate the level of overdispersion of the number of whites one is acquainted with.<sup>11</sup> For blacks and Hispanics, however, our results show overdispersion parameters of about 10. In a network of 500 acquaintanceships, we would expect at random about 12% black and Hispanic acquaintances, or 60 blacks and Hispanics each out of 500, and a standard deviation of about 8, and so 95% of social networks would have between 44 to 76 of each group. Instead, the estimated standard deviation is 25, giving a 95% band of 10-110 for each group. If anything, these estimates probably underestimate the actual overdispersion, in that 12% of the American population is black and more than half of them are very likely acquainted with more than 110 blacks.<sup>12</sup>

Another way to illustrate the meaning of overdispersion is to compare our estimated probabilities of knowing especially few (or especially many) members of any particular group against the benchmark of random mixing. Table 4 shows the estimated fraction of a 400 person network (the 25th percentile of estimated network size) that would belong to each of the measured subgroups based on the proportion that each of these groups constitutes of the American population. This table then compares our estimates with the number of these subgroup acquaintances that we estimate would be recalled by the GSS respondents on the basis of our normalization on names. Based on the estimated size of each of these groups, a 400 person acquaintanceship network would be expected to include 4 prisoners, 17 Asians, 17 women who are cohabiting, 20 gay men or women, and larger numbers of all other groups. For the counterfactual of random mixing, only 5% of networks would include 10 or fewer Asians or cohabiting women, almost everyone would know 10 or fewer prisoners, and only 1% would have networks containing as few as 10 gay men or women. For all of our other groups, the probability of having 10 or fewer acquaintanceships in a 400 person network would be extremely small. In contrast, the estimated probabilities of having such segregated networks from our negative binomial model is much larger than the random benchmarks would suggest. Sixteen percent (as opposed to 1 in a 1000) would know 10 or fewer unemployed persons, nearly 1/3 would know 10 or fewer Asians, and 16% would know 10 or fewer gay people.<sup>13</sup>

Our results differ from earlier findings, however, in suggesting that segregation by race is not notably higher than segregation on the basis of class or religion. Like race, both of these variables also have overdispersions that approach 10. We estimate that the chances of knowing no one who goes to church regularly, no one who is unemployed, no one who is gay, no one who cohabits, no one who is strongly liberal, or no one who is strongly con-

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11 The highest response category for our questions was “more than 10.” Almost everyone knows more than 10 whites, and so we have relatively little information about overdispersion for this group.

12 Our recall corrections affect our estimates of the number who are known but not the overdispersion parameter. Generally speaking, however, we expect that recall error will bias downward the level of overdispersion in a group.

13 The estimated number of people in a 400 person network who belongs to any particular social group is of course greater than the estimated number of people that one would *recall* from a 400 person network. The illustration could equally well have been worked out for the recalled network as for the total network, and the results would be the same, with the caveat for both cases that the overdispersion refers to what ego *knows* about the people in his network rather than what these people know about themselves.

Table 4: Deviation from Random in a 400 Person Acquaintanceship Networks

Persons who (are)	N Known	Probability of knowing $\leq 10$			Over- dispersion
		Random	Estimated	Odds Ratio	
Unemployed	24	0.00	0.16	175	9.1
Own second homes	24	0.00	0.05	46	3.7
In prison	4	1.00	0.91	0	3.8
Asians	17	0.05	0.32	8	7.9
Blacks	48	0.00	0.01	>1000	10.5
Hispanics	52	0.00	0.00	>1000	8.5
Whites	291	0.00	0.00	>1000	51.6
Gay men or women	20	0.01	0.16	17	5.1
Women who are cohabiting	17	0.05	0.26	6	5.4
Attend church regularly	125	0.00	0.00	>1000	9.3
Attend church rarely/never	168	0.00	0.00	>1000	8.3
Strongly liberal	60	0.00	0.00	>1000	5.1
Strongly conservative	78	0.00	0.00	>1000	5.6
Total	929				

Note: Estimated Number Known Based on Group Population Size. Sum of N Known exceeds 400 because people can have multiple statuses.

servative is always at least 5 times and as much as 9 times higher in American social networks than would be true under random mixing. Our results suggest a polyvalent pattern of segregation in American social networks which challenges the conventional wisdom that “race and ethnicity are clearly the biggest divides in social networks” (McPherson et al. 2001: 6).

Table 5 shows that the pattern of segregation varies across subnetworks, sometimes in predictable ways but also in ways that challenge conventional wisdom. Naturally, race and ethnicity are most highly segregated within families, where integration occurs only either through intermarriage, or through members of mixed-race and mixed-ethnic families assuming different racial or ethnic identities. Outside of the family, race and ethnic segregation are of comparable size within the neighborhood, voluntary associations, and the workplace. Scholarship has, of course, demonstrated widespread residential segregation so its existence within associational subnetworks is no surprise. It is also well known that schools, churches, and social organizations are also segregated by race and ethnicity. The average census tract-level index of black-white dissimilarity in the 50 largest metropolitan areas of the U.S. is .62, while the average tract-level Hispanic-white index of dissimilarity is .48 (Charles 2003). Our recent knowledge about workplace segregation derives from EEO-1 data on private establishments with 50 or more employees (Robinson et al. 2005). Tomaskovic-Devey et al. (2006) found that American establishments had a mean white-black dissimilarity index of about .35 and a similarly sized white-Hispanic dissim-



ilarity index.<sup>14</sup> However, they argue that this number is an underestimate because first it excludes establishments that are racially homogeneous, and second because it is based on the highly aggregated EEO nine-category occupational classification. Racial or ethnic segregation by job is conceptually quite different from racial or ethnic acquaintanceship at work, because people potentially interact both vertically (between superiors and subordinates) and horizontally at the workplace. Given these differences, it is striking how similar is the extent of acquaintanceship segregation in the workplace (with overdispersion estimates of 10.0 for blacks and 11.2 for Hispanics) and in the neighborhood (where the corresponding estimates are 12.9 and 9.2).

The second striking pattern in Table 5 is the extent to which “bridging” social capital is more likely to be found within families than in the associations and business organizations that make up the public sphere. There is less overdispersion in knowing the unemployed or people with a second home in the family than at work, within associations, or in neighborhoods. The same is true for prisoners.<sup>15</sup> Acquaintanceship ties with gays are more randomly distributed within the family than at work, in associations, or in neighborhoods. This pattern may partly be explained by the fact that American families have become much more heterogeneous over time, and therefore it is more likely that people who are dissimilar with respect to class or prison status will be located in the same family than in the past. It also may be harder to mask certain statuses such as sexual orientation within the family than it is at work.

Table 5 shows that segregation in church attendance and in political ideology follow the more predictable pattern of being greater within the family than they are in the neighborhood or at work. Even at work, however, acquaintanceships across religiosity or ideological lines are much less random than is mixing of people by first names. Glaeser and Ward (2006) estimated that the index of dissimilarity by political party at the national level is about .2 when counties are the unit of analysis. This is much lower than standard results for residential segregation at the tract level, but these numbers are not readily comparable. Counties are much bigger than tracts and county-level racial segregation is doubtless much lower than is tract-level segregation, but racial segregation *within* counties is very high, while the level of political segregation within counties is an unknown. Religiosity is much more segregated within associations than at work or in the neighborhood, but this is not surprising given that the category of associations includes places of worship. Political ideology is similarly more segregated within voluntary associations than it is at the workplace or in the neighborhood. Certainly it is not the case that political associations are a central aspect of the associational life of Americans, but people appear to choose associations or choose whom to associate with in associations in order to produce a greater level of ideological segregation than they experience in their neighborhoods or workplaces.

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14 Roughly 15% of establishments were missing either blacks or whites and roughly 20% of establishments were missing either Hispanics or whites (Tomaskovic-Devey et al. 2006).

15 Someone who is in prison or unemployed is of course not at work, but one could know such a person through work.

Table 5: Estimated Mean Level of Overdispersion in Acquaintanceship Subnetworks

	Work		Associations	
	Mean	S.E.	Mean	S.E.
Unemployed	8.7	1.5	6.5	0.9
Second Home	4.2	0.6	5.1	0.7
Prison	4.5	1.6	8.0	2.6
Asians	8.5	1.3	6.0	0.9
Blacks	10.0	1.3	12.9	2.0
Hispanics	11.2	1.7	8.2	1.3
Whites	27.2	6.0	43.4	11.6
Gays	3.6	0.4	3.9	0.5
Go to Church regularly	4.4	0.5	7.9	1.2
Go to Church rarely/never	5.0	0.6	7.7	1.1
Liberals	2.8	0.3	3.9	0.4
Conservatives	3.8	0.4	4.3	0.5
Cohabitators	3.8	0.4	6.0	0.7

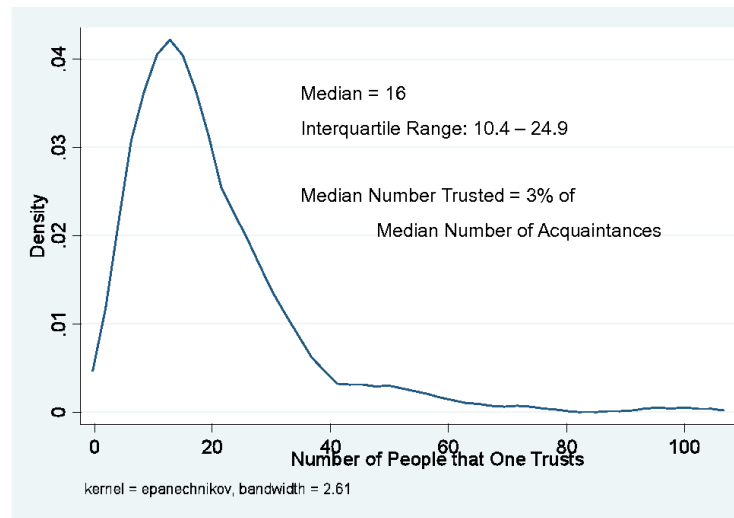
	Neighborhood		Family	
	Mean	S.E.	Mean	S.E.
Unemployed	8.2	1.2	5.0	0.6
Second Home	3.3	0.5	2.5	0.3
Prison	12.9	6.5	3.5	0.8
Asians	7.4	1.3	16.4	4.8
Blacks	12.9	2.0	79.2	26.1
Hispanics	9.2	1.4	24.7	6.4
Whites	32.5	7.4	299.0	110.1
Gays	4.4	0.8	2.5	0.3
Go to Church regularly	4.6	0.6	8.1	1.0
Go to Church rarely/never	4.1	0.5	6.5	0.8
Liberals	2.9	0.3	4.1	0.4
Conservatives	3.4	0.4	5.6	0.6
Cohabitators	3.2	0.4	4.0	0.5

## 5.2 Trusting Networks

The number of individuals that one trusts is obviously smaller than the number of people that one is acquainted with, but how much smaller? McPherson et al. (2006) found that the mean size of confiding networks (as measured by the GSS question concerning a list of people one has “discussed important matters with” in the last six months) dropped from 2.94 out of a maximum of 5 in 1985 to 2.08 in 2004, with 24.6% of the sample listing no names at all. Our 2006 GSS question about trust differs from the 2004 (and 1985) GSS questions; it broadens the relationship to include friends, and it is closer to the Coleman idea of trust as the willingness to place material resources along with information at the disposal of someone else. For these reasons, it provides an alternative perspective on the level of isolation among contemporary Americans. We computed the proportion of people in our sample who reported that they trusted no one at all in any of the social categories that we asked about (i.e., all the specific names, all the specific occupations, all races, liberals and conservatives, churchgoers and non-churchgoers, the unemployed, those in prison, those with a second house, gays, and cohabiting women). Only 1.35% of the 2006 GSS sample reported that they didn’t trust any specific person in any of these categories that we queried about, which is very different from the 2004 GSS. We further computed the proportion of respondents who did not trust anyone in all but one of these categories (we let the excepted category be anything at all). This relaxed criterion only raised the proportion of “extremely low trusters” to 3.14%. It seems that when confronted with specific prompts for specific types of people, Americans are much more likely to report that they trust at least some specific individual than they are to provide the specific name of someone with whom they have discussed “important matters.”

Next, we estimated the degree distribution of the trusting network. Recall from above that our model contains an indeterminacy in its parameters because the expected number of people one knows in group  $k$  is the product of the size of one’s network multiplied by the proportion of all ties that map to people in group  $k$ . For purposes of estimating the acquaintanceship network, we needed to adjust our estimates to correct for recall error. Because the size of the trusting network is likely to be much smaller than the size of the acquaintanceship network, we assumed as a lower bound that respondents were able to recall all the individuals in each category that they trust, and then we normalized on race groups, which implies that the total distribution of trusting ties to the different race groups matches the distribution of these racial groups in the population. The result is displayed in Figure 2. The distribution of trust ties is skewed to the right, with a median of 16, and an interquartile range between 10.4 and 24.9. These values are much higher than the mean of 2.08 reported out of the 2004 GSS (McPherson et al. 2006). At the same time, trust networks are much smaller than acquaintanceship networks. Whereas the median number of acquaintanceships estimated from our data is 543, our estimate of the median number of people that one has a trusting connection with is only 16, or 3% of the median acquaintanceship network. The large discrepancy between these two numbers suggests that respondents correctly reported about specific trust relations rather than about generalized trust, since one-third of GSS respondents reported that most people can be trusted, which presumably would have included most of the people that they themselves

Figure 2: Estimated Distribution of Trusting Degree



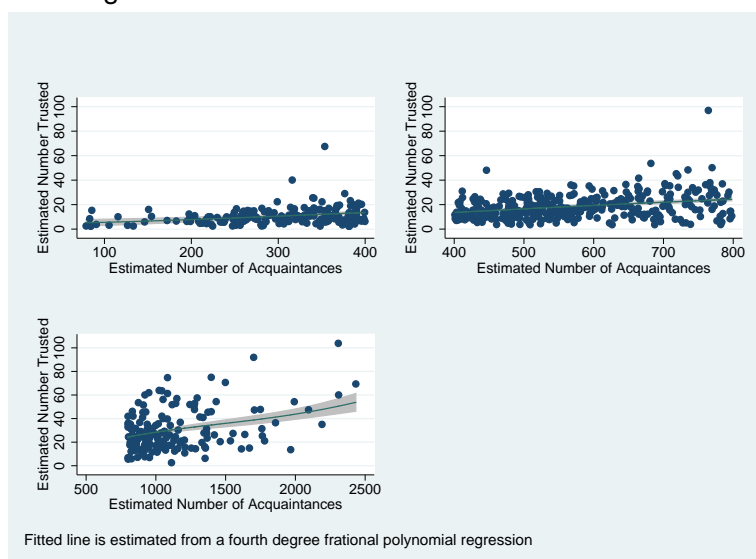
were acquainted with.

Why the discrepancy between the 2004 network questions and our estimates of the size of trusting networks from 2006? As noted earlier, McPherson et al. (2006) raised two possible explanations concerning (a) the meaning of the word “discuss” and the possibility strongly supported by Bearman and Parigi 2004 that many people rarely or ever consider that they are engaged in discussions about “important matters.” The 2006 GSS question was broader and did not require a decision about whether “important matters” had been discussed with specific people that the respondent trusted. Another possibility is that the the 2006 GSS questions did a better job of recalling people to the minds of GSS respondents than did the open-ended question used in the 2004 GSS.<sup>16</sup> Finally, it is possible that people who were uncomfortable in the 2004 GSS about revealing specific names of individuals were nonetheless willing to count their trusting ties within specific social categories.

To establish the determinants of the size of the trusting network, we first estimated a fractional polynomial regression of the estimated size of the trusting network against the estimated size of the acquaintanceship network. Figure 5.2 shows the estimated relationship between the number known and the predicted number trusted along with a scatterplot of the estimated number trusted against the estimated number known. Among those whose estimated acquaintanceship degree is in the bottom 25% of the distribution, the predicted number trusted moves from about 5 to about 15, with virtually everyone in this quartile trusting fewer than 20 people. In the middle 50% of the distribution, the expected number trusted climbs from about 15 to about 25. In this range, it becomes more common for

16 The use of the six month window in the 2004 GSS prompt may also have played a role, though we think it unlikely that the width of this time window by itself is the cause for the very large discrepancy between the two surveys.

Figure 3: Estimated Number of Trusted v. Known



people to report that they trust between 20 and 40 people, even though there is a persisting minority of respondents who trust very few individuals. Finally, in the top quartile, the expected number trusted climbs from 25 to over 40. A minority of people assert that they trust over 60 people, while another minority report that they trust very few individuals.

To further explore the determinants of the trusting network degree, we regressed the estimated number trusted on a set of covariates, and we report the answers in Table 6. In Model 1, we omit acquaintance degree. In this model, the only variables that have statistically significant effects are education (the more educated trust more), race (whites trust more people than blacks and others), and church attendance (regular church attenders trust more people). In model 2, we include the estimated size of one's acquaintanceship network as a covariate. Model 2 suggests that education and church attendance mostly affected the number trusted because of their effect on the number known, while the effect of nonwhite is diminished. Net of estimated degree size, age appears to have a curvilinear relationship with trust; young adults and people over 65 trust a higher proportion of their acquaintance network than do people of other ages. Model 3 includes the generalized trust variable.<sup>17</sup> In the absence of any other covariates except for degree size, generalized trust has a significant effect on the number trusted; those who think that people mostly can be trusted trust an estimated 15% more people (net of estimated degree size) than do people who disagree that most people can be trusted (results available upon request from the authors). In the presence of other covariates, however, the effect of generalized trust on the degree of one's trust network is weakened below the level of conventional statistical significance.<sup>18</sup> When generalized trust as well as degree size are controlled, church atten-

17 NORC asked the generalized trust question to approximately 2/3 of the GSS sample that was also asked our questions about trust, and so the sample size for model 3 is smaller than for models 1 and 2.

18 However, respondents with high generalized trust know an estimated 70 more people than do those with low generalized trust. Generalized trust is related to the number one trusts partly through its effect on

Table 6: Regression of the Logarithm of Estimated Trust Degree on Selected Covariates

	Model I	Model II	Model III
<i>Age Category</i>			
25-34	0.174	0.201*	0.303*
35-44	0.185	0.156	0.178
45-54	0.105	0.114	0.171
55-64	0.13	0.104	0.003
66+	0.228	0.301**	0.249
Highest year of school completed	0.032**	0.008	0.002
Total family income	0.001	0	0
Income is missing	0.028	-0.037	-0.09
Female	-0.075	-0.04	0.01
Black	-0.138	-0.083	-0.137
Other race	-0.332**	-0.155*	-0.167
Attend church sometimes	0.149*	0.077	0.142*
Attend church weekly or more	0.292**	0.098	0.214**
Moderate political views	-0.041	-0.025	-0.004
Conservative political views	-0.035	0.047	0.041
Widowed	-0.189	-0.126	-0.096
Divorced	0.009	-0.054	-0.016
Separated	-0.104	-0.115	0.006
Never married	0.054	0.039	0.075
Estimated acquaintance degree/100	0.272**	0.281**	
(Estimated degree/100) <sup>2</sup>	-0.013**	-0.014**	
(Estimated degree/100) <sup>3</sup>	0.000**	0.000*	
Cannot trust most people		-0.093	
Whether one can trust “depends. . .”		-0.142	
Intercept	2.092**	1.317**	1.359**
Number of observations	661	661	430

\* p &lt; .05; \*\*p &lt; .01

Table 7: Estimated Level of Overdispersion in Trust Networks

	Mean	S.E.
<i>Persons who are named</i>		
Kevin	1.04	0.04
Karen	1.12	0.07
Shawn	1.21	0.09
Brenda	1.40	0.15
Keith	1.18	0.09
Rachel	1.34	0.13
Mark	1.14	0.09
Linda	1.21	0.11
Jose	2.05	0.25
Maria	2.37	0.30
<i>Persons who (are)</i>		
Unemployed	4.84	0.53
Own second homes	2.84	0.28
In prison	2.83	0.71
Asians	5.35	0.67
Blacks	6.58	0.69
Hispanics	7.11	0.86
Whites	8.97	1.22
Gay men or women	3.79	0.42
Women who are cohabiting	3.71	0.37
Attend church regularly	6.01	0.61
Attend church rarely/never	4.98	0.45
Strongly liberal	3.84	0.32
Strongly conservative	3.88	0.33

dance again becomes a significant predictor of the size of one's trusting network; net of other factors, those who attend church weekly or more trust about 20% more people than do those who never go to church. We speculate that these additional people in the trusting network are in fact the people that churchgoers go to church with, but we do not have the data to confirm this.

Next, we address the question of overdispersion in trusting networks. Table 7 shows the level of overdispersion in the trusting networks and table 4 illustrates the impact of overdispersion by comparing the probability of trusting no one in our measured groups as compared with the expected outcome under random mixing. As for the case of acquaintanceship networks, overdispersion is highest for racial groups, but church attendance follows closely behind. Under random mixing, only 9% of people would be expected not to trust a single African-American. In the actual data, the estimated probability of this event

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the number one knows.

Table 8: Deviation from Random in a 400 Person Trust Networks

Persons who (are)	Probability of knowing $\leq 10$			Over-dispersion
	Random	Estimated	Odds Ratio	
Unemployed	0.36	0.66	3.4	4.8
Own second homes	0.38	0.57	2.2	2.8
In prison	0.89	0.94	1.8	2.8
Asians	0.38	0.69	3.6	5.3
Blacks	0.09	0.44	8.2	6.6
Hispanics	0.21	0.60	5.8	7.1
Whites	0.00	0.05	>1000	9.0
Gay men or women	0.39	0.64	2.8	3.8
Women who are cohabiting	0.32	0.57	2.9	3.7
Attend church regularly	0.00	0.09	76.0	6.0
Attend church rarely/never	0.01	0.14	20.9	5.0
Strongly liberal	0.03	0.20	7.1	3.8
Strongly conservative	0.02	0.15	9.5	3.9

Note: Estimated number known based on group population size. Sum of N known exceeds 400 because people can have multiple statuses.

is 44%. Sixty percent are estimated to trust no Hispanics and nearly 70% are expected to trust no Asians; both numbers are much higher than expected under random mixing. Because those who regularly go to church and those who rarely or never go to church are a larger proportion of the population, the effects of overdispersion magnify the likelihood of knowing no one in the group relative to the baseline random mixing model. A similar result is obtained for those on the left or right of the American political spectrum. While only 3.5% of the population would be expected not to trust a single liberal under random mixing, our actual estimated probability is over 20%. For conservatives, we estimate that 15.4% of the population do not trust a single conservative, which contrasts with the probability of only one in fifty in a situation of random mixing.

We elaborated our analysis of racial segregation in trusting networks by comparing the actual frequencies of trusting people of other races that we obtained from the GSS. Table 9 shows the actual distribution of trust of whites, blacks, and Hispanics by the race of the respondent. As other studies have noted, it is relatively common for blacks and whites to report significant contact with members of the other race. In a 1989 national survey, 82% of blacks and 66% of whites claimed to have friends of the other race (Sigelman and Welch 1993). Jackman and Crane (1986) reported results from a 1975 national sample that showed 10% of whites to have a good black friend, and another 21% reporting having a black acquaintance.<sup>19</sup> In this same survey, 25% of blacks claimed to have a “close” white

<sup>19</sup> Jackman and Crain’s data used a “stronger” form of acquaintanceship than used in our data. Their prompt defined acquaintanceship as people that respondents “keep in touch with or get together with occasionally.” It seems likely that many people who would be defined as acquaintances based on knowing



Table 9: Distribution of Trust of Other Races, by Own Race

Number of	Own Race		
	White	Black	Other
<i>Whites Trusted</i>			
0	3.6	31.0	19.7
1	3.6	16.1	14.8
2-5	20.4	35.6	34.4
6-10	16.7	3.5	11.5
11+	55.8	13.8	19.7
<b>N</b>	<b>504</b>	<b>87</b>	<b>61</b>
<i>Blacks Trusted</i>			
0	48.0	13.6	52.4
1	14.9	4.6	15.9
2-5	25.0	26.1	23.8
6-10	7.1	22.7	3.2
11+	5.0	33.0	4.8
<b>N</b>	<b>504</b>	<b>88</b>	<b>63</b>
<i>Hispanics Trusted</i>			
0	59.9	64.4	38.7
1	12.5	11.5	8.1
2-5	20.2	20.7	17.7
6-10	3.8	1.2	11.3
11+	3.8	2.3	24.2
<b>N</b>	<b>506</b>	<b>87</b>	<b>62</b>

Note: Percentages add to 100 within each column in each panel of the table.

friend. Sigelman et al. (1996) reported from their 1992 Detroit survey that 43% of blacks and 27% of whites said that they had a good friend of the other race. However, only 6% of whites and 15% of blacks actually listed a friend of another race when prompted in a recent GSS study (NORC 2001, reported in Mouw and Entwisle 2006). In the 2006 GSS, 37% of whites claim to trust 2 or more blacks, and 28% claim to trust 2 or more Hispanics. A small majority of blacks and a larger majority of people of another race report that they trust two or more whites. While Jackman and Crain used a different operationalization than we did, the 2006 GSS data suggest that interracial contact may have increased from 1975 to 2006. These results further suggest that studies which rely on the direct production of names may understate the number of cross-racial trust-based ties, as well as close ties in general.<sup>20</sup> Nonetheless, trusting networks are clearly still highly segregated.

As we noted earlier in the paper, relatively little is known about the relative level of segregation of trusting networks vs broader acquaintanceship networks. On theoretical grounds, McPherson et al. (2001) predicted that homophily is stronger in what they refer to as “multiplex” relationships, in which people have a relationship along more than one dimension. One corollary of this is that trusting networks should be more homophilous than are acquaintanceship networks, because one is likely to have a more elaborated structure of ties involving kinship, marriage, and friendship in addition to more instrumental connections with people that one trusts than with people that are only acquaintances. Similarly, Putnam (2000) conjectured that “bonding” ties tend to be with people like oneself; his question was whether bridging ties would be sufficiently heterophilous to create a socially integrated society. A comparison of the estimated overdispersion in the acquaintanceship and trusting results provides a simple test of this conjecture. In fact, our estimated overdispersions are generally smaller for trusting networks than for acquaintanceship networks. Given that our estimated overdispersion parameters for acquaintanceship networks are if anything downwardly biased because of recall error, this result would appear to be robust. Trusting networks are if anything slightly less segregated than are acquaintanceship networks.

## 6 Discussion

Segregation in American social networks is pervasive across multiple statuses that have been identified as dimensions of potential social cleavage in the popular press and in the academic literature. Other studies have found this to be true in the context of core networks. Our data confirm that segregation is also pervasive in broader acquaintanceship networks as well. Beyond this confirmation, our data contain three major findings that contain both optimistic and sobering news for those who believe the social integration is an essential component of modern society. On the optimistic side, we find that trusting net-

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their name and stopping on the street to say hello are not people that one keeps in touch with or gets together with occasionally.

20 Marsden's (1987) study of the 1985 GSS social network questions found that only 8% of adults with networks of size two or more reported being tied to someone of a different race. Marsden estimated this frequency as only one-seventh as high as one would expect if people sorted themselves at random.

works have not atrophied to the extent implied by the 2004 GSS. The typical American is able to identify between 10 and 20 individuals that are trusted. Some individuals do have fewer than 10 individuals that they trust, and these individuals typically have relatively few acquaintanceships as well. At the other extreme there are people who have a relatively large number of acquaintances but few people that they trust. The typical American has a trusting relationship with only about 1/30th of the people that they “know.” While this may sound low, it may also reflect the fact that building a trusting relationship takes time and most people do not have enough time in their lives to build more than twenty or so such relationships.

The greater concern, we suggest, lies not with the size of trusting relationships but rather with the structure of acquaintanceship networks, which we find to be as segregated as trust networks. That core (including trust) networks are homophilous is almost a truism. Scholars would also expect that people make acquaintances more frequently with people like themselves than with people who were different. However, the daily requirements of life and work require that people also interact with others who are different from themselves. The opportunity for meeting people who are different from oneself is of course not a constant. It depends on the level of homogeneity in one’s neighborhood, one’s workplace, the associations one belongs to, and the other places where one has the chance to get to know others. People have a certain amount of choice over the neighborhoods in which they live, the places they work, and the associations they join. They also have some control over the people to get to know in these neighborhoods, these workplaces, and these associations. When social barriers are high, people of different races or with different political views or religious orientations may avoid social interaction to the extent possible or at least may hide their differences with others that they must work with or see on a regular basis. Structural opportunity mixes with personal preferences in order to shape the extent of heterogeneity in weak ties.

Core networks are different. People are socialized to be like their family members, and they choose their mates and their friends. It is for this reason that one expects homophily to be high in core networks. That acquaintanceship networks are at least as segregated as are core networks has, we suggest, two potentially important implications. The first, which is consistent with concerns raised by Putnam, Skocpol, and others, is that the organizations of American civil society in the American economy do not play a strongly integrative role in contemporary American society. A second potentially important implication is that new forces in American society may provide the basis for increased integration even in the American core networks, or, to put it another way, in the bonding social capital of Americans. One such force may stem from the increasing heterogeneity of the American family. To put it another way, the very factors that are operating to destabilize American families may also be increasingly exposing Americans to people different than themselves an environment that motivates more than limits social interaction. One of these factors is rising rates of interracial marriage. A second factor is the relatively high rate of instability of cohabitation and marriage which increases the rate of repartnering at older ages and thereby lowers marital homogamy (Schwartz and Mare 2005). A third factor is the relative difficulty of masking one’s religious orientation, sexual orientation, political orientation, or cohabitation behavior within the context of the family in contrast with work

or associations.

Our third major finding is more difficult to characterize as either optimistic or pessimistic. Our results suggest that the level of segregation by race and association networks is roughly on par with the level of segregation by religion or employment status. Religion in particular has emerged as a fundamental cleavage in American society at the level of day-to-day interaction. From the perspective of the culture wars that we have seen play out in the American political sphere and the past decade or so, this may not be surprising. However, it is often assumed that the most visible participants in these culture wars are a relatively small number of partisans. Our findings show that Americans in general segregate their social networks on the basis of religious behavior. The same is true to a lesser extent for political orientation. Because a lack of interaction may heighten a lack of understanding and a lack of tolerance for the views of others, this pattern is worrisome.

Aside from technical issues concerning measurement and model specification, there are important substantive questions raised by our results. One such issue concerns the extent to which our measured levels of segregation are driven by the objective characteristics of the people that Americans know and the extent to which they are driven by misperception or masking of behaviors and opinions that Americans think would be disapproved of by certain people that they associate with. A second important issue concerns trends over time. While our study provides a baseline for the assessment of future trends, our limited comparisons with previous studies provide some grounds for concluding that segregation in association by race may be diminishing or at least is not increasing. We have no firm basis for drawing any similar conclusions concerning segregation by religious behavior, political orientation, sexual orientation or the other variables measured in the 2006 GSS. Future data collections can provide the basis for comparisons with existing data to establish a level of stability and change in segregation of social networks along these dimensions. A final issue concerns the causes and consequences of network segregation. The General Social Survey provides a good platform for collecting descriptive information about social networks and for studying the behavioral correlates of network structure. However, causal estimates involving these network characteristics cannot readily be obtained from these data, and imaginative strategies are needed in order to determine the individual and structural factors that can explain heterogeneity in segregation across individuals and over time. These are important topics for future research.

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