

A Friend in Creed: Does the Religious Composition of Geographic Areas Affect the Religious Composition of a Person's Close Friends?

DANIEL V. A. OLSON
*Department of Sociology
Purdue University*

PAUL PERL
*Center for Applied Research in the Apostolate
(CARA)
Georgetown University*

Numerous theories of religion rest on the assumption that the religious composition of local populations influences the religious identities of a person's close friends, but there have been few empirical tests of this assumption. Using a combination of data on the religious identity of close friends (from the 1988 and 1998 General Social Survey) and information on the religious composition of counties (from the U.S. Religious Congregations and Membership Study) we find that despite tendencies toward religious homogeneity, the religious composition of the surrounding population has an effect on the proportion of a respondent's same-religion friends and on the proportion of friends belonging to specific other religious groups. Local population characteristics are unrelated to the proportion of respondents' friends known in congregational settings. Results have implications for a broad range of sociological theories of religion as well as research examining the impact of same-congregation and same-religion friends (e.g., health and well-being).

Keywords: *social networks, religious social ties, population share.*

INTRODUCTION

Does geography matter when it comes to religion? Not mountains and rivers, but the religious composition of different geographic regions? A number of important attempts to understand regional and local variation in the religious behavior of individuals and religious organizations suggest that it matters a great deal. Most of these attempts rely on explanatory mechanisms having to do with variations in the number and types of religious “suppliers” (e.g., congregations, denominations) in different geographic areas (e.g., Finke and Stark 1989; Stark and Iannaccone 1994) or having to do with the influence of interpersonal social ties on the religious identity and behavior of people living in these areas. In this analysis, our concern is with the latter mechanism and more particularly with the assumption that these explanations make, the assumption that the religious composition of a geographic area has a substantial influence on the religious composition of the close social ties of people living in the same area.

Three quite different causal explanations suffice to demonstrate how important and widespread this assumption is in theorizing in the sociology of religion. First, one component of many secularization theories (e.g., Berger 1967) is that greater religious diversity in a geographic area will undermine religious commitment and lessen religious involvement in part because it is assumed that individuals living in more religiously diverse areas will necessarily tend to have

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Correspondence should be addressed to Daniel Olson, Department of Sociology, Purdue University, 700 West State Street, West Lafayette, IN 47907-2059. E-mail: dolson@purdue.edu

interpersonal social ties that are also more religiously diverse. The conflicting influences of these religiously diverse social ties, in turn, are thought to undermine commitment to strong, distinctive, religious identities thus leading to declining religious commitment in more religiously diverse areas, a claim that has never been fully resolved (e.g., Chaves and Gorski 2001; Finke and Stark 1989; Olson 1999; Voas, Olson, and Crockett 2002).

Similarly, Olson's (2008) explanation of why small population share denominations (denominations with a small proportion of the population in an area) have more committed members also relies on the assumption that the religious composition of the population of a geographic area will be reflected to some degree in the religious composition of churchgoers' close social ties. Olson assumes that members of small population share denominations have a smaller proportion of their close social ties with fellow members (because there are fewer denomination members in the population) and more of their close ties are therefore with nonmembers. Olson believes these cross-denomination ties explain the much higher membership turnover rates (members joining and leaving each year) found among small population share denominations because such ties are known to facilitate religious switching (e.g., Stark and Bainbridge 1980). Rates of membership turnover are positively correlated with the per-member financial giving and attendance rates of current members because the least committed are the first to leave and because the most committed from among the potential joiners are the first to join. Thus the religious composition of an area is the first element in a causal chain that ends up influencing average commitment levels of congregations. A key link in this chain is the assumption, for which Olson presents no evidence, that the religious composition of geographic areas affects the personal social networks of churchgoers.

Finally, in an important but seldom cited article, Iannaccone and Makowsky (2007) also assume a strong relationship between the religious composition of a geographic area and the religious composition of people's close social ties. Why, they ask, are the regional differences in both overall religiosity (e.g., low on the West Coast, high in the South) and denominational distributions (e.g., Baptists and Methodists in the South, Catholics in Northeastern urban areas) so stable over the decades when we know that there is a great deal of interstate migration? Why does migration not lead to religious homogeneity or at least some convergence across regions over time? Iannaccone and Makowsky suggest that the explanation lies with the power of close social ties to reshape people's identities and behaviors. When an interstate migrant arrives in his or her new location, the migrant develops new close social ties from among the people living there. The religious composition of the new migrant's close social ties thus comes to resemble, in significant ways, the religious composition of the people living around him or her. This enables the religious influences of the surrounding population to be transmitted to the migrant in ways that can alter the migrant's religious identity and behavior so that he or she comes to more closely resemble the people in the new location.

All three of these quite diverse explanations share two common assumptions: first, that a person's close social ties have a major impact on his or her religious beliefs, identities, and behaviors and, second, that the religious composition of these close social ties will resemble, to some degree, the religious composition of the people living in the person's geographic area. The first of these assumptions is a sociological commonplace but the second is more contested and complicated. In this article we examine this second assumption, that the religious composition of a geographic area significantly affects the religious composition of close social ties of people living in that same area.

CONTRARY FORCES

Even in the Internet age, one might still suppose that most of a person's important close social ties will still tend to be with people who live nearby. If so, then a person can only pick

friends from among these people. As a result, one would suppose that a person's close friends must to some degree, have religious characteristics that resemble the religious characteristics of the people that live nearby.

However, there are at least three well-established sociological reasons to think that close social ties would *not* necessarily resemble the religious composition of the surrounding population: psychological tendencies toward homophily, the religious homogeneity of congregational foci, and participation in particular religious traditions whose theology, culture, or history especially encourage religiously homogeneous social ties. The first of these reasons is homophily, the well-documented tendency for people, when given a choice, to prefer associates who resemble themselves in terms of their important social characteristics, including religion (McPherson, Smith-Lovin, and Cook 2001). The tendency toward homophily within religious groups (Bainbridge and Stark 1981; Blum 1985; Laumann 1969, 1973; Verbrugge 1977) is quite strong. For example, Verbrugge (1977:587) estimates that most people in 1960s Detroit were six to eight times more likely to form friendships with members of their own religious tradition than outsiders were to form friendships with members of that tradition.

A second reason that the religious composition of close social ties might not reflect the religious composition of the surrounding geographic area is that many close social ties are formed in the context of what Feld (1982) calls "foci," social settings around which activities are organized (e.g., work, neighborhood, school). Some foci such as work settings tend to bring diverse people together in ways that counter tendencies toward homophily, but foci based in voluntary associations, especially congregations, can greatly increase the religious homogeneity of individuals' close social ties. Because religious people are often heavily involved in congregations, they may tend to have a disproportionate number of close ties with people who are religiously similar regardless of the religious composition of the surrounding area (Fischer 1982). Regular and long-time attenders are especially likely to have close congregation friends (Scheitle and Adamczyk 2009). The religious composition of an area might thus have little effect on the religious composition of churchgoers' social ties.

Third, within the sociology of religion it is well known that members of certain religious groups are especially likely to limit their important social contacts primarily to others in their religious group. Sometimes these tendencies toward within-religious-group social ties arise out of the theology and culture of the religious tradition. For example, Stark and Glock (1968:165–68) and Scheitle and Adamczyk (2009) find that evangelical Protestants are more likely than mainline Protestants to have close friends in their congregations. Some (e.g., Hammond and Hunter 1984; Wald, Owen, and Hill 1990) suggest this is because evangelical Protestants are more likely than mainline Protestants to believe that their own religion is the only, or the most, true religion and that salvation can only be achieved within their own religious group or tradition (e.g., within Protestant fundamentalism). Conservative theology may also promote intragroup ties because of strict rules, some of which may discourage close social ties with nonmembers and demand high levels of religious volunteerism that brings members into greater social contact (Iannaccone 1994).

In addition to theologically conservative religious traditions, the religious homogeneity of close friendship ties is likely to be high in religious traditions with a strong racial or ethnic identity or within groups that are discriminated against or groups that are avoided by others in society. McPherson and colleagues (2001:420) argue that "race and ethnicity are clearly the biggest divide in social networks today in the United States." Race and ethnicity do not always act alone, however. Often homophily among racial and ethnic groups is closely intertwined with other factors, particularly religion and social class (Laumann 1973). Judaism illustrates just how strong homophily can be as a result. In 1960s Detroit, an average of 80–83 percent of Jews' friends were fellow Jews (Laumann 1969:185; Verbrugge 1977:587). They were an extraordinary 644 times more likely to form friendships with fellow Jews than other Detroit residents were to form friendships with Jews (Verbrugge 1977:587).

Thus, although many important theories of geographic variation in religion assume that the religious composition of local populations greatly shapes the religious composition of individuals' close social ties, this link may actually be quite weak or may vary in ways such that it applies to some religious groups better than others.

WHAT IS KNOWN?

What is actually known about the population-close-friendship composition link? There are two limitations in the existing literature. First, although surveys have long asked about the proportion of churchgoers' close friends who attend their congregation (e.g., Stark and Glock 1968) or the proportion of close friends who share a person's religious identity regardless of setting (e.g., Lenski 1961), seldom have these variations been tied to geographic differences in the religious composition of the areas where respondents live. Blum (1985) and small portions of Fischer (1982) may be the significant exceptions. Fischer (1982) collected extensive data on the personal networks (friends, relatives, and associates) of residents randomly sampled from 50 localities (small towns or noncontiguous census tracts in large cities), all located in Northern California. However, unlike our analysis where the main independent variable is the population share of a respondent's religion, Fischer was more interested in the effects of population density (rural vs. urban location) on respondents' friendship networks. He found, for example, that people have more church friends when they live in rural areas. Blum (1985) used Fischer's data. He used the 50 localities as his units of analysis and found that the overall religious heterogeneity of the localities (independent variable) was positively related to the probability that friendships involved people of different religious backgrounds (dependent variable). Because the localities rather than the individual respondents were his units of analysis, Blum's study does not statistically control for the religious affiliation, rate of attendance, or other characteristics of individuals that might influence the religious composition of their social ties. Nevertheless, his results suggest that the religious composition of geographic areas affects the religious composition of close friends. However, the lack of statistical controls and the fact that the data are limited to Northern California, a religiously atypical area of the United States, limits the generalizability of Blum's results.

The second limitation in the existing literature is that, to our knowledge, no published research distinguishes the proportion of friends known in congregation settings and the proportion of same-religion friends known only outside of congregation settings. These proportions may vary together or in opposite ways, depending on geographic location. For example, it may be that in areas where people are part of a religious minority, they compensate for the lack of co-religionists in the surrounding environment by increasing their involvement and social contact with co-religionists in congregations, thus nullifying the potential effects of the religious composition of the area.

Most of the evidence supporting a significant link between the religious composition of an area and the religious composition of close social ties is indirect. That is, researchers observe the presumed effects of this connection, but not the actual composition of close social ties that is believed to bring about the observed effects. For example, religious homogamy is more common in areas where larger numbers of potential same-religion spouses are available (Davidson and Widman 2002; Lehrer 1998). Similarly the suicide rate tends to be lower for a religious group in areas where there are many members of the group (Pescosolido 1990).

Actually, the data necessary to undertake an analysis of the link between the religious composition of geographic areas and the religious composition of friendship networks have been available for some time but have not been exploited in published research. This is because such an analysis first requires merging data from multiple sources (the General Social Survey [GSS] and the Religious Congregations and Membership Study [RCMS]) and then further matching the denominational categories used in these two different sources, a rather painstaking and meticulous

task. Because it is possible to obtain information on the metropolitan areas or counties in which GSS respondents live, we were able to match each GSS respondent's data to information on the religious composition of these areas found in the RCMS.

The combination of these two data sources makes possible, for the first time, a detailed analysis of the extent to which the religious composition of an individual's friendship networks varies with the religious composition of the surrounding area and the extent to which any such tendencies might be blunted by tendencies toward homophily, heavy involvement in congregational settings, and the additional tendencies of some religious groups to have especially high levels of within-group social ties.

METHODS

Data Sources, Social Network, and Religious Identity

The data come from the 1988 and 1998 editions of the GSS (Davis, Smith, and Marsden 2003). In 1988, a subsample of GSS respondents was asked: "Many people have some good friends they feel close to. Who are your good friends (other than your spouse)?" Respondents were allowed to name up to three friends. Next, they were asked whether each of these individuals belonged to their religious congregation.¹ If not, respondents were asked the religion and denomination of that friend. In 1998 these questions were repeated except that respondents were allowed to name up to five friends rather than three. We combine the 1988 and 1998 years to maximize sample size. A total of 2,820 GSS respondents were asked the questions about their friends. On average, they named 3.1 friends (2.7 in 1988 and 3.6 in 1998). The higher number in 1998 is due to the opportunity to name five rather than just three friends. Because of this difference in the data collection procedures we focus on the proportion of friends that belong to certain religious categories (e.g., proportion church friends, proportion in the same denomination, etc.), rather than the actual numbers. Unlike the social network questions from the 1985 and 2004 GSS, in which changes in numbers of friendships have been the focus of some controversy (cf. Fischer 2009), we investigated but found no important differences in proportions of same-congregation, same-denomination, same-tradition friends between the two years.² Nevertheless, all our regressions include a dummy variable control for year of the survey.

The GSS uses the same detailed coding scheme to identify the religion and denomination of each friend as it uses to identify the religion and denomination of respondents. Thus one can match these codes to determine whether or not a respondent's friend belongs to the same denomination. For each respondent, we separately calculate the proportion of friends who share (1) his or her congregation, (2) his or her denomination, and (3) his or her religious tradition.

Determining whether a respondent's friend is in the same congregation or denomination is fairly straightforward. Determining if they share the same tradition is more complicated. We measure religious traditions using the Steensland et al. (2000) RELTRAD (religious

¹ Respondents could also indicate that they did not belong to any congregation.

² In 1988, the mean percentage of friends in one's congregation is 26 percent, and in 1998 it is 23 percent. In 1988, the mean percentage of friends in one's denomination but not congregation is 18 percent. In 1998 it is 19 percent. While it does seem likely that friends named first are "closer," we find only a slight tendency for earlier-named friendships to be more religiously similar—and only for shared congregational membership. Of friends named first, an average of 25 percent belong to the respondent's congregation. This compares to 24 percent of second friends, 22 percent of third friends, 20 percent of fourth friends, and 22 percent of fifth friends. In exploratory regressions, we added a control for total number of named friends. It made no difference for the results, and the final models omit this control. We also explored separate regressions for each year. Results were very similar for each.

tradition categories that they defined for GSS respondents. These categories include evangelical Protestant, mainline (liberal) Protestant, black Protestant, Catholic, Jewish, and other (e.g., Mormon, Jehovah's Witness, Muslim, Hindu, and Unitarian). In addition to these traditions we have a category for respondents who say they have no religion.

Steenland et al. (2000) further subclassify some of the "other" religions as "conservative nontraditional" (the largest of these are Mormon and Jehovah's Witness) and "liberal nontraditional" (the largest being Unitarian-Universalist). We do not use the other category, but instead merge the liberal nontraditional respondents with the mainline Protestant tradition and, for most analyses, treat conservative nontraditional as a separate category. In other analyses we examine Mormons independently from other conservative groups. Response categories for the friendship questions make it impossible to measure the denominational homophily of the remaining other respondents. Thus we do not include these 77 respondents in regressions, but we do include them in the bottom row of Table 1.

Steenland et al. (2000) split members of some Baptist denominations into separate traditions (black Protestant vs. evangelical or mainline Protestant) depending on whether the respondent's race is black. In contrast, we assign all respondents of a given Baptist denomination to the same tradition.³

We follow Steenland et al.'s strategy for dealing with people who said they were Protestant but who reported not having a denomination. If such persons attend religious services once per month or more they are classified as "nondenominational" evangelical Protestants. We do not include the remaining 89 "Protestant or Christian only" respondents in our regressions because denominational homophily has little meaning for them, but they appear as a separate row near the bottom of Table 1. An online supplement associated with this article contains exact details of how the denomination and tradition of the respondents' friends were coded.

Dependent Variables

We use four dependent variables in our regressions and the analyses (regressions) that underlie the construction of Figure 1. The first two are the proportion of all named friends who belong to one's congregation and the proportion of all friends who belong to one's denomination. We generally assume⁴ that same-congregation friends are same-denomination friends. The third dependent variable measures, among friends who are *not in one's congregation*, the proportion who are fellow denomination members.⁵ The fourth dependent variable (used in Figure 1) is the proportion of all friends that belong to particular *other* traditions (not the same religious tradition as the respondent). Although we experimented with transforming these dependent variable proportions by taking their logs or by making them logits (Fox 2008:66–68) and by using raw numbers of friends rather than proportions of friends, we found that the substantive results

³ We code respondents belonging to the Southern Baptist Convention as evangelicals regardless of their race because the Southern Baptist Convention is majority-white. All American Baptists and Missionary Baptists are coded as black Protestants because these denominations are majority-black. (Although the American Baptist Association is historically white, in the past 50 years many black congregations have affiliated with the denomination so that it is now majority-black.) We do follow Steenland et al. (2000) in separating black and nonblack respondents who identify themselves as "Baptist, doesn't know which" into black Protestant and evangelical, respectively.

⁴ We assume that when respondents with no religion report congregational friends, those friends are, in fact, religious. We keep those friends coded as belonging to the respondent's congregation but, for regressions, recode them as *not* belonging to the same denomination.

⁵ In calculating each dependent variable, friends with a response of "don't know" are included in the denominator rather than excluded as missing data. To exclude them would reduce sample size because some respondents do not know the religion of any named friends (approximately 10 percent of all respondents). Moreover, it would do so systematically; 23 percent of those with no religion do not know the religion of any friends.

were nearly identical and the coefficients predicting proportions were more easily interpretable than coefficients predicting variables that involve natural logs or logit transformations.

Independent and Control Variables

Our key independent variable is *denominational population share* (the proportion of the population that shares the respondent's denominational identity). For some analyses we also calculate *tradition population share* (the proportion of the population that shares a particular religious tradition). We estimate population share at the level of GSS sampling areas (GSS mnemonic = *sampcode*), which are census-defined metropolitan areas and individual nonmetro counties. Whenever possible, we have based estimates on data from the 1990 and 2000 RCMS (Jones et al. 2002). The RCMS lists, for each U.S. county, the number of adherents belonging to each of more than 100 participating denominations. Adherents are official members plus estimated (using census age distribution data) numbers of children for denominations such as Baptists, who do not have child membership. After matching counties to GSS sampling areas, we were thus able, for most of the respondents, to use RCMS data to estimate the proportion of the population in each sampling area that belongs to each respondent's denomination.

For the respondents in denominations that did not participate in the RCMS (and for respondents with no religion and some who gave indeterminate responses on denomination, e.g., "Methodist do not know which") we have estimated population share using GSS data from all years in which the respondent's sampling area was used by the GSS. The GSS used the same primary sampling areas in all its surveys from 1983 through 1993 and another set of sampling areas from 1993⁶ through 2002. Thus, for a 1988 respondent with no religion, we estimated population share by using the proportion of all GSS respondents from 1983 through 1993 in the same sampling area that indicated that they did not have a religion. For many denominations and traditions we were able to compare estimates derived from the two different data sources (RCMS vs. GSS). For example, the correlation between the two estimates of Catholic population share (across all the sampling areas) is .91. For Jews it is .82 and for Mormons it is .99. The lowest correlation among those we checked is .70, for the black Protestant tradition as a whole. These generally high correlations give us some confidence that both methods are measuring the same population characteristics and that one would likely achieve similar substantive results using either method. An online supplemental file associated with this article includes a table showing the GSS religion codes and denomination names for all respondents. For each religion code the table indicates which source (RCMS or GSS) we used to estimate the population share of the respondent's denomination. Another online supplemental file contains a full description with exact details of the methods used to calculate denominational population share for GSS religious codes that do not correspond to denominations that participated in the RCMS study.

Our regressions include seven dichotomous indicator, "dummy," variables for *religious tradition*: Catholic, denominationally affiliated evangelical, nondenominational evangelical, non-traditional conservative ("conservative"), black Protestant, Jewish, and no religion. Mainline or liberal is the suppressed reference category. We created a separate dichotomous measure that controls for respondents of indeterminate denominations (e.g., "Methodist, do not know which") because coding limitations result in a disproportionately high level of denominational friendships among these individuals.⁷

⁶ In the 1993 survey respondents were drawn from both the 1980s and 1990s sampling frame to check if there were systematic differences in the two sampling frames.

⁷ By necessity we code the friends of these respondents as belonging to the same denomination if the friend's religion is described in the same terms. For example, when individuals describe themselves as "Methodist, don't know which" and their friends as "Methodist, don't know which," those friends are coded as co-denominationalists. Table 1 shows

We control a number of *demographic and background characteristics*. These include gender, age, race (1 = *black*, 0 = *all others*), Hispanic ancestry, Asian ancestry,⁸ and highest degree (a five-point ordinal variable ranging from less than high school to a graduate degree). Marital status is controlled with dichotomous measures designating those who are married, divorced or separated, and widowed (with never married as the suppressed reference category). Three dichotomous variables designate major census region: Northeast, Midwest, and South, with West as the reference category. Additionally, a dichotomous variable designates those who lived in a different geographic region at age 16 because geographic mobility may disrupt social ties with co-religionists (Welch and Baltzell 1984).

We also control *biblical literalism, frequency of church attendance, and congregation membership*. These variables are important for determining whether variations in denominational population share affect numbers of same denomination friends *after* taking into account how involved respondents are in church settings and the extent to which they hold beliefs that are known to be associated with larger number of church friends (Scheitle and Adamczyk 2009).⁹ Biblical literalism is a dichotomous measure that codes respondents who believe the Bible is “the actual word of God and is to be taken literally, word for word” as 1 and all others (including responses of “do not know”) as 0. Attendance is a nine-point ordinal measure ranging from never to more than once a week. Because the GSS directly asked about congregation membership in 1988 but did not repeat the question in 1998 we created an alternate measure from responses to the friendship questions that we instead use for both years. When asked whether friends were members of their congregation, respondents were allowed to volunteer that they did not belong to a congregation. We recognize that large numbers of people who are classified as congregation members by this measure are not actually “official” congregation members but, on the plus side, it provides for a fairly uniform definition of “belonging” to a congregation across denominations whose official definitions vary widely. We classify 81 percent of the respondents as congregation members by this measure. Finally, a dichotomous measure designates respondents who belonged to a different denomination at age 16. We expect that switching could diminish the number of same-denomination friends a respondent might have in the current denomination.

Our regressions control a number of additional variables whose coefficients we do not show in the table (because of space considerations) but that we wanted to include to minimize the potential for spurious relationships. The variables whose coefficients are not displayed include *census population characteristics* at the level of GSS sampling areas, using data from the 1990 and 2000 censuses: the percentage of the population that is male, the percentage black, the percentage Hispanic, the percentage divorced, the percentage with a four-year college degree, the percentage residing in urban areas, the percentage residing at the same address as five years previously, and the median age. Note that very few of these coefficients turn out to be statistically significant.

We also do not display coefficients for a set of dichotomous indicator variables for the rural vs. urban location of the respondent’s residential residence, derived from the GSS variable *srcbelt*.

the relatively high rates of denominational homophily that result from this. Note that the dummy for “indeterminate denomination” designates respondents who are *already included* under the variables for mainline/liberal, evangelical, and black Protestant.

⁸ We designate respondents as Hispanic if they report any Mexican, Puerto Rican, or “other Spanish” ancestry—or if they report Spain as the first ancestry or the one with which they most strongly identify. We designate respondents as Asian if they report any ancestry of Chinese, Japanese, Filipino, or “other Asian.” Contact the authors for information on how values were imputed for missing data on ancestry.

⁹ One reviewer suggested that one may choose to see these less as “control” variables and more as representing alternative explanations for numbers of same congregation friends. We agree that people who regularly attend, or who hold religious beliefs, e.g., biblical literalistic beliefs, that might cause them to attend more faithfully, might also both desire to have more same-religion friends and naturally acquire more same-religion friends simply because they spend so much time in religious settings. Regardless of whether one views these as control variables or variables representing alternative explanations, they need to be included in our regressions.

People who live in rural areas may tend to have more congregational friends than those living in cities (Fischer 1982:211–12). However, because no coefficients for these variables attained statistical significance, we also cut these coefficients from Table 2 to save space for the significant results. Note that a complete version of Table 2, including the variables and coefficients not included in the printed version of Table 2, can be found in the online supplemental information associated with this article.

As seen in Table 1, there are 2,487 respondents who provided valid information for the congregation and denomination of at least one friend. After deletion of cases with missing values on key control variables, the sample for multivariate analyses is 2,461 respondents.

Statistical Methods

We use multilevel linear regression (Gelman and Hill 2006) for our analyses. Respondents are nested within 183 GSS sampling areas. Our key independent variables, denominational and tradition population share, are measured at this level, as are the census population characteristics we use as control variables. The multilevel regressions include random intercepts for the 183 sampling areas and allow for correct calculation of degrees of freedom and probability values for the variables measured at the sampling area level. Because the multilevel regressions are based on maximum likelihood, rather than least squares, methods we report a pseudo *R*-square value that is simply the square of the correlation between the predicted values (from the multilevel regression) and the actual values of the dependent variable.

RESULTS

Overall Patterns by Religious Tradition

Table 1 provides a descriptive overview of responses to the GSS friendship questions by respondent's religious tradition. It also reveals some important characteristics of religiously based social ties. The table includes all 2,653 respondents who provided valid information for their own religious identity and who gave a minimal response of "do not know" about the religion of at least one friend.

The first column in Table 1 presents the mean percentage of named friends who are in the respondent's congregation. Among Catholics, the mean is 29 percent. In other words, an average of 29 percent of their friends belong to the same Catholic parish. Note that for respondents in most "traditions," between 20 and 30 percent of close friends belong to the same congregation. The percentage is highest for nontraditional conservatives at 44 percent. This largely reflects a very high level of within-congregation friends among Jehovah's Witnesses. As demonstrated by previous research, evangelicals tend to have more congregational friends than mainliners, though unexpectedly, the difference is not particularly great (an average of 27 compared to 23 percent).

The second column presents the mean percentage of respondents' friends who belong to the same denomination but not the same congregation. Such friendships are most common among Jews, with an average of 44 percent. They are least prevalent among nontraditional conservatives.

Consistent with the literature discussed above, people in some religious traditions are especially likely to have same-denomination friendships. Summing the first two columns yields the approximate total percentage of friends who share one's denomination. For Jews, this is 72 percent, a proportion lower than that observed in 1960s Detroit but still remarkably high. Denominational friendships also are relatively high among Catholics, with an average of 58 percent. For mainliners, evangelicals, and black Protestants, the figures are 31 percent, 40 percent, and 44 percent, respectively.

Table 1: Mean percentage of the respondent's friends who are in the same congregation, denomination, and religious tradition

Respondents' Religion	Percentage of Friends . . .				Whose Religion is Unknown to Respondent	N
	In the Same Congregation	Not in Congregation, but the Same Denomination	Not in Denomination, but the Same Tradition	In a Different Tradition		
Catholic	29%	29%	N/A	27%	14%	701
<i>Mainline Protestant/liberal</i>						
Specific denomination	24	8	8	42	18	446
Indeterminate denomination ^{ab}	9	14	9	43	25	57
All mainliners/liberals	23	8	8	42	19	503
<i>Evangelical Protestant</i>						
Specific denomination	28	12	9	34	17	594
Indeterminate denomination ^{ab}	17	10	8	33	31	62
Nondenominational ^b	30	16	16	27	11	54
All evangelicals	27	13	9	33	18	710
<i>Black Protestant</i>						
Specific denomination	27	15	10	32	17	124
Indeterminate denomination ^{ab}	22	27	10	20	22	67
All black Protestants	25	19	10	27	18	191
Nontraditional conservative	44	4	N/A	36	16	57
Jewish	24	48	N/A	21	5	52
No religion ^b	2	23	N/A	43	32	273
Total of above	24	19	5	34	18	2,487
Protestant or Christian, not further specified	13	- ^c	- ^c	- ^c	22	89
Other	33	- ^c	N/A	- ^c	11	77

^aBaptist, Methodist, Lutheran, or Presbyterian but respondent does not know which specific denomination.

^bFor these respondents, a friend is defined as being in the same "denomination" if the identical response is given for self and friend.

^cCannot be calculated.

The third column in Table 1 shows, for Protestant respondents, the mean percentage of friends who belong to a different denomination that is still a part of the same tradition. Among all respondents only 5 percent of friends fall in this category (see row labeled “Total of above”).

The fourth column shows that across all groups an average of 34 percent of friends are people in *different* religious traditions. This is an important result for theories, such as secularization theories, that argue that the religious composition of geographic areas affects the religious composition of close social ties. It is a measure of the extent to which respondents are exposed to potentially contrary religious influences from their close friends. If the figures in this column were all extremely low (say less than 10 percent) such exposure would be so limited that any geographic variations could have little leverage on respondents’ behavior and beliefs. Results suggest that people in other religious traditions play a significant, if minority, role in respondents’ friendship networks.

The final column of percentages contains another important result. It shows that on average respondents indicate that they do not know the religion of 18 percent of their friends. Although this means that these 18 percent of friendships are probably having little religious influence on respondents’ behavior (other than implying that religion is not salient for the relationship), it also implies that respondents have some idea about the religious identity of the remaining 82 percent of their friends. If it were true that respondents generally did not know the religious identity of most of their friends, then it would imply that variation in the actual religious composition of these friends could have little influence on respondents’ behavior and beliefs. However, results in Table 1 give us reason to think such influences are possible.

Homogeneity in Friendships

Next we briefly examine a crude indicator of the overall religious homogeneity of close friends among all the GSS respondents in our sample. One rough indicator of the extent of homophily’s power long used by others (e.g., Verbrugge 1977) is to examine the ratio of in-group to out-group selection rates. For example, we find among Catholic GSS respondents that 48 percent of their friends are fellow Catholics. In contrast, non-Catholic respondents have only 12 percent of their close social ties with Catholics. The ratio, 48/12, indicates that Catholics are four times more likely to select Catholic friends than are non-Catholics. Because the percentages in both the numerator and the denominator refer to the same “target” religious group, both the denominator and the numerator should tend to be larger in areas (or whole samples in our case) where the target religious group (e.g., Catholics in this example) are a larger proportion of the population. Such ratios therefore “adjust” for the size of the target group and can serve as a crude indicator of how much homophily and/or avoidance/discrimination may play in shaping social ties with respect to particular groups.

As noted above, the ratio for Catholics is 4.0. The corresponding ratios for the other traditions we examine in Figure 1 is 6.1 for evangelicals, 6.0 for mainline Protestants, 4.6 for people with no religion, 32.7 for black Protestants, 68.6 for Jews, and 379.1 for Mormons. We also note that there is greater potential for variability in such ratios when the target group is smaller. For example, in the case of Mormons the responses of the small number of Mormons (37, approximately half of whom are located in Utah) affects the numerator of the ratio, but not the denominator, which is determined by the responses of all non-Mormon respondents. Despite this potential variability for small groups, the general pattern of these results suggests that homophily and/or discrimination/avoidance could significantly blunt the potential influence of religious composition of geographic areas on the religious composition of a person’s close social ties. For all target groups, in-group friendships are much more likely than out-group friendships. Thus we next ask if the religious composition of local areas is able to overcome these tendencies toward friendship homogeneity.

Same-Denomination and Same-Congregation Friends

In Table 2, we explore the extent to which the population share of the respondent's denomination is related to the proportion of the respondent's friends who share his or her denominational identity. Model 1 includes all but three of the control variables described above. The beta for denominational population share (.46) is statistically significant ($p < .001$). It can be interpreted as indicating that a one unit increase in population share (from a proportion of zero to a proportion of one) corresponds to a .46 increase (46 percent) in the proportion of close friends who share the respondent's denomination.

Model 2 adds statistical controls for the respondent's attendance rate, whether he or she belongs to a congregation, and whether the respondent is a biblical literalist. In addition to religious tradition, these are variables that our literature review suggests might focus respondents' social ties on people in their own denomination. As expected these three additional control variables all have strong positive relationships with the proportion of friends respondents have in their own denomination. Moreover, the addition of just these three variables increases the pseudo *R*-square from .158 in Model 1 to .219 in Model 2. Yet even with the addition of these controls, the beta for denominational population share diminishes only slightly, to .45. Population share matters a great deal in the religious composition of a person's close ties.

Our literature review also suggests that people in certain religious traditions are especially likely to focus their social ties on people in their denomination. A comparison of the betas for religious tradition in Models 1 and 2 reveals some interesting patterns. Model 1 shows that Jews, nondenominational Protestants, Catholics, and black Protestants are especially likely to have friends in their own denomination, relative to mainline and liberal respondents. However, in Model 2 where we add controls for the attendance, congregational belonging, and biblical literalism of the respondents, only the betas for Catholics and Jews remain statistically significant and positive. Apparently the focus on same-denomination friends among nondenominational Protestants and black Protestants is largely explained by these respondents' congregational participation and biblical literalism.

It is clear from Models 1 and 2 that denominational population share greatly affects most respondents' proportion of friends in the same denomination. However, it remains to be determined if denominational population share also increases same-congregation friendships. Are people better able to form same-congregation friends in areas of higher denominational population share because there are likely to be more congregations of that denomination nearby?

The dependent variable in Models 3 and 4 is the proportion of each respondent's close friends that belong to the same congregation (the first column in Table 1). Model 4 includes the two measures of congregational participation and biblical literalism. Not surprisingly, the addition of these three variables nearly doubles the pseudo *R*-squared from .121 in Model 3 to .229 in Model 4.

The striking difference when comparing Model 4 with Model 2 is that when attempting to predict just congregation friends in Model 4, the population share of the respondent's denomination makes no difference (beta = .05, n.s.). Moreover, the respondent's religious tradition makes less difference when predicting same-congregation friends (in Model 4) than it does when predicting all same-denomination friends (in Model 2). What is more important for predicting same-congregation friends is, not surprisingly, the extent to which the respondent is involved in congregations and his or her biblical literalism (which may be causing a focus on congregational activities). The only strong, fairly robust beta for religious tradition is for nontraditional conservatives, who, as we noted in our discussion of Table 1, have very large proportions of friends in the same congregations. The beta for Jews (.10, $p = .046$) borders on statistical nonsignificance.

The pattern of results in Model 4 versus the pattern in Model 2 suggests that quite different processes affect the proportion of same-congregation friends versus the proportion of same-denomination friends known only outside of congregations. Model 5 helps to highlight

Table 2: Unstandardized coefficients from multilevel, linear regressions predicting the proportion of the respondent's friends in his or her denomination and congregation

Predictor variables	Of All Friends, the Proportion Who Are in R's Denomination		Of All Friends, the Proportion Who Are in R's Congregation		Of Friends Not in R's Congregation, the Proportion Who Are in R's Denomination
	1	2	3	4	5
Denominational population share	.46***	.45***	.06	.05	.57***
<i>Tradition</i> (ref = mainline/liberal)					
Catholic	.15***	.13***	.04	.02	.14***
Evangelical					
Denominationally affiliated	.04	-.01	.02	-.03	.01
Nondenominational	.19**	.09	.07	-.04	.18***
Nontraditional conservative	.10	.04	.19***	.13**	-.12*
Black Protestant	.08*	.04	.01	-.03	.08*
Jewish	.43***	.46***	.05	.10*	.52*
No religion	-.05	.10**	-.17***	.02	.15*
Indeterminate denomination (control)	-.06*	-.01	-.10***	-.04	.04
<i>Individual characteristics</i>					
Church attendance		.04***		.04***	.01**
Congregation member		.07***		.15***	-.02
Biblical literalism		.06***		.07***	.02
Female	.05**	.03	.06***	.04**	-.01
Age	.002***	.002***	.003***	.002***	.001
Black	.10**	.05	.08**	.03	.04
Hispanic	.12***	.11***	.11***	.10***	.05
Asian	.17**	.13*	.16**	.12*	.11
Highest degree	-.01	-.02*	-.02**	-.03***	.002
Marital status (never married)					
Married	-.01	-.03	-.02	-.04*	-.002
Divorced or separated	-.08**	-.07**	-.06*	-.05*	-.05
Widowed	-.003	-.02	-.01	-.03	.01
Different region at age 16	-.002	.001	.02	.02	-.02
Different denomination at age 16	-.02	-.05**	.002	-.03	-.04*
<i>Contextual controls</i>					
GSS year 1998	-.03	-.02	-.03	-.02	-.01
Region (West)					
Northwest	-.03	-.02	-.09*	-.08*	.08*
Midwest	-.02	-.02	-.05	-.05	.04
South	.02	.01	.02	-.002	.02

(Continued)

Table 2 (Continued)

Predictor variables	Of All Friends, the Proportion Who Are in R's Denomination		Of All Friends, the Proportion Who Are in R's Congregation		Of Friends Not in R's Congregation, the Proportion Who Are in R's Denomination
	1	2	3	4	5
Intercept	.71	.33	.30	-.72	1.03
Pseudo R^2	.158	.219	.121	.229	.179
No. of respondents	2,461	2,461	2,461	2,461	2,130
No. of GSS sampling areas	183	183	183	183	183

* $p < .05$, ** $p < .01$, *** $p < .001$.

Note: All models include additional control variables. See Appendix S1 for entire table with all coefficients.

these differences. The dependent variable in Model 5 calculates—from among friends who are *not in the respondent's congregation*—the proportion who are nevertheless in the respondent's denomination (similar to the second column in Table 1 but with a different denominator¹⁰).

A comparison of the statistically significant variables in Model 5 versus Model 4 (same-congregation friends) is quite striking. In Model 5 denominational population share and most of the tradition indicator variables are statistically significant predictors of noncongregation but same-denomination friends. Almost no other variables attain statistical significance. In contrast, in Model 4, denominational population share is not statistically significant, nor are most of the tradition indicator variables. However, the congregational involvement measures, biblical literalism, and a host of individual background variables are related to the proportion of friends that are in the respondent's congregation. Almost none of the individual background characteristics is a statistically significant predictor of same-denomination friends outside of congregations (in Model 5).

To sum up, same-congregation friends are mostly determined by how involved one is in a congregation and by personal background characteristics that either also affect congregational involvement or one's desire for same-congregation friends. Denominational population share and religious tradition make less difference. In contrast same-denomination friendships outside of congregations are massively determined by denominational population share and the religious tradition to which one belongs.

Friends in Other Traditions

Results from Table 2 suggest that, at least for friendships outside of congregations (on average about 76 percent of all friends, according to Table 1), the religious composition of the surrounding population affects the proportion of an individual's friends that are in the same denomination. However, does it also affect the proportion of friends that are in *different* religious groups? That is, if the population share of different religious traditions increases will most people respond by increasing the proportion of their friends in *different* religious traditions? Tendencies toward religious homophily might predict the former but not the latter pattern. Yet, the latter pattern is also

¹⁰ The N is lower for this model because it excludes respondents whose friends are all fellow congregation members. Note also that we ran regressions where the dependent variable was the proportion of all friends that are in the same denomination while *statistically controlling* for the proportion of friends that are in the respondent's congregation. Both methods led to very similar substantive results.

an important assumption of the theories described in the introduction. For example, secularization theories assume that as the religious diversity of an area increases and the proportion of people with different religious identities increases, individuals will tend to have more of their social contacts with people who have different religious identities.

Figure 1 visually summarizes the key results from seven different multilevel linear regressions similar to those in Table 2, except that the dependent variable in each regression is the predicted proportion of friends belonging to one specific religious tradition (hereafter called the “focal” tradition) and the key independent variable is the population share of the focal tradition. Additionally, the regression for each focal tradition is limited to respondents who do not themselves belong to the focal tradition. For example, the line labeled “Catholic” in the upper plot in Figure 1 is based on a multilevel regression in which the dependent variable is the proportion of all friends that are Catholic and in which only respondents who are not Catholic are used in the regression.

The predicted values plotted on these lines are calculated using the regression equation coefficients, just as one would normally calculate predicted values. However, only the key independent variable (the population share of the focal religious tradition) is allowed to vary across its actual values in the data. All the remaining independent variables are assigned their mean values for all cases prior to plugging their values into the regression equation. Thus the plotted predicted values represented by the Catholic line represent only the effect of variation in Catholic population share as predicted by the regression (holding all other variables constant). The slope of the line equals the unstandardized coefficient for Catholic population share in the Catholic regression. The steeper the line, the greater is the influence of the focal tradition’s population share on the proportion of friends that nonmembers have with people in that tradition.

Connected points on the lines indicate actual population share values of the 183 GSS sampling areas and the corresponding predicted proportion of all friends in the focal religious tradition among nonmembers of the focal tradition. For example, on the line representing the Catholic results, the point plotted farthest up and to the right represents the predicted proportion of Catholic friends (.34) among non-Catholic respondents living in the GSS sampling area with the highest Catholic population share (.81). The slope of the line for Catholic friends equals .36 ($p < .001$), the unstandardized coefficient from the regression. This indicates that if Catholic population share were to increase by one unit, i.e., from zero to one, the proportion of Catholics among the friends of non-Catholic respondents would increase by .36.

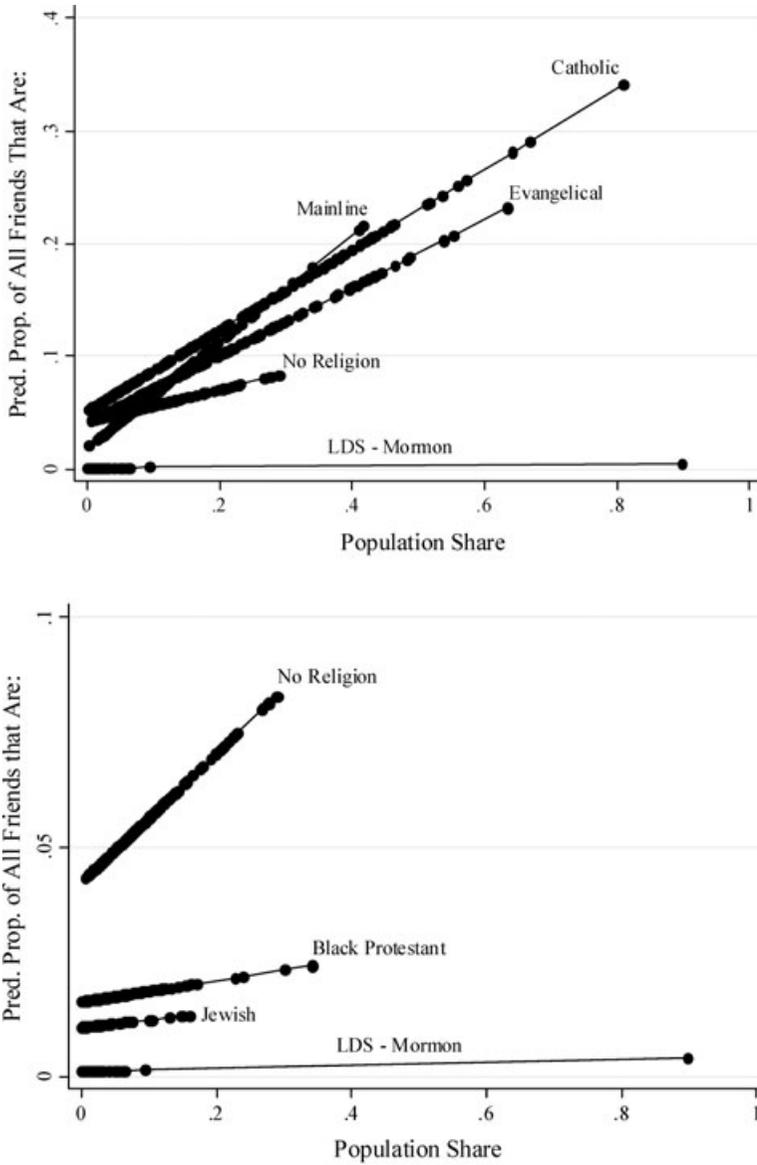
Figure 1 contains two plots because the results of the seven regressions for the seven focal religious traditions fall into two groups. Results for the first four religious traditions are shown in the upper plot. The results for the three remaining traditions are shown in the lower plot. Note that both plots include results for the no religion and Mormon traditions. Because the y-axis in the lower plot is expanded to show details at lowest values, we repeated results for these two traditions to give the viewer a better sense of the scale differences between these plots.

The upper plot of Figure 1 shows results for three traditions (Catholic, mainline, and evangelical) in which increases in the population share of the focal tradition are clearly associated with increases in the proportion of friends that nonmembers have with people in the tradition. The slopes for the Catholic (.36), mainline (.47), and evangelical (.30) lines are all positive and statistically significant ($p < .001$). The slope for the line labeled “No Religion” is positive (.14), but does not attain statistical significance ($p = .189$). In comparison, the line for “LDS-Mormon” in the upper plot appears to be almost horizontal.

The lower plot in Figure 1 contains the line for “No Religion” as well as lines for black Protestant friends (slope = .02), Jewish friends (slope = .02), and LDS-Mormon friends (slope = .003). None of these slopes is statistically different from zero. Note that the results for these smaller groups are not the result of having too few respondents. The regression for Mormons, for example, is based on data from all of the non-Mormon respondents in the study. Only the

Figure 1

Predicted proportion of all friends that belong to specific other religious traditions (different from the respondent's religious tradition) based on the population share of the specific other tradition



Note: Predicted values are based on linear multilevel regressions that control for the same variables as those used in Table 2. The predicted values are calculated using the regression equation coefficients and by setting all the control variables to their mean values but allowing the population share of the specific other tradition to vary across its actual values. Connected points indicate actual population share values of GSS sampling areas and the predicted proportion of all friends in that religious tradition among nonmembers of that tradition.

right-most plotted point in this line is questionable.¹¹ What explains the differing patterns of results for the traditions shown in the upper versus lower plots of Figure 1?

¹¹ The only uncertain predicted value in the line for LDS-Mormons in Figure 1 is the one prediction where LDS-Mormon population share is greater than .8. There are only two non-Mormon respondents from this sampling area in our data.

The most important factor is the size of the group in question. Among all 2,820 GSS respondents asked friendship questions in 1988 and 1998, 26 percent are Catholic, 25 percent are evangelical, 19 percent are mainline, 11 percent have no religion, 7 percent are black Protestant, 2 percent are Jewish, and 1 percent are Mormon.¹² Note that this order almost exactly matches the order for both the heights and slopes of the corresponding lines in Figure 1. This suggests that, all else being equal, when a religious tradition is very large, it is harder for nonmembers of that tradition to avoid having close friends in the group, but when a religious tradition is very small, it becomes more difficult for nonmembers to encounter and form friendships with group members.

The positive slopes of the lines in Figure 1, especially for the larger traditions, suggest that the population share of other religious traditions affects the religious composition of people's social ties. However, it is clearly not true that people select their close social ties randomly so that the proportion of their friends in each tradition approximates the population share of the tradition. All of the lines in Figure 1 have a slope that is far less than 1.0, the slope when the proportion of friends in a focal group equals the population share of the group.

Nevertheless, the results shown in Figure 1 suggest that the population share of *other* religious traditions clearly has an important effect on the religious composition of respondents' close social networks. This is most true for religious traditions that are relatively large. It is much less true for smaller traditions. The population shares of *other* traditions affect one's personal networks but not as substantially as does the population share of one's own denomination.

DISCUSSION

Does the religious composition of geographic areas affect the religious composition of a person's close friends? Our results in Table 2 and Figure 1 lead us to reply with a qualified yes. The results in Model 2 in Table 2 suggest that denominational population share exerts a very substantial force on the religious composition of close social ties despite the influences of religious homophily and the fact that many friends are known in religiously homogeneous congregations. Additionally the results depicted in Figure 1 indicate that the population share of *different* religious traditions has a similar effect.

We qualify our conclusions in two important ways. First, the effect of religious geography appears limited to friends known outside of congregations. Religious geography has no apparent influence on the number of same-congregation friends known by churchgoers. Instead, congregational friendships depend more on individual characteristics such as sex, age, education, theology, and especially whether and how often a person attends a congregation. Additionally we found that after taking account of these individual characteristics, the *direct* effects of the respondents' religious traditions on the number of their same-congregation friends is quite weak. Of course, religious traditions can exert an indirect influence on same-congregation friendship by setting norms for participation rates. However, even without any statistical controls for background characteristics, the descriptive statistics in Table 1 suggest that same-congregation friendships, at least those measured using the GSS methods, do not vary greatly by religious tradition (with the exception of Jews and nontraditional conservatives—mostly Jehovah's Witnesses and Mormons). For most religious traditions, the percentage of all friends known in congregations does not vary by more than 10 percentage points from the mean of 24 percent among all respondents.

Does it matter that religious geography only influences the religion of friends known outside of congregational settings? That depends on whether the well-being, health, and civic participation

Neither of these non-Mormons have any Mormon friends. Among the other 2,449 non-Mormon respondents in the remaining sampling areas, the average proportion of Mormon friends is .001.

¹² These percentages do not total to 100 because we do not include denominations that do not fall into one of these categories.

effects attributed to social ties in congregational settings also operate through same-religion ties outside congregational settings. Past research has mostly examined outcomes of congregation-based ties. For example, research shows that people with more congregational ties feel more life satisfaction (Lim and Putnam 2010), exhibit lower levels of depression (Krause and Wulff 2005), have lower mortality rates (Hummer et al. 1999; Strawbridge et al. 2001), and are more civically engaged (Becker and Dhingra 2001; Putnam and Campbell 2010). We suspect that in some cases similar effects might be found for same-religion ties based outside congregations. Indeed, in one of the few instances where research has examined multiple types of networks (though very indirectly), results suggest that both congregational ties and same-religion ties outside congregations may decrease suicide rates (Pescosolido 1990; Pescosolido and Georgianna 1989). Nevertheless, there may be some kinds of effects that are limited to same-congregation friends, friendships whose formation is little affected by the religious composition of the surrounding area.

The point here is that if the effects attributed to same-congregation ties also apply to same-denomination ties outside of congregations, religious geography might well influence the happiness, well-being, and civic participation of religious people just as it appears to affect suicide rates of people living in different areas of the country. Perhaps Catholics have higher happiness when they live in more Catholic areas like Rhode Island whereas Baptists experience greater happiness living in more Baptist areas in the South. These are questions for future research.

Our second qualification concerns the effect of population shares of *other* religious traditions on the religious identity of a person's close friends. Figure 1 shows that these effects are very significant for large religious groups (e.g., Catholics, mainline Protestants, and evangelicals) and virtually nonexistent for smaller religious groups (e.g., black Protestants, Jews, and Mormons). This implies that most Americans might have few close friends with members of quite small religious groups, especially those that might be initially shunned, for example, American Muslims. Although such contacts might more easily occur in workplace and educational settings, they might be slower to develop into the kinds of close friendships examined here.

For us, an especially interesting result from Figure 1 is for friends with no religion (among respondents who have a religion). Although the slope of this line is not statistically significant in its difference from zero, the magnitude of the slope (.14) falls right where it should fall based on the relative size of this tradition. This suggests that religious people are making friends with people of no religion at about the rates that we would expect, given the population share of those with no religion in their area. Religious people are not especially avoiding friendships with the nonreligious. If the nonreligious sector of the population is growing, as many, e.g., Putnam and Campbell (2010), claim, then we would expect more people, including religious people, to develop close friends with nonreligious people in the coming decades. Given that our data are more than one to two decades old, such friendships may already be more common than is indicated by our results. What are the consequences of such friendships? Do religious people begin to question the plausibility of their beliefs when they have close friends who are not religious? Or do they simply believe differently, perhaps with less certainty about the unique correctness of their own beliefs? To what degree can secularizing tendencies (and counter-tendencies) be transmitted through close friendships as Iannaccone and Makowsky (2007) imply, and how might the population share of nonreligious people at one point in time affect the proportion of nonreligious people in the future via the changing frequency with which religious people form close social ties with nonreligious people? These also are questions worth examining.

Our results confirm what others have found. Close friendships are much more homogeneous than what one might predict based solely on the sizes of religious groups in the population. Still, we also find that the religious identities of peoples' close friends are strongly influenced by local variations in the religious composition of the surrounding population. Even though people prefer same-religion friends, the empirical reality is that in contemporary American society, the

religious diversity of geographic areas is at least partially transmitted to personal friendship networks where it can potentially influence the religious behavior and beliefs of Americans.

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SUPPORTING INFORMATION

The following supporting information is available for this article:

Appendix S1. Complete version of Table 2, including coefficients excluded for reasons of space in the printed version (unstandardized coefficients from multilevel linear regressions predicting the proportion of the respondent’s friends in his or her denomination and congregation).

Appendix S2. Details on calculation of population share for groups not included in the RCMS.

Appendix S3. Details on coding of the friendship variables.

Appendix S4. GSS religion codes and sources used for estimates of population share.

Supporting Information may be found in the online version of this article at wileyonlinelibrary.com.

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