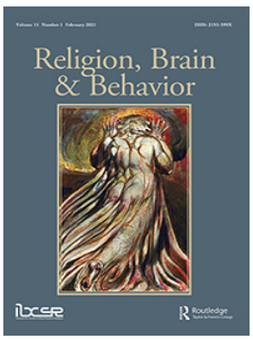

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Religiosity and religious attendance as factors in wellbeing and social engagement

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ABSTRACT

There is accumulating evidence that being an active member of a social community predicts health, wellbeing and even survival. I use data from an online survey to determine whether religious behavior has the same effect. The results suggest that religiosity and attendance at religious services most strongly affect engagement with the local community and through that the numbers of friends someone has, as well as the level of trust in the local community and bondedness with friends and family. However, they seem to have little direct impact on happiness or life satisfaction. Frequency of attendance at religious services (but not private prayer) is associated with a larger sympathy group and a greater sense of bonding to congregation members. I suggest that regular attendees may feel they can count on the emotional support of congregation members more readily than they can conventional friends and family because they interact with them more often.

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Wellbeing; happiness; trust; support clique; religiosity; emotional support

Introduction

Humans have evolved a number of behavioral mechanisms for maintaining community cohesion in their large social groups. These have included singing (Pearce, Launay, & Dunbar, 2015), dancing (Tarr, Launay, Cohen, & Dunbar, 2015), feasting (Dunbar, 2017; Dunbar et al., 2017) and storytelling (Dunbar et al., 2016). All of these have been shown to increase the sense of bonding to the individuals with whom these activities are done. The rituals and processes of religion have been suggested as another (Dunbar, 2013, in press; Durkheim, 1912; Saroglou, 2011; Turner, 1974). In this context, bonding (*sensu* Dunbar & Shultz, 2010) refers to a sense of immersion in the community as a collective (or in a particular individual such as a charismatic leader). The term "bonding" has also been used in a very difference sense, the transactional sense of "bridging and bonding" used in network science (see Kim & Wilcox, 2013; Putnam, 2000). Formally, this latter usage is often also associated with cooperation, and it is certainly true that regular attendance at religious rituals correlates with an enhanced sense that other members will be cooperate (Sosis & Ruffle, 2003).

This economic sense of bonding and cooperation is often viewed as central to group, or community, formation in humans. However, in primates, groups do not form in order to make cooperation possible; rather, groups form to make behavioral *coordination* (mainly as an anti-predator strategy) possible (Dávid-Barrett & Dunbar, 2014; Dunbar, 2020). The mechanism underpinning this is commonly known as group-level or group-augmentation selection (Kingma, Santema, Taborsky, & Komdeur, 2014; Kokko, Johnstone, & Clutton-Brock, 2001), and is not to be confused with group

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selection. Cooperation arises later as a consequence of the opportunities provided by living in stable social groups.

Here, I use the term to refer to the psychological sense of "being one" with someone else, of an emotional sense of commitment and obligation that comes from having a relationship such as friendship with someone. It is this psychological, as opposed to the economic, sense of bonding that seems to explain the now considerable epidemiological evidence that the number and quality of friends that someone has, and how socially active they are, is the single most important factor influencing their health, happiness, life satisfaction and even longevity (Cruwys et al., 2013; Cundiff & Matthews, 2018; Fowler & Christakis, 2008; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015; Holt-Lunstad, Smith, Layton, & Brayne, 2010; Kim, Benjamin, Fowler, & Christakis, 2016; Pressman et al., 2005; Rosenquist, Fowler, & Christakis, 2011; Smith & Christakis, 2008; Steptoe, Shankar, Demakakos, & Wardle, 2013; van Harmelen et al., 2016; Yang et al., 2016). Similar findings have been reported in respect of membership of a social group (Haslam, Cruwys, & Haslam, 2014; Jetten, Haslam, Haslam, Dingle, & Jones, 2014). These, and especially longevity, may be expected to have direct effects on an individual's fitness.

My concern here, then, is with the sense of belonging, or *communitas* (Turner, 1974), that creates membership of a group as the essential stepping stone to the provision of a variety of direct and indirect fitness benefits. Friendships provide the underpinnings for communities, and this in turn creates the effectiveness with which the community provides key group-level benefits like protection, exchange of favors and other forms of cooperation (Dunbar, 2018). The activities that humans use to create this sense of bonding share an important feature in that they all trigger the brain's endorphin system, the principal bonding mechanism in primates including humans (Dunbar, 2010, 2017; Loseth, Ellingsen, & Leknes, 2014; Machin & Dunbar, 2011). Because it involves opioids, this mechanism creates a sense of belonging, of contentment and relaxation, that has knock-on consequences for our health. In a pair of studies of the role of feasting (communal eating and the social consumption of alcohol), Dunbar (2017; Dunbar et al. 2017) found that eating or drinking socially formed part of a web of causal relationships that included both the number of close friends and key psychological variables such as how happy we feel, how satisfied we are with our lives, how worthwhile we feel life is, how engaged we are with our local community, how much we trust our local community, and how immersed we are in our local community. Many, but not all, of these causal pathways are bidirectional: having more close friends increases our sense of contentment, and the more contented we are the more friends we are likely to have.

Because religion is both a central feature of most (if not all) human societies, this study aimed to determine whether engaging in religious activity (e.g., church attendance, private prayer or simply having a religious disposition) plays a similar psychosocial role to feasting. It uses the same format as the previous studies (an online survey), with the same core questions except for the addition of questions relating to religiosity and religious observance. I also included measures of social sensitivity, mainly to ascertain what role this might play.

Methods

The study was run on the panel provider Prolific (www.prolific.co). A total of 303 participants took part, but three were excluded either because they provided impossible answers (claiming to have more friends on Facebook than Facebook allows) or because they repeatedly typed the same number across questions, leaving 300 (194 female with five non-declared gender; median age 25–30) as the final sample. Of these, 236 were from the UK, 43 from the USA and the rest from elsewhere in Europe or Asia. All declared that they had a fluent command of English. Most of the respondents were either Christian or of no religious affiliation (Table 1).

After completing demographic questions, participants answered a series of questions about their current psychological state based on questions used in national surveys by the UK Office of National Statistics (how happy were you yesterday, how anxious were you yesterday, how

Table 1. Denominational make-up of the sample population.

Religion	%
Roman Catholic	9.7
Protestant Christian	13.7
Orthodox Christian	1.0
Hindu	0.3
Sunni Islam	1.3
Judaism	1.3
Buddhism	1.7
Not religious	53.0

satisfied are you with your life, how worthwhile you consider your life to be, how engaged you are with your local community, how much do you trust other members of your local community), all indexed on a 1–10 analogue scale (where 1 is "not at all"). In addition, they completed the *Inclusion of Self in Other* (IOS) rating scale (adapted from Aron, Aron, & Smollan, 1992) of how emotionally close they felt they were to (a) their closest friends, (b) their wider family, (c) their wider community and, if they attended a place of worship, (d) the other members of their congregation. The IOS is a 1–7 visual analogue scale, in which 1 indicates low connectedness/immersion and 7 indicates high connectedness/immersion. They were asked to check their Facebook or other social networking page and give the number of friends listed; they were also asked to specify how many friends and family they had whose death tomorrow would upset them (the sympathy group) and how many friends and family they would go to for support in times of great distress (the support clique) (with the latter two defined following Dunbar & Spoors [1995] and Sutcliffe, Dunbar, Binder, & Arrow [2012]).

To provide measures of the extent to which subjects felt themselves to be religious, I used two standard questionnaires, the *Santa Clara Strength of Religious Faith* questionnaire (Plante, Vallaeys, Sherman, & Wallston, 2002) and the *Duke University Religion Index* (Koenig & Büssing, 2010), whose questions all require a Y/N response. The first provides a measure of religiosity, or predisposition to religious feelings and beliefs, while the second provides a measure of active involvement in religious activities. I use the summed number of *Yes* responses on the Santa Clara scale as an index of religiosity (range of possible scores: 0–10), and two of the Duke scale ratings (attendance at religious services and frequency of acts of private prayer) as stand-alone measures of religious engagement (in both cases: Never, Once a year, A few times a year, A few times a month, Once a week, More than once a week). To determine whether religious people are more socially sensitive, I used the *Social Sensitivity Scale* (Aron & Aron, 1997) and the *Rejection Sensitivity Scale* (Berenson et al., 2009), both of which involve Y/N response with Y responses indicating greater sensitivity. The first is a measure of sensitivity to sensory experiences, while the second is a measure of sensitivity to social rejection. I summed the number of Y's on the two sensitivity scales to give a single overall sensitivity index (range of possible scores: 0–27). The variables used in the analyses, and their definitions, are given in Table 2.

The main analysis is a path analysis of the causal pathways involving the principal variables (see Table 2).

Results

On a 0–10 religiosity scale, 71% of respondents scored 0, and only 8% scored above 5. Thus, the proportion of people with religious convictions, however mild, was quite low (about 30%), but probably in line with the contemporary UK population as a whole. The great majority of respondents declared that they only attended religious services a few times a year at most, if at all; just 8% declared that they did so more than once a month. Although mean Religiosity score, Attendance at religious services and Private Prayer were higher for women than for men, the differences were not significant (Mann–Whitney tests, $p > 0.244$).

Table 2. Variables used in the path analysis.

Variable	Definition
Anxiety	Overall, how anxious did you feel yesterday? [scale 1–10]
Happy	Overall, how happy did you feel yesterday? [scale 1–10]
Satisfaction	Overall, how satisfied are you with your life nowadays? [scale 1–10]
Worthwhile	Overall, to what extent do you feel the things you do in your life are worthwhile? [scale 1–10]
Engaged	Overall, how engaged are you in the local community where you live (e.g., through being part of a community project, helping with community activities like scouts, helping with local charities)? [scale 1–10]
Trust	Overall, how much do you trust the members of the local community where you live? [scale 1–10]
Sensitivity	Aron *Social Sensitivity Scale* plus Berenson *Rejection Sensitivity Scale* combined [27 questions Y/N; summed Ys; scale 0–27]
Religiosity	*Santa Clara Strength of Religious Faith* scale [10 Y/N questions: summed Ys, scale 0–10]
Attendance	How often do you attend church or other religious meetings? [6-point Lickert scale]
PrivatePrayer	How often do you spend time in private religious activities, such as prayer, meditation or Bible study? [6-point Lickert scale]
Facebook	Number of friends on Facebook or other SNS.
Support clique	Think about all the people you would feel comfortable about going to in times of great personal crisis for emotional, social or financial help (i.e., your "shoulders to cry on"). How many people would be in this list.
Sympathy group	Including the people in your list of "shoulders to cry on," how many people are there among your family and friends whose death tomorrow would be extremely upsetting for you (as opposed to just making you feel sad)?
IOS best friend	Aron *Inclusion of Other in Self* scale to best friend [7-point visual analogue scale]
IOS family	Aron *Inclusion of Other in Self* scale to wider family (including grandparents and cousins) [7-point visual analogue scale]
IOS community	Aron *Inclusion of Other in Self* scale to wider community within which you live [7-point visual analogue scale]
*IOS congregation	Aron *Inclusion of Other in Self* scale to congregation attended *if you attend a religious service at least once a month* [7-point visual analogue scale]

*Not included in path analysis because it only applies to those respondents who attended religious services regularly.

Mean support clique size was 7.95 ± 10.48 and mean sympathy group size was 15.40 ± 16.88. These are well within the range of variation reported in previous studies (means of 5 and 15: see Sutcliffe et al., 2012). In a few cases, respondents claimed they had between 100 and 500 people in their support clique or their sympathy group. These are implausibly high numbers by any standards, and the fact that the values were given as round numbers in these cases suggests that care hadn't been taken to enumerate the actual number of individuals as participants were instructed to do (i.e., they were guessing). However, even setting limits of <20 for support clique and <30 for sympathy group (roughly the normal upper limits: Sutcliffe et al., 2012) only reduces the means to 5.7 ± 3.4 ($N = 271$) and 9.6 ± 6.7 ($N = 246$). Again, these values are still well within the normal range. Neither support clique size ($F_{10,262} = 0.46$, $p = 0.916$) nor sympathy group size ($F_{10,259} = 1.14$, $p = 0.330$) varied significantly by religion (including "no religion" as a category).

Figure 1 plots the results of the path analysis for the principal variables. The path analysis seems to suggest that these variables partition into several distinct clusters that interact only to a limited extent: a "contentment" set (Happiness, Satisfaction, Worthwhile), an "engagement with the community" set (Trust, IOS and Community Engagement), a "grouping" set (consisting of the three personal network indices), a "sensitivity" set (Anxiety and Sensitivity) and a "religiosity" set (Religiosity, Attendance and PrivatePrayer). What is immediately obvious is that the three religious indices (Frequency of Attendance, Religiosity and Frequency of Private Religious Activity) sit out on one side, connecting to the main network only via the degree of engagement with the local community. These three measures all interconnect strongly, as we might anticipate. They do not connect directly with the number of friends that people have (however measured), and they do not connect with either the contentment set or the sensitivity set. These clusters were confirmed by a factor analysis which suggests that the 16 variables can be reduced to five factors with eigenvalues >1 (Table 3) that closely match the clusters in Figure 1.

To explore these relationships in finer detail, I ran a multivariate analysis with Attendance Frequency (at religious services), Religiosity and the frequency of Private Religious Acts as the dependent variables and age, sex and the three network indices as the independent variables (Table 4).

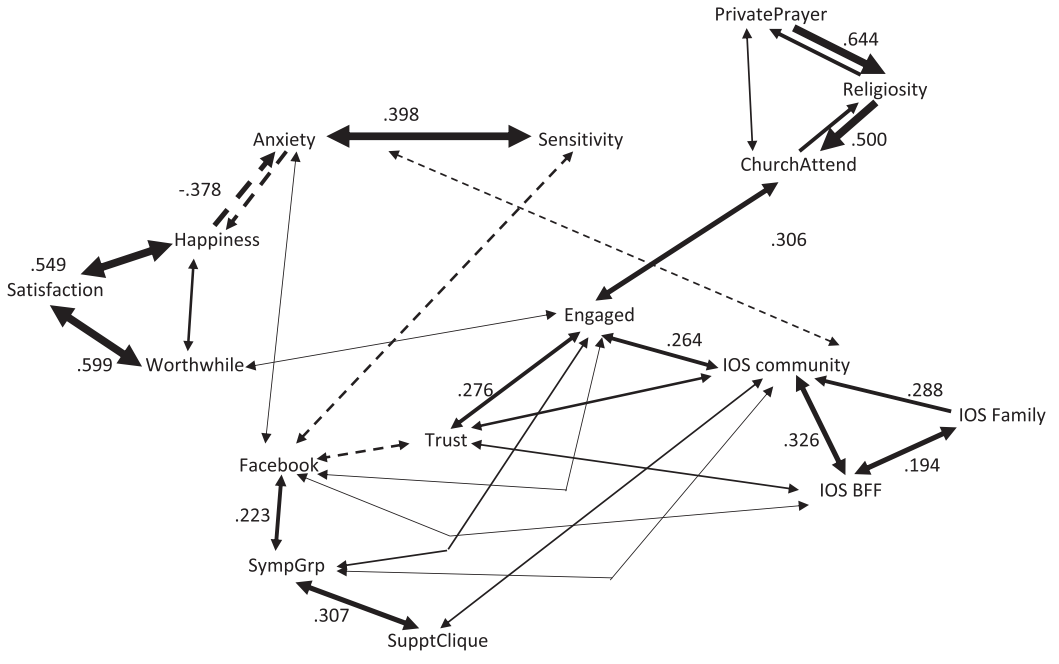

Figure 1. Path analysis of main variables. Thickness of lines indicates weighting indexed by standardized *ßs*. Solid lines: positive effects; dashed lines: negative effects. Only *ßs* > 0.2 that are statistically significant effects in the directional multiple regression are shown. Doubled-headed arrows: *ß*1 < 2*ß2, with larger of two *ßs* shown. Sample size = 285 respondents.

Controlling for age and sex, Attendance Frequency was significantly correlated only with the size of the sympathy group (the number of people you can rely on for emotional and social support: Figure 2(a)). There was no relationship between Attendance frequency and either the size of the support clique or the total number of friends (indexed as the number of friends on Facebook). Broadly similar results were obtained for the other two dependent measures: controlling for age and sex, both sympathy group and support clique correlated with religiosity, while only support clique correlated with Private Religious Acts (Table 4). I ran a similar analysis for the three IOS variables as the

Table 3. Factor analysis (with Varimax rotation) of the 16 variables included in the path analysis of Figure 1.

	Weighting on Factor				
Variable	1	2	3	4	5
Happiness	0.811				
Satisfaction	0.878				
Worthwhile	0.838				
Engaged	0.399	0.345	0.437		
Trust	0.399		0.551		
Support Group				0.553	
Sympathy Group				0.678	
Facebook Friends				0.718	
IOS best friend			0.603		
IOS family			0.620		
IOS community			0.765		
Religiosity		0.925			
Attendance		0.826			
Private prayer		0.903			
Anxiety	−0.390				0.687
Sensitivity					0.775
Variance explained (%)	24.4	15.1	9.2	7.8	6.9

Note: Only weightings >0.3 are shown.

Table 4. Multiple regression analysis of frequency of religious engagement as a function of the personal network variables, controlling for age and sex. β_{stand} is the standardized slope.

	Attendance			Religiosity			Private religious acts		
Variable	β_{stand}	t_{280}	p	β_{stand}	t_{276}	p	β_{stand}	t_{276}	p
Age	0.177	3.05	0.003	0.139	2.37	0.018	0.163	2.80	0.005
Sex	−0.050	−0.87	0.386	−0.047	−0.81	0.416	−0.009	−0.16	0.874
Facebook friends	0.027	0.03	0.457	−0.028	−0.47	0.638	−0.044	−0.74	0.458
Sympathy group	0.209	3.43	0.001	0.138	2.25	0.025	0.077	1.27	0.207
Support clique	0.062	1.01	0.315	0.158	2.54	0.012	0.205	3.31	0.001
Overall model:	$F_{5280} = 6.532$, $p < 0.001$			$F_{5280} = 5.684$, $p < 0.001$			$F_{5280} = 6.010$, $p < 0.001$		

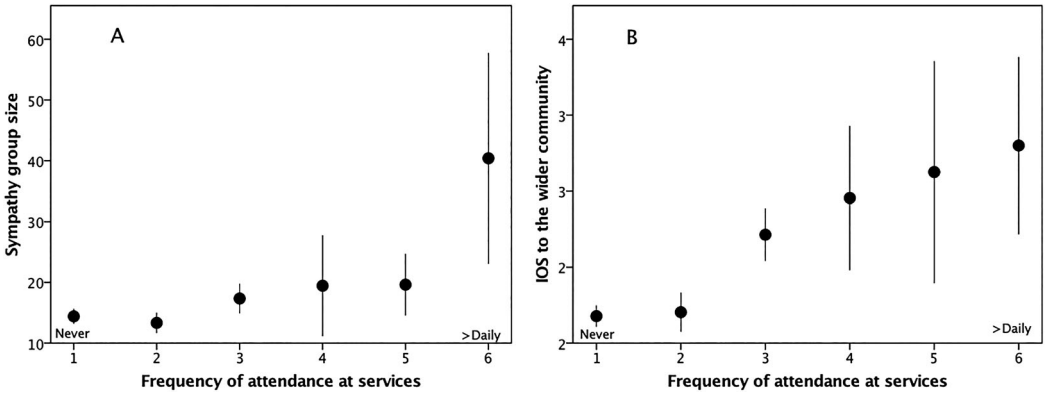

Figure 2. Mean (±1se) (a) Sympathy group size and (b) IOS (bondedness) to the wider community as a function of the frequency of attendance at religious services.

independent variables. For all three indices of religious engagement, the single best predictor was bondedness (IOS) to the community as a whole (Table 5; for the relationship to Attendance, see Figure 2(b)).

I reran both of these analyses with Support Clique <20 and Sympathy Group <30 (for a reduced sample size of 247), but doing so does not substantively change the results other than to weaken the relationship between Facebook Friends and Sympathy Group.

Finally, I ran a separate analysis for IOS to other congregation members: this variable was not included in the path analysis because not everyone attended services. Figure 3 plots IOS as a function of frequency of attendance at services. Bondedness to fellow congregation members increases linearly and significantly ($r = 0.582$, $N = 151$, $p < 0.0001$) with frequency of attendance. The more you attend your local place of worship, the more bonded you feel to your co-worshippers. Indeed, those who attend religious services very frequently have much larger than expected sympathy groups (mean ≈40 compared to a norm of ∼15: Figure 2(a)), suggesting that they view the entire regular congregation as close friends.

Table 5. Multiple regression analysis of frequency of religious engagement as a function of the bondedness variables, controlling for age and sex. β_{stand} is the standardized slope.

	Attendance			Religiosity			Private religious acts		
Variable	β_{stand}	t_{291}	p	β_{stand}	t_{291}	p	β_{stand}	t_{291}	p
Age	0.157	2.73	0.007	0.136	0.14	0.021	0.181	3.08	0.002
Sex	−0.054	−0.97	0.332	−0.058	−0.06	0.309	−0.022	−0.38	0.702
IOS to best friend	−0.031	−0.52	0.605	0.008	0.01	0.895	0.060	0.97	0.331
IOS to wider family	−0.080	−1.38	0.168	−0.048	−0.05	0.423	−0.049	−0.82	0.413
IOS to wider community	0.256	0.26	<0.001	0.184	0.18	0.005	0.111	1.71	0.088
Overall model:	$F_{5291} = 6.680$, $p < 0.0001$			$F_{5291} = 4.202$, $p = 0.001$			$F_{5291} = 3.793$, $p = 0.002$		

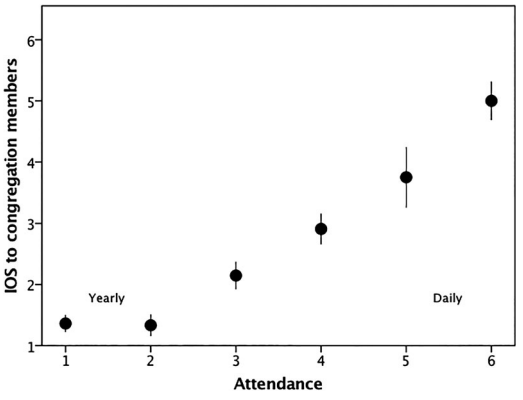

Figure 3. Mean (±1se) IOS (bondedness) to the other members of the congregation as a function of the frequency of attendance at religious services.

Discussion

This study yields two main findings. First, in contrast to the context of feasting, religiosity and religious attendance form a close knit functional unit that is somewhat separated off from other aspects of people's psychological and sociological domains, with few direct effects on these two aspects of their behavior. Second, attendance at religious functions (but not religiosity indices or private prayer to quite the same extent) positively influences both the size of the sympathy group and the sense of engagement in the local community (by which is meant the wider community, not just the congregation), as well as bondedness to other members of the congregation.

Note that engagement with the wider community increases roughly linearly with frequency of attendance, but sympathy group size seems to involve more of a phase transition that suddenly rises to a new level once attendance reaches a certain level (at least once a week). Conventionally, people list only 3–7 individuals in their support clique—a finding that has been reported consistently across studies (Sutcliffe et al., 2012). We see much the same pattern among those who attend religious functions only intermittently (once a month or less): in Figure 2(a), these average a very consistent 7. Those who attend religious services at least once a week, however, list around 20 individuals, or three times as many as the societal norm. It could be that those who attend services frequently are over-enthusiastic in rating their relationships with other people. However, an alternative explanation may be that seeing and interacting with a large number of people at a daily or weekly service creates the sense of bonding intensity normally associated with support cliques. Weekly interaction is the frequency required for creating and maintaining the intense bonds found among best friends (the inner core of ~5 most intimate friends and family that form the support clique) (Sutcliffe et al., 2012). It may be no accident that the Abrahamic religions, at least, enjoin their members to attend a weekly service.

This sense of belonging or bondedness may well be compounded by the belief that shared interests and beliefs (Dunbar, 2018) and the charitable demands of most religions will make fellow congregation members (but not strangers, and perhaps not even less religious friends) more willing to provide the kinds of intense, time-costly emotional support that one would normally expect only from a member of one's support clique. In effect, being a member of a congregation that meets regularly may create a large support clique that one can rely on. People who were more assiduous in their attendance at religious services also felt more engaged with the wider community within which they lived (many of whom they will not know personally). This second finding suggests that actively religious people may indeed be genuinely more willing to invest time and effort into the welfare of other people (i.e., behave altruistically for the greater good of the community).

In retrospect, it would have been desirable to have included questions on both the size of the subject's congregation and how long subjects had been a member. It may be that the size of the congregation directly affected how many people were listed in the support clique and sympathy group for the reasons suggested above. A more important complication is that there is a potential confound between frequency of attendance at services and how long someone has been attending a particular place of worship: it may be that the effects attributed to attendance in these analyses are in fact due to length of association with a particular congregation (and hence familiarity with its members). Future studies should consider these variables.

Contrary to some previous studies (Francis, Ziebertz, & Lewis, 2003; Mookerjee & Beron, 2005), the survey found less evidence that religious people, or those who attended religious functions more often, were consistently happier, or more satisfied with their lives. This suggests that any beneficial effects of an actively religious life come not through elevated feelings of happiness and contentment, but through the communal moral, social, and perhaps financial support provided by the congregation and the sense of belonging that a close-knit congregation creates. Historically, congregations have usually been the main source of financial support for parishioners who have fallen on hard times. Examples include both the Poor Roll in English and Scottish parishes that, for over two centuries until the Poor Law Amendment Act of 1834, provided poor relief for the destitute with funds raised by charitable donations from the congregation, as well as the Islamic tradition that charity to beggars may be not refused on a Friday.

The results strongly suggest that it is active participation in the religious services that is important, rather than merely a sense of being religious. Religiosity certainly plays a role, as does engaging in private religious activities like prayer, but Figure 1 rather strongly suggests that there is a causal sequence running from private prayer to religiosity to regular attendance, which in turn creates a greater commitment to being engaged with the wider community. From this, there is a small residual effect the leads to larger sympathy and support groups. This suggests that it is the active participation in communal rituals, not the belief state or predisposition to believe, that is instrumental in creating these psycho-social effects and benefits. It may be that the particular beliefs of a religion serve a different function—such as persuading people to keep turning up to the regular religious services (Dunbar, 2013) or to maintain an appropriate degree of moral rectitude (the supernatural punishment hypothesis: Johnson, 2005).

Disclosure statement

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