Scottish Longitudinal Study (SLS)
Research Working Paper Series

Research working paper 7

Inter-sectarian couples in the 2001 census

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Put online: 15 January 2010

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Summary

- We have used data on over 111 thousand couples where both partners were born in Scotland, aged 16 to 74 and with one member an SLS member, who reported in the 2001 census that they were raised in a Christian denomination, or that they were raised with no religion. This sample represents approximately 11% of all such couples in the census.

- Religion raised was divided into Church of Scotland (CofS), Roman Catholic (RC), other Christian (OthC), and None.

- The breakdown of religion raised changed markedly with the age of the respondents, with the proportion reporting being raised CofS falling sharply and the proportion with no religious upbringing rising from the oldest to the youngest age groups (Figure 2), while other groups, including RCs, have maintained more stable proportions.

- We have studied the extent to which couples share the same religion of upbringing. Two measures as examined, the proportion of same religion raised couples and the index of homogamy (IH) which measures the relative odds of a same raised couple compared to what would be expected if couple formation were at random.

- CofS has the highest proportion of same religion raised couples overall but this is largely because it comprises much the largest overall population share. Apart from the OthC group the IH is highest for those with no religion, followed by OthC, CofS and with RC having the lowest IH, implying that they are the group most likely to form couples with people of a different background.

- These results for IH by religion were not the result of differences in Social Class or Education between religious groups and IH by religion differed very little between groups defined by either education or social class.

- The proportion of same religion raised couples and the IHs have decreased sharply with the age of the couples for both RCs and those raised with no religion. In the case of RCs the decline was sharpest up to couples at the oldest ages and then flattens out from around age 40 (representing couples most of whom will have formed from 1960 onwards) and are very likely to have formed a couple with a partner from another religious group.

- The proportion of RC is much higher in Local Authorities in the West of Scotland and, as expected, the proportion of same religion raised couples also increases, but the IH for RCs in the West is lower than for Scotland as a whole. The patterns with the age of the proportion of mixed religion couples is similar in all areas.

- The proportion of inter-sectarian (RC and protestant) couples has increased steeply for the youngest age groups and in the West of Scotland they make up around 25% of all couples.

- Those in a religiously mixed partnership are more likely to have no current religious practice, but RCs in mixed partnerships are the most likely to maintain their religious practice of upbringing.

- Taken together these findings suggest a breakdown of sectarianism in Scotland between RC and others. This is accompanied with an increase in secularism and with some evidence of the separation of those with no religious upbringing, who are generally a disadvantaged group, from others.

1 Background

1.1 Sectarianism in Scotland

There has been much recent debate as to the extent of sectarianism between Roman Catholics and protestant groups in Scotland. Sectarianism involves bigotry, discrimination, prejudice or hatred towards others and is notorious for legitimating territoriality, particularly in Northern Ireland (Anderson and Shuttleworth,1998). Clayton (2005,100) defines sectarianism as being activities causing oppression and exclusion of a community. Despite national secular trends in terms of marriage and church attendance in England (Voas, 2003), controversy continues about whether Scotland contains remnants of religious sectarianism (Bruce et al. 2004, Walls and Williams 2005). Glasgow City Council (2003) found that sectarianism is perceived by Glasgow residents as a characteristic of Scottish society, a finding echoed elsewhere (NFO System 3 Social Research Poll, 2003).

Historically, the debate has focused upon west-central Scotland, with its history of settlement by Irish Catholics (Devine 1999, 2000; Davies 2006). Adult Glaswegians link sectarianism with the politics of Ireland, believing local labour markets are anti-Catholic (Walls and Williams 2003). Davies (2006) argues that during the mid-twentieth century the 'Old Firm' (Rangers and Celtic football clubs) contributed to stimulating sectarianism (Murray,1984). In an Edinburgh International Festival lecture, the eminent Scottish Catholic composer, James McMillan, called sectarianism Scotland's shame' (Devine 2000). Contrary to such a thesis Bruce et al (2005) argue sectarianism is a Scottish myth. Walls and Williams (2005, 765) differ believing instead existing discrimination has sectarian roots and that it "… has affected Catholic working careers in the period 1950 – 2000 ... that large numbers of Catholics who are aged 50 at this moment in the west of Scotland have lived their lives at an economic disadvantage…". In Northern Ireland sectarian segregation and conflict remains powerfully present (Hamilton, et al, 2008). Harris (1972) documented 'avoidance strategies' amongst members of the socio-religious divide in Northern Ireland. Qualitative research into Glasgow's urban communities is consistent with the view that religious discrimination also afflicts Scotland (Walls and Williams (2003, 2005). Walls and Williams (2003; 2005) argue in favour of the existence of sectarian bigotry in Glasgow as an anti-Catholic phenomenon and a source of the relatively poor health of those of Irish Catholic descent and their comparatively humble social-class status. Around 30% of the Clyde-side population are Catholics with many being of Irish descent (Williams, 1993). These authors suggest the Catholic experience in Glasgow exhibits the persistence of ethnic prejudice, having its origin in an Irish identity with religion playing the role of a marker of this despite an increasingly secular society. Walls and Williams (2003, 656-668) claim: "…anti-Irish racism in the west of Scotland is constructed as a 'religious conflict ….. Even in an increasingly secular society, there are a number of means to identify people of Irish origin, notably their religious background." Accounts given by older Catholics and Protestants about discrimination over employment, especially in relation to professional jobs and posts in the private sector, indicate a marginalisation of Catholics.

Consistent with accounts of the sectarian basis of discrimination is Patterson's (2000, 364) research found for older Catholics, that educational qualifications "have not always been fully rewarded in the labour market" whereas this was not found to be the case for older non-Catholics. Despite these data Bruce et al (2005) challenge the thesis that sectarianism has structural roots within Scottish society claiming instead that Walls and Williams (2003) data do not justify a sectarian interpretation and argue they unjustifiably treat their respondents as expert witnesses implying they are capable of giving authoritative accounts. Bruce et al (2005) argue such accounts could be hearsay, lacking factual support and conclude, "… It is certainly a mistake to treat ordinary people as expert in social realities beyond their immediate experience" (Bruce et al, 2005, 166). Bruce et al speculate that it is the power of a sectarian myth which controls perceptions that sectarianism actually exists in Scotland. That perceptions favour the existence of sectarian, anti-Catholic discrimination means that it seems to be the

existence of potent belief systems which underlie and give rise to contested interpretations of documented social tensions: Glasgow City Council (2003) found in its interview survey of sectarianism in Glasgow that many adults believe it is common and affects lives despite few of the adults interviewed having had any personal experience of it. An NFO System 3 Social Research Poll (2003) for BBC Five Live did however find that within Scotland 13% of adults claimed to have experienced sectarian abuse, Catholics being at greater risk of physical assault, suggesting that contrary to Bruce et al the putative myth has a basis in fact, as recent research suggests (Clayton, 2005).

Sectarianism implies segregation and social integration of religious groups might result in its decrease. Here we explore intermarriage between Christian religious groups in Scotland to investigate to what extent Scotland is socially integrated on a religious dimension. Intermarriage can be viewed through the prism of the Contact Hypothesis meaning that mixing of separated groups may cause greater mutual understanding and societal harmony.

1.2 Rates of homogamy in couples as measures of sectarian segregation

The extent to which social groups are segregated, as opposed to integrated, is a key factor in understanding society (Barth, 1969). The extent of segregation can be measured in ways that vary along a spectrum from softer indicators, such as reports of attitudes, intentions and friendship patterns to harder indicators such as measures of residential segregation (e.g. Massey and Denton, 1988). While the softer indicators may help in understanding mechanisms, they may be vulnerable to reporting biases.

One of the harder indicators of segregation is the extent to which couples are formed from members of the same groups. The term ‘homogamy’ is used to refer to couples formed from two people from the same group, where the grouping may be ethnic, social or, as in this case, religious and such couples are described as homogomous. These indicators have been widely used in studies of ethnic segregation (e.g. Pullman & Peri 1999, Model and Fisher 2001), but some disagree with this thesis that intermarriage is a good indicator of societal integration (Song, 2009).

A simple measure of ethnic homogamy is the percentage of people in couples who are married to a partner of the same ethnic group. A measure of religious homogamy can be calculated along the same lines. While this measure of segregation gives us some indication of the segregation of a group it does not allow for the size of the groups. For example, a person from a small group would only have a very small number of potential partners from the same group. To adjust for this various indices of homogamy have been derived. The recommended one (see Pullman and Peri 1999) which we will refer to as the ‘index of homogamy’, measures the ratio of the numbers of couples where the partners come from the same group (e.g. religious or ethnic) to that which would be expected if couple formation in the population was completely random with respect to this grouping.

Marriages are homogomous with respect to other factors such as social class and education as well as the group of interest. If these other factors are different for different religious groups, then apparent homogamy due to religion may in fact be due to some other factor. For example, if a certain religious group had very different levels of education, then a high measure of religious homogamy might partly be due to couples formed between people of the same educational level. The advantage of using the homogamy index is that it can be adjusted for other factors. It is also possible to calculate homogamy coefficients within different subgroups by other factors. This is achieved by fitting probability models as described in detail in the Appendix where SAS programs to carry out the analyses presented in this report are given.

2 Scottish longitudinal study (SLS) data for religion of couples

2.1 Religious questions in the 2001 census of Scotland

The Scottish 2001 census asked respondents to answer two questions about their religion, the religion or denomination they currently belong to, and that in which they were brought up. Although it was not compulsory by law to answer this question, unlike the rest of the census form, over 94% of the respondents gave a valid answer to this question for their current religion and over 91% for the religion in which they were raised. The census records contain information about relationships within a household that enable cohabiting couples to be identified. The census also includes data on the age, sex, social class and education level of each partner so that indices of homogamy can be calculated and adjusted for other factors. The question on religion raised is the most appropriate one to use in considering couple formation and current religion can be used to investigate the effect of inter-faith partnerships on religious practice.

2.2 Data available for couples in 2001

The SLS holds anonymised individual 2001 census records for a semi-random 5.3% sample of the Scottish population, and also the records of all other individuals living in the same households as the SLS member (ref to SLS working paper). Extracts from the SLS can be accessed in a secure setting in GRO(S) in Edinburgh. The SLS provides a higher sampling fraction of the 2001 census than does Scottish household sample of anonymised records (HSARs). The religious questions in the HSARs are part of the restricted data that can only be accessed in a safe setting in Southport.

By selecting all SLS members who are members of couples and their partners, we should have a sample of approximately 10.3% of all couples enumerated in the Census (5.3% x 2 – 5.3% of 5.3% where both partners are SLS members). Social class and educational qualifications were not asked for those over 75 or for non-resident students in the 2001 census. A sample of couples was first extracted from the SLS data, restricted to male/female couples aged 16 to 75, both born in Scotland, with complete data on religion raised. For the purpose of studying inter-sectarian couples we have excluded the small number of Scottish born couples where one or more member was raised in a non-Christian religion. This provided a sample of 111,627 couples for whom the initial tables are presented. Details are in Table 1.

Table 1 : Numbers of couples available for analysis

	Numbers of couples	**Remaining**
All	16,7784	167,784
Sex of 1 partner missing	731	167,053
MM couples	206	166,847
FF couples	184	166,663
One or more partner non resident student	51	166,612
One or more members of a couple with missing ages or age <16 or >74 years.	8,784 (5.3%)	157,828
With question on religion raised not answered or inadequately described for one or more members of a couple	1,1586 (7.3%)	146,242
One or more partners not born in Scotland	34,231(23.4%)	112,011
One or more partner from non-Christian religion	315 (0.3%)	**111,627**

2.3 Demographics by religious group

The religious question was grouped into five main categories, Roman Catholic (RC), Church of Scotland (CofS), Other Christian (OthC) and None. Figure 1 shows the religion of upbringing of male and female members of couples, grouped into these four broad categories. Slightly higher proportion of women than men report any religious upbringing. The corresponding numbers are in Table 1.

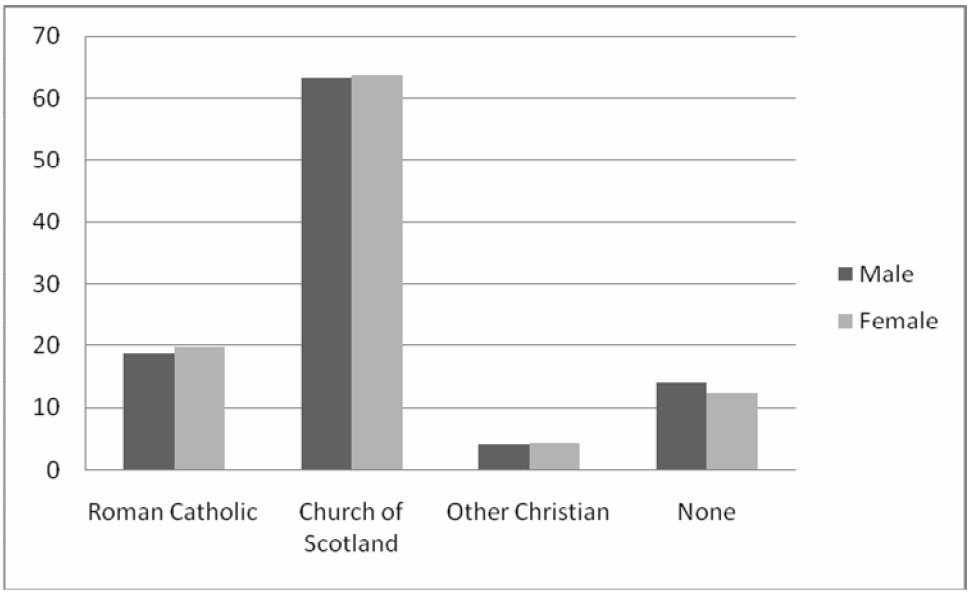


Figure 1 : Percentage of men and women in couples by religion raised

Table 1: Numbers and percentage of men and women in couples by religion raised

	Male		Female	
Religion of upbringing	N	%	N	%
Roman Catholic (RC)	70,627	63.3	71,129	63.7
Church of Scotland (CofS)	21,012	18.8	21,972	19.7
Other Christian (OthC)	4,433	4.0	4,836	4.3
None	15,555	13.9	13,690	12.3
Total	111,627	100	111,627	100

The OthC group will include both Episcopalians/Anglicans, who might be regarded as between RC and CofS on a religious dimension and also other protestant groups (Free Church of Scotland, Methodist, Baptist etc) who would be considered further from RC than the CofS. The census data does not discriminate between these groups. However, by excluding those born outside Scotland it seems likely that most of the Episcopalians/Anglicans will have been excluded. The percentage of the OthC group born outside Scotland was 65% for males and 64% for females, much higher than for other religious groups. For OthCs born outside Scotland (mostly E&W), and hence excluded from these analyses, only 6% of males and 5% of females classified themselves as in the "White Scottish" ethnic group, whereas the percentage "White Scottish" for Scottish born other Christians was 98 % males and 97% for females. Also the OthC percentages were highest in the Highlands and the Western Isles (see below). All of this is consistent with the OthC group being predominantly from the other protestant sects.

2.3.1 Age group

Figure 2 shows how religious upbringing varies with the age of the woman in the couple. An equivalent figure for men) showed a very similar pattern. This policy of showing an analysis by female members of couples, for cases where the results for men are very similar, has been adopted throughout this report. The X axis on Figure 2 is shown

reversed since it corresponds to women with the earliest date of birth. The oldest age group would have been born in the period 1927 to 1931. We can see that the proportion of the couple members reporting a CofS upbringing has declined substantially for the youngest members only than 47% of the population share in the oldest group. Other Christian denominations have also declined but by a lesser amount (youngest have 80% of the population share for the oldest). In contrast the proportions reporting a RC upbringing have remained fairly stable, increasing slightly from the oldest to the 35 year olds (this could be differential mortality) and then a small decrease to the youngest age group. The deficit due to declining Christian groups is taken up by those who report no religious upbringing, increasing their proportion from 3% in the oldest age group to 45% in the youngest.

These results are consistent with other survey findings (Paterson and Ianelli, 2006 and references therein) on how religious affiliation has changed over the latter half of the 20th century in Scotland.

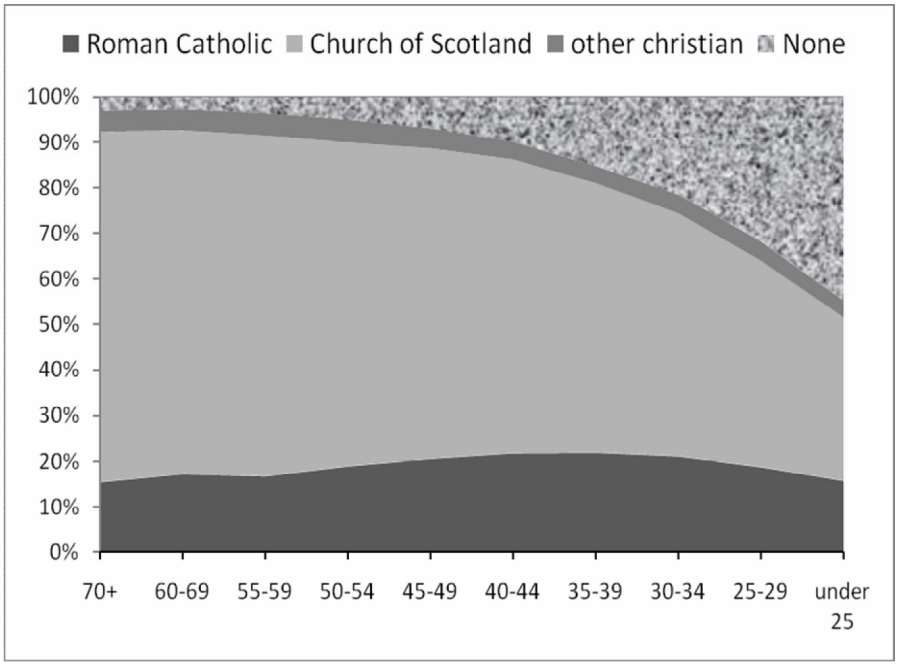


Figure 2: Percentage of women in couples by religion raised and age group

2.3.2 Local authority

Religious groups are differentially represented in the regions of Scotland. Table 2 gives the percentage for female members of couples by local authority. As expected, we find much higher percentages with an RC upbringing in the local authorities in the West of Scotland. In contrast the percentages with an RC upbringing are very low in the South and the North, with the exception of the Western Isles, where some areas were not reached by the reformation. The final column shows the regional grouping of local authorities and Table 3 summarises by area of the country.

Table 2: Female members of couples % in each religious group, ordered by percentage RC (descending) by local authority

	% by religious group of female				Total	
	RC	**CofS**	**OthC**	**None**	**couples**	**Area***
Inverclyde	**41.1**	50.3	4.1	4.5	1,974	W
North Lanarkshire	**40.2**	49.7	3.3	6.8	8,694	W
West Dunbartonshire	**39.2**	50.1	3.3	7.4	2,110	W
Glasgow	**38.6**	50	2.6	8.8	9,205	W

Renfrewshire	29.8	58.5	3.6	8.1	4,270	W
East Dunbartonshire	28.5	60.9	4.1	6.5	2,942	W
South Lanarkshire	27.7	59.8	3.8	8.7	7,873	W
East Renfrewshire	27.0	62.1	4.7	6.2	2,416	W
Dundee City	26.3	55.2	5.0	13.5	2,733	E
West Lothian	19.3	62.8	3.3	14.6	3,913	E
North Ayrshire	19.3	67.3	3.5	9.9	3,273	W
Stirling	17.0	70.2	3.4	9.4	1,810	C
Argyll & Bute	15.3	72.7	4.7	7.2	1,683	N
Falkirk	14.3	67.6	3.5	14.6	3,733	C
Clackmannanshire	13.6	64.7	4.0	**17.7**	1,146	E
Edinburgh	13.2	66.8	3.9	16.2	7,188	E
Western Isles	13.2	54.0	**30.5**	2.3	665	N
East Ayrshire	13.1	71.3	2.7	12.9	3,151	E
Midlothian	13.0	66.3	2.8	**18.0**	2,022	E
South Ayrshire	12.2	**76.0**	4.1	7.8	2,804	S
East Lothian	11.7	68.3	4.3	15.7	2,084	E
Fife	10.7	64.4	4.1	**20.8**	7,802	E
Perth & Kinross	9.5	73.9	5.0	11.6	2,896	C
Highland	8.9	70.7	**9.6**	10.8	4,528	N
Dumfries & Galloway	8.1	**78.7**	2.5	10.8	3,139	S
Angus	7.5	75.9	4.6	12.0	2,652	N
Borders	7.4	**78.2**	3.8	10.6	2,129	S
Moray	6.9	69.8	**7.4**	15.9	1,849	N
Aberdeen City	4.9	62.7	5.0	**27.4**	4,333	N
Aberdeenshire	3.6	73.9	5.9	16.5	5,666	N
Shetland Islands	2.7	69.8	**13.5**	14.0	480	N
Orkney Islands	2.4	**81.5**	5.6	10.6	464	N
All	19.7	63.7	4.3	12.3	111,627	

The 4 local authorities with the highest proportions of each group are shown in bold
W = West N=North S=South E=East C=Central

Table 3: Female members of couples % in each religious group, by area

	% by religious group of female				Total
Area	**RC**	**CofS**	**OthC**	**None**	**couples**
North	6.8	70.4	7.3	4.5	22,320
South	9.3	77.6	3.4	6.8	8,072
Central	13.3	69.7	4.0	7.4	9,585
West	33.4	55.4	3.4	8.8	42,757
East	14.4	65.1	3.8	8.1	28,893

2.3.3 Social class

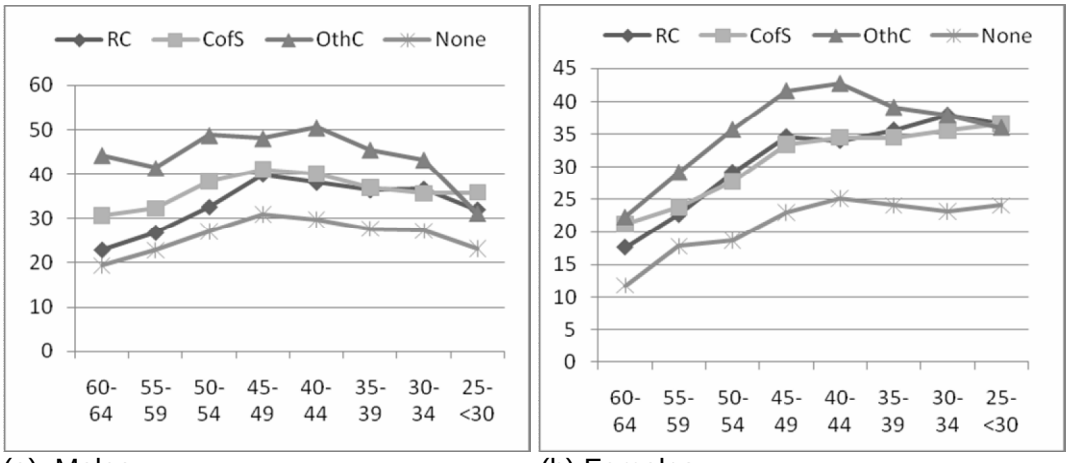
Religion of up-bringing is related to social class as defined by the chapters of NS-SEC classification (Rose et al 2001). Here we show male and female members of couples separately because the patterns differ somewhat.

The most notable feature is the under-representation of those with no religious upbringing in the higher NS-SEC groups. This is also true, but to a lesser extent for those with an RC upbringing. The opposite is true for those with an OthC upbringing.

Table 4: Religion of upbringing by NS-SEC chapter and sex

	missing	Higher prof	Lower prof	Interme diate	Small org	Lower tech/ sup	semi- routine	Rou- tine	NA	All
Male	%	%	%	%	%	%	%	%	%	%
RC	6.2	10.0	21.0	5.7	9.7	16.3	10.8	18.0	2.2	100
CofS	5.1	12.4	21.8	5.5	12.4	16.8	9.6	15.1	1.3	100
OthC	4.3	16.6	25.6	5.7	13.3	14.2	8.1	10.8	1.3	100
None	4.4	7.8	16.5	5.0	10.9	19.4	12.1	20.6	3.2	100
All	***5.2***	***11.5***	***21***	***5.5***	***11.7***	***17.0***	***10.1***	***16.2***	***1.8***	***100***
Female	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
RC	5.7	3.6	24.9	18.3	2.9	5.1	21.4	14.2	3.9	100
CofS	5.0	3.8	24.3	20.6	4.6	5.0	21.7	12.5	2.6	100
OthC	4.0	4.4	29.5	20.8	5.2	3.9	19.9	9.7	2.6	100
None	4.3	2.8	17.4	17.8	3.4	5.9	25.4	17.1	5.8	100
All	***4.8***	***4.7***	***25.0***	***19.0***	***4.8***	***4.8***	***20.8***	***12.0***	***4.0***	***100***

Exploratory analysis also found that these patterns differed by age group Figure 3 shows the percentage in the two professional/managerial groups by age group and religion raised. The oldest groups are again shown to the left of the plot since they represent an earlier cohort. It is reasonable to assume that the rising trend for the oldest age groups is mainly a period effect, since cohort studies have shown that social class is fairly stable beyond age 50. For men the percentage professional in the RC group has caught up with the CofS, in agreement with other findings (Paterson 2001 and Paterson and Ianelli 2006). For women the RC proportions are very similar to those for CofS. Those raised with no religion have persisted with a lower percentage professional than CofS while the OthC group is higher than the other groups, except among the youngest group.



(a) Males (b) Females

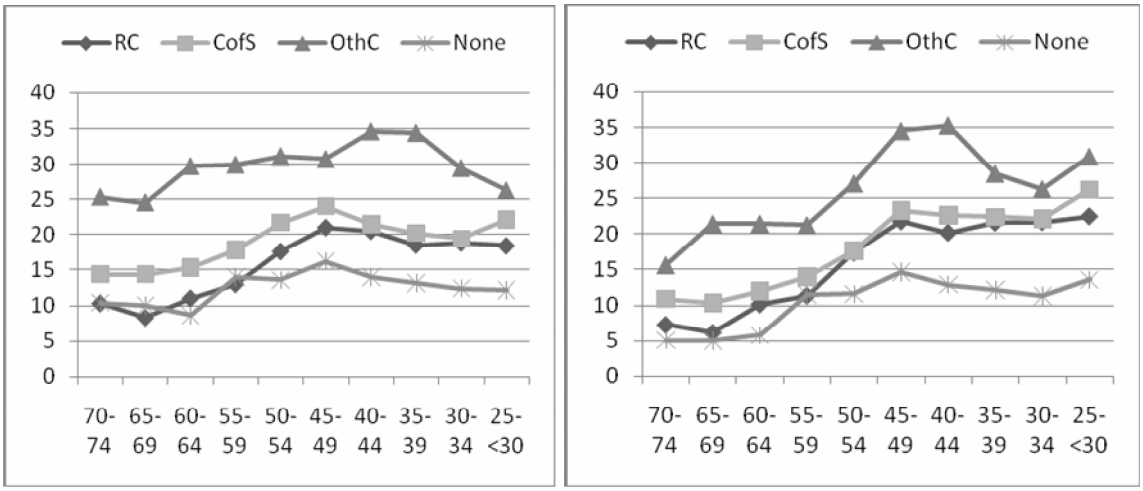
Figure 3: Percent professional managerial by religion raised and age group members of couples

2.4 Education

The patterns we saw for social class are also mirrored for education level. Details are in Table 4 and Figure 4. In Figure 4 we can see that the percentage of RCs with degree level qualifications has increased towards the younger ages for both men and women.

Table 5: Religion of upbringing by highest qualification received and sex

	Percentage highest qualification						
	Missing	**None**	**Standard Grade**	**Highers**	**HNC/ HND**	**Degree**	**All**
Male	%	%	%	%	%	%	%
RC	4	34.9	22.7	14.1	7.6	16.7	100
CofS	3.2	32.5	23.1	14.5	7.6	19.1	100
OthC	2.4	25.6	19.8	15.4	7.3	29.6	100
None	3.2	31.8	31.2	13.6	7.7	12.5	100
All	**3.3**	**32.6**	**24**	**14.3**	**7.6**	**18.1**	**100**
Female	**%**	**%**	**%**	**%**	**%**	**%**	**%**
RC	2.8	34	25.9	12.7	6.6	18	100
CofS	2.6	31.7	27.2	13.7	5.9	18.9	100
OthC	2	24.7	24.1	15.2	6.7	27.3	100
None	2.2	28.9	36.5	13.5	7.4	11.5	100
All	**2.6**	**31.5**	**28**	**13.5**	**6.2**	**18.2**	**100**



(a) Males (b) Females

Figure 4 Percent with a degree or equivalent qualification by religion raised and age group for members of couples

3 Inter-sectarian partnership rates and measures of religious homogamy

3.1 Simple measures of homogamy

Table 5 gives a cross tabulation of the religion raised for male and female members of couples. The data are displayed as the percentages of females of each group forming couples with males of each other group. They could equally well have been displayed as percentages for males, but the results and their interpretation would be very similar.

Table 6: Religion raised by members of couples and homogamy coefficients (Models 2 & 3)

Raised religion of female partner	Raised religion of male partner: RC %	CofS %	OthC %	None %	All %	Homogamy coefficients (models 2 and 3)
RC	**45.0**	40.9	2.3	11.8	100	2.23
CofS	11.8	**79.4**	2.7	6.1	100	3.35
OthC	11.5	42.7	**34.7**	11.1	100	9.96
None	15.9	22.4	2.3	**59.4**	100	8.63
All females	18.8	63.3	4	13.9	100	3.82 (model 2)

CofS has the largest in-coupling rate but this is largely because they are the majority. Those raised with no religion have the next highest rate, despite being small group. Note also that fewer than half (45.0%) of the RC women are in homogomous couples and that the percentage in partnerships with protestant couples (43.2%) almost equals this.

Looking at the homogamy coefficients, which adjust for the proportions in the population, we see that the greatest homogamy is seen in the OthC group due to their small numbers which reduces the numbers of partnerships expected from random partnering. The RC group have the lowest coefficient which means that their propensity to out-partner is lower than CofS even after adjusting for their smaller numbers.

Poisson regression models were fitted to the data for the 25 counts in this table as described in Appendix 1 section 1.01. The deviances for these models are given in Table . Cleary the fit improves as we go from model 1 to 3, but the fit is still not very good. A good fit will have deviance similar to its degrees of freedom. Looking at the residuals from model 3 this is largely due to:

- a deficit of couples with one member being RC and the other being OthC
- an increase in couples with one member being CofS and the other being OthC
- an excess of couples where a woman with no religious upbringing has an RC partner

The first two would be what might be expected from the relative positions of the three sectarian groups on the religious spectrum, while the third is more surprising. However, the homogamy coefficients from model 3 still provide a valid summary of the extent of in-coupling in each religious group.

Table 7: Measures of fit for simple homogamy models

Model	Description	deviance	df	Difference	df
1	Just margins	38183.6	9		
2	Common homogamy	3487.1	8	34696.5	1
3	Religion specific homogamy (by religion of female)	593.2	5	2893.9	3

3.2 Is the effect of religion on religious homogamy explained by other factors

In order to check whether the homogamy coefficients described above are due to the effect of other factors we first investigate which factors affect couple formation. We have seen in section 2 that age, education and social class all differ by religious groupings, so they have the potential to act as confounders if they are also related to couple formation (see Appendix 1 section 1.02). Details of this are not presented here, because the main focus is to see to what extent these factors confound the effect of religion. But age, social class and education all have a powerful effect on couple formation. The

effect of local authority cannot be assessed as we measure this from current address, not from the local authority of upbringing.

Age was modelled by calculating the difference in couple's ages, grouped into 7 categories, with the difference in years between male and female partners grouped as (more than 5, 4 or 5, 3, 2, 0, -1, -2, less than -2), and fitting both this and the age group of the female member of the couple in 5 year age groups.

Table 8: Adjusted homogamy coefficients

	Homogamy coefficients adjusted for			
Raised religion of female partner	**Nothing (model 3)**	**Age**	**Age and education**	**Age and social class**
RC	2.23	2.29	2.29	2.30
CofS	3.35	3.16	3.16	3.16
OthC	9.96	10.06	9.82	10.11
None	8.63	6.73	6.54	6.62

We can see that the most of the homogamy coefficients are very little changed, so that they are not due to confounding from other factors. The exception is the coefficient for no religious affiliation which is reduced after adjusting age.

3.3 Does religious homogamy vary by other factors

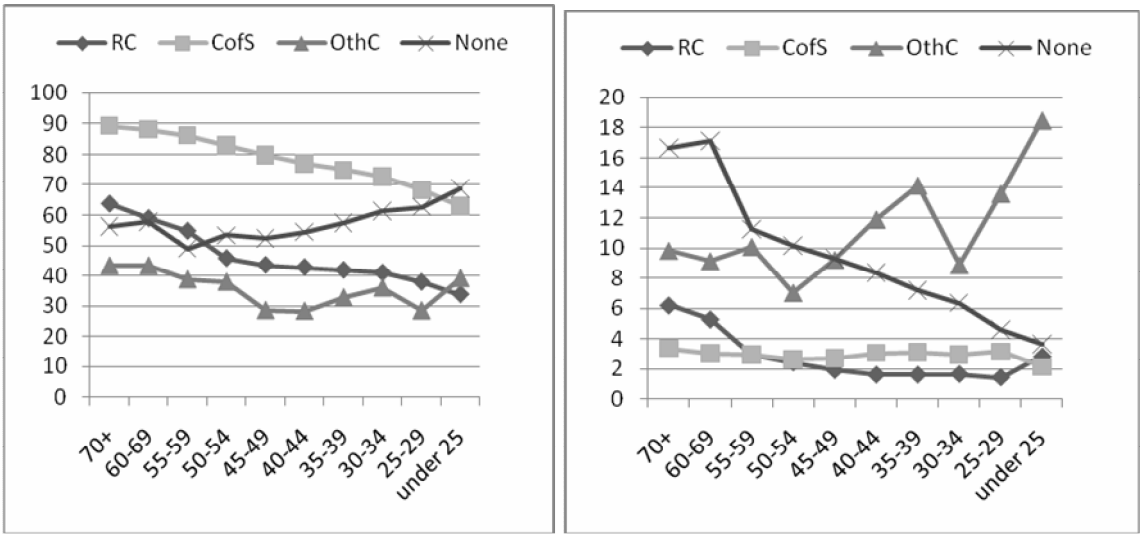
Further more complex models were fitted that allowed the homogamy to vary by age, education and social class. See The appendix (section 4.3 for a formal definition of the models). These showed that in-coupling were more common in the younger ages and when the female partner has a higher level of qualification or social class. These effects are detailed below, but none of them changed the relative size of the homogamy coefficients for the religious groups.

To illustrate the effects for other factors including the area of the country affect homogamy we can divide the couples into groups by these factors and calculate the percentages of homogomous couples and homogamy coefficients for each subgroup.

3.3.1 Religious homogamy by age

Figure 6 illustrates how the percentages of same religion couples and the homogamy coefficients for each religious group vary by the age of the female member of the couple. Results for the male member of the couple give a very similar pattern.

Both figures show the oldest groups on the left since they refer to couples that, on average, will have formed in an earlier time period. We can see that there has been a decline in the percentages of same religion couples for younger couples for all Christian groups but this has increased slightly, particularly in those under 50, for those raised with no religion.



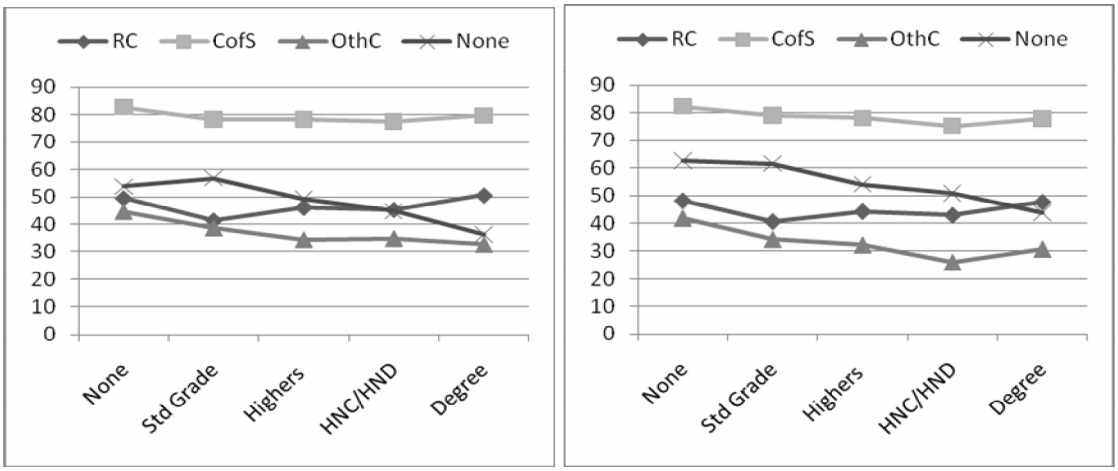
(a) Percentage same religion couples (b) Homogamy coefficient by age group

Figure 6 Homogamy by the age of the female partner

As we saw in section 2, the percentages of these religious groups has changed markedly over the age-range of these couples with those raised with no religion increasing sharply and Christian protestant groups decreasing as we go to the younger groups. Even though the percentage of same religion couples has increased for younger couples, their homogamy has actually decreased because more couples would expect to be formed by chance between those who both had no religious upbringing. Although the percentage of same religion couples has decreased for CofS the homogamy coefficient has remained relatively stable because they are a decreasing group. Because the RC group has maintained its numbers at the younger ages the decrease in same religion couples also corresponds with a decrease in homogamy.

3.3.2 Religious homogamy by education.

Although partnerships were more commonly between people with similar educational levels the extent of religious homogamy was very little affected by the education of the partners. The percentage out-partnering decreases as education levels increase for those with no religious upbringing and the OthC group. But there is little evidence of a trend for RCs or for CofS there except for slightly increased co-religious partnering for those with no qualifications.

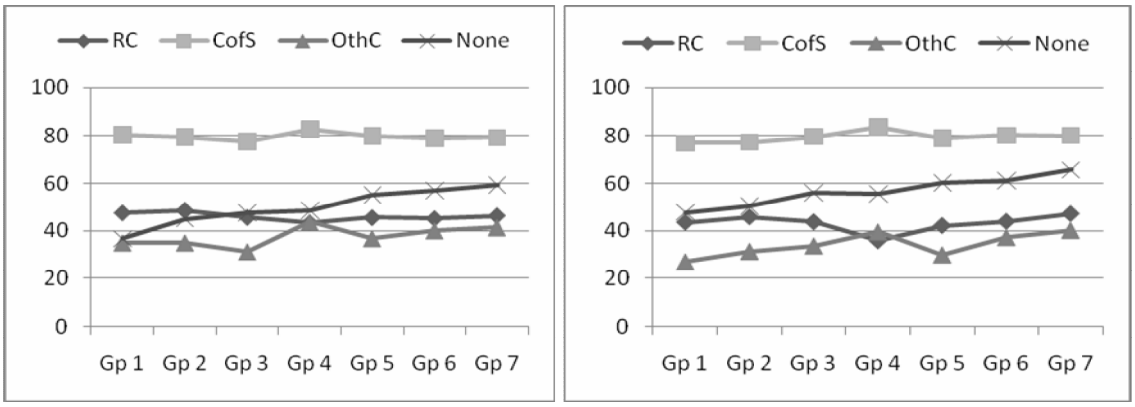


(a) male partner (b) female partner

Figure 7 : Percent of same religion partners by level religious group and education of partner; by sex

3.3.3 Religious homogamy by social group

Similar results were found for the NS-SEC classification as is shown in Figure 8. Out-partnering for the those raised with no religion and for other OthC is highest for the most advantaged social groups. CofS and RCs show no trend in the rates of out-partnering by social class.

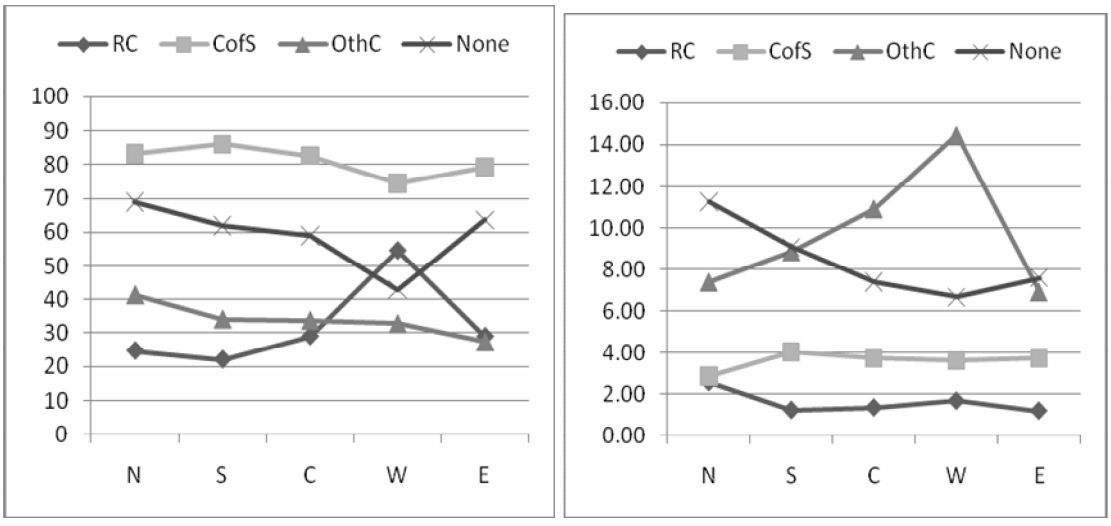


(a) By NS-SEC of male partner (b) by NS-SEC of female partner

Figure 8: Percent with partner of the same religion by religious group and NS-SEC classification where 1 = Higher prof/man, 2 = lower prof/man, 3 = Intermediate, 4 = Small org/own account, 5=Lower tech/sup, 6= semi-routine 7 = routine

3.3.4 Effect of area on religious homogamy

Figure 9 (a) shows how the percentage of co-religious partnerships varies by region of the country and 9 (b) shows the corresponding homogamy coefficients. Results are shown for women, but those for males were very similar. The proportion of same religion partnerships for RCs is highest in the West of Scotland, but the homogamy coefficient for the West is very similar to other areas, Thus the increase can be explained by the higher proportion of RCs in the West of Scotland. Neither rates nor coefficients vary by region for CofS. The OthC group shows some variation between regions in both the percent of same religious marriages and the homogamy coefficients. This probably reflects the different composition of this group in different places. Those with no religion are most likely to find partners also with no religion in the North and least in the West.



(a) Percent with partner of same religion (b) Homogamy coefficients

Figure 9: Homogamy by religion and area of the country for females

Thus homogamy for CofS and RC seems to vary little by region of the country, once we adjust for the relative numbers in these groups.

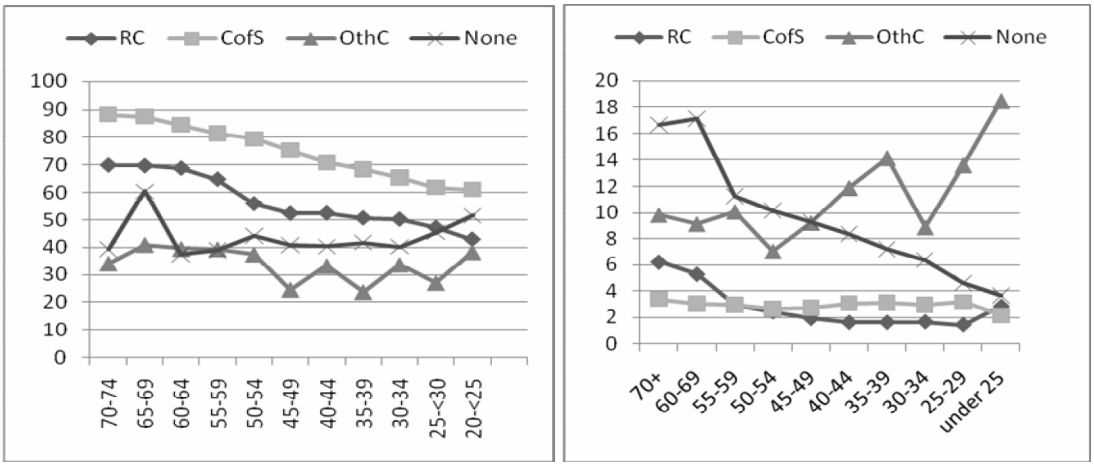
4 Analyses for West of Scotland only

Because of the particular interest in the West of Scotland in relation to sectarianism we repeated the analyses by age from sections 3.1 and 3.3.1 for the West of Scotland only.

Table 9: Religion raised and homogamy coefficients for members of couples in the West of Scotland (Models 2 & 3)

Raised religion of female partner	Raised religion of male partner					Homogamy coefficients (models 2 and 3)
	RC	CofS	OthC	None	All	
	%	%	%	%	%	
RC	**54.6**	35.3	1.7	8.5	100	1.66
CofS	19.2	**74.5**	2.1	4.3	100	3.63
OthC	20.3	38.5	**32.9**	8.3	100	14.46
None	31.7	23.4	1.9	**43.0**	100	6.65
All females	32.0	56.2	3.0	8.9	100	2.97 (model 2)

Despite the higher proportion of Catholics in the West of Scotland, the proportion of religiously homogomous partnerships is not much higher than for Scotland as a whole. This results in the homogamy coefficient being lower in the West of Scotland than in Scotland as a whole. The trends for proportions of same religion partnerships homogamy coefficients are similar to those for Scotland as a whole (Figure 10).



(a) Percentage same religion couples group

(b) Homogamy coefficient by age

Figure 10: Homogamy by the age of the female partner in West of Scotland

The fact that a higher proportion of the population is RC in the West of Scotland and that there is a high rate of out-partnering combine to produce a relatively large proportion of inter-sectarian partnerships in the West of Scotland. This is particularly the case for the younger age groups. We can see that in the West of Scotland around a quarter of all partnerships in those under 55 could be considered intersectarian and they make up a larger proportion of all couples than co-religious RC partnerships. Outside the West of Scotland inter-sectarian partnerships are also more common than co-religious RC partnerships, but the numbers of each are much smaller.

Table 10: Intersectarian partnerships by age group for West of Scotland and Scotland excluding the West. Protestant refers to CofS and OthC combined

	Type of mixed partnership			
	RC with RC	Protestant with Protestant	RC with Protestant	One or more partner with None
Age group				
West of Scotland				
55 or over	19.26	59.83	15.53	5.37
40-54	18.12	46.64	25.61	9.63
under 40	17.64	34.04	26.29	22.03
Scotland except West				
55 or over	3.75	80.23	9.31	6.71
40-54	3.07	67.23	13.90	15.80
under 40	2.69	47.48	11.84	37.98

5 Religion of upbringing

In this section we look at the religion practiced compared to the religion of upbringing, looking particularly at those in religiously mixed couples. Table 11 shows that changes from upbringing to current practice are most often in the direction of a move towards no current religious practice. Moves between denominations are fairly uncommon except from an OthC upbringing to CofS. Moves to no religious practice are greatest for the OthC group and least for RCs.

Table 11: Religion practiced (%) by religion raised and sex

	Religion practiced for females(%)						
Religion raised	**RC**	**CofS**	**OthC**	**None**	*Other**	*Not known*	**Total**
RC	**83.2**	4.0	0.9	11.4	*0.2*	*0.4*	21,972
CofS	1.5	**82.2**	1.9	14.0	*0.2*	*0.3*	71,129
OthC	1.8	14.6	**62.6**	19.9	*0.5*	*0.6*	4,836
None	2.2	5.8	1.9	**89.5**	*0.3*	*0.3*	13,690
	Religion practiced for males (%)						
	RC	**CofS**	**OthC**	**None**	*Other**	*Not known*	
RC	**84.0**	1.4	0.7	13.3	*0.3*	*0.4*	21,012
CofS	0.6	**78.3**	1.4	19.0	*0.2*	*0.4*	70,627
OthC	0.9	12.9	**58.7**	26.2	*0.5*	*0.8*	4,433
None	1.6	5.5	1.8	**90.1**	*0.6*	*0.3*	15,555

For members of couples a move away from religious practice or conversely a continuation of the religious practice of upbringing is influenced by the religious upbringing of the partner (Table 12). Rates of secularism are highest in those whose partners have no religious upbringing and lowest in those in religiously homogomous couples. Those with a RC upbringing are the most likely to continue the religious practice of their upbringing. This is especially the case for those in RC homogonous partnerships, but even those with religiously mixed partnerships have high rates of continuing practice.

Table 12: Percentage of members of couples with a religious upbringing who have no current religious practice or unchanged religious practice

Religion raised	% No current religious practice				% Unchanged religious practice			
	Partner religion raised				Partner religion raised			
Males	**RC**	**CofS**	**OthC**	**None**	**RC**	**CofS**	**OthC**	**None**
RC	**5.0**	20.3	20.0	22.1	**94.3**	75.0	68.7	75.9
CofS	29.2	**15.7**	27.3	44.5	64.5	**82.8**	55.4	52.3
OthC	35.8	31.8	**12.1**	51.4	51.1	43.5	**81.6**	42.3
Females								
RC	**3.6**	16.6	15.3	22.4	**95.6**	72.8	72.0	74.2
CofS	23.1	**10.9**	19.6	34.8	63.4	**87.3**	59.5	61.5
OthC	27	21.2	**9.5**	40.2	51.4	52.6	**82.5**	50.1

6 Conclusions

What are the implications of these demographic patterns for the continuation or decline in sectarianism in Scotland, and particularly in the West of Scotland. We have shown that there has been a very steep increase in inter-sectarian partnerships as the age of couples decreases. The steepest increase being those aged 50-59 in 2001, most of whom will have formed partnerships in the 1970s. Similar patterns are seen in all areas of Scotland, but the higher proportion of RCs in the West of Scotland leads to a much higher proportion of inter-sectarian couples there. A high proportion of RCs continue their religious practice, even when part of a religiously mixed couple. This may mean that many people in the West of Scotland will have practicing RCs who are part of their extended family. Holligan and Deuchar (2009) found that young people aged 16-17 in Glasgow perceived their group membership as relating to a territorial rather than sectarian construction of society. These attitudes may have their origins in societal changes, increasing secularism, for instance, that have come about from the formation of inter-sectarian couples and an additional contribution is likely to lie in the plethora of anti-sectarian governmental initiatives. It would be interesting to explore this aspect in further qualitative work.

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8 Appendix: Homogamy coefficients and code to calculate them

This appendix gives a brief summary of the theory of homogamy coefficients and an example of how they can be calculated along with SAS code for a program to derive them.

8.1 Definition of simple coefficients

In the simplest case we can define a homogamy coefficient for a cross tabulation of the members of a couple. An example would be the numbers used to calculate

Table in this report. In terms of symbols this gives (for simplicity assuming that there are just 3 religious groups of interest as shown below

n_{11}	n_{12}	n_{13}	$n_{1.}$
n_{21}	n_{22}	n_{23}	$n_{2.}$
n_{31}	n_{32}	n_{33}	$n_{3.}$
$n_{.1}$	$n_{.2}$	$n_{.3}$	N

where n_{mf} is the numbers of couples where the male is in group *m* and the female in group f, $n_{m.}$ the total of couples with male in group m and $n_{.f}$ the total number of couples with the female in group f.

If couples were formed completely at random then we would expected value of each cell would be given by

$$E(n_{mf}) = Np_{m.}p_{f.}, \quad \text{.....(1)}$$

where $p_{m.}$ and $p_{.f}$ are the probabilities of the male member being in group *m* and the female member being in group *f*. Where we assume that couple formation is at random we estimate $p_{m.}$ by $n_{m.}/N$ and $p_{.f}$ by $n_{.f}/N$ so that (1) reduces to the usual formula for calculating expected values.

And this could also be written as

$$\log\lfloor E(n_{mf})\rfloor = \log(N) + \log(p_{m.}) + \log(p_{f.}) \quad \text{.....(2)}$$

showing that it has the form of a generalised linear model with a log link. Since the n_{mf} are counts, the appropriate way to fit this model is a Poisson regression with a log link. We will not expect this model to fit well and indeed it does not (see main report Table ?).

Now we can extend this model by defining a variable *S* which takes the value 1 when the members of a couple are from the same religious group, and zero otherwise (i.e. on the diagonal of the table). The model equation then becomes.

$$\log\lfloor E(n_{mf})\rfloor = \log(N) + \beta_{m.}\log(p_{m.}) + \beta_{.f}\log(p_{.f}) + \beta S \quad \text{.....(3)}$$

This model implies that the probability of a couple being from the same religious group is $\exp(\beta)$ times greater than being from different religious groups, and the fitted value of this known as the homogamy coefficient. Note that this model must now be fitted iteratively since the previous expressions for the estimates of $p_{m.}$ and $p_{.f}$ are no longer valid but have to be obtained by fitting the model with the margins defined as categories. This is model 2 in the report. The multiplier $\exp(\beta)$ is then the homogamy coefficient.

We can expand this model by allowing the homogamy coefficient to vary by religious group. A decision must be taken as to whether to define the religion of the couple by that of the male or that of the female. Unless the table is very asymmetric this will not make much difference. In the analyses we present here we have presented results using the woman's religion though the results for taking the males to define the couples were very similar in all cases examined. The new model becomes

$$\log\lfloor E(n_{mf})\rfloor = \log(N) + \beta_{m.}\log(p_{m.}) + \beta_{.f}\log(p_{.f}) + \beta_f S_f \quad \text{.....(4),}$$

where S_f is 1 when *m=f* for female religious group *f* and zero otherwise. This is model 3 in this report and $\exp(\beta_f)$ is religious-group-specific homogamy coefficient for religious group *f.* The SAS code to fit these models is given in Appendix II.

8.2 Adjusted coefficients - confounding

If a person's religion is associated with their level of education (as we saw it was in section 2 of the main report) and if people tend to form couples with others of the same education (as is the case for our data) then what appears as homogamy due to religion raised may actually be the effect of people having similar educational backgrounds.

In order to adjust the model that includes other factors, we need to generate larger tables. For example, if we wish to adjust for education we need to generate the cross tabulation of religions and education (6 levels) giving a 5 x 5 x 6 x 6 table. We are now modelling the probability of cells p_{mfEe} where *E* corresponds to the education level of the male partner and *e* that of the female partner. We can then extend model (4) by fitting the relationship of religion and education for each of males and females and a term for homogamy by beducation giving model 5. This will change the homogamy coefficients by religious group.

$$\log\lfloor E(n_{mfEe})\rfloor = \log(N) + \beta_{m.}\log(p_{m.}) + \beta_{.f}\log(p_{.f}) + \beta_{m.E}\log(p_{m.E.}) + \beta_{.f.e}\log(p_{.f.e}) + \beta_{..Ee}\log(p_{..Ee}) + \beta_f S_f \quad \text{.....(5)}$$

Similar adjustments were made for social class. For the age of the members of the couple a cross-tabulation of all age groups would have given too large a table. Instead a variable for the difference in ages of the couples was calculated, with 6 groups (age male- age female as -2 or less, -1,0,1,2,3,4 to 5, 6 or more. Homogamy by age was fitted by using this age difference classified by the age of the female.

When large tables are used it is important that cells that have no cases are included as zeros in the data file or the wrong result will be obtained. Also for large sparse tables the absolute measures of fit (deviance statistics) can be very low even when the model could fit much better.

Models are presented that adjust for age, education and social class.

Simultaneous adjustment for all of these factors can also be done, but requires a substantial amount of computer time as a table with almost 7 million cells must be generated.

8.3 Effect modification

Although the effect of religion is not modified by other factors, it can still vary greatly within groupings by other factors. For example, the percentage of RCs forming couples with RCs may differ by education and the homogamy coefficient will also differ for different religious groups. Thus equation (5) is extended to become

$$\log\lfloor E(n_{mfEe})\rfloor = \log(N) + \beta_{m.}\log(p_{m.}) + \beta_{.f}\log(p_{.f}) + \beta_{m.E}\log(p_{m.E.}) + \beta_{.f.E}\log(p_{.f.E}) + \beta_{fE}S_{fE} \quad \text{.....(6)}$$

where S_{fE} is 1 when *m=f* for female religious group *f* and education n level *E,* and zero otherwise. Thus the coefficients for religious homogamy now differ by education group of the female partner.

Other terms, such as $\beta_{.f.e}\log(p_{.f.e})$ or $\beta_{..Ee}\log(p_{..Ee})$ could be added to improve the fit to equation 6, but they will not alter the estimates obtained for the coefficients β_{fE}.

Equation (6) is equivalent to carrying out a separate analysis based on equation (4) for couples classified by the education of the female ,member.

Again we must decide whether to use the grouping for males and females, though similar results would be obtained for each. For education and NS-SEC we have used males and for age females.

8.4 SAS program to calculate homogamy coefficients by religion

The data file used for this analysis consisted of a record for each couple. The variable used to illustrate the method here are:

The program below fits the simple models with no adjustment for other factors

```
/*-------------------------------------------------------------
First make a table of counts and store in tablex
The frequency of each cell is stored in variable COUNT
Note the use of sparse to allow zero cells in the table.
-------------------------------------------------------------*/
title 'models from small table';
proc freq data=couplesmfnormiss ;*by religion;
table religrfgp*religrmgp /  nocol norow nopercent sparse
out=tablex;
format religrmgp religrfgp  religgr. agem agef agecouples.;
run;
/*-------------------------------------------------------------
now make a new variable for when religions of a couple are the
same
-------------------------------------------------------------*/
data tablex2;
set tablex;
if religrmgp=religrfgp  then samerel=1; else samerel=0;
run;
/*-------------------------------------------------------------
now analyses using PRoc GENMOD as  a Poisson Regression
-------------------------------------------------------------*/
proc genmod data=table2;* Fit Poisson regression null model
model 1;
class religrmgp religrfgp;
model count= religrmgp religrfgp  /dist=poisson link=log  type3;
run;
proc genmod data=tablex2;* Fit Poisson regression common hegonomy
model 2;
class religrmgp religrfgp;
model count= religrmgp religrfgp samerel /dist=poisson link=log
type3;
run;
proc genmod data=tablex2;* Fit Poisson regression hegonomy by
female rel raised  model 3;
class religrmgp religrfgp;
model count= religrmgp religrfgp religrfgp*samerel /dist=poisson
link=log  type3;
output out=mod3out   pred=p ;
run;
```

To fit a model that adjusts for other factors a larger table must be created. Here the example is for the highest qualification of males and females. Note the sparse option in PRoc FREQ which ensures that cells with zero entries are included in the output file.

```
proc freq data=couplesmfnormiss ;*by religion;
table religrfgp*religrmgp*highestqualm*highestqualf /  nocol
norow nopercent sparse  out=tablex;
format religrmgp religrfgp  religgr. agem agef agecouples.
Highestqualm highestqualf highestqual.;
run;
/*-----------------------------------------------------------------
now make a new variable for when religions of a couple are the
same
-----------------------------------------------------------------*/
data tablex2;
set tablex;
if religrmgp=religrfgp  then samerel=1; else samerel=0;
run;
/*-----------------------------------------------------------------
now analyses using PRoc GENMOD as  a Poisson Regression
-----------------------------------------------------------------*/
proc genmod data=tablex2;* model adjusted for highest
qualifications;
class religrmgp religrfgp;
model count= religrmgp religrfgp highestqualf highestqualm
religrmgp*highestqualm religrfgp*highestqualf
highestqualm*highestqualf
religrfgp*samerel /dist=poisson link=log  type3;
output out=mod3out   pred=p ;
run;
```

And finally the model that gives a different IH for each education and religious group. It uses the same table (tablex2) as the example above.

```
/*-----------------------------------------------------------------
-----------

Note that this model must contain the interaction terms of both
religrmgp  and  religrfgp  with  the  effect  modifier  (here
highestqualf). It can contain other terms too to improve the fit,
but they will not change the coefficients of interest.

-----------------------------------------------------------------
---------*/

proc genmod data=tablex2;* model modified by highest
qualifications;
class religrmgp religrfgp;
model count= religrmgp religrfgp
religrmgp*highestqualf religrfgp*highestqualf
highestqualf*religrfgp*samerel /dist=poisson link=log  type3;
output out=mod3out   pred=p ;
run;
```