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Scottish Social Attitudes 2015: Technical Report

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SCOTTISH SOCIAL ATTITUDES 2015: TECHNICAL REPORT

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1. The Scottish Social Attitudes series

1.1 The *Scottish Social Attitudes* (*SSA*) survey was launched by ScotCen Social Research in 1999, following the advent of devolution. Based on annual rounds of interviews of between 1,200 to 1,500 people drawn using probability sampling (based on a stratified, clustered sample)[1], it aims to facilitate the study of public opinion and inform the development of public policy in Scotland. In this it has similar objectives to the *British Social Attitudes* (*BSA*) survey, which was launched by ScotCen's parent organisation, NatCen Social Research, in 1983. While *BSA* interviews people in Scotland, these are usually too few in any one year to permit separate analysis of public opinion in Scotland (see http://www.bsa.natcen.ac.uk/ for more details of the *BSA* survey).

1.2 SSA has been conducted annually each year since 1999, with the exception of 2008. The survey has a modular structure. In any one year it typically contains four or five modules, each containing 40 questions. Funding for its first two years came from the Economic and Social Research Council, while from 2001 onwards different bodies have funded individual modules each year. These bodies have included the Economic and Social Research Council, the Scottish Government, the Equality and Human Rights Commission, and various charitable and grant awarding bodies, such as the Nuffield Foundation and Leverhulme Trust.

[1] Like many national surveys of households or individuals, in order to attain the optimum balance between sample efficiency and fieldwork efficiency the sample was clustered. The first stage of sampling involved randomly selecting postcode sectors. The sample frame of postcode sectors was also stratified (by urban-rural, region and the percentage of people in non-manual occupations) to improve the match between the sample profile and that of the Scottish population. For further details of the sample design, see Paragraph 5.1 below.

2. The 2015 survey

2.1 The 2015 survey contained questions on:

- Attitudes to Government – 21 questions funded by Scottish Government
- Discrimination – 50 questions funded by Scottish Government
- Social Capital – 11 questions funded by Scottish Government
- Minimum Unit Pricing – 4 questions funded by Scottish Government
- Language Learning – 4 questions funded jointly by Scottish Government, University of Edinburgh and Scottish Centre for Information on Language Teaching
- Attitudes to Policing – 25 questions funded jointly by Scottish Institute for Policing Research, Police Scotland and Scottish Police Authority

2.2 Findings from the modules funded by the Scottish Government will be available in reports published on the Scottish Government website (www.gov.scot). Separate programmes of dissemination are planned for each of the key topic areas covered in the different modules. This technical annex covers the methodological details of the survey as well as further discussion of the analysis techniques used in this report.

3. Fieldwork

3.1 Fieldwork for the 2015 survey ran between July 2015 and January 2016, with 84% of interviews completed by the end of October 2015 and 95% by the end of November 2015. An advance postcard, followed by an advance letter, was sent to all sampled addresses and followed up by a personal visit from a ScotCen interviewer. Interviewers were required to make a minimum of 6 calls at different times of the day (including at least one evening and one weekend call) in order to try and contact respondents. All interviewers who were either new to the study or had previously only worked on it once before attended a one day briefing conference prior to starting work on the study. More experienced interviewers completed a self-briefing at home.

3.2 Interviews were conducted using face-to-face computer-assisted interviewing (a process which involves the use of a laptop computer, with questions appearing on screen and interviewers directly entering respondents' answers into the computer). All respondents were asked to fill in a self-completion questionnaire using the interviewer's laptop. If the respondent preferred, the questions could be read out by the interviewer. Table 1 (below) summarises the response rate and the numbers completing the self-completion section in 2015.

4. Response rates

4.1 The numbers completing the face-to-face and self-completion sections of the survey in 2015 are shown in Table 1 below.

Table 1: 2015 Scottish Social Attitudes survey response		
	No.	% of 'eligible' (in scope) sample
Addresses issued	3,120	
Vacant, derelict and other out of scope [1]	324	10
Achievable or 'in scope'	2796	
Unknown eligibility [2]	17	1
Interview achieved	1,288	46
Self-completion completed	1,233	44
Interview not achieved		
Refused [3]	1104	39
Non-contact [4]	242	9
Other non-response [5]	162	6

Notes to table

1 This includes empty / derelict addresses, holiday homes, businesses and institutions, and addresses that had been demolished.

2 'Unknown eligibility' includes cases where the address could not be located, where it could not be determined if an address was residential and where it could not be determined if an address was occupied or not.

3 Refusals include: refusals prior to selection of an individual; refusals to the office; refusal by the selected person; 'proxy' refusals made by someone on behalf of the respondent; and broken appointments after which a respondent could not be re-contacted.

4 Non-contacts comprise households where no one was contacted after at least 6 calls and those where the selected person could not be contacted.

5 'Other non-response' includes people who were ill at home or in hospital during the survey period, people who were physically or mentally unable to participate and people in which a language barrier made recruitment too difficult (despite translation and interpreting services being offered)

4.2 Table 2 below shows the achieved response rates for all years the survey has taken place.

Table 2: *Scottish Social Attitudes* survey response rate by year

Survey year	Response rate
1999	59%
2000	65%
2001	60%
2002	62%
2003	59%
2004	61%
2005	56%
2006	56%
2007	55%
2009	55%
2010	54%
2011	55%
2012	54%
2013	55%
2014	54%
2015	46%

5. Sample design

5.1 The survey is designed to yield a representative sample of adults aged 18 and over, living in Scotland. The sample frame is the Postcode Address File (PAF), a list of postal delivery points compiled by the Post Office. The detailed procedure for selecting the 2015 sample was as follows:

i. 104 postcode sectors were selected from a list of all postal sectors in Scotland, with probability proportional to the number of addresses in each sector for addresses in urban areas and a probability of twice the address count for sectors in rural areas (i.e. the last 3 categories in the Scottish Government's 6 fold urban-rural classification). Prior to selection the sectors were stratified by Scottish Government urban-rural classification[2], region and percentage of household heads recorded as being in non-manual occupations (SEG 1-6 and 13, taken from the 2011 Census).

ii. 30 addresses were selected at random from each of these 104 postcode sectors.

iii. Interviewers called at each selected address and identified its eligibility for the survey. Where more than one dwelling unit was present at an address, all dwelling units were listed systematically and one was selected at random using a computer generated random selection table. In all eligible dwelling units with more than one adult aged 18 or over, interviewers had to carry out a random selection of one adult using a similar procedure.

[2] See http://www.gov.scot/Topics/Statistics/About/Methodology/UrbanRuralClassification

6. Effect of 2015 sample size

6.1 Table 3 below shows the achieved sample size for the full SSA sample (all respondents) for all years the survey has taken place.

Table 3: *Scottish Social Attitudes* survey sample size by year

Survey year	Achieved sample size
1999	1482
2000	1663
2001	1605
2002	1665
2003	1508
2004	1637
2005	1549
2006	1594
2007	1508
2009	1482
2010	1495
2011	1197
2012	1229
2013	1497
2014	1501
2015	1288

6.2 The achieved sample size for SSA 2015 was smaller than in most previous years. As such, we have considered whether this reduction in the achieved sample size in 2015 (as a result of lower response rates) had an effect on:

- representativeness of the sample,
- accuracy of the estimates,
- ability to detect differences in estimates from different sub-groups,
- ability to detect differences in estimates across years (trend analysis).

6.3 In order to assess whether the sample's representativeness was affected, we compared the age and sex distribution of the population (ONS 2014 mid-year population estimates) with the achieved sample in 2015 and 2014 when the response rate was higher (achieved sample size=1501). The survey estimates have been weighted by pre-calibration weights so that we maximize the chance of observing a pure effect of potential differential non-response of males and females in

different age groups.[3] Unfortunately age and sex are the only characteristics available from ONS for use to assess the representativeness of the sample (therefore they are used for the final step of weighting – calibration).

6.4 The last two columns of Table 4 (below) present the difference in the distribution of 2015 and 2014 sample profile to the population estimates. The mean of the absolute values of the differences, used here to measure the relative difference of the sample to the population distribution, has increased only by 0.1 percentage point as compared with 2014. Therefore, we can claim that the reduction in the achieved sample size did not lead to a loss in representativeness of the sample with regards to age and sex.

Table 4: SSA 2014 and 2015 sample distribution compared with population totals

Age/sex	2014 MID-YEAR POPULATION ESTIMATES	Survey distribution*		Difference to population totals	
		2015	2014	2015	2014
Male 18-24	5.8	5.0	4.3	-0.8	-1.5
Male 25-34	8.0	5.1	7.1	-2.9	-0.9
Male 35-44	7.6	7.2	6.7	-0.4	-0.9
Male 45-54	9.0	9.5	9.7	0.5	0.7
Male 55-64	7.6	9.3	7.2	1.7	-0.4
Male 65+	9.9	10.8	10.7	0.9	0.8
Female 18-24	5.8	5.0	5.8	-0.7	0.1
Female 25-34	8.2	7.9	7.1	-0.3	-1.1
Female 35-44	8.0	8.8	10.3	0.7	2.3
Female 45-54	9.5	10.4	9.6	0.8	0.1
Female 55-64	8.0	9.0	9.6	1.0	1.7
Female 65+	12.6	12.0	11.6	-0.6	-0.9
Mean absolute difference to population totals				**1.0**	**0.9**
Max value of a difference to population totals				1.7	2.3
Min value of a difference to population totals				-2.9	-1.5

*Survey estimates have been weighted by pre-calibration weight – a step before adjusting them to the distribution of mid-year population estimates.

6.5 Table 5 (below) presents the distribution of age and sex in the unweighted data. With respect to this characteristic, the mean absolute difference to population distribution is exactly the same for 2014 and 2015 raw data (1.8 percentage points).

[3] Pre-calibration weights account for differential selection probabilities (e.g. oversampling of rural areas), or non-response on an area level. When applying these weights we are left with possible bias due to non-response on an individual level.

Table 5: SSA 2014 and 2015 unweighted sample distribution compared to population totals					
Age/sex	**2014 MID-YEAR POPULATION ESTIMATES**	**Survey distribution (unweighted)**		**Difference to population totals**	
		2015	**2014**	**2015**	**2014**
Male 18-24	5.8	3.1	3.0	-2.7	-2.8
Male 25-34	8.0	4.8	5.7	-3.2	-2.2
Male 35-44	7.6	6.2	6.5	-1.4	-1.1
Male 45-54	9.0	8.8	8.7	-0.3	-0.4
Male 55-64	7.6	9.4	7.4	1.8	-0.2
Male 65+	9.9	12.9	12.3	3.0	2.4
Female 18-24	5.8	3.1	3.7	-2.6	-2.1
Female 25-34	8.2	7.8	7.2	-0.5	-1.0
Female 35-44	8.0	8.3	10.2	0.3	2.2
Female 45-54	9.5	10.0	8.6	0.5	-0.9
Female 55-64	8.0	9.8	10.2	1.8	2.3
Female 65+	12.6	15.7	16.4	3.2	3.9
Mean absolute difference to population totals				**1.8**	**1.8**
Max value of a difference to population totals				**3.2**	**3.9**
Min value of a difference to population totals				**-3.2**	**-2.8**

6.6 It is difficult to assess a general impact of a reduced sample size on the accuracy of estimates. The design effect (deff)[4] used to calculate the effective sample size for analysis differs across estimates and depends on various aspects of complex survey design, weighting adjustments, so indirectly also on the sample size. We know that weights were a little bit more variable in 2015 than in 2014 (the design effect due to weighting in 2015 was 1.51 compared with 1.45 in 2014), which may be indirectly due to a smaller sample size. However, in order to assess a general design effect it is recommended to average deffs across several estimates. This was done for political party identification, strength of party identification, level of interest in politics and constitutional preference (altogether 19 deffs). The effect of the sample design and weighting together for these estimates is comparable to the one observed in 2014. In effect, in both 2014 and 2015 the effective sample size for the analysis constitute around 57% of the achieved sample size. This means that the loss in accuracy of survey estimates, presented in Table 6 (below) for estimates of prevalence rates of 50%, 30/70% and 10/90%, is mainly due to the reduced sample size. The magnitude of the loss is very small - 0.2 percentage points for the estimates on the total sample.

[4] The *design effect*, often called just *deff*, quantifies the extent to which the expected sampling error in a survey departs from the sampling error that can be expected under simple random sampling. The design effect increases for more complex sample designs and when weighting adjustments are applied to the final results of the survey.

Table 6: Accuracy of estimates in 2014 and 2015							
					50%	30/70%	10/90%
Total sample	Achieved sample size	average DEFF*	Effective sample size	Effectiveness of the design	Margin of Error	Margin Of Error	Margin Of Error
					(+/-)	(+/-)	(+/-)
2014	1501	1.77	850	56.6%	3.4%	3.1%	2.0%
2015	1288	1.75	735	57.0%	3.6%	3.3%	2.2%

*The value presented in the table is an average of design effects estimated using complex sample design for the same questions and their categories in 2014 and 2015: Party identification (party3), Strength of party identification (idstrng2), Level of interest in politics (politic2), constitutional perference (scotpar2).

6.7 Table 7 (below) presents the same but for subgroups: by sex and age. The effect of sample design and weighting (deff) is more even across both sex and age categories in 2015 as compared with 2014. For an estimate of prevalence rate of 50% (most conservative scenario), the change in precision as measured by margin of error, compared with 2014, estimates ranges from a loss of 1.2 percentage points to a gain of 0.2 percentage points. Despite a decrease in sample size for the age group 18-29 years old from 183 to 142 the precision is improved as a result of a decrease in the design effect for this group.

Table 7: Accuracy of estimates in subgroups in 2014 and 2015								
	Year	N	Average deff*	Effective sample size	effectiveness	50% Margin of Error	30/70% Margin of Error	10/90% Margin of Error
						(+/-)	(+/-)	(+/-)
Sex								
Males	2014	656	1.83	359	55%	5.2%	4.7%	3.1%
	2015	582	1.76	330	57%	5.4%	4.9%	3.2%
Females	2014	845	1.54	550	65%	4.2%	3.8%	2.5%
	2015	706	1.60	442	63%	4.7%	4.3%	2.8%
Age2								
18-29	2014	183	2.70	68	37%	11.9%	10.9%	7.1%
	2015	143	2.05	70	49%	11.7%	10.8%	7.0%
30-39	2014	220	1.46	151	69%	8.0%	7.3%	4.8%
	2015	193	1.69	114	59%	9.2%	8.4%	5.5%
40-64	2014	665	1.34	495	74%	4.4%	4.0%	2.6%
	2015	582	1.36	429	74%	4.7%	4.3%	2.8%
65+	2014	430	1.11	388	90%	5.0%	4.6%	3.0%
	2015	368	1.28	287	78%	5.8%	5.3%	3.5%

*The value presented in the table is an average of design effects estimated using complex sample design for the same questions and their categories in 2014 and 2015: Party identification (party3), Strength of party identification (idstrng2), Level of interest in politics (politic2), constitutional preference (scotpar2).

6.8 We conducted power analysis to explore the ability to detect significant differences between the sub-groups at an acceptable level of precision. The statistical power is the probability of detecting an effect (e.g. difference in proportions) when it really exists in a population. An acceptable level is 80%, which tells us that the study has an 80% chance of detecting a statistically significant difference in a test for difference of proportions if there really was one in a population. Power is directly related to effective sample size, which is why we should expect a decrease in the ability of detecting differences in 2015, especially for sub-groups, as compared with 2014.

6.9 Table 8 (below) presents results of power analysis for two examples of estimates from 2015. The difference in the proportion of males and females trusting Scottish Government to work in Scotland's best long-term interest was estimated at 4.7 percentage points. However, it has not been found statistically significantly, because the effective sample sizes of the two groups allow only for detecting difference of at least 6.2 percentage points. However, if the effective sample sizes were increased to the levels from SSA 2014 the difference would still be too small to be detected: males and females' trust in the Scottish Government would need to differ by at least 5.8 percentage points. However, it is clear that smaller sample size results in a reduced ability to detect smaller differences between groups.

Table 8: Minimal detectable difference in proportions between males and females for two estimates from SSA 2015 (power=0.8, alfa=0.05)

Question: answer	Effective sample size (survey estimate)		Difference in estimates between the groups	Minimal detectable difference	Minimal detectable difference (if N in 2015=1500)
	Male	Female			
How much do you trust Scottish Govt to work in Scotland's best long-term interest?: **A great deal / Quite a lot**	320 (75.0%)	456 (70.3%)	4.7	6.2	5.8
Trust in Scottish Government to make fair decisions? : **A great deal / Quite a lot**	345 (52.4%)	621 (46.5%)	5.9	6.6	6.1

6.10 A very similar approach has been taken to evaluate the impact of a reduced sample size on the ability to detect differences in trends over time. Table 9 (below) presents an example of two views on how people want Scotland to be governed, and an estimates percentage of respondents supporting them in the 2011 and 2015 SSA surveys. A small difference was observed for the first opinion (Scotland should become independent) and it could not have been detected by statistical

tests because the effective sample sizes allowed for detecting a change of 3.5 percentage points. If we were to increase the 2015 sample's size to 1500, the minimal detectable difference would decrease slightly but not enough to enable detecting the difference of 1.9 percentage points. From this example we can say that increasing the sample size from 1288 to 1500 only results in a small increase in the power to detect the difference. It should be noted that in 2011 the sample size was 1197.

6.11 If we compare the years when the achieved sample size was 1500, the minimal detectable difference would decrease by another 0.2 percentage points. It seems that the benefit of increasing the sample size by 200 in the ability to detect the difference across years is marginal. This example also shows how important it is to treat significance tests only as a guide rather than a strict rule to follow when deciding on the conclusions from a survey. The decrease of 5.7 percentage points in the support for Scotland remaining in the UK with its own elected parliament could be detected with statistical tests with the samples achieved in both 2011 and 2015.

Table 9: Minimal detectable difference in proportions between years for two estimates from SSA 2015 and 2011 (power=0.8, alfa=0.05)

Question: answer	Effective sample size (survey estimate)		Difference in estimates between the groups	Minimal detectable difference	Minimal detectable difference (if N in 2015=1500)
	2011	2015			
Scotland should become independent, separate from the UK and EU	685	825	1.9	3.5	3.3
	11.6%	13.5%			
Scotland should remain part of the UK, with its own elected parliament and some tax powers	641	768	5.7	5.2	5.0
	48.9%	43.2%			

7. Weighting

7.1 All percentages cited in this report are based on weighted data. The weights applied to the SSA 2015 data are intended to correct for three potential sources of bias in the sample:

- Differential selection probabilities
- Deliberate over-sampling of rural areas
- Non-response

7.2 Data were weighted to take account of the fact that not all households or individuals have the same probability of selection for the survey. For example, adults living in large households have a lower selection probability than adults who live alone. Weighting was also used to correct the over-sampling of rural addresses. Differences between responding and non-responding households were taken into account using information from the census about the area of the address as well as interviewer observations about participating and non-participating addresses. Finally, the weights were adjusted to ensure that the weighted data matched the age-sex profile of the Scottish population (based on 2014 mid-year estimates from the General Register Office for Scotland).

7.3 Adding weights to a sample can affect the sample efficiency. If the weights are very variable (i.e. they have very high and/or very low values) the weighted estimates will have a larger variance. More variance means standard errors are larger and confidence intervals are wider, so there is less certainty over how close the estimates are to the true population value.

7.4 The affect of the sample design on the precision of survey estimates is indicated by the effective sample size (neff). The effective sample size measures the size of an (unweighted) simple random sample that would have provided the same precision (standard error) as the design being implemented. If the effective sample size is close to the actual sample size then we have an efficient design with a good level of precision. The lower the effective sample size, the lower the level of precision. The efficiency of a sample is given by the ratio of the effective sample size to the actual sample size.

7.5 The final weights in 2015 were slightly more variable than in 2014, which may be due to some of the groups being under- or overrepresented to a greater extent in the sample (e.g. males 25-34). In effect, the effective sample size due to weighting is 34%, smaller than the achieved sample size (as compared with 31% in 2014). Please note the weighting is only one of several design elements influencing the final

effective sample size, and the overall effect is different for all estimates. The range of the weights, the effective sample size and sample efficiency for both sets of weights are given in Table 10 below.

Table 10 Comparison of final weights in 2014 and 2015 SSA

Weights	Variance of weights	Achieved sample size	Effective sample size (weighting effect only)
2014 final	0.45	1501	1034
2015 final	0.51	1288	903

8. Analysis variables

8.1 Most of the analysis variables are taken directly from the questionnaire and are self-explanatory.

National Statistics Socio-Economic Classification (NS-SEC)

8.2 The most commonly used classification of socio-economic status used on government surveys is the National Statistics Socio-Economic Classification (NS-SEC). SSA respondents were classified according to their own occupation, rather than that of the 'head of household'. Each respondent was asked about their current or last job, so that all respondents, with the exception of those who had never worked, were classified. The seven NS-SEC categories are:

- Employers in large organisations, higher managerial and professional
- Lower professional and managerial; higher technical and supervisory
- Intermediate occupations
- Small employers and own account workers
- Lower supervisory and technical occupations
- Semi-routine occupations
- Routine occupations.

8.3 The remaining respondents were grouped as 'never had a job' or 'not classifiable'.

Scottish Index of Multiple Deprivation (SIMD)

8.4 The Scottish Index of Multiple Deprivation (SIMD)[5] 2012 measures the level of deprivation across Scotland – from the least deprived to the most deprived areas. It is based on 38 indicators in seven domains of: income, employment, health, education skills and training, housing, geographic access and crime. SIMD 2012 is presented at data zone level, enabling small pockets of deprivation to be identified. The data zones are ranked from most deprived (1) to least deprived (6,505) on the overall SIMD 2012 and on each of the individual domains. The result is a comprehensive picture of relative area deprivation across Scotland.

[5] See http://www.gov.scot/Topics/Statistics/SIMD/ for further details on the SIMD.

8.5 The analysis in this report used a variable created from SIMD data indicating the level of deprivation of the data zone in which the respondent lived in quintiles, from most to least deprived.[6]

[6] These variables were created by the ScotCen/NatCen Survey Methods Unit. They are based on SIMD scores for all datazones, not just those included in the sample – so an individual who lives in the most deprived quintile of Scotland will also be included in the most deprived quintile in the *SSA* dataset.

9. Analysis techniques

Significance testing

9.1 Where this report discusses differences between two percentages (either across time, or between two different groups of people within a single year), this difference is significant at the 95% level or above, unless otherwise stated. Differences between two years were tested using standard z-tests, taking account of complex standard errors arising from the sample design. Differences between groups within a given year were tested using logistic regression analysis, which shows the factors and categories that are significantly (and independently) related to the dependent variable (see below for further detail). This analysis was done in PASW 18, using the CS logistic function to take account of the sample design in calculations.

Regression analysis

9.2 Regression analysis aims to summarise the relationship between a 'dependent' variable and one or more 'independent' explanatory variables. It shows how well we can estimate a respondent's score on the dependent variable from knowledge of their scores on the independent variables. This technique takes into account relationships between the different independent variables (for example, between education and income, or social class and housing tenure). Regression is often undertaken to support a claim that the phenomena measured by the independent variables cause the phenomenon measured by the dependent variable. However, the causal ordering, if any, between the variables cannot be verified or falsified by the technique. Causality can only be inferred through special experimental designs or through assumptions made by the analyst.

9.3 All regression analysis assumes that the relationship between the dependent and each of the independent variables takes a particular form. Logistic regression analysis is a method that summarises the relationship between a binary 'dependent' variable (one that takes the values '0' or '1') and one or more 'independent' explanatory variables.

9.4 The significance of each independent variable is indicated by 'P'. A p-value of 0.05 or less indicates that there is less than a 5% chance we would have found these differences between the categories just by chance if in fact no such difference exists, while a p-value of 0.01 or less indicates that there is a less than 1% chance. P-values of 0.05 or less are generally considered to indicate that the difference is highly statistically significant, while a p-value of 0.06 to 0.10 may be considered marginally significant.

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The views expressed in this report are those of the researcher and do not necessarily represent those of the Scottish Government or Scottish Ministers.

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