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Measuring the Bridging Nature of Voluntary Organizations:
A Note on the Importance of Association Size

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ABSTRACT

**Measuring the Bridging Nature of Voluntary Organizations:
A Note on the Importance of Association Size**

by Hilde Coffé and Benny Geys *

Recently, a distinction between cross-cutting (or bridging) and closed (or bonding) networks has been proposed in the social capital literature. One approach to empirically operationalize this distinction builds on connections between voluntary associations through individuals with multiple memberships. However, simply counting the number of members' additional memberships in other associations, as in previous work, is inappropriate. Indeed, we illustrate that this is biased towards finding that large associations are more bonding. We then propose a technique to alleviate this bias and illustrate that the proposed correction is crucial to avoid erroneous conclusions in tests of the hypothesis that membership in bridging or bonding associations is differently related to individuals' civic attitudes.

Keywords: Bridging and bonding, flemish municipalities, methodology, social capital, voluntary associations

ZUSAMMENFASSUNG

Untersuchung des bridging Charakters von zivilgesellschaftlichen Organisationen: Zur Bedeutung der Vereinsgröße

Seit kurzem wird in der Literatur zu Sozialkapital eine Unterscheidung zwischen heterogenen (cross-cutting oder bridging) und homogenen (bonding) sozialen Netzwerken vorgenommen. Eine Möglichkeit, diese Unterscheidung empirisch umzusetzen, setzt an Verbindungen zwischen verschiedenen Vereinigungen über Personen mit mehreren Mitgliedschaften an. Wie in vorangegangenen Arbeiten ausschließlich die Anzahl der zusätzlichen Mitgliedschaften in anderen Vereinen als Maß der Verbindung zwischen einzelnen Organisationen zu zählen, erweist sich jedoch als ungeeignet. Zunächst zeigen wir, dass in diesem Fall die Schlussfolgerung begünstigt wird, große Vereine als homogener (bonding) zu beurteilen. Wir schlagen ein Verfahren zur Verminderung dieser Verzerrung vor und veranschaulichen, dass diese Korrektur ausschlaggebend für das Ergebnis von Hypothesentests ist, die auf den Zusammenhang zwischen der Mitgliedschaft in heterogenen (bridging) verglichen mit homogenen (bonding) Vereinigungen und dem sozialen Verhalten von Individuen schließen sollen.

Introduction

Various strands of literature have stressed the importance of building bridges across social networks. In social network formation theory, for example, such bridges are argued to allow for a wider dissemination of knowledge, understanding and information than would be feasible without them (e.g. Weimann, 1982; Calvó-Armengol and Jackson, 2004). In sociology, the theories of "weak ties" (Granovetter, 1973) and "structural holes" (Burt, 1992) similarly argue that relationships that span holes in a social structure provide an important opportunity and advantage for the people involved. Spanning the divide between otherwise disconnected segments of society is more important than entertaining a closed network of strongly interconnected elements. Indeed, "through such interorganizational associations, members (…) foster a sense of solidarity (…) involving feelings of mutual protection, trust, friendship and shared feelings of norms" (Cornwell and Harrison, 2004, 865). In social psychology, research on inter-group relations shows that strong inward-looking social relations might lead groups to develop high levels of trust and commitment among its members, but often at the same time lead them to distinguish themselves from other groups or even avoid or distrust members from these other groups (e.g. Portes, 1998; Abrams, et al. 2005; Münster, 2006). A failure to build bridges between groups may thus strengthen us versus them thinking.

Recently, the importance of building bridges has also been recognized in the social capital literature, where a distinction is made between bridging and bonding networks (Paxton, 1999; Putnam, 2000). Bridging networks are thereby defined as those cross-cutting social boundaries. Members of such networks are more likely to come into contact with diverse others, thus preventing "the creation of pockets of isolated trust and networks" (Paxton, 2002: 259). Bonding networks focus on 'similar' individuals. They may enforce social isolation and "could intensify inward-focused behaviour, reduce exposure to new ideas, and exacerbate existing social cleavages" (Paxton, 2002: 259; see also Gulati and Gargiulo, 1999).

Interestingly, the division between bridging and bonding social networks provides a way out of the predicament that certain closely knit groups (such as the mafia, militia groups or religious sects) do not generate the positive externalities the social capital literature expects from networks high in social capital. However, making a theoretical distinction between bridging and bonding networks introduces the difficulty of empirically differentiating between these two types of networks. Clearly, such an empirical operationalization is fundamental for empirical tests of the hypothesis that bridging social capital excels over bonding social capital (cfr. Putnam, 2000). Yet, the operationalization of bridging versus bonding social capital is at present, at best, underdeveloped.

One approach that has been proposed to measure the bridging or bonding nature of a voluntary association builds on its connections to other associations.[1] Specifically, one

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[1] An alternative approach based on the socio-economic heterogeneity of association membership is presented in Stolle and Rochon (1998), Stolle (2001) and Coffé and Geys (2007). The idea there is that associations with a more heterogeneous membership constitute a platform for bridging across social groups *within* the association. As far as we know, only (Geys, 2007) puts both methods next to each other, but does so empirically rather than theoretically. While the present note also leaves this

counts the number (or share) of an association's members who are also a member in other associations and thereby form bridges or ties between these two organizations (e.g. Paxton, 2002). Such multiple affiliations are argued to "generate organizational embeddedness" and thereby represent a significant "field of potential social capital for organizations" and their members (Cornwell and Harrison, 2004, 863).

Simply counting the number of additional memberships of a given individual in an association to gauge the association's interconnectedness is, however, not optimal. In fact, as illustrated in the first section of the present paper, exclusive reliance on the number (or share) of members who are also a member in other associations biases the results towards designation of large associations as more bonding. The reason is that all links between groups are necessarily symmetric. Under that condition, "the size of the groups distinguished by a given parameter is inversely related to the extent of their intergroup relations" (Blau, 1977, 24). Therefore, in the second section, we present a means to alleviate the indicated bias and illustrate it using survey data on membership in voluntary associations in Flanders. Specifically, we argue that the residuals from a regression model relating the observed number of interconnections to the size of the associations in the sample indicates the bridging or bonding nature of an association *net of the membership size effect*. These residuals are by construction free of the 'association-size' bias and can be interpreted as a size-adjusted measure of the bridging or bonding nature of voluntary associations. In the third section, we show that neglecting the indicated bias when assessing whether bridging associations outperform bonding ones in their effect on, say, democracy, economic growth or members' civic attitudes may lead to flawed results – and policy recommendations. Our results thus have important implications for the approach of such studies (Paxton 2002; Beyerlein and Hipp 2005; Hill and Matsubayashi, 2005; Coffé, 2006; Geys, 2007) and thereby on the practice and study of voluntary organisations in society. Finally, section 4 concludes.

Multiple memberships as a measure of bridging/bonding

As mentioned, one way to define the bridging or bonding nature of a voluntary organization is to look at its connections to the wider community. This builds on the notion that the bridging character of organizations is not necessarily produced within the associations, but could result from overlapping memberships between organizations (Paxton, 2002; Hooghe and Stolle, 2003).[2] This interconnectedness can be measured through the prevalence of its members' memberships in other organizations. By being member of multiple organizations, a given individual acts as a bridge or tie between these two groups – and thereby embeds the association into the broader organizational structure of society. Hence, an association of which the members have a high average number of additional memberships is classified as connected to the wider community – and thus as a bridging association (Paxton, 2002). An association which members have

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issue aside, the literature would clearly benefit from a theoretical discussion of the benefits and disadvantages of both approaches.

[2]   We follow previous work (i.e. Stolle and Rochon, 1998; Stolle, 2001; Paxton, 2002; Coffé and Geys, 2007) in concentrating on voluntary association membership. Clearly, however, individuals also engage in social interactions in other settings (e.g. schools or the workplace). While this implies we engage in a partial (empirical) analysis of bridging and bonding social capital, it does not affect the general nature of the *methodology* itself.

little additional memberships are designated as isolated and thus as a bonding association.

While constituting a very intuitive measure, simply counting multiple memberships is problematic in a situation where the number of members differs over the associations. Let us, for example, imagine associations A, B and C to have 1500, 500 and 250 members respectively. Then all members of B and C can have another membership in (at least) one other association. However, at most 750 members of A can have a membership in B or C. The reason is that membership is by definition symmetric, such that the number of additional memberships by A's members is limited to the total number of members in B and C. Due to this constraint, the maximum value that the average number of additional memberships can attain for association A is 0.5 (i.e. 750/1500). For associations B and C, however, this upper bound takes values 1.5 (i.e. 750/500) and 2 (i.e. 500/250) respectively. "Although this does not preclude that some small groups have lower rates of intergroup relations than some large ones, it does imply *the probability* that any small group has higher rates of intergroup relations (…) than does any larger one" (Blau, 1977, 23-24, italics added). Moreover, the upper bound imposed on A becomes more stringent when its membership increases relative to that of the other associations. Simply counting interconnections therefore implies that (a) larger associations are more likely to be deemed isolated (or bonding) than smaller ones and (b) this bias increases with the size inequality between associations. Relying solely on the average number of additional memberships is therefore likely to generate inappropriate conclusions.[3]

This mathematical regularity and its consequence are illustrated using data from five surveys conducted between 1999 and 2004 by the "Administration Planning and Statistics" (APS) of the Flemish government (total sample = 7276 individuals). The APS-surveys ask, among other things, whether respondents are active or passive members in 22 different types of voluntary associations (e.g. hobby clubs, sports clubs, women's associations, and so on).[4] This allows us to calculate the number of individuals claiming membership of an association of a given type and the average number of additional memberships claimed by members of a given association type.[5] The results are presented in Table 1. The position of each association type on a scale from most bridging (1) to most bonding (20) based on the average number of additional memberships its members claim is given between brackets.

Before discussing these results, one crucial caveat should be mentioned. While similar data – based on World Values Studies – are used in the study originally proposing the method (i.e. Paxton, 2002), they are much less than ideal. Indeed, they only provide information at the level of associational <u>types</u>, not of individual organizations. Clearly,

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[3] While a similar reasoning holds for the share of members who have other memberships, the argumentation is here restricted to the average number of additional memberships to preserve space.

[4] We regard both active and passive members since the effects of active and passive membership are often found to be only marginally different (Hooghe 2003: 56; see also Stolle 2001; Wollebaek and Selle 2002; Stutzer and Frey, 2006). Moreover, associations lacking face-to-face interactions might still generate 'symbolic' communities that also provide a valuable resource for those involved (e.g. Minkoff, 1997; Keane, 1998).

[5] We exclude health care associations (because membership is obligatory in Belgium) and the white protest movement (which lacks sufficient members to allow reliable analysis), leaving 20 association types in the analysis.

however, the number of people who participate in a type of association is not the same as the size of any given association within this type. Both the real number of associations and their size are remain unknown in the dataset. Importantly, the reliability of the inferences drawn from such aggregated data with respect to the bridging and bonding nature of voluntary associations (rather than association types) is likely to be seriously impaired.[6] Nevertheless, though this aggregation problem should lead us to be very cautious in interpreting the results using this type of data, it does not invalidate the methodology proposed (nor our extension in the next section). Hence, for the purpose of illustrating the method, we feel justified in assuming that each association type in our sample represents one group on unified individuals. The caveat mentioned should, however, be kept in mind when considering our specific results (and those in the original study of Paxton, 2002).

Table 1: Average number of additional memberships by association type in Flanders

Association type	Number of members	Average number of additional memberships
Youth associations	332	2.166 (15)
Environmental and nature associations	396	2.667 (9)
Organizations providing aid to elderly, handicapped or deprived people	466	2.796 (6)
Arts activities (literature, dance, theatre, music)	488	2.713 (8)
Women's groups	573	2.101 (16)
Socio-cultural associations	560	3.038 (3)
Sports associations	1766	1.620 (19)
Neighbourhood committee	323	2.731 (7)
Third world development and international peace	282	3.521 (1)
Local community advisory and school council	335	3.101 (2)
Family organizations	898	2.343 (14)
Associations linked to local pub	453	1.960 (17)
Humanitarian organizations	585	2.345 (13)
Associations for retired people	510	1.861 (18)
Fan club	112	2.589 (11)
Hobby club	492	2.461 (12)
Unions	2221	1.488 (20)
Religious groups	308	2.971 (4)
Political parties	368	2.897 (5)
Self-help groups	80	2.663 (10)
Correlation coefficient		-0.68

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[6] A more direct analysis of association membership based on data from the voluntary associations themselves would obviously not suffer from this problem. Unfortunately, we lack such data on associations' memberships. An important task for future research might therefore be to "generate a representative sample of organizations from which a sample of members may be contacted" (McPherson, 1983, 1061).

When assessing the results in Table 1, the correlation between the number of members in a given association and the average number of additional memberships they claim is of central interest to us. As expected, this relation is strongly negative ($r = -0.68$; $p < 0.01$). The larger the association in terms of the number of memberships, the lower the connectedness of its members to other associations tends to be. Removing the two largest (i.e. unions and sports organizations) and two smallest (i.e. fan clubs and self-help groups) association types from the sample reduces the correlation to -0.44. The drop in the relation between membership and interconnectedness when excluding these 'outliers' – which, moreover, becomes statistically insignificant ($p > 0.10$) – is suggestive that the observed negative relation at least partly derives from the mathematical regularity noted above.

Note, moreover, that this result does not depend on the use of the Flemish dataset. Indeed, Paxton (2002), analysing 15 association types surveyed in the 1980 and 1990 waves of the World Values Studies, finds that trade unions, religious groups and sports associations are the most bonding groups. Peace, human rights and environmental organizations are the most bridging groups. While the number of memberships in the various association types is not reported, few will dispute that trade unions and sports groups are likely to be larger than human rights and peace organizations – suggesting a similar bias as found in the Flemish data.

A correction

One straightforward means to expunge the effect of unequal membership sizes from the results, is to regress the observed number of interconnections (i.e. the average number of additional memberships of association members; CONNECT) on the membership level of the associations (MEMB). That is (with subscript i referring to associations):

$$CONNECT_i = a + b\ MEMB_i + e_i \qquad (1)$$

Where e_i is a well-behaved error term. The parameter b hereby provides an estimate of the relation between association size and interconnectedness, which – given the bias mentioned in the previous section – is expected to be significantly negative. This is corroborated when we use the Flemish APS data to estimate the parameters a and b (t-values between brackets):

$$CONNECT_i = 2.89 - 0.00068\ MEMB_i \qquad (2)$$
$$(21.77) \quad (-3.93)$$

The sign and statistical significance of the parameter b in equation (2) indicate that members of larger associations tend to have a significantly lower average number of additional memberships. Importantly, the residuals of this estimation (i.e. the difference between the observed value of CONNECT and that predicted by the model) provide an indication of the bridging or bonding nature of an association *net of the membership size effect*. Higher residuals indeed indicate that an association is more bridging (or less bonding), while lower residuals indicate that an association is more bonding (or less bridging) – given the existing differences in membership size.

The residuals of the model are presented in column 4 of Table 2. The ranking of associations on a scale from most bridging (1) to most bonding (20) is given between

brackets. When the ranking based on the regression's residuals are compared with that based on the average number of additional memberships (Columns (4) and (3) respectively), one observes that large associations such as the unions, sports and family associations tend to be ranked higher (i.e. more bridging). Smaller associations such as self-help groups and fan clubs are ranked lower (i.e. more bonding). These changes indicate that a correction for the inequality in membership size is important to make adequate inferences concerning the *relative* bridging or bonding nature of associations. Still, some associations move but little in the final ranking. For example, associations for youth, women and retired people remain among the most bonding association types while associations for third world development, the arts and socio-cultural activities remain among the most bridging ones. These associations, however, vary little in terms of membership size. Consequently, little variation in the results could be expected for these associations. Overall, the fact that the changes in the ranking are stronger for the very large associations suggests that the observed bias indeed becomes stronger the further membership numbers diverge (as argued above).

Table 2: Size-corrected interconnectedness of voluntary associations in Flanders

Association type	Number of members	Average number of additional memberships	Residuals of regression model
Youth associations	332	2.166 (15)	-0.502 (18)
Environmental and nature associations	396	2.667 (9)	0.042 (11)
Organizations providing aid to elderly, handicapped or deprived people	466	2.796 (6)	0.219 (6)
Arts activities (literature, dance, theatre, music)	488	2.713 (8)	0.151 (7)
Women's groups	573	2.101 (16)	-0.403 (17)
Socio-cultural associations	560	3.038 (3)	0.524 (2)
Sports associations	1766	1.620 (19)	-0.075 (12)
Neighbourhood committee	323	2.731 (7)	0.056 (10)
Third world development and international peace	282	3.521 (1)	0.819 (1)
Local community advisory and school council	335	3.101 (2)	0.435 (3)
Family organizations	898	2.343 (14)	0.059 (9)
Associations linked to local pub	453	1.960 (17)	-0.626 (19)
Humanitarian organizations	585	2.345 (13)	-0.151 (14)
Associations for retired people	510	1.861 (18)	-0.686 (20)
Fan club	112	2.589 (11)	-0.228 (16)
Hobby club	492	2.461 (12)	-0.098 (13)
Unions	2221	1.488 (20)	0.101 (8)
Religious groups	308	2.971 (4)	0.286 (4)
Political parties	368	2.897 (5)	0.253 (5)
Self-help groups	80	2.663 (10)	-0.177 (15)

Implications for social capital research

Studies assessing the possibly different effects of bridging and bonding associations on, for example, democracy, economic growth or members' civic attitudes have recently become a popular topic of research (Stolle and Rochon, 1998; Paxton, 2002; Beyerlein and Hipp, 2005; Hill and Matsubayashi, 2005; Coffé, 2006; Geys, 2007). Our findings have important implications for such analyses. Indeed, the results presented above suggest that using the number of interconnections between associations as an indication of their relative bridging nature and *not* correcting for unequal association sizes can have significant repercussions on the inferences drawn in such studies. For example, designating the three types of associations at the lower end of the scale as bonding and the others as bridging (as proposed by Paxton, 2002), entails that *only* associations for retired people are bonding before and after the correction for unequal membership levels (see Table 2). Such changes are unlikely to leave the results unaffected and may, if disregarded, lead to erroneous conclusions – and policy recommendations.

This is illustrated in Table 3. There, we present the results of an analysis relating association membership to civic attitudes (using individual-level data from the 2002 wave of the APS survey). Specifically, we estimate the following model using OLS (subscript i for individuals):[7]

$$Value_i = a + b_1\ Membership_i + Controls_i + e_i \qquad (3)$$

$Value_i$ represents a vector of three independent variables: viz. individual-level measures of political powerlessness, utilitarian individualism and ethnocentrism – attitudes which have been shown to be affected by association membership in previous research (e.g. Hooghe, 2003; Freitag, 2003). Details concerning these variables, which derive from PCA analyses, are presented in the Appendix. $Membership_i$ is a vector of two variables measuring the number of an individual's memberships in either bonding (defined as the lowest three associations of the bridging-bonding scale; see Paxton, 2002) or bridging associations (i.e. the remaining associations). Crucially, the values of both these variables differ depending on whether the uncorrected measure of interconnectedness (Column (3) in Table 2) is employed or the preferred size-corrected version (Column (4) in Table 2). Hence, comparing the coefficient of b_1 across both approaches (i.e. corrected and uncorrected) allows a test of whether the results depend on the approach employed. To avoid spurious inferences, we also include a number of control variables taken from prior research (e.g. Putnam 2000; Hooghe 2003; Freitag, 2003): viz. religious affiliation and practice, gender, age, educational level, marital status, number of children, and hours of television watching on weekdays.

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[7]   The direction of the causal link between participation and attitudes is not self-evident. However, our main intention is to assess the possible difference in the conclusions from using the uncorrected or the corrected measure of bridging and bonding. The inability to pin-point causality is therefore not overly problematic for our research question.

Table 3: Bridging and bonding memberships and civic attitudes

	Individualism	Ethnocentrism	Political powerlessness
Uncorrected			
Bridging associations (number of memberships)	-0.122 ***	-0.073 ***	-0.061 ***
	(-7.00)	(-4.19)	(-3.00)
Bonding associations (number of memberships)	0.044	0.037	-0.033
	(1.17)	(1.00)	(-0.83)
R²	17.17	21.15	13.09
Size-corrected			
Bridging associations (number of memberships)	-0.115 ***	-0.067 ***	-0.075 ***
	(-6.54)	(-3.94)	(-3.71)
Bonding associations (number of memberships)	0.153 **	0.097	0.106 *
	(2.29)	(1.48)	(1.69)
R²	17.24	21.12	13.48
F (uncorr. bridging = uncorr. bonding)	15.09 ***	6.64 ***	0.39
F (corr. bridging = corr. bonding)	13.29 ***	5.31 **	6.63 ***
F (corr. bonding = uncorr. bonding)	2.65 *	0.83	4.91 **
F (corr. bridging = uncorr. brigding)	0.20	0.16	0.46
N	1357	1291	1355

Note: t-values based on heteroscedasticity-consistent standard errors between brackets; *** significant at 1%, ** at 5% and * at 10%. N differs over specifications due to missing observations. F-tests reflect significance of difference between the coefficients indicated.

The results are given in Table 3 (results for the control variables corroborate previous findings and are suppressed to preserve space). The most important information is contained in the F-tests at the bottom of Table 3. These attest whether the coefficients of the various estimates are statistically significantly different from one another. From these tests, it is clear that not correcting for size inequalities leads one to conclude that for feelings of political powerlessness, there is no significant difference between bridging and bonding associations ($F = 0.39$; $p > 0.10$). Using instead the size-corrected data, we find that there is a significantly different relation between feelings of political powerlessness and membership in bridging or bonding associations ($F = 6.63$; $p < 0.01$). Moreover, for feelings of political powerlessness as well as individualism, the uncorrected results would lead one to conclude the absence of an effect of bonding association membership, where the size-corrected membership variables clearly indicate the presence of a significant and positive effect. Note also that the difference in these estimates is statistically significant ($F = 2.65$ and 4.91 respectively; $p < 0.10$). Hence, the conclusions about the differential relation of bridging and bonding associations to civic attitudes are indeed flawed when not correcting the interconnectedness-measurement for size inequalities.

Conclusion

A distinction has recently been made between bridging and bonding networks. It is thereby argued that the external effects of bridging networks are likely to be positive, while bonding networks might lack such positive externalities or invoke negative side-effects (Putnam, 2000; Putnam and Goss, 2002). Empirical tests of this hypothesis require a separation of bridging from bonding associations. One approach taken in the literature to do so is to look at the number of links association members entertain with other associations. Associations of which members more extensively participate in other associations are deemed to be bridging, while those where this is less the case are designated as bonding (Paxton, 2002).

The present note firstly indicated that exclusive reliance on the number of members with additional memberships – as in previous work – leads to a bias towards designation of large associations as more bonding. Secondly, we introduced a straightforward econometric technique to alleviate this bias. Applying this methodology to a dataset on associational life in Flanders, we find that correcting for membership size inequalities is important to reach correct conclusions on the bridging potential of associations. Moreover, we showed that this correction is crucial to accurately assess the relative effects of bridging and bonding associations on socio-economic outcomes. Future research on the effects of bridging or bonding voluntary associations on the broader society should clearly take this into account.

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APPENDIX

The dependent variables in section 3 derive from a PCA including individuals' answers to a number of related statements. Answers were structured using a Likert-type scale from totally disagree (1) to totally agree (5). We present the statements employed and their component weights in the PCA as well as the eigenvalue, the percentage of explained variance and the Cronbach alfa of the component.

Utilitarian individualism

0.79   In society, one better looks after himself/herself first.
0.79   In society, one has to fight for his/her own position, the rest follows automatically.
0.79   People should always pursue their personal pleasure and mustn't think about others.
0.78   It is important to strive pre-eminently for a prominent for yourself.
0.75   Everybody has to take care of himself /herself first and defend his/her own interests.
0.69   What counts is money and power. The rest is hot air.
0.66   Well-informed people can use this primarily to improve their own position.
0.63   Striving for personal success is more important than having good relations with others.

Eigenvalue   4.3
Explained variance   54%
Cronbach Alfa   0.88

Ethnocentrism

0.85   Immigrants take advantage of our social welfare system.
0.82   If employment opportunities decrease, immigrants should be repatriated.
0.82   Muslims threaten our culture and traditions.
0.80   In general, immigrants cannot be trusted.

Eigenvalue   2.7
Explained variance   67%
Cronbach Alfa   0.84

Political powerlessness

0.81   Political parties are only interested in my vote, not my opinion.
0.78   Most politicians promise much, but do little.
0.73   There is no point in voting since parties do what they want.
0.72   Politicians never listen to ordinary people.
0.64   If Parliament has accepted an unjust law, there is little a citizen can do about that.

Eigenvalue   2.7
Explained variance   54%
Cronbach Alfa   0.78