

Environmental Attitude – Behaviour Correlations in 21 Countries

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Abstract

We used data from the International Social Survey Program to investigate the correlation between ‘green’ attitudes and ‘green’ consumption behaviours in 21 different countries. Despite avoiding the methodological problems often blamed for poor attitude-behaviour correlations, we found lower correlations than reported in a recent meta-analysis of this subject. Furthermore, the correlations varied considerably between countries, and in some countries were not significant at all. These results suggest that previous findings on attitude-behaviour correlations are not generalisable to all countries, and that attitudes seldom explain more than 10% of the variance in behaviour.

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The authors would like to thank Phil Gendall for access to the ISSP data and helpful comments on an earlier version of this paper, Esther Chong and Erica Riebe for reviewing the final draft of this paper, and the JEMS reviewers.

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Introduction

Much consumer and market research is based on the assumption that knowledge of consumer attitudes will help to predict consumer behaviour. This is, in fact, not as straightforward as it might seem. For over sixty years the strength and direction of the link between attitudes and behaviour has been subject to critical examination (eg. La Piere 1934, Wicker 1969, East 1993, Foxall 1993, Kraus 1995, Foxall 1997). This paper contributes to the study of the attitude-behaviour link by analysing the correlations between 'green' (environmentally concerned) attitudes and 'green' behaviours in 21 countries.

Green attitudes and behaviours are certainly of interest to marketers. Environmental concern reached unprecedented levels in the 1990s (Smith 1990; Dunlap and Scarce 1991; Young 1991, Berger 1993; Dunlap, Gallup, and Gallup 1993; Saunders and Saker 1994; Witherspoon 1994, Zimmer, Stafford, Stafford, and Royne. 1994), and manufacturers in many countries seek to take account of this concern in their product design and promotion.

We proceed by describing the data we used from the International Social Survey Program (ISSP), explaining our method, including the method used to identify general attitudes and behavioural propensities, and then presenting our results, including analyses at different levels of aggregation and specificity.

Whilst our research represents a replication of past studies of attitude-behaviour correlations, it also contains some important extensions. These include the extension to 'green' attitudes and behaviour, the extension to identify latent attitudes and behavioural propensities, and the extension of attitude-behaviour analysis to 21 different countries. Furthermore, the recent meta-analysis by Kraus (1995) only analysed 88 attitude-behaviour correlations, while our work provides over 40 additional results.

Replication and extension of existing results are recognised as vital to the development of empirical generalisations (Lindsay and Ehrenberg 1993, Hubbard and Armstrong 1994, Wright and Kearns 1998). Similarly, comparisons of results from different situations are required to help identify the boundary conditions of current theories and findings (Greenwald, Pratkanis, Leippe, and Baumgarder 1986, Wright and Kearns 1998). Consequently, while there is nothing particularly innovative about the work we present, we believe that this sort of research is essential to the development of normal scientific

knowledge. Our results provide important evidence about the strength of attitude – behaviour correlations and about their variations across different countries.

The Link Between Attitudes and Behaviour

One of the first and most frequently cited studies on the link between attitudes and behaviour was La Piere's investigation into racial prejudice conducted in the early 1930s (La Piere 1934). La Piere travelled across the United States with a young Chinese couple to determine whether the couple would be refused service on the basis of race. Of the 251 hotels, restaurants and other establishments visited only one refused service. La Piere sent a letter to each of the establishments some six months later asking whether they would serve "members of the Chinese race." Of the 128 establishments that replied to the letter, over 90 per cent claimed that they would not accept members of the Chinese race as their guests. La Piere concluded that, although attitudes could be measured quantitatively, they were ineffective predictors of behaviour.

Researchers largely ignored La Piere's warning until the 1960s, when concerns about the usefulness of attitudes became more prominent. This culminated in an influential article by Wicker in 1969. Wicker reviewed 47 empirical studies of attitudes and behaviour and found that attitude-behaviour correlations were rarely above 0.30, and often nearer to zero, a finding later supported by McGuire (1985). Wicker concluded that "It is considerably more likely that attitudes will be unrelated or only slightly related to overt behaviours than that attitudes will be closely related to actions".

More recently, Kraus (1995) published a comprehensive meta-analysis and review of this attitude-behaviour link. He questioned the results of Wicker (1969) and McGuire (1985) upon finding that the average correlation of the 88 studies he examined was 0.38 and that 52% of these were above 0.30 (Kraus 1995). Kraus interpreted this as a high level of attitude-behaviour correlation, but as we indicated earlier, we still regard this a rather weak relationship.

In the area of environmental attitudes and behaviour, Hines et al. (1987, cited in Peattie 1995, p. 162) reviewed 51 studies and found only a moderate correlation. While there appears to be a growing awareness of the environmental consequences of personal consumption (Berger 1993), studies in this area have generally failed to show any clear relationship between environmental concern and environmentally oriented consumer behaviour (Gillroy, Crosby and Taylor 1986; Martin and Simintiras 1995). These results are consistent with the findings of La Piere (1934), Wicker (1969), and Kraus (1995),

suggesting that the strength of the relationship between environmental attitudes and behaviour is similar to that found for other attitudes and behaviours.

Some researchers have also questioned the direction of the attitude-behaviour link. East suggests that "the precedence in the attitude-behaviour relationship varies with the subject matter" (1993, p. 66). Foxall suggests four possible causal relationships between attitudes and behaviour: (i) attitudes cause behaviours; (ii) behaviours cause attitudes, (iii) attitudes and behaviours are reciprocally causative, or (iv) attitudes and behaviours are unrelated (1983, p. 45). Foxall proposes that behaviour may be "the result, not of intrapersonal events [attitudes], but of the consequences of previous behaviour in similar situations. The reward or reinforcement of that behaviour shapes and sustains present and future behaviour of the same or similar kind" (1983, p. 3). Consequently, there is often a strong link between past and present behaviour, but this link may be maintained by environmental (non-green) influences rather than attitudes; that is, by the reinforcers normally encountered by an individual in their daily life (Foxall 1997).

This difficulty of establishing that attitudes cause behaviour prompted many attitude researchers to offer possible explanations for the poor research results. After all, as East states, "finding no evidence is not the same as there being no evidence" (East, 1993, p. 65). Kraus (1995) divides the explanations for poor results into moderator variable explanations and methodological explanations.

In examining moderator variable explanations, Kraus (1995) found that the attitude-behaviour relationship was moderated by attitudinal variables (stability, certainty, affective-cognitive consistency, direct experience, and accessibility), the topic of the research, the personality trait of self-monitoring, and certain situational variables such as self-awareness and time pressure. We have not examined these moderator variable explanations in this research.

Methodological explanations included the inappropriate reliance on student samples, the use of different respondents for measurements of attitude and behaviour, temporal lags between measurements during which attitudes might change, and the artificial nature of experimental choices (Kraus 1995). In his meta-analysis, Kraus found that self reported behaviours and non-student samples both tended to give higher attitude-behaviour correlations. The ISSP data used in this research relies on self reported behaviours from non-student samples, so we might reasonably expect relatively high correlations between attitudes and behaviour. Furthermore, the ISSP data does not suffer from any of the other methodological problems cited by Kraus, 1995.

The most important methodological explanation comes from Azjen and Fishbein, who argued that the correlation between attitudes and behaviours would be higher if the measurements corresponded in their 'target' and 'action' elements (Azjen and Fishbein 1977). Kraus gives the following exposition of this point.

Attitude measures that specify a target and no specific action should predict behaviour measures that specify a target but no specific action; similarly, attitude measures that specify both a target and a specific action should predict behaviour measures that specify a target and a specific action. For example, general attitudes towards the environment should predict a "multiple-act" criterion consisting of relevant actions such as recycling, donating to environmental groups, and so on; "attitudes towards an action" like attending church should predict a "single-act" criterion of church attendance. (Kraus 1995, p 60).

Kraus (1995) found from his meta analysis that attitudes and behaviour were more highly correlated (with an average value greater than 0.50) when they were measured at corresponding levels of specificity. As it happens, the ISSP data, when combined with our method of analysis, almost perfectly corresponds to the hypothetical environmental example of corresponding specificity used by Kraus (1995).

Therefore we sought to use the ISSP data on the environment to investigate whether we could achieve levels of attitude-behaviour correlation similar to those summarised by Kraus, and to investigate how these correlations varied across the countries in our sample.

The ISSP Data

As mentioned previously, this research draws on data from the 1993 International Social Survey Program (ISSP). The ISSP surveys are administered by leading academic institutions in each of the member countries, and involve annual surveys of economic and social policy issues, with the specific topics varying in a five-year cycle. This resulting data is freely available to all ISSP participants.

The survey methodology and sample size varies slightly from country to country. Some use mail surveys, others face-to-face interviewing. However, the questionnaire is developed in consultation with all member institutions, ensuring that a comparable instrument is used in all countries. The sample size also varies between countries; in 1993,

the smallest sample size was 767 (Northern Ireland) while the highest was 1931 (Russia), and the average was 1263 across the 21 countries for which data was available.

The main topic in 1993 was attitudes towards the environment. Researchers in twenty-one countries provided data to the central archive in Cologne on a total of 26,522 respondents. The survey contained twelve related questions about the perceived danger posed by various threats to the environment, four related questions about environmentally motivated changes in consumption behaviour, and four related questions about environmental activism.

The questions regarding the perceived danger to the environment consisted of six questions measuring the level of concern for the 'danger to the environment' and six for the 'danger to self and family' from various environmental threats. These environmental threats were: air pollution by industry; water pollution; nuclear power stations; rise in the world temperature; air pollution by cars; and the use of pesticides and chemicals in farming. The questions on danger to 'the environment' were seen as the most relevant to general attitudes to the environment, or general environmental concern, so these were used in the research rather than the questions on danger to 'self and family'. Concern was measured on a five point scale and, following Witherspoon (1994), we took responses on the top two points ('extremely' or 'very' dangerous) to be an expression of environmental concern.

The questions about environmentally motivated changes in consumption behaviour included whether respondents: made an effort to sort materials for recycling; bought fruits and vegetables grown without pesticides or chemicals; cut back on driving a car for environmental reasons; or refused to eat meat for moral or environmental reasons. These behaviours were measured on a four point scale, and the top two points ('always' or 'often') were taken to be environmentally motivated changes in consumption behaviour.

The questions about environmental activism asked whether respondents: were members of an environmental group; had signed an environmental petition in the last five years; had made a donation to an environmental group in the last five years; or had participated in an environmental protest or demonstration in the last five years. Respondents answered 'yes' or 'no'. This environmental activism is also a form of consumption behaviour.

Method

Our investigation primarily concerned Kraus' (1995) example of general attitudes to the environment and 'multiple act criterion' of various relevant actions. In particular, we were interested in 'environmental concern', which has been a major focus of the investigation of attitudes to the environment (see Van Liere and Dunlap 1980, Zimmer, Stafford, Stafford, and Royne 1994). The behavioural propensities (or 'multiple act criterion') have had somewhat less investigation in the literature.

The overall levels of environmental concern and behavioural propensities were assumed to be reflected in the answers of individual ISSP questions in the relevant areas, although the individual questions may also have included some extraneous 'noise', or elements which were unrelated to the underlying attitude and behaviours of interest. For example, attitudes to Nuclear Power might have been influenced by attitudes towards Nuclear Weapons as well as by general environmental concern.

Therefore, before undertaking the analysis, we sought to identify and extract latent variables expressing the underlying general attitude and behavioural propensities of interest, namely environmental concern, the propensity for environmentally motivated consumption behaviour, and the propensity for environmentally motivated activism. As a test of the existence of these latent variables, we undertook global (across all 21 countries) factor analysis with varimax rotation. If each set of variables loaded onto a separate factor, and only three factors were retained, then these three factors could be taken to represent the relevant latent variables.

Conducting a single factor analysis for all 14 variables ensured that the resulting factors were orthogonal. As we were interested in examining correlations between latent variables the extraction of orthogonal factors was somewhat problematic. Moreover, a case with a missing value on one question would be excluded from all three factors, maximising the number of missing values. Consequently, once we had established that latent variables could be identified, we undertook a separate factor analysis for each set of questions. The results of this second analysis were used to address our objectives, and we have labelled the resulting factors 'concern' (for general environmental concern), 'consume' (for the propensity for environmentally motivated consumer behaviour), and 'activism' (for the propensity for environmentally motivated activism).

We considered constructing and testing additive indices, but concluded that this was an inappropriate approach to identifying a latent variable. In particular, such indices

necessarily include 'noise' irrelevant to the latent variables, whereas factor analysis could be expected to relegate such 'noise' to the rejected components.

Hini, Gendall, and Kearns (1995) had used regression on New Zealand ISSP data to assess whether environmental attitudes explained the variations in environmental behaviours (they found adjusted r-square values ranging from 3% to 26%), but we not want to undertake regression for two reasons. First, we wanted to avoid implying a direction of causation. Second, we wanted to produce results that could be directly compared with those of Kraus (1995). We therefore investigated the correlations between 'concern', 'consume', and 'activism'. We did this first for all the data (a 'global' or pooled correlation), and then on a country-by-country basis. This enabled us to both minimise the effect of missing values and to look for differences between countries.

To extend the analysis, we also considered the global correlation between 'concern' and the eight individual behaviours. Furthermore, we took advantage of the data gathered on 'danger to self and family' to examine some correlations between specific attitudes and specific behaviours.

Results

Factor Analysis

The factor analysis using all 14 variables did retain just three factors, with all variables loading as expected (see Appendix One for factor loadings). The three individual factor analyses then each extracted only a single factor, with all variable loadings above 0.5, and 11 of the 14 loadings above 0.6. The Eigenvalues and explained variance of both sets of analysis are summarised in Table 1. While our statistical program (SPSS 5.0) used the Eigenvalue greater than one rule for factor retention, the scree plots also indicated that, in both sets of analysis, these factors should be the only ones retained.

Table 1: Summary of Factor Analysis Results

	Eigenvalue	Explained Variance
All 14 Variables		
- Factor 1 (Concern)	3.0	21
- Factor 3 (Consume)	1.3	9
- Factor 2 (Activism)	1.8	13
Concern Variables Only	2.6	43
Consume Variables Only	1.6	40
Activism Variables Only	1.8	45

These results confirmed the hypothesised latent variables that we have labelled ‘concern’, ‘consume’, and ‘activism’. These factors each accounted for approximately 40% of the variance in the set of items on which they were based, indicating that the original questions did indeed contain considerable "noise", and supporting the decision not to use additive indices.

Correlations Using Pooled Data

The global correlations between the individually extracted factor scores are detailed in Table 2. There were a large number of missing values in ‘consume’ due to widespread reports that some behaviours, such as car driving and recycling, were ‘not applicable’ or ‘not available’. Nevertheless, there were still at least 11,000 cases in each of the global correlations.

Table 2: Correlations Between Latent Variables

	Correlation	n
Concern and Consume	.23	11,664
Concern and Activism	.09	19,925
Consume and Activism	.24	11,355

All correlations were significant at the 0.1% level.

Table 2 clearly demonstrates that while the attitude-behaviour correlations were significant, they were not particularly high. This was despite the fact that self reports of behaviour were obtained from a non-student sample, two factors that Kraus (1995) found tended to increase the attitude-behaviour correlation. In fact we found that the behaviour-behaviour correlation (between 'consume' and 'activism') was the largest of the three correlations, suggesting that environmental behaviours can be better predicted by other behaviours than by attitudes. This supports Foxall's comments on the importance of behaviour as an explanatory and predictive variable, especially when individuals' situations (and thus reinforcers) remain unchanged (Foxall 1997).

Correlations Using Individual Country Data

The large number of missing values and the aggregation across 21 countries in Table 2 may obscure more important results at an individual country level. Consequently Table 3 presents the attitude-behaviour correlations on a country by country basis.

Table 3: Correlations between concern and behaviour by country

	Correlation with 'consume'	n	Correlation with 'activism'	n
Northern Ireland	.37 ^c	423	.21 ^c	575
New Zealand	.32 ^c	950	.28 ^c	994
Netherlands	.29 ^c	1095	.25 ^c	1575
Great Britain	.28 ^c	759	.25 ^c	950
Canada	.28 ^c	983	.20 ^c	1149
USA	.27 ^c	1047	no data	no data
East Germany	.26 ^c	568	.13 ^c	945
W. Germany	.23 ^c	687	.18 ^c	901
Norway	.23 ^c	796	.18 ^c	1122
Ireland	.21 ^c	415	.15 ^c	862
Hungary	.20 ^b	222	ns	867
Israel	.18 ^c	401	.12 ^c	799
Slovenia	.17 ^c	430	.12 ^c	832
Japan	.17 ^c	668	.10 ^c	1112
Italy	.15 ^c	539	.08 ^a	917
Czech Republic	.15 ^a	200	.09 ^a	841
Russia	ns	270	ns	1320
Bulgaria	ns	197	ns	747
Poland	ns	456	ns	1208
Spain	ns	425	ns	1036
Philippines	ns	133	ns	1173

^a sig. at 5% level; ^b sig. at 1% level; ^c sig. at 0.1% level; ns not significant.

Table 3 makes it apparent that the correlations are reasonably low, and that they vary considerably between countries.

The highest correlation is just .37, and there are only two correlations greater than .30. The average (weighted by sample size) of the significant correlations between 'concern' and 'consume' is .25 while the average (weighted by sample size) of the significant correlations between 'concern' and 'activism' is .17. These are considerably lower than might have been expected, given that none of the methodological problems, thought to lower attitude – behaviour correlations, were present in this data. In fact these results appear remarkably similar to those obtained by Wicker (1969).

It is not clear why the correlations are lower than Kraus' (1995) meta-analysis would suggest. There may be a moderating variable affecting environmental attitude – behaviour correlations (eg. see the range of moderating variables examined by Kraus, 1995). Alternatively, it may be that studies that report significant findings are more likely to be published, resulting in over-estimates of effect sizes (Greenwald 1975).

Table 3 also demonstrates considerable variation in correlations between countries. English speaking countries all appear to have relatively high correlations, as do Western European countries. Poorer and less developed countries have weaker correlations, while in Russia, Bulgaria, Poland, Spain, and the Philippines there were no significant correlations. This last finding may be due to the small sample sizes after the deletion of missing values for 'consume'. Nevertheless, the sample sizes for 'activism' for these countries were still quite respectable.

This variation between countries is an important finding. First, it casts doubt on the generalisability of the finding from the English language literature summarised by Kraus. The results in Table 3 suggest that these findings can only be reliably applied to English speaking or Western European countries, and that the relationship is considerably different in other countries. Second, it demonstrates that in some countries there is *no detectable attitude - behaviour correlation*. In such circumstances, it is hard to see how the study of elicited attitudes serves any purpose. Some might object that this failure is due to the subject material (environmental attitudes and behaviours), but in this case it is difficult to explain why significant correlations were found in other countries.

The order of results for 'consume' and 'activism' are very consistent between countries. Northern Ireland and Hungary are exceptions to this rule, but relatively minor ones. This consistency between two different types of behavioural propensities provides a small within-country replication, confirming that genuine differences between the countries are likely to be the reason for the differences in attitude – behaviour correlations.

Correlations with Individual Behaviours

The latent variables represent non-specific targets and actions, and some may wish to claim that this is the reason they yielded lower attitude-behaviour correlations. However Kraus' (1995) exposition of Azjen and Fishbein's (1977) work specifically used the example of general attitudes towards the environment being likely to "predict a 'multiple act' criterion consisting of relevant actions such as recycling, donating to environmental groups, and so on". The 'consume' and 'activism' latent variables would seem to be just such multiple act criteria.

Nevertheless, to help explore this issue thoroughly, Table 4 breaks the latent behavioural variables back down to individual behaviours, and explores the global correlations between the general attitude 'concern' and these individual specific behaviours. This procedure also reduces the effect of missing values. To avoid unnecessary loss of information on the first four behaviours, the original scales have been used rather than the dichotomies on which the population proportions and factor analyses were based. We have assumed that the scales represent interval level data, but in fact the Spearman and Pearson correlations for these variables were virtually identical.

Table 4: Correlations Between "Concern" and Individual Behaviours

	Correlation	n
Sort glass	.07	18,069
Buy organic	.21	18,361
Cut back driving	.15	15,069
Refuse meat	.17	21,849
Signed petition	.10	21,582
Given money	.03	20,315
Joined env. group	.03	21,858
Protested	.09	21,274

All correlations were significant at the 0.1% level.

A comparison of Table 4 with Table 2 demonstrates that only one of the individual behaviours has a higher correlation with 'concern' than the relevant behavioural latent

variable. Most of the individual behaviours yield lower correlations, further undermining the attitude-behaviour link in an environmental context. The higher correlations in Table 2 also illustrate the value of the factor analysis in eliminating extraneous 'noise'.

Specific Attitudes and Specific Behaviours

A further objection can be raised against the results of Table 3 and Table 4. Despite Kraus' (1995) earlier comments about general attitudes and general behaviour, some may argue high attitude-behaviour correlations actually require specific attitudes linked to specific behaviours. Fortunately, the ISSP data did contain specific attitudinal and specific behavioural questions on both air pollution, and pesticides and chemicals in farming.

Earlier, it was mentioned that the attitudinal questions were asked on the perceived danger of air pollution caused by cars, both the environment and to 'self and family', and that self reports of cutting back on car driving for environmental reasons were also obtained. The correlation between these specific attitudes and the specific behaviour was 0.15 for danger to the environment (significant at the 0.1% level, $n = 17,068$), and 0.13 for danger to self and family (significant at the 0.1% level, $n = 17,003$). This was no higher than the correlation between the non-specific environmental concern and cutting back on car driving for environmental reasons.

It could be argued that the benefits of cutting back on car driving were too indirect, and that this was why the correlation was still low. A more direct link was found between the attitudinal question on the perceived danger of pesticides and chemicals in farming (both to the environment and to 'self and family'), and the self reported behaviour of buying fruits and vegetables without pesticides or chemicals. In this case the correlation between the specific attitude and specific behaviour was .20 for danger to the environment (significant at the 0.1% level, $n = 21,099$), and .21 for danger to self and family (significant at the 0.1% level, $n = 21,048$). Again, there was no noteworthy difference between the specific attitude - specific behaviour link, and the general attitude - general behaviour link.

Discussion and Conclusion

Despite following the methodological advice provided by a recent meta-analysis (Kraus 1995), we were unable to obtain attitude - behaviour correlations higher than .37, and in general could only obtain correlations considerably less than this. Furthermore, these

correlations varied considerably between countries, and in some cases no significant correlations could be detected despite respectable sample sizes.

These results suggest that previous findings on attitude-behaviour correlations are not generalisable to all countries. This has important implications for international marketers, implying that standard attitude based consumer research will be of limited usefulness in some countries.

Furthermore, only two out of forty-one correlations were greater than .30, implying that in only two cases did the attitudes explain more than 10% of variation in behaviour. While the correlations were (usually) statistically significant, the fact that attitudes explain so little of the behavioural variation makes them of questionable use in marketing decision making.

However, we must acknowledge that this is a subjective interpretation; others may view correlations of this size as quite adequate to inform marketing decisions. There is no obvious way to resolve such disputes objectively.

Clearly it would be desirable to obtain a similar range of cross-country data for other attitudes and behaviours relevant to marketing decision making. This would enable the magnitude and range of attitude-behaviour correlations to be more thoroughly investigated.

This is important, as it may be that there is something specific to environmental issues which contributes to the results found in this work (although we cannot think what this might be).

It would also be interesting to further investigate the between-country differences; the *fact* of the differences has been established, but the *reasons* remain unclear. These reasons would represent important boundary conditions for generalisations about attitude-behaviour correlations.

For now, however, we must conclude that the reasons offered to explain relatively low attitude-behaviour correlations in the past are not adequate. Even when these reasons are taken into account, we find correlations that we believe are too low to enable standard attitude-based consumer research to provide much assistance to marketing managers.

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APPENDIX ONE

Rotated Factor Matrix Using All 14 Variables Across All Countries (Varimax Rotation)

	FACTOR 1	FACTOR 2	FACTOR 3
Water Poll.	.70	.02	.06
Air Poll. Industry	.70	.08	.02
Pesticides	.68	-.01	.16
World Temp.	.67	.06	.06
Air Poll. Cars	.59	.07	.07
Nuclear Power	.56	.02	.02
Buy Organic	.17	-.06	.68
Cut Back Driving	.09	.05	.64
Refuse Meat	.05	.14	.62
Recycle	-.02	.20	.52
Give Money	.01	.76	.04
Sign Petition	.13	.72	.07
Member	-.00 ¹	.65	.04
Protest	.06	.48	.18

¹ Actual value -.004.