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Attitude Strength and Perceived Prevalence of Attitude Positions

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Two studies are reported that evaluate the hypothesis that people with involved or extreme (as opposed to moderate) attitudes on an issue will tend to overestimate the extent to which others' attitudes are polarized toward *both* extremes (cf. Judd & Johnson, 1981). Unlike previous tests of this hypothesis, the present studies included a complete range of subject attitude groups and target categories, obtaining prevalence estimates on a variety of nuclear-related issues. However, support for the hypothesis was limited, being clearest for pronuclear subjects' estimates of pronuclear positions but almost nonexistent for other subjects and target categories. It is suggested that the cognitive mechanism proposed by Judd and Johnson needs to be supplemented by broader social, functional, and knowledge-based considerations.

The following studies are designed to evaluate the hypothesis that perceivers with involved or extreme attitudes on an issue will tend to see the world as comparatively polarized on that issue and will therefore tend to overestimate the prevalence of people at *both extremes* relative to perceivers with moderate attitudes. Judd and Johnson (1981) made the most explicit statement and test of this hypothesis. They suggested a relationship between attitude intensity and prevalence judgments such that "strong affect toward a pro viewpoint and negative affect to an anti one, may render *both* viewpoints salient, thus enhancing estimates of their prevalence" (p. 34).

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Thus, Judd and Johnson asserted that the relative salience of the extremes may make them more accessible, resulting in inflated prevalence estimates (cf. McArthur, 1981; Taylor & Fiske, 1978; Tversky & Kahneman, 1973). Moreover, because attitude "intensity" is correlated with attitude "extremity" (Judd & Krosnick, 1982; Suchman, 1950), it follows that people with extreme views should also overestimate the prevalence of extremes in the population. Hereafter, this is referred to as the "polarization-prevalence hypothesis."

In their study, Judd and Johnson (1981) tested this hypothesis by asking subjects to estimate the percentage of pro, neutral, and anti attitudes toward "women's rights." Participants were divided into feminists and nonfeminists, although "all subjects had relatively pro [women's rights] attitudes" (p. 29). Judd and Johnson found that the hypothesis was confirmed for target groups that were relatively remote or abstract. For these groups, the feminists perceived a higher percentage of people for *and* against women's rights than "nonfeminists" (although the effect did not generalize to target populations with which subjects were in close contact).

One possible criticism of Judd and Johnson's (1981) study is that the distribution of attitudes held by the subjects was one-sided; only subjects with feminist attitudes of varying degrees participated—people neutral toward or against women's rights did not.

In a more recent study by van der Pligt, Ester, and van der Linden (1983), subjects having a complete range of attitudes were approached on the issue of building more nuclear power stations (*strongly opposed* to *strongly in favour* on a 5-point scale). Respondents indicated the percentage of the Dutch population and of the Members of Parliament who would be in favor of increasing the number of nuclear power stations nationally. However, the resulting upward linear trend, spanning estimates from people with extremely antinuclear to extremely pronuclear attitudes, only provided partial support for the polarization-prevalence hypothesis. A curvilinear effect, associated with the relative overestimation of pronuclear people by both attitude extremes, would have been more in keeping with the hypothesis. Moreover, these target populations could not realistically be classed with the "close contact groups" for which Judd and Johnson (1981) did not obtain the effect. However, a noteworthy difference between this study and that of Judd and Johnson is that only one category is employed as a dependent measure, instead of three (i.e., pro, neutral, anti).

In the present study, the polarization-prevalence hypothesis was tested with both independent and dependent variables including a complete range of attitude positions. In this way, it was possible to ensure that any effect was not confined to a particular subject or target attitude position. The attitude topics used in this study and in the following study are all

concerned with various aspects of nuclear issues, primarily attitudes toward nuclear power and nuclear weapons.

STUDY 1

Data reported in this study were collected in conjunction with a series of experiments unrelated to the present issue and reported elsewhere (Spears, 1986; Spears, van der Pligt, & Eiser, 1985, 1986). Although all the data collected in these (four) experimental sessions take a similar form, we have not collapsed them together, as they were collected over quite a wide time span (with up to 3 years between sessions: 1983 to 1986). Preserving their independence avoids masking of possible differences that may have occurred over time as well as allowing for some "convergent validation." The method employed is common to all four experiments.

Method and Procedure

Subjects

First-year undergraduate volunteers served as subjects (Experiment 1, $N = 128$; Experiment 2, $N = 72$; Experiment 3, $N = 91$; Experiment 4, $N = 94$). In Experiments 2 and 3, subjects were paid £1 ($1.70) for their participation; in Experiment 4 (see Spears, 1986; Spears et al., 1986), they were paid 50p ($.85).

Independent and Dependent Measures

Subjects indicated their attitude to nuclear power on a single 7-point scale with points labeled *extremely opposed, moderately opposed, slightly opposed, neutral/don't know, slightly in favour, moderately in favour,* and *extremely in favour.*[1] They then made judgments of the percentage of "people in general" they estimated to be "pro", "neutral," and "anti" toward nuclear power.

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[1]Previous use of the single 7-point attitude scale in conjunction with a more comprehensive measure involving the rating of attitude statements revealed the simpler measure to be a quite reliable index of attitude. For example, in Spears et al. (1985), the single scale was highly correlated with an 8-statement measure ($r = 0.85$), which in turn had a Cronbach alpha of 0.86.

Results

Subjects' estimates of the percentage of people judged to be pronuclear and antinuclear—over the four experiments—are presented in Table 1. (We have excluded estimates for the neutral category, as this can be inferred from the other two estimates.) Table 1 also breaks these data down by the subject's own attitude as defined by the 7 point measure—namely, into "pronuclear" and "antinuclear" subjects and further into "extreme", "moderate" and "slight" degrees of attitude strength within these groups. (The number of "neutral" subjects was negligible as compared to the other classifications, and so these were excluded from the analyses.)

The polarization-prevalence hypothesis predicts an increase in prevalence estimates for either pro or anti attitude positions as a function of attitude extremity. Therefore, analyses of variance, with tests for linear trends, were conducted on pronuclear and antinuclear subjects' estimates of pronuclear and antinuclear people as a function of the threefold extremity classification. As indicated in Table 1, the only combination of subject and target attitudes that seems to bear any consistent evidence of the polarization-prevalence hypothesis is for pronuclear subjects' estimates of the pronuclear category. Specifically, Experiments 1 and 2 reveal a very significant increase in estimates, ranging from subjects with "slight" to those with "extreme" attitudes ($p < .01$), whereas Experiment 4 indicates a marginally significant trend in this direction. However, there was no evidence of such a trend in Experiment 3. Moreover, of the 12 remaining subject–target combinations across the four experiments, only one achieved a significant trend in the predicted direction. This was for antinuclear subjects' estimates of pronuclear people in Experiment 2 ($p < .05$). Indeed, there are two instances of marginally significant trends *against* the predicted direction (namely, for pronuclear and antinuclear subjects' estimates of the antinuclear category in Experiment 1).

In summary, the evidence provided for the polarization-prevalence hypothesis by these four experiments, on this particular attitude issue, seems fairly limited. In general, it is only displayed for estimates of the pronuclear category and, more specifically, only with any consistency by pronuclear subjects.

STUDY 2

Possible weaknesses of the data presented in the previous study are that they are based on one issue or "item" and that the sample and cell sizes were relatively small. The present study aims to correct these shortcomings by

TABLE 1
Prevalance Estimates of Attitudes to Nuclear Power as a Function of Own Attitude and Attitude Extremity

		Attitude of Subjects									
		Pronuclear					*Antinuclear*				
Experiment		*Extreme*	*Moderate*	*Slight*	*df*	*F(lin)*	*Extreme*	*Moderate*	*Slight*	*df*	*F(lin)*
		Percentage Estimates of Pronuclear Attitude Positions									
1	*M*	43.4	37.8	31.8	1, 62	7.29***	32.0	29.2	30.5	1, 63	<1, ns
	SD	17.0	10.5	11.1			15.6	9.9	13.9		
2	*M*	45.4	42.3	28.3	1, 37	7.92***	36.0	33.3	25.0	1, 29	6.48**
	SD	17.1	16.7	8.9			11.7	7.8	9.4		
3	*M*	38.9	51.3	33.3	1, 34	2.18, ns	30.0	34.0	31.3	1, 50	<1, ns
	SD	11.7	13.1	8.6			9.3	15.0	13.8		
4	*M*	39.6	34.8	32.9	1, 51	2.87*	30.8	32.7	27.9	1, 37	<1, ns
	SD	13.5	8.4	11.4			14.6	11.0	10.3		
		Percentage Estimates of Antinuclear Attitude Positions									
1	*M*	31.3	32.2	36.6	1, 62	3.27*	34.2	40.0	41.4	1, 63	2.95*
	SD	9.9	8.3	8.7			14.4	15.6	15.0		
2	*M*	29.2	35.1	32.0	1, 37	<1, ns	37.0	35.0	41.5	1, 29	<1, ns
	SD	17.4	12.7	10.1			13.4	14.5	10.3		
3	*M*	35.0	29.1	38.8	1, 34	1.10, ns	46.3	44.2	38.3	1, 50	2.29
	SD	13.7	10.0	9.9			9.6	15.3	14.3		
4	*M*	25.7	34.5	31.7	1, 51	1.45, ns	32.5	38.9	41.1	1, 37	1.41
	SD	11.3	10.9	12.1			17.0	12.0	15.0		

*$p < .10$. **$p < .05$. ***$p < .01$.

sampling a larger number of respondents on a variety of (albeit related) topics and target populations. It comprises a questionnaire survey carried out in November 1983.

Method and Procedure

Subjects

First-year students at Exeter University served as subjects. One thousand questionnaires were delivered; 264 were returned.

Independent and Dependent Measures

Percentage estimates. Respondents estimated the percentage of "pro," "neutral," and "anti" people in various groups on the issues of nuclear weapons and nuclear power. Specifically, they estimated the percentage of people in the United Kingdom and the percentage of Exeter University students to be pro, neutral, or anti having nuclear weapons in the UK; the percentage of people in the UK to be pro, neutral, or anti having nuclear power stations in the UK; and the percentage of non-CND (Campaign for Nuclear Disarmament) members in the UK and the percentage of UK media supporting, neutral toward, and opposing the aims of CND.

Attitude measure. Attitudes toward "having nuclear weapons in this country" and "having nuclear power stations in this country" were measured on 7-point scales ranging from *very strongly opposed* to *very strongly in favour* (see Footnote 1).

Results

Respondents' percentage estimates on the five nuclear questions are presented in Table 2. As in Table 1, data are broken down according to the attitudes of the target groups (pronuclear vs. antinuclear), the attitudes of the subjects (pronuclear vs. antinuclear), and attitude strength (very strong, strong, slight). (Note: Subjects' attitudes were classified on the attitude scale relevant to each particular issue; that is, on all but the nuclear power item, attitudes were classified in terms of responses to the Nuclear Weapons Attitude Scale.) On the same basis as before, the neutral category is not directly reported, and a small number of neutral respondents have been excluded. Also, to make the table easier to interpret, we have located estimates relating to the aims of CND in accordance with the overall "pronuclear" and "antinuclear" camps (e.g., estimates for those *opposed* to the aims of CND are located with other estimates of the *pro*nuclear position).

TABLE 2
Prevalance Estimates of Attitudes on Nuclear Issues as a Function of Own Attitude and Attitude Strength

		Attitude of Subjects									
		Pronuclear					*Antinuclear*				
		Strong	*Moderate*	*Slight*	*df*	*F(lin)*	*Strong*	*Moderate*	*Slight*	*df*	*F(lin)*
		Percentage Estimates (Pronuclear)									
In favor of having nuclear weapons in the UK											
Percentage of UK citizens	*M*	52.9	44.1	36.2	1, 136	23.1***	39.3	33.3	35.8	1, 121	2.0, ns
	SD	17.8	17.6	13.5			16.3	13.9	19.3		
Percentage of Exeter students	*M*	54.0	42.4	38.5	1, 137	17.9***	42.5	34.8	32.1	1, 121	6.2**
	SD	17.1	20.4	16.9			20.0	16.0	20.3		
In favor of having nuclear power stations in the UK											
Percentage of UK citizens	*M*	54.6	45.7	42.8	1, 169	10.7***	37.8	43.8	33.8	1, 83	<1, ns
	SD	19.5	20.7	18.2			17.0	19.1	16.7		
Opposing the aims of CND											
Percentage of UK citizens	*M*	54.6	45.2	41.5	1, 137	9.8***	39.3	34.2	39.4	1, 121	<1, ns
	SD	22.6	20.3	18.3			15.2	17.0	18.4		
Percentage of UK media	*M*	52.5	48.4	45.5	1,135	1.9, ns	59.8	55.4	38.6	1, 119	9.8***
	SD	26.2	24.3	22.4			23.4	22.3	16.1		

		Attitude of Subjects									
		Pronuclear					*Antinuclear*				
		Strong	*Moderate*	*Slight*	*df*	*F(lin)*	*Strong*	*Moderate*	*Slight*	*df*	*F(lin)*
		Percentage Estimates (Antinuclear)									
Opposed to having nuclear weapons in the UK											
Percentage of UK citizens	*M*	22.4	25.3	30.5	1,136	11.9***	35.6	34.4	32.6	1,121	<1, ns
	SD	11.1	9.7	12.2			11.2	12.8	17.1		
Percentage of Exeter students	*M*	27.7	30.1	33.8	1,137	4.9**	34.1	39.8	34.4	1,121	<1, ns
	SD	12.4	15.0	11.7			17.0	14.9	16.0		
Opposed to having nuclear power stations in the UK											
Percentage of the UK citizens	*M*	18.0	21.7	20.6	1,169	1.9, ns	29.2	27.9	25.4	1,83	<1, ns
	SD	11.9	12.3	13.8			13.2	12.5	13.8		
Supporting the aims of the CND											
Percentage of UK citizens	*M*	16.1	17.6	29.9	1,137	3.1*	29.8	24.3	20.5	1,121	7.1***
	SD	10.6	9.4	10.9			13.7	15.8	13.4		
Percentage of UK media	*M*	23.1	19.9	20.3	1,135	<1, ns	17.7	21.0	28.9	1,119	9.7***
	SD	18.1	15.7	12.6			12.5	12.4	13.0		

*$p < .10$. **$p < .05$. ***$p < .01$.
*df*s vary slightly due to missing data.

In terms of the polarization-prevalence hypothesis, the most consistent support comes once more from the pronuclear subjects estimating support for the pronuclear category. On four of the five questions in this quadrant, there was a very significant linear trend in the predicted direction ($p < .01$). That is, estimates of the pronuclear category increased as a function of attitude strength. Estimates on the fifth issue (media support for the aims of CND) are in the right direction, although this trend was not significant.

More patchy support for the hypothesis is forthcoming from the antinuclear subjects. In terms of their estimates of pronuclear positions, they reveal significant linear effects on two of the five questions ("students pro having nuclear weapons in the UK" and "media opposing the aims of CND"). For estimates of the antinuclear position, the hypothesis is supported on one of the five issues ($p < .01$; "percentage of UK support for the aims of CND"), but there is a trend in the opposite direction on another ($p < .01$; "percentage of media support for CND"). Thus, whereas perceived public support for CND seems to increase as a function of attitude intensity for antinuclear respondents, media support is perceived to decrease correspondingly.

Finally, regarding pronuclear subjects' estimates concerning the magnitude of antinuclear groups, evidence from two of the five issues appears to go directly against the hypothesis, with a third trend in this direction being marginally significant (the percentage of the public and students against having nuclear weapons in the UK and the perceived public support for CND, respectively).

Overall then, the pattern revealed in the four quadrants of Table 2 is remarkably similar to that of Table 1. To summarize, there is evidence supporting the hypothesis for estimates of pronuclear positions, although this is most reliable among the pronuclear subjects themselves. However, in terms of estimates of the antinuclear positions, the weight of significant findings run contrary to the hypothesis, again, particularly among the pronuclear respondents.

DISCUSSION

The data in the two studies reported here provide only partial and one-sided support for the polarization-prevalence hypothesis. Although pronuclear subjects' estimates of pronuclear positions appear to support the hypothesis quite strongly in both studies, this appears to be the full extent of the support. Moreover, significant trends in the reverse direction, particularly in terms of pronuclear subjects' estimates of the antinuclear positions, cannot easily be dismissed, nor is it possible to interpret these results purely in terms of an egocentric bias akin to the "false consensus effect" (e.g.,

Ross, 1977), whereby subjects tend to progressively overestimate support for their own position and underestimate support for their adversaries as a function of own attitude strength. Although this could characterize the pattern of results for "pronuclear" subjects, it would not seem to account for the data of the antinuclear subjects. In their case, there is no convincing evidence for such a progressively egocentric effect regarding estimates of other antinuclear opinions and, if anything, quite the reverse for estimates of opposed (i.e., pronuclear) positions. In sum, if it were at all possible to fit one overall trend to these findings, it would have to be that estimates of the *pronuclear* category generally increase as a function of attitude strength, with estimates of the antinuclear category decreasing (although it must be said that this overall pattern is much weaker among the antinuclear subjects). This interpretation would seem to argue against a simple cognitive "heuristic" foundation for prevalence estimation.

However, our pattern of findings could be explained in combination with a more knowledge-based understanding of the social context on the part of the perceiver. For example, if it is assumed that public opinion is actually predisposed toward nuclear power and nuclear arms (as was the case in opinion polls around the time these studies were conducted), involvement in the issue, by pronuclear or antinuclear people, might be reflected in greater awareness of this information. Conversely, lack of conviction and interest might, by definition, render this information less salient, and, other things being equal, people may tend to assume rough parity between the two camps. In terms of underlying mechanisms then, the estimates obtained in our studies may reflect the operation of two rather different processes working in combination. On the one hand, there is the heuristic mechanism of accessibility due to affective intensity, as predicted by the polarization-prevalence hypothesis (cf. Judd & Johnson, 1981; Tversky & Kahneman, 1973). On the other hand, world knowledge may also cause subjects to "adjust" estimates (cf. Tversky & Kahneman, 1974). For example, subjects may "anchor" estimates at a position determined by heuristic processing and adjust them in line with their knowledge concerning base rates (or, conversely, the effects of information processing may act on or influence this knowledge). High involvement on an issue may simply be associated with more elaborated or representative knowledge structures leading to more accurate adjustment. (Also, rich knowledge structures may well be more salient than less developed ones and may lead to greater judgmental confidence or certainty concerning this information.) At the very least then, combining the effects of differential social knowledge or expectations with the "heuristic" mechanism would seem to fare better in explaining our results than a simple heuristic account on its own.

The role of social knowledge, if not of more functional influences, is

further illustrated by data from Study 2. Recall the finding that antinuclear subjects perceived support for the aims of CND among the general public to increase as a function of own attitude strength but, for corresponding estimates of the media, to decrease with own attitude strength. Clearly this subtle discrimination is unlikely to reflect the operation of any simple cognitive heuristic operating free from contextual factors. Rather, it could be explained if it is assumed that CND receives a poor press and that involved people are simply more sensitive to this fact. This pattern may also serve a rationalizing function ("support might be greater if the media were not against us . . ."). Similarly, the perception of increased public support as a function of subjects' attitude intensity could partly reflect sampling biases and/or motivational factors related to involvement (Goethals & Darley, 1977; Ross, 1977). Cognitive explanations premised on the "salience" and accessibility of information should not, therefore, be emphasized to the exclusion of social knowledge in a broader sense, as well as the motivational functions of such estimates. This is especially true given the evidence that prior knowledge or expectations can have a far stronger impact on information processing than data-driven biases (e.g., Jennings, Amabile, & Ross, 1982; Spears, Eiser, & van der Pligt, 1987).

Overall, our findings address a more general issue in this and related literatures—an issue that concerns specifying those conditions under which people employ simple heuristics in social judgment. In particular, how do we integrate the products of information-processing mechanisms with the social and cultural knowledge that is often acquired vicariously—as base-rates and in other forms (cf. Ginosar & Trope, 1980; Hilton & Slugoski, 1986)? In this respect, the factor of "involvement" does not seem to load systematically on either side of this equation; it may have both heuristic- and knowledge-related influences on judgment, depending on the nature of the task. For example, involvement can attenuate the heuristic effects of perceptual salience (Borgida & Howard-Pitney, 1983) as well as bias the consensus estimation in certain circumstances (e.g., Spears et al., 1985, 1986). Conversely, the present data suggest that greater involvement can also be associated with enhanced knowledge, possibly leading to increased judgmental accuracy in consensus estimation. A crucial difference between these last two lines of research is that the studies by Spears et al. (1985, 1986) involved sample-based judgments, whereas the present data reflect self-generated estimates. Paradoxically then, heuristic influences may be greatest when the judgment task is data driven or sample based and the perceiver is subject to the biases of "on-line" information processing (cf. Hastie & Park, 1986). However, it is plausible that knowledge-based factors are more likely to come into play when judgments are self-generated, as here. It is important to reemphasize that this knowledge does not necessarily

have to be accumulated "on-line" itself but may reflect more global social knowledge—such as base rates—promulgated socially and through media polls.

To summarize then, the results of our studies indicate that the polarization-prevalence hypothesis proposed by Judd and Johnson (1981) requires at least some qualification. Just as their research offered a timely reminder of the influence of affect on cognitions, the present findings also suggest that it is important not to emphasize *form* to the exclusion of *content* in social cognition. Focusing on the information-processing heuristics underlying consensus estimation may sometimes lead us to neglect the impact of social knowledge on these judgments.

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