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Illusory Correlation in the Perception of Group Attitudes

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The present study extended the illusory correlation explanation of group stereotyping (Hamilton & Gifford, 1976) by investigating the perception of group attitudes as a function of the observers own attitude. Subjects ($N = 141$) with pro- or anti-attitudes to nuclear power viewed opinion statements supposedly made by residents of two towns. One town was large and statements from it occurred frequently, the other was small and statements from it were infrequent. Statements expressed either pro- or anti-attitudes to the building of a nuclear power station, in which one position was in a majority over the other. Despite the fact that the proportion of pro- and anti-statements was the same for both towns, it was predicted that the most statistically infrequent category, *minority position/small town*, would appear most distinctive and receive greatest encoding, leading subjects to overrepresent this category. It was also hypothesized that attitude-congruent positions would appear more salient than others because of their self-relevance, resulting in enhanced illusory correlation for minority-congruent attitude holders (distinctiveness *plus* salience). Furthermore, it was predicted that salience and therefore illusory correlation would increase as a function of attitude extremity for these subjects. All three predictions were supported. For the majority-congruent attitude holders, the absence of an overall illusory correlation effect, together with an inverse relation between attitude extremity and illusory correlation, suggested that the salience of own position may serve to weaken the illusory correlation effect when it is pitted against distinctiveness. The implications of these findings for attitude and stereotyping research were discussed.

Recent research into social stereotyping has emphasized the underlying cognitive processes involved (Hamilton, 1981; Rothbart, Fulero, Jensen, Howard, & Birrell, 1978; Tajfel, 1969). An example par excellence of the cognitive approach to group perception and stereotyping is provided in the studies of illusory correlation conducted by Hamilton and his colleagues (Hamilton & Gifford, 1976; Hamilton & Rose, 1980). This paradigm forms the basis for the present study.

Hamilton and Gifford (1976) extended the concept of illusory correlation identified by

Chapman (1967) on a verbal learning task, to processes involved in the stereotyping of groups. Illusory correlation is defined by Chapman as "the report by observers of a correlation between two classes of events which in reality (a) are not correlated or (b) are correlated to a lesser extent than reported" (Chapman, 1967, p. 151). Hamilton and Gifford's experiments are an application to a specific social context of the finding that people tend to over associate distinctive events because these distinctive co-occurrences receive more attention, and are better encoded, than nondistinctive co-occurrences.

In their studies these events constituted serially presented instances that varied along two dimensions, a *group* dimension and an *attribute* dimension. Because stereotyping in its simplest form reflects the attribution of a certain characteristic to a group, this provided a setting in which to investigate a cognitive basis for social stereotyping. Hamilton and Gifford showed that an illusory correlation occurred between the two statistically infre-

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quent and therefore distinctive categories on these dimensions; subjects tended to overestimate the prevalence of infrequent behaviors in a small, infrequently occurring group. This finding held when the infrequent behaviors were *moderately undesirable* or *moderately desirable*, suggesting that distinctiveness due to statistical infrequency rather than distinctiveness due to undesirability per se is the important factor in mediating illusory correlation. The relevant social context that their study sought to represent was the case where a majority (e.g. whites) stereotypes a distinctive minority (e.g. blacks) because majority members might erroneously associate distinctive behaviors with the distinctive minority. This finding concurs with a growing literature that relates distinctiveness in the social context to stereotyping processes via its consequences for perceived salience and availability (e.g. Rothbart et al., 1978; Taylor, 1981).

A criticism that has been leveled at cognitive accounts of stereotyping is that they tend to operate in a social vacuum (Tajfel, 1981). Although Tajfel is credited with signaling the switch to a cognitive approach (Hamilton, 1981), he is equally concerned that neglecting the social dimension and the evaluative dimension in particular, represents a theoretical retreat (Tajfel, 1981). The cognitive approach in general has tended to treat the evaluative aspects of social stereotypes as epiphenomena of cognitive processes. Recent evidence, however, indicates that value may also act on cognitions (e.g. Judd & Johnson, 1981; van der Pligt, 1984). In the present case, it is notable that the illusory correlation paradigm Self-Relevant or Involvement factors, which could provide information concerning the motivational aspects of stereotyping phenomena.

The present study incorporates the Self-Relevance factor in order to test the generalizability of the illusory correlation paradigm. One way of making the typical illusory correlation task self-relevant is by using more value laden and involving stimuli on the attribute dimension. In this study, subjects were presented with attitude statements ranging from *extremely pro* to *extremely anti* on an issue about which they were likely to have strong views (as compared with the moderate

behavioral instances in the Hamilton and Gifford study). To achieve the distinctiveness manipulation, half the time pronuclear-statements formed a majority while antinuclear-statements formed a minority and half the time the reverse was the case. Therefore subjects attitudes could be congruent with either the majority or minority position.

There are two ways in which using a value-laden issue may have important consequences for the perception and judgment of stimuli. First, because people are likely to be more ego-involved in the issue as a whole, this will lead to more polarized judgments of the stimuli (e.g. Judd & Johnson, 1981; Judd & Krosnick, 1982; Sherif & Sherif, 1967). A second and related factor is that the person's own attitude on the issue may form an important feature in the person's self-perception, and it is this aspect that we refer to as *self-relevance*. It is argued here that self-relevant attitude positions are likely to appear more salient than other positions and therefore, like distinctive stimuli they should be better encoded (distinctiveness and salience are related because they both serve to enhance the attention and encoding devoted to stimuli).

Lemon & Warren (1974) have shown that self-relevant traits are more salient, and evidence that self-relevant information is more easily processed is also forthcoming from research on self-schemata (Markus, 1977). In the realm of attitudes, Ross (1977) has suggested that our own preferred viewpoints are likely to be more familiar and available to us, helping to explain the *false consensus* effect—people's tendency to overestimate the prevalence of their own attitudes and behaviors. In addition there may be motivational factors that affect the salience and therefore perceived prevalence of attitude congruent positions (e.g. Goethals & Darley, 1977).

The degree of commitment or involvement associated with one's own attitude position should also enhance the salience of attitude congruent positions; high commitment and involvement will make the attitude a more important and central feature in one's self-perception (e.g. Judd & Krosnick, 1982). Because the degree of ego-involvement in a position is also related to attitude polarization (Judd & Krosnick, 1982; Sherif & Sherif,

1967), the salience of attitude congruent positions should increase as a function of attitude extremity.

Relative to the illusory correlation paradigm, for minority-congruent attitude holders, the minority position will be both distinctive due to its statistical infrequency and salient due to self-relevance. Thus, illusory correlations between the minority position and the distinctive group should be greater for minority-congruent attitude holders than for majority-congruent attitude holders where distinctiveness and salience oppose each other on the attribute dimension (the majority rather than the minority position is salient). In so far as ego-involvement is also related to the perceived salience of own position, illusory correlation should increase as a function of attitude extremity for minority-congruent attitude holders, but not for majority-congruent attitude holders.

To summarize, the present article explores the possible mediating roles of own attitude position and attitude extremity within the illusory correlation paradigm, where own attitude may be congruent with either majority or minority positions. The major departure from Hamilton and Gifford's study is that all stimuli are located on a single issue (as compared with a wide range of unrelated behavior items) and hence own attitude position becomes a salient variable (self-relevance). The extent to which it is salient should depend on the degree of ego-involvement or attitude extremity. These factors should serve to potentiate illusory correlations for minority-congruent holders but not for majority-congruent attitude holders.

The particular attitude issue used in this study was nuclear power and the building of nuclear power stations. At the time this experiment was conducted, this was a fairly prominent political issue both nationally and locally in the south west of England. The Central Electricity Generating Board was in the process of embarking on a well-publicized nuclear energy policy including plans for a new nuclear power station somewhere in the south west, possibly in a completely new location. As a result, people in the areas affected became involved in the issue and on one of the possible sites, a prolonged, public

sit-in took place, which was covered by the national press and electronic media. In this context, nuclear power, and specifically the building of nuclear power stations was a salient issue about which people might hold strong views. This involvement was reflected by the high response rates to postal questionnaire surveys on this issue (50%–80%) (Eiser, van der Pligt, & Spears, 1984) and is confirmed generally by the bimodal or polarized distribution of attitudes toward nuclear power found in numerous studies (van der Pligt, 1982). This polarization is operationally useful because it allows for a simply dichotomy of pro- and anti-attitudes in the experiment without seriously misrepresenting the distribution of attitudes people typically hold.

Method

Subjects

Students at Exeter University ($n = 126$) and local members of the Campaign for Nuclear Disarmament ($n = 15$) agreed to participate in a study "about people's opinions on nuclear power." Subjects were run individually or in groups no larger than 5 persons per session. They were randomly assigned to experimental conditions.

Stimulus Materials

A list of 80 opinion statements was developed to cover the range from *extremely in favor of* to *extremely opposed* to the building of a nuclear power station locally. Ostensibly neutral items were not included, leaving 40 pronuclear items and 40 antinuclear items. Thirty students rated the statements on 11-point scales in terms of how pronuclear or antinuclear power they judged each opinion. On the basis of this pilot, items with the smallest *SD* (0.63 to 1.2) and representing the whole distribution (1.37 to 10.73) and range of opinion contents were selected for use in the experiment (24 pro- and 24 anti-items). Four stimulus sets were constructed. All sets consisted of a series of 36 exposures of statements recorded on videotape. Each statement was credited to a person from either Town A (frequent) or Town B (infrequent), the conditions being either a majority of pronuclear statements and a minority of antinuclear statements, or vice versa. The towns were presented as being close to possible sites for a new nuclear power station. Items were of the form "Mrs. Jones, a resident in Town A, is generally in favor of nuclear power because . . . 'I think nuclear power will mean cheaper electricity bills.'" Sex, name, town, and opinion were systematically varied (substituting "generally opposed to" for the antinuclear residents). Extremity and content of the items were also balanced as far as possible across town and condition. Additionally, both conditions were counterbalanced for item content by exchanging all the Town B statements

Table 1
Distribution of Stimulus Sentences

Town	Attitude position		Subtotals
	Majority	Minority	
Town A	16 (0.67)	8 (0.67)	24
Town B	8 (0.33)	4 (0.33)	12
	24 (1.00)	12 (1.00)	36

Note. Conditional proportions in parentheses.

with equivalently valenced and rated Town A statements from the original sets, making up the four stimulus sets altogether (there were no significant differences in the extremity of the pronuclear and antinuclear statements across the four stimulus sets). Specifically, the distribution of the 36 statements was as follows: *either* Town A, pro: 16, Town A, anti: 8, Town B, pro: 8, Town B, anti: 4; *or* Town A, anti: 16, Town A, pro: 8, Town B, anti: 8, Town B, pro: 4 (see Table 1). It can be seen that the ratio of statements is always 2:1 in favor of residents in Town A. Also in any one condition the ratio is always 2:1 for *both* towns in favor of either pro *or* anti nuclear positions. Thus Town B is more distinctive by virtue of its occurring less frequently than Town A, whereas in one condition antinuclear positions are more distinctive and in the other, pronuclear positions are more distinctive for the same reason.

Procedure

Subjects were told that the experiment was about people's attitudes to nuclear power. Before proceeding, they rated a number of attitude statements concerning the issue of nuclear power. The experiment was outlined in a written introduction given to the subjects. It read as follows:

This experiment investigates how people perceive and retain other people's views on a certain subject. You will be presented with a series of slides showing a sentence describing a person's opinion. To make things real we actually asked people to sum up in a few words their views on a topical local issue: the building of a new nuclear power station in their area. People were asked if they were generally in favor of or opposed to this proposal and they were asked to state a reason for their opinion. (People with no opinion either way have been ignored for this experiment.) In the sentences you will see in the experiment, the people expressing their opinions will be identified as coming from either one of two towns in the south west of England. Just in case knowing the real names of these places affects your answers later, we will call these *Town A* and *Town B*. However, we can tell you that these towns are close to sites that were recently considered by the CEGB (Central Electricity Generating Board) for a possible new nuclear power station. In collecting opinions on this issue, we drew random samples that were representative of each town. However, because Town A is bigger than Town B, opinions of people from Town A occur *less* frequently in the slides as you will see. . . .

Subjects were then shown a few example slides to familiarize them with the format. At this point it was stressed that it was not important to remember each person's name but to pay particular attention to the resident's opinion and which town they came from. Subjects were then presented with the sequence of 36 exposures on a video screen. The exposures lasted 11 s each with 1-s fade intervals. Immediately after the screening subjects were instructed to answer questions in a booklet containing the dependent measures.

Dependent Measures

Attitude measure. Prior to the experiment, subjects rated eight attitude statements concerning the issue of nuclear power on Likert-type scales, ranging from *very strongly disagree* (1) to *very strongly agree* (7).

Attribution of statements to town. This section asked the subject to attribute each opinion statement to Town A or Town B. All the opinions were listed without names and subjects were asked to fill in a letter for each, corresponding to the resident's town.

Trait ratings. Four positive traits and four negative traits were selected for their relevance as possible descriptions of both sides of the nuclear debate. The positive traits were *level-headed*, *trustworthy*, *objective*, *intelligent*; the negative traits were *complacent*, *irrational*, *extremist*, *self-interested*. Subjects rated how much each trait described residents from both towns on a 9-point scale ranging from *not at all* (1) to *extremely* (9). These trait ratings provide a measure of evaluation differences in the perception of the two towns.

Percentage estimates of positions. On this measure subjects indicated what percentage of pronuclear and antinuclear residents they estimated there were in each town. (The pronuclear and antinuclear categories were actually further subdivided into *moderate* and *extreme* residents although this division will not concern us here.)

Single attitude measure. On the same page as the percentage estimates, subjects indicated their own attitude to nuclear power on a single 7-point scale: *extremely opposed*, *moderately opposed*, *slightly opposed*, *neutral/don't know*, and *extremely in favor*.

Because the basic manipulation requires that residents in Town B be perceived as occurring less frequently than these in Town A, if the subject perceived more Bs than As, Town B could not have been perceived as more distinctive. It was therefore decided, following Hamilton and Gifford (1976), to eliminate these data from the analyses. Twenty subjects were thereby excluded leaving 121, a default ratio (14%), which compares favorably with Hamilton and Gifford's study (17.5%, Study 1; 24%, Study 2). On the percentage estimates measure, a further 3 subjects were excluded because their percentage estimates did not sum to a hundred ($n = 118$ for this measure). Some subjects were also eliminated from the trait measures because not all trait labels were rated.

Results

Independent Variables and Manipulations

The subjects' attitude to nuclear power formed a basic independent variable in the experiment. A reliability check on the eight statement attitude scale yielded a Cronbach's

alpha of 0.86 ($n = 121$). Scores on this scale were correlated with responses on the single 7-point measure of attitude to nuclear power. This yielded a Pearson's correlation coefficient of 0.85 ($n = 121$), $p < .0001$. This suggests that the single attitude measure may reliably be used as a general indicator of attitude on this issue. The remainder of the results divide into three main sections concerned respectively with the basic illusory correlation hypothesis, the effects of attitude; whether own position is congruent with the majority or minority position, and the effects of attitude extremity.

Test for Overall Illusory Correlation Effect Attribution of Statements to Town

A 2×2 contingency table was computed for each subject representing the number of pronuclear or antinuclear positions attributed to each town. From Table 1 it can be seen that there is no real relation between town and the attitudes of residents. However, Table 2, which presents the attribution of statements means across all subjects indicates a trend toward illusory correlation in the direction of paired distinctiveness. Namely, the ratio of attributed to actual occurrences of statements is greatest in the minority-attitude small town cell (0.47 compared to an actual conditional probability of 0.33).

In order to test the illusory correlation hypothesis, a phi (ϕ) coefficient was computed from each subject's 2×2 contingency table. Phi is a correlation coefficient for the case of a 2×2 contingency table, which provides a measure of the degree of relation between, in this case, town and minority-majority attitude position. Phi can vary between *no relation* (0) and *completely related* (1).¹ Because phi is a proportion measure, these data were transformed following Winer (1971).² Comparing the mean of subject's transformed phi scores to zero resulted in a significant difference: $\phi = 0.259$, $t(120) = 2.45$, $p < .01$ (one-tailed). Thus illusory correlation in the direction of paired distinctiveness does occur on the statement attribution measure.

Percentage Estimates of Attitude Positions within Towns

In the nature of the previous dependent measure, the frequency of attitude positions

Table 2
Overall Attribution of Statements to Town Means

Town	Attitude position				<i>M</i> total
	Majority		Minority		
	Pro- portion		Pro- portion		
Town A					
<i>M</i>	14.75	0.61	6.41	0.53	21.16
<i>SD</i>	3.43		2.78		
Town B					
<i>M</i>	9.25	0.39	5.59	0.47	14.84
<i>SD</i>	3.43		2.78		
Total	24.00	1.00	12.00	1.00	36.00

was kept constant while subjects were asked to attribute given statements to either town. The present measure is directed at detecting divergent perceptions of the towns when subjects are given a free hand to determine the proportions of either position in each town. Again a 2×2 contingency table was computed for each subject, representing the percentage of pronuclear and antinuclear residents attributed to each town. Table 3 presents these mean scores over all subjects. Inspection of these data suggest a trend toward illusory correlation; the ratio of estimated to actual percentages is greatest in the minority attitude/small town cell (43.68% compared to 33.33%).

To test the illusory correlation hypothesis a phi coefficient was once more computed for each subject on this measure. Comparing the mean transformed phi scores to zero resulted in a significant difference: $\phi_t = 0.247$, $t(117) = 3.00$, $p < .005$ (one-tailed); illusory correlation in the direction of paired distinctiveness also occurs on the percentage estimates measure.

Congruence between Attitude and Majority or Minority Position

These analyses concentrate on differences between majority-congruent and minority-

¹ Phi scores deriving from a relation along the minor diagonal of the contingency table, the reverse of paired distinctiveness as manipulated in the experiment, were assigned a negative value to differentiate them from illusory correlation obtaining from paired distinctiveness.

² Transformed $\phi = 2 \arcsin \sqrt{\phi}$.

Table 3
Overall Percentage Estimates Means

Overall Percentage Estimates Means					
Town	Attitude position				Total
	Majority		Minority		
	Perceived %	Actual %	Perceived %	Actual %	
Town A					
<i>M</i>	62.38	66.67	32.62	33.33	100.00
<i>SD</i>	16.14		16.14		
Town B					
<i>M</i>	56.32	66.67	43.68	33.33	100.00
<i>SD</i>	17.45		17.45		
Total	118.70		81.30		200.00

Note. $n = 118$.

congruent attitude holders. For these purposes subjects were categorized as either pro- or anti- according to the 7-point attitude scale.

Attribution of Statements to Town

In categorizing subjects as pro- or anti- on this measure, four neutral subjects were ex-

cluded ($n = 117$). Table 4 presents the attribution of statements means for the majority-congruent and minority-congruent attitude subjects, respectively. Comparison of these data indicate that the trend toward illusory correlation is greater in the minority-congruent attitude category. A 2×2 (Attitude $\times$ Majority Position) analysis of variance

Table 4
Attribution of Statements to Town Means As a Function of Congruence Between Own Attitude and Majority or Minority Position

Attitude position					
Town	Majority		Minority		Total
	Proportion	Proportion			
Majority-congruent attitude subjects					
Town A					
<i>M</i>	14.24	0.59	6.90	0.58	21.14
<i>SD</i>	3.51		3.01		
Town B					
<i>M</i>	9.76	0.41	5.10	0.42	14.86
<i>SD</i>	3.51		3.01		
Total	24.00	1.00	12.00	1.00	36.00
<i>n</i> = 62					
Minority-congruent attitude subjects					
Town A					
<i>M</i>	15.40	0.64	5.80	0.48	21.20
<i>SD</i>	3.13		2.40		
Town B					
<i>M</i>	8.60	0.36	6.20	0.52	14.80
<i>SD</i>	3.13		2.40		
Total	24.00	1.00	12.00	1.00	36.00
<i>n</i> = 55					

(ANOVA) was performed on subjects' transformed phi coefficients. This revealed a significant interaction of attitude (pro- or anti-) and majority position (pro- or anti-), $F(1, 113) = 4.89, p < .05$, but no significant main effects of attitude or majority position. This finding points to a difference between the majority-congruent and minority-congruent attitude categories.

The ratio of attributed to actual occurrences in the minority attitude/small town cell, is larger for the minority-congruent subjects (0.52:0.33) compared with the majority-congruent subjects (0.42:0.33). Furthermore, in the majority-congruent category there seems to be a tendency to relatively overestimate the prevalence of the majority position in Town B as well as the minority position in Town B, which weakens the prospect of there being a relation between the two dimensions in the direction of paired distinctiveness. Thus, although the proportion of attributed statements for the majority position/Town A cell is close to the actual proportion for the minority-congruent group (0.64 compared with 0.67), the attributed proportion in this cell for the majority-congruent group is smaller (0.59 compared to 0.67).

To test directly for a difference in illusory correlation between majority-congruent and minority-congruent attitude holders, a one-way ANOVA was performed on subjects transformed phi scores across these two groups. This resulted in a significant difference; minority-congruent subjects produced more illusory correlation ($M = 0.523$) than majority-congruent subjects ($M = 0.059$), $F(1, 116) = 4.93, p < .05$. Furthermore the mean of transformed phi coefficients was not significantly greater than zero for the majority-congruent group, $t(61) = 0.38, ns$, whereas for the minority-congruent group it was, $t(54) = 3.82, p < .001$.

To summarize, it appears that illusory correlation by paired distinctiveness is largely restricted to minority-congruent attitude holders on the statement attribution measure.

Percentage Estimates of Attitude Positions Within Towns

A similar procedure was adopted here as for the statement attribution measure. In

categorizing subjects as pronuclear or anti-nuclear, 3 neutral subjects were excluded ($n = 115$). A 2×2 (Attitude $\times$ Majority) Position ANOVA was performed on subjects transformed phi coefficients. This resulted in a significant interaction, $F(1, 111) = 15.90, p < .001$ and no significant main effects of attitude or majority position. Again this finding points to a difference between majority-congruent and minority-congruent attitude categories. Table 5 presents the percentage estimate means of the 2×2 contingency tables for majority-congruent and minority-congruent attitude holders, respectively.

Inspection of these data suggest that there is no trend toward illusory correlation by paired distinctiveness in the majority-congruent group (Table 5). Although these subjects estimated that nearly 40% of residents in the smaller town subscribed to the minority position compared to an actual value of 33%, in terms of the association between town and position dimensions, this is inconsequential because subjects also estimated the prevalence of the minority position in Town A to be in excess of 40% (42.08%). Majority-congruent subjects seemed to generally overrepresent the proportion of minority attitude positions per se. However, a very different pattern of percentage estimates means is evident for minority-congruent subjects (Table 5).

Whereas the distribution of estimated percentages of attitude positions for Town A is identical with the actual values (66.67% and 33.33% for majority and minority positions, respectively), the distribution in Town B is much more equal (52.41% and 47.59% for majority and minority positions, respectively), indicating a trend toward illusory correlation by paired distinctiveness. Testing directly for the difference between minority-congruent and majority-congruent attitude subjects, a one-way ANOVA was performed comparing transformed phi coefficients between these two groups. This confirmed that the degree of association between dimensions was greater for minority-congruent subjects ($M = 0.566$ compared to $M = -0.068$ for majority-congruent subjects), $F(1, 114) = 16.44, p < .001$. Again, as for the statement attribution measure, the mean of transformed phi coefficients was not significantly greater than zero for the majority-congruent attitude group, $t(60) =$

-0.58, *ns*, whereas it did significantly exceed zero for the minority-congruent group, $t(54) = 5.56$, $p < .0001$.

To summarize, evidence of illusory correlation on this measure once again appears to be confined to the minority-congruent attitude holders.

Trait Ratings

One important indicator of how people perceive and stereotype groups is their use of trait ratings. The previous measures have shown that the majority-congruent and minority-congruent subject groups differed in the degree to which they estimated the relative prevalence of preferred and nonpreferred attitudes within the two towns. Subjects could use these estimates as a basis for making evaluations regarding the towns.

A similarity-attraction hypothesis (e.g. Byrne, 1961) would suggest that subjects who perceive an illusory correlation should evaluate more positively the town associated with the preferred attitude position and evaluate

more negatively the town associated with the opposed attitude position. Thus it would be predicted that the minority-congruent group for whom illusory correlation was greatest, should evaluate Town B more positively than Town A. There should be no significant evaluative differences for the majority-congruent group who did not display the illusory correlation effect overall. To test this, evaluative scores were computed by summing trait ratings by evaluation valence (positive, negative) and Town (A, B) making four scores for each subject.

The evaluative scores for the two towns were then compared within subjects for positive and negative traits. Table 6 presents these data with t values. Consistent with the above hypotheses, minority-congruent subjects significantly evaluated Town B more positively ($M = 20.15$ compared to 17.60 for Town A), $t(49) = -3.13$, $p < .005$. They also significantly evaluated Town A more negatively ($M = 21.74$ compared to 19.38 for Town B), $t(49) = 3.28$, $p < .005$. There were

Table 5
Percentage Estimates Means As a Function of Congruence Between Own Attitude and Majority or Minority Position

Town	Attitude position				Total
	Majority		Minority		
	Perceived %	Actual %	Perceived %	Actual %	
Majority-congruent subjects					
Town A					
<i>M</i>	57.92	66.67	42.08	33.33	100.00
<i>SD</i>	17.83		17.83		
Town B					
<i>M</i>	60.02	66.67	39.98	33.33	100.00
<i>SD</i>	18.09		18.09		
Total	117.94		82.06		200.00
<i>n</i> = 61					
Minority-congruent subjects					
Town A					
<i>M</i>	66.67	66.67	33.33	33.33	100.00
<i>SD</i>	12.44		12.44		
Town B					
<i>M</i>	52.41	66.67	47.59	33.33	100.00
<i>SD</i>	16.25		16.25		
Total	119.08		80.92		200.00
<i>n</i> = 54					

Table 6
*Trait Evaluation of Town as a Function of Congruence Between Own Attitude
 and Majority or Minority Position*

Town	Majority-congruent			Minority-congruent		
	Positive trait (Town A)	Negative trait (Town B)	<i>t</i> (58)	Positive trait (Town A)	Negative trait (Town B)	<i>t</i> (49)
<i>M</i>	19.15	20.95	-0.80	17.60	21.74	-3.13*
<i>SD</i>	4.43	4.15		4.46	5.31	
<i>M</i>	19.73	19.83	1.66	20.14	19.38	3.28*
<i>SD</i>	4.51	4.21		4.59	4.09	

Note. *M* = the sum of positive or negative traits (range 4-36).

* $p < .005$.

no significant differences in evaluation for majority-congruent attitude subjects. Nevertheless, the evaluative difference in ratings of the towns was only marginally greater for the minority-congruent subjects on the positive traits, $F(1, 107) = 3.29$, $.05 < p < .1$, and was not significantly greater for the negative trait ratings, $F(1, 107) = 1.58$, *ns*.

Effects of Attitude Extremity

In this section the effects of attitude extremity on illusory correlation is examined for majority-congruent and minority-congruent attitude holders on the two indices of illusory correlation. Attitude extremity was measured by the 7-point attitude scale; subjects were classified according to whether they described their attitude as *slight*, *moderate*, or *extreme*.

Figure 1 presents the plot of transformed phi coefficients across these three attitude categories, for majority-congruent and minority-congruent subjects, on the statement attribution and percentage estimates measures. The ordinate indicates the magnitude of transformed phi coefficients and thus the degree of illusory correlation due to paired distinctiveness. Inspection of both graphs suggests an interaction between attitude extremity and minority/majority-congruence. For majority-congruent attitude holders illusory correlation appears to decrease as a function of attitude extremity, although this trend was only significant on the percentage estimates measure and not on the statement attribution measure: $F_{linear}(1, 58) = 7.21$, $p < .01$ and $F_{linear}(1, 59) = 1.34$, *ns*, respectively.

For minority-congruent attitude holders, illusory correlation seems to increase as a function of attitude extremity, although this time the trend was significant on the statement attribution measure but not on the percentage estimates measure: $F_{linear}(1, 52) = 4.78$, $p < .05$ and $F_{linear}(1, 51) = 2.47$, *ns*, respectively. Together, these two measures suggest that illusory correlation increases with attitude extremity for minority-congruent attitude holders and decreases with attitude extremity for majority-congruent attitude holders.

As a further test of this interaction one-way ANOVAs were performed comparing transformed phi coefficients between majority and minority-congruent subjects for the three attitude categories on the two dependent measures. For both statement attribution and percentage estimates measures there was a significant difference in illusory correlation for extreme subjects. On the statement attribution measure the mean transformed phi value for the minority-congruent group ($M = 0.858$) significantly exceeded the equivalent value for the majority-congruent group ($M = -0.088$), $F(1, 38) = 7.33$, $p < .05$. Similarly, on the percentage estimates measure, the mean transformed phi value for the minority-congruent group ($M = 0.823$), very significantly exceeded its majority-congruent equivalent ($M = -0.362$), $F(1, 37) = 24.99$, $p < .001$.

Parallel analyses for moderate subjects resulted in a similar though weaker pattern. The mean transformed phi value was significantly higher for minority-congruent subjects than for majority-congruent subjects on the

percentage estimates measure ($M = 0.440$ compared to $M = -0.154$), $F(1, 38) = 4.37$, $p < .05$, although the equivalent means showed only a marginal significant difference on the statement attribution measure ($M = 0.584$ compared to $M = -0.045$, respectively) $F(1, 39) = 3.04$, $.05 < p < .1$. There were no differences between majority and minority-congruent attitude subjects with slight attitudes ($F_s < 1$).

Figure 1. Illusory correlation as a function of attitude extremity and attitude congruence. (The illusory correlation corresponds to mean transformed phi values).

Finally, only extreme subjects in the minority-congruent condition produced transformed phi values that were significantly greater than zero on both dependent measures: $t(17) = 4.55, p < .001$ and $t(17) = 7.99, p < .001$ for the statement attribution and percentage estimates indices, respectively. (Moderate minority-congruent subjects marginally exceeded zero on these two measures, $t(17) = 2.08$, and $t(16) = 1.89, .05 < p < .1$, respectively. The mean transformed phi value also significantly exceeded zero on the percentage estimates measure for *slight* attitude holders in the minority-congruent group: $M = 0.437, t(18) = 2.56, p < .05$. For majority-congruent subjects on the percentage estimates measure, the mean transformed phi value was marginally less than zero for extreme attitude holders and marginally greater than zero for slight attitude holders, $t(20) = -1.80$ and ($M = 0.411$), $t(16) = 1.99, .05 < p < .1$, respectively).

Discussion and Conclusion

First of all, this study replicates the findings of Hamilton and Gifford (1976); distinctiveness, operationalized as statistical infrequency, mediated an illusory correlation effect. In keeping with the paired distinctiveness hypothesis, which posits that the most distinctive co-occurrences are encoded best, subjects tended to overassociate the minority-attitude position with the smaller town overall. Thus this hypothesis generalizes to the perception of group attitudes as well as behaviors.

However, these data also suggest that people's own attitudinal characteristics may be as, if not more, important in mediating those illusory correlation processes that distort the estimated distribution of attitudes within groups. Specifically, minority-congruent attitude holders displayed significantly more illusory correlations than majority-congruent attitude holders, who did not show illusory correlation overall. Because the illusory correlation effect results from the differential encoding of certain events or co-occurrences (Hamilton, Dugan, & Trolier, 1985) one explanation for this finding may be that minority attitude positions are relatively better encoded when they are congruent with the observer's attitude.

We predicted that positions congruent with one's own attitude would appear more salient than others because of their self-relevance. It is axiomatic that salient stimuli will receive greater attention than nonsalient stimuli. Therefore, it follows that co-occurrences that combine salience and distinctiveness on respective dimensions will receive enhanced encoding. The minority-congruent attitude group therefore represents the case where two factors join to enhance the encoding of co-occurrences in the minority position/small town cell. First, as in Hamilton & Gifford (1976), the most statistically infrequent co-occurrences should be encoded best because they represent the most distinctive category. Second, the conjunction of salience and distinctiveness implies that again instances of the minority position/small town cell will be most elaborately encoded. Should these two effects summate, illusory correlation would be expected to be highest for minority-congruent attitude holders. Turning to the majority-congruent attitude holders, it is interesting that no illusory correlation is produced overall in this subsample, despite the distinctiveness manipulation. It may be that because it is now the majority-attitude positions that are congruent with one's own attitude that these appear relatively salient and are more efficiently encoded than, say, minority positions perceived by minority-congruent attitude holders. In this case, the enhanced encoding of the majority position due to the salience of self-relevant attitude positions is pitted against the enhanced encoding due to distinctiveness, so that these two effects may cancel each other out.

These issues may be addressed in more detail by turning to the effects of attitude extremity on illusory correlation. First, as predicted, the present data suggest that illusory correlation increases as a function of attitude extremity for minority-congruent attitude holders. If the salience of minority-congruent attitude positions is greatest for people with extreme attitudes, these positions should receive most attention and be encoded best in this subgroup. Co-occurrences between these positions and the distinctive town should also receive correspondingly high levels of attention and encoding, resulting in a relatively high degree of illusory correlation. Thus

for minority-congruent attitude holders, it is possible that illusory correlation may be mediated chiefly by distinctiveness for people with slight attitudes, but mediated by distinctiveness and salience for people with extreme attitudes. However, these data also suggest that illusory correlation decreases as a function of attitude extremity for majority-congruent attitude holders. In this case it is the majority positions that should appear salient, and these will receive greatest attention and encoding from extreme-attitude holders. Again, this trend may work to weaken the effect of paired distinctiveness on illusory correlation.

The present data also suggest that differences in the pattern of illusory correlation between minority-congruent and majority-congruent attitude holders manifest themselves in differential evaluations of the towns on the trait measure. Because the minority-congruent attitude holders significantly overestimate the prevalence of their own position in the small town, it is predictable that they should evaluate the small town more positively and the large town more negatively. Conversely, because there is no overall illusory correlation effect in the majority-congruent attitude group, divergent evaluations of the two towns would not be predicted and do not occur.

The current findings should now be considered in terms of their implications for previous studies of group perception and their relevance to group perception in real life. In their study, Hamilton and Gifford identify the social stereotyper with membership of or reference to the larger more frequent group. Thus ubiquitous white people might tend to associate infrequent black people with infrequent or extreme behaviors. As it stands, a weakness of this argument is that it seems to ignore group perception from the perspective of the distinctive minority group. Minorities are typically less in a position to exercise discrimination or prejudice correspondent with a negative stereotype, so not unnaturally the stereotyping and ethnocentrism literature tends to concentrate on the stereotyping of minorities by majorities. However, because we are interested in the cognitive aspects of group perception generally, and not just overt discrimination, the minority perspective must

be included. An important empirical justification for this rapprochement is contained in the present findings.

For the reasons outlined above, it is precisely among people endorsing a minority position that greatest divergences in intergroup perception seem to occur. Previously it has been shown that people subscribing to a minority position have a relatively distorted and overoptimistic view of consensus for their own position (Sanders & Mullen, 1983). The present study uncovers a cognitive bias, originating from attitudes, explaining why such people may also misperceive the distribution of consensus for their position across social groups. This tendency may also be very functional in terms of providing support for one's own position. To examine this, consider the case where there is no illusory correlation, and a minority view is equally distributed across two or more unequal groups. In terms of base rates, the amount of consensus for the minority view may be identical to the case where illusory correlation occurs and the minority view is seen as relatively more representative of the distinctive group. Although objectively there may be no difference in support for the minority position in these two examples, they may be very different in psychological terms. Whereas minority views evenly distributed across groups may appear dissipated without any chance of challenging the dominant consensus, these views may be much more powerful and influential if they characterize opinion in a distinctive social group albeit a minority group (and conversely, in terms of people advocating the majority position, denial of intergroup differences in consensus for the minority position may reduce its threat as a cohesive force characteristic of a certain group). A line of research conducted by Moscovici and his colleagues supports the notion of minority group influence (Moscovici, 1976; Mugny, 1982). The influence of a radical minority group in effecting social change can be considerable. The cognitive bias discussed here may not only lead certain people to overestimate support for their attitudes in certain distinctive groups, it may also instigate group identification processes, which may regulate their behavior toward and within such groups.

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Corrections to Spears et al.

In the article "Illusory Correlation in the Perception of Group Attitudes" by Russell Spears, Joop van der Pligt, and J. Richard Eiser (*Journal of Personality and Social Psychology*, 1985, Vol. 48, No. 4, pp. 863-875), several important corrections and additions were not made in the course of the production process. One of these corrections includes Table 6 (originally cited on p. 871), which is reprinted here in its corrected format. Other corrections are listed below and are grouped according to page numbers.

Page 864

In column 1, paragraph 1, a sentence reads, "In the present case, it is notable that the illusory correlation paradigm Self-Relevant or Involvement factors, which could provide information concerning the motivational aspects of stereotyping phenomena." It should read, "In the present case, it is notable that the illusory correlation paradigm *excludes* Self-Relevance or Involvement factors, which could provide information concerning the motivational aspects of stereotyping phenomena."

In column 1, paragraph 2, a sentence reads, "In this study, subjects were presented with attitude statements ranging from *extremely pro* to *extremely anti*, on an issue about which they were likely to have strong views (as compared with the moderate behavioral instances in the Hamilton and Gifford study). It should read, "In this study, subjects were presented with attitude statements ranging from *extremely pro* to *extremely anti* on nuclear power, an issue about which they were likely to have strong views (as compared with the moderate behavioral instances in the Hamilton and Gifford study)."

Page 867

In column 1 the first heading reads, *Tests for Overall Illusory Correlation Effect Attribution of Statements to Town*. It should read, *Test for Overall Illusory Correlation Effect: Attribution of Statements to Town*.

In column 1, paragraph 2, the sentence reads, "Comparing the mean of subject's transformed phi

scores to zero resulted in a significant difference: $\phi = 0.259$, $t(120) = 2.45$, $p < .01$ (one-tailed). It should read, "Comparing the mean of subjects' transformed phi scores to zero resulted in a significant difference: $\phi_1 = 0.259$, $t(120) = 2.45$, $p < .01$ (one-tailed).

Page 868

In Table 3 the mean for Minority Perceived % reads 32.62%. It should read 37.62%.

Page 870

In column 2, line 11, the sentence reads, "To test this, evaluative scores were computed by summing trait ratings by evaluation valence (positive, negative) and Town (A,B) making four scores for each subject." The sentence should read, "to test this, evaluative scores were computed by summing trait ratings by *evaluative* valence (positive, negative) and Town (A,B) making four scores for each subject."

In column 2, paragraph 1, a sentence reads, "Consistent with the above hypotheses, minority-congruent subjects significantly evaluated Town B more positively ($M = 20.15$ compared to 17.60 for Town A, $t(49) = -3.13$, $p < .005$. It should read, "Consistent with the above hypotheses minority-congruent subjects significantly evaluated Town B more positively ($M = 20.14$ compared to 17.60 for Town A, $t(49) = -3.13$, $p < .005$.

Page 873

In column 2, paragraph 1, the sentence reads, "It may be that because it is now the majority-attitude positions that are congruent with one's own attitude that these appear relatively salient and are more efficiently encoded than, say, minority positions perceived by minority-congruent attitudes holders." It should read, "It may be that because it is now the majority-attitude positions that are congruent with one's own attitude that these appear relatively salient and are more efficiently encoded than, say, *majority* positions perceived by minority-congruent attitude holders.

Table 6
Trait Evaluation of Town as a Function of Congruence Between Own Attitude and Majority or Minority Position

Traits	Majority-congruent			Minority-congruent		
	Town A	Town B	$t(58)$	Town A	Town B	$t(49)$
Positive						
<i>M</i>	19.15	19.73	-0.80	17.60	20.14	-3.13*
<i>SD</i>	4.43	4.51		4.46	4.59	
Negative						
<i>M</i>	20.95	19.83	1.66	21.74	19.38	3.28*
<i>SD</i>	4.15	4.21		5.31	4.09	

Note. *M* = the sum of positive or negative traits (range 4-36).

* $p < .005$.