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Illusory correlation and attitude-based vested interest

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Abstract

The present studies test whether having a 'vested interest' in a particular outcome affects perceived covariation. Vested interest was defined as a function of whether Dutch university students were in favour or against the implementation of a threatening policy (receiving lectures in English as opposed to the native Dutch). In both studies subjects were told that this policy would be tried out at either their own or another comparable university, and that the university chosen would be the one with the greatest proportion of support for the plan. In Study 1 subjects ($n=151$) were presented with statements expressing pro or contra attitudes and arguments to the policy. These were ostensibly derived from students at both universities but university affiliation was not indicated. In Study 2 ($n=114$) similar information was provided but the statements were attributed to students from the two universities, such that there was an equal proportion of opposition/support for the plan at both universities. We hypothesized that illusory correlations would reflect the vested interest of attitude such that students opposing the policy would overestimate the proportion of opponents to supporters at their own university compared to those in favour of the policy. The results of both studies supported our hypothesis and they also revealed attitude to be a more important predictor of illusory correlation than perceived personal consequences for themselves. The prediction that illusory correlations would be weaker in Study 2 than in Study 1, because it provides less scope for bias, was not supported. The implications of these findings are discussed.

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INTRODUCTION

Judgment of covariation plays an important role in a number of central areas in psychology including learning theory (Bandura, 1977), cognitive development (e.g. Inhelder & Piaget, 1958), implicit personality theory (e.g. Bruner & Taguiri, 1954), clinical assessment (e.g. Chapman & Chapman, 1967), helplessness and control (e.g. Seligman, 1975), attribution theory (e.g. Kelley, 1967), and social stereotyping (e.g. Hamilton & Sherman, 1989) (for general reviews see Alloy & Tabachnik, 1984; Crocker, 1981). Of particular interest for social psychologists are the processes and conditions that bias the perceived covariation of social stimuli, resulting in 'illusory correlations'. The term *illusory correlation* refers to the perception of covariation between two classes of events which are uncorrelated (or less strongly correlated than perceived) and was originally introduced by Chapman (1967) to describe the overassociation of semantically related word pairs or word pairs of unusual length. Within social cognition, Hamilton and Gifford (1976) applied this 'paired distinctiveness' mechanism of illusory correlation to the perception of social groups and argued that stereotypic beliefs could result from cognitive information processing biases, without recourse to motivational principles (Hamilton, 1981; Hamilton & Sherman, 1989). However, it could be argued that the implied opposition between cognitive and motivational sources of stereotyping characteristic of this approach has led researchers to neglect the possibility that motivational factors might themselves also produce illusory correlations in social perception. In the present studies we explore one such motivational factor, namely the role of the perceiver's 'vested interest' in the judgmental outcome.

In their research, Hamilton and Gifford (1976; Study 1) presented subjects with behavioural instances from two groups where a majority of behaviours were positive and a majority emanated from one of two groups, such that there was no correlation between type of behaviour and group. They demonstrated that the co-occurrence of the infrequent behaviour and the infrequent group was overestimated and explained this illusory correlation effect by means of 'paired distinctiveness': because statistically infrequent categories are particularly distinctive to the perceiver, they receive more attention, are efficiently encoded and consequently are better available in memory than non-distinctive categories. This mechanism offers a purely cognitive explanation for the acquisition of stereotypes of minorities or infrequently encountered groups. Subsequent research in this paradigm has shown that the distinctiveness-based illusory correlation effect is a reliable phenomenon (see e.g. Mullen & Johnson, 1990).

One shortcoming of an exclusively cognitive emphasis is that it neglects those social and motivational factors that may affect the perception of covariation between social stimuli. Although affect and involvement have been researched in the illusory correlation paradigm, the tendency has been to investigate how these factors enhance the salience and processing of certain 'involving' stimuli, which then form the cognitive basis for illusory correlation (e.g. Spears, van der Pligt & Eiser, 1985, 1986; Tomarken, Mineka & Cook, 1989). In other words the *explanatory mechanism* of illusory correlation in terms of differential information processing remains cognitive, although the source of salience or distinctiveness may itself be affective or motivational in nature. For example Tomarken *et al.* (1989) demonstrated that the

perception of covariation between fear-relevant stimuli and shock increased as a function of fear because such stimuli were more salient to phobic subjects. Spears *et al.* (1985, 1986) examined how a person's prior attitudes affect the formation of illusory correlations. They showed that the perceived covariation between attitudes to nuclear power and town of residence was influenced by the self-relevance of the stimulus attitudes (whether the attitude positions were congruent with own attitude), and that this effect increased with involvement. This operationalization of involvement has close affinities with the concept of 'value relevance' described by Johnson and Eagly (1990). The salience of the stimuli, and therefore illusory correlation, were determined by value-relevance as well as the more perceptual feature of statistical infrequency.

A more genuinely motivational *explanation* for illusory correlation, in which motivational factors counteracted rather than contributed to the cognitive basis for illusory correlation, is provided in a study by Schaller and Maass (1989). In this research subjects were actually implicated as group members of the target groups in the Hamilton and Gifford paradigm, so that the predicted distinctiveness-based illusory correlation effect was set against a more motivational ingroup bias (e.g. Tajfel & Turner, 1986). Subjects' covariation judgments did indeed reveal evidence of the classic ingroup bias when these two effects were opposed. A difference from the 'cognitive' explanation then is that here motivational factors were shown to play a role in creating the preferred judgment, rather than simply dictating the differential salience of the stimuli independent of the eventual judgmental outcome. The present studies develop this line of inquiry and investigate a related but conceptually distinct motivational basis for illusory correlation in covariation judgment, namely the degree of involvement or *vested interest* in the outcome of the judgment. Like Schaller and Maass we implicate subjects as members of the groups presented in the stimuli, although we relate the judgment more specifically to the relevance of a consequential outcome than to striving for a positive evaluation of one's group as such.

The point to make here is that, assuming that perceivers prefer an advantageous outcome to a disadvantageous one, having a vested interest in a particular outcome may provide a motivational basis for biased covariation judgment. This motivational aspect of involvement relates more closely to 'outcome relevance' than to 'value relevance' (*cf.* Johnson & Eagly, 1990), where perceivers may have no clear *a priori* stake in the covariation judgment. This conceptual distinction is perhaps made clearer by considering some research on consensus estimation cited by Granberg (1984). He found that bigoted whites not only overestimated their own preferred prosegregation attitudes among whites but also (albeit somewhat less) among blacks. Here bigoted whites overestimated their own preferred attitude position in the outgroup, presumably because it served their vested interest in maintaining segregation. This finding illustrates that the role of vested interest can involve more than simply overestimating preferred attributes in one's own group, and non-preferred attributes in the outgroup, but relates to the *functional outcome* served by this judgment. The present studies are also concerned with the perceived distribution of attitudes although across ingroup and outgroup. However, in contrast to the correlational fieldwork of Granberg, it is the aim here to investigate the motivational processes involved experimentally within a modified illusory correlation paradigm (*cf.* Spears *et al.*, 1985, 1986). An important objective is to link the outcome of the

covariation judgment more explicitly to self-interest and not just to preferred evaluative perceptions of the ingroup alone.

To our knowledge there has been little previous experimental research investigating the role of vested interest in the illusory correlation paradigm. However, a relevant study by Crano (1983) has explicitly examined the influence of this variable on consensus estimation. He investigated the influence of the relationship between the hedonic relevance of a particular outcome on perceived consensus, and demonstrated that having a vested interest in this outcome could enhance the 'false consensus effect'. 'False consensus' refers to the tendency to overestimate the prevalence of one's own attitudes or preferences relative to those who have the opposing attitude or preference (Ross, Greene & House, 1977). Specifically, Crano demonstrated that student subjects who thought they would be affected by a tuition surcharge at their university estimated the proportion of students objecting to this as higher than did respondents who were not affected by the plan. It should be noted that Crano assumed that subjects' attitude to the tuition surcharge would be generally negative although this assumption seemed only partly justified. This raises the question as to whether a difference in evaluation of the consequences of the policy implied by one's attitude affects consensus estimations. It seems likely that opponents of the tuition surcharge would have considered the implementation of the policy even worse than supporters, and that implementation would probably weigh more heavily for opponents than non-implementation would for supporters. Attitude may then have moderated the false consensus effect. In our research we take such considerations into account and use the perceiver's own attitude to a consequential proposal as an important element in defining vested interest. It is also important to stress that the illusory correlation paradigm differs in critical respects from the false consensus paradigm¹.

In the first study reported here subjects are presented with stimulus information concerning the attitudes of both ingroup and outgroup populations, but information concerning group affiliation is omitted. The aim of this study then is to assess experimentally first of all whether the vested interest of attitude actually biases covariation judgments when subjects are left relatively free to 'project' their preferred distribution across the two groups (similar to the case of 'self-generated' judgments, see footnote 1). In the second study, more in line with the standard illusory correlation paradigm, information concerning the group affiliation is provided, such that there is no correlation between attitude (pro versus contra the policy) and group. This should arguably restrict the scope for self-serving covariation biases compared to the first experiment. This point is clearly stated by Kunda (1990) who

¹Firstly, false consensus studies usually concern consensus estimations about one general population, whilst in the classic illusory correlation studies the focus is usually on two target populations or groups. A second important difference between false consensus and illusory correlation paradigms concerns the information that underlies the responses of subjects. In the false consensus paradigm no stimulus information is provided, while in the case of illusory correlation stimulus information varying on two dimensions (group and attribute) is presented and forms the basis for subsequent judgments of covariation between them. This is critical because it seems quite possible that there will be more scope for bias when estimates are 'self-generated' and thus not potentially disconfirmable by contradictory sample information. For example the research of Granberg (1984) involved self-generated rather than sample-based estimates and so the question remains whether effects of vested interest associated with attitude persist in the face of disconfirming data.

proposed that if one wants to draw a particular conclusion, one also seeks a justification for this conclusion. People do this by accessing a biased subset of the relevant beliefs. In the first study, because judgment is less constrained or 'contradicted' by the data, this would be predicted to result in stronger illusory correlations than the second study. Similarities between the studies in terms of the stimulus sets used were designed to enable us to compare the degree of 'illusory' correlation produced across studies in order to evaluate this hypothesis.

To summarize, we hypothesize that illusory correlation will be higher in the self-serving direction for subjects expressing an attitude against a threatening policy that might affect them or their group. Second, we predict that the illusory correlation effect will be stronger when there is more scope for bias, as is the case in Study 1 compared to Study 2. It is now necessary to describe how we defined and measured attitude-based vested interest.

Pilot studies: defining attitude-based vested interest

The attitude issue employed to investigate the effects of vested interest was the proposal to use English as opposed to the native Dutch as the teaching language for lectures at the University of Amsterdam. Our assumption, based on previous research on this issue (Manstead, Spears & Bosveld, 1992), was that the majority of Dutch students would be against the introduction of English, and also that opponents would find the prospect of introducing English as more serious or threatening than supporters of this plan would find its non-introduction. The logic here is that non-introduction of English should not be threatening because it represents both the *status quo*, and teaching in one's native language.

Results from the first pilot study confirmed that first-year psychology students ($n=22$) found the issue 'Adopting English as the teaching language during lectures' reasonably involving: $M=4.59$, measured on a 7-point scale ranging from 'not at all' (1) to 'extremely' (7). Furthermore, about 70 per cent of the students held a negative attitude toward the issue and 30 per cent held a positive attitude, confirming the general opposition to the measure found in our previous research (Manstead *et al.*, 1992). These subjects then rated statements for use as stimulus materials (see below).

In the second pilot study we tested the assumption that attitude would affect the evaluation of the consequences of a policy (vested interest). Psychology students ($n=52$) were told that there is a possibility that English would become the teaching language during lectures. First, they gave their attitude toward this issue (for or against). Subsequently, opponents were asked how bad it would be if the policy were carried out and supporters were asked how bad it would be if the policy were not carried out. All subjects indicated their answers on a 9-point scale ranging from 'not bad at all' (1) to 'very bad' (9). The results supported our expectation that opponents consider it worse if English were to become the teaching language ($M=5.27$) than would supporters were English *not* to replace Dutch as the teaching language ($M=3.77$), $t(50)=4.27$, $p<0.001$ (one-tailed). This confirms the assumption that on this issue students who are against the policy have a greater vested interest in the policy not being carried out at their university than do people who are in favour were the policy to be implemented. In other words we operationally define vested interest

in terms of attitude involvement as reflected in the differential personal relevance of the judgmental outcome. The following studies are designed to test whether vested interest defined in this way affects perceived covariation.

STUDY 1

In the standard illusory correlation paradigm subjects are presented with information about the attributes of two groups (e.g. group members' behaviours or attitudes). However, before examining this more restrictive case, the present study sets out to examine whether there is any influence of the vested interest of one's own attitude on the perception of covariation when subjects are not constrained by feedback about the actual distribution of attitudes across groups. In this study student subjects from the University of Amsterdam were confronted with the strong possibility that as part of a national trial policy English rather than Dutch would become the main teaching language for lectures at their university, or that this would occur at another major university (Utrecht). They were presented with arguments for or against the policy in which specific information identifying the university from which each attitude statement derived was omitted. Vested interest was defined by the attitude of subjects to adopting English as the teaching language as described earlier.

We also examined another conceptually related but distinct aspect of vested interest which incorporates the operationalization of Crano (1983). He described vested interest in terms of objective personal consequences, while we have defined it as the personal relevance of the judgmental outcome depending on the subject's own attitude. We manipulate the personal consequence of the outcome independently of attitude by implying that were the plan to go ahead at their own university, then this would occur during their period of study, thus affecting them, or that it would only affect the student cohorts following them. This allows us to see whether objective consequences are more critical than or perhaps even mediate the attitude-based vested interest.

As indicated earlier, we expected the vested interest of attitude to result in illusory correlations reinforcing the preferred outcome. Thus, we predicted that opponents to the proposal would not only overestimate the number of opponents at their own university (Amsterdam) relative to the number of opponents in the other university (Utrecht), but also overestimate the number of supporters at the other university (Utrecht) relative to supporters at their own (Amsterdam), reflecting the hope that English would not be introduced at their university. This pattern of responses produces the predicted illusory correlation effect. Moreover, if personal consequence is a necessary component of vested interest, then we predict that opponents who are personally affected by the outcome should be even more motivated to perceive a self-serving illusory correlation, resulting in a predicted two-way interaction with the attitude factor. In contrast, we predict little or no illusory correlation for those who are in favour of introduction who we define on the basis of the pilot research as having a low vested interest in the outcome. We expect therefore the personal consequence manipulation to be of relatively little consequence for them.

These predictions concerning illusory correlation were made for the dependent measures referring to the *number* of supporters and opponents in both cities. Another traditional measure of differential group perceptions in the illusory correlation paradigm is by means of evaluative ratings of the two groups. In the classic paradigm developed by Hamilton and Gifford, these judgments are simply predicted to reflect the pattern of illusory correlation, such that the group with the higher proportion of negative behaviours is perceived as relatively negative. Following this line of argument, and assuming perceivers judge those who share their attitude more positively than those who do not (*cf.* Spears *et al.*, 1985, 1986), we might expect the illusory correlation effect to be reflected in more positive evaluation of one's own university, because the effects of vested interest implies that this will be perceived as having a greater proportion of like-minded people compared to the other university. This evaluative difference between the two universities should disappear, along with degree of illusory correlation, if the vested interest associated with attitude is low or nonexistent.

It is important to note that the students participating in this study might have had prior expectancies concerning the distribution of attitudes for and against this policy across the two universities, and that this might be confounded with attitude and thus vested interest (for example, opponents might expect there to be more opponents in Amsterdam). We therefore control for prior expectancies in the present study. To summarize, we predict a main effect of attitude, with opponents overestimating the proportion of opposition at their own university which is reflected in a more positive evaluation, and an interaction, with this effect even stronger for those who would be personally affected by the plan.

Method

Subjects and design

A total of 151 first-year psychology students of the University of Amsterdam participated in the experiment. Subjects were randomly assigned to the experimental conditions (personal consequence or not). The design consisted of two between-subjects factors: attitude (for versus against English as the teaching language) and personal consequence (affected or not by the proposed policy).

Stimulus materials

In order to select items for the present study subjects from the pilot study rated 76 statements on the issue on a 9-point scale ranging from 'in favour of English as the teaching language' (1) to 'against English as the teaching language' (9). Items were selected which were not neutral and were interpreted unambiguously (either for or against the issue) by both opponents and supporters, resulting in a pool of 67 statements. In a follow-up study 14 different subjects judged the persuasiveness of these items resulting in two sets of items (28 items against the policy, 20 items in favour) which did not differ in persuasiveness which we used in the experiments.

Procedure and cover story

Subjects were introduced to the research by informing them in a questionnaire about the possibility that English could become the teaching language during lectures, and that this policy will be first tried out either at the University of Amsterdam or at the University of Utrecht. Furthermore, they were told that the choice between the two universities depended on the number of opponents compared to supporters: the policy would be introduced at the university with the smallest proportion of opponents.

In one condition subjects were told that English would take effect in the next academic year (personal consequence, given that the subjects were first-year students). In the other condition subjects were told that the policy would take effect after two years and would apply only to first-year students at that moment (no direct personal consequence). In order to decide on which university the policy would be tried out, the Ministry of Education needed to know the number of supporters and opponents at the two universities. Because forming a considered opinion about English as the teaching language during lectures is difficult, they were informed that they would see the opinions of psychology students who were supporters or opponents of the policy to get them thinking about the issue.

Next, subjects were told that the opinions were expressed by students from both their own university (Amsterdam) and from the other university (Utrecht), but that university was not indicated in the statements because that information was not relevant in forming a considered opinion about the issue. Before reading the opinions, they were asked to indicate their expectancy concerning the proportion of opponents at the two universities. Subjects were then presented with the 48 statements which varied as a function of attitude (28 opponents and 20 supporters of the policy). After viewing all the statements, subjects' attitude was measured and they were next asked to complete a series of dependent measures.

Independent measure

Subjects indicated their attitude concerning the issue English as the teaching language on a 9-point scale, ranging from 'very strongly pro' (1) to 'very strongly anti' (9).

Dependent measures

Before perceiving the opinions, subjects indicated their expectancy about the number of opponents at the two universities by choosing one of the following response categories: (1) there are proportionately more opponents in Amsterdam than in Utrecht, (2) the proportion of opponents in Amsterdam is the same as in Utrecht, (3) there are proportionately more opponents in Utrecht than in Amsterdam.

The next dependent measures were those used in the standard illusory correlation paradigm. For the assignment task, subjects were instructed to guess from which university the opinion statements emanated. They assigned each of the 48 opinion

statements (28 expressed by opponents and 20 by supporters) to the own university or the other university. For the frequency estimation task, subjects were informed that 24 statements were expressed by students from each university. They were asked to estimate the number of statements expressed by supporters and by opponents from each university. Subjects were also asked to indicate how much they generally liked the supporters and opponents on a 9-point scale ranging from 'not at all' (1) to 'extremely' (9) and how much they liked the students from Amsterdam and Utrecht on a similar scale.

Results

Independent variables: vested interest

Three subjects indicated having a neutral attitude to English as the teaching language and were thus excluded from the analyses. Of the remaining 148 subjects, 95 (64 per cent) were opponents and 53 were supporters of English as the teaching language.

The personal consequence manipulation resulted in no significant main effects or interactions between this factor and subjects' attitude on all three measures of illusory correlation (all $ps > 0.15$). To facilitate the presentation of data, we have therefore collapsed across the personal consequence factor in the subsequent analyses resulting in a design involving an attitude-based vested interest: opponents of English as the teaching language (high vested interest), and supporters of the policy (low vested interest).

Subjective expectancies

There were no significant correlations between expectancy and the dependent variables for either opponents or supporters of the policy. The majority of subjects displayed no specific expectation concerning the differential distribution of supporters and opponents at the two universities: 76 per cent of the opponents and 64 per cent of the supporters expected the same proportion of opponents at both universities. Furthermore, of subjects with an expectation, both supporters and opponents expected proportionately more opponents in Utrecht (respectively 36 per cent and 17 per cent) than in Amsterdam (respectively 0 per cent and 7 per cent). We therefore collapsed across this variable in the subsequent analyses.

Assignment of statements to university and frequency estimates

Table 1 reports the statement attribution means and the mean frequency estimates of statements for and against the policy from the two universities, for the two conditions. It can be seen that on both tasks the expected pattern of illusory correlation is strongest for opponents of the policy who have a high vested interest. In line with our prediction, these subjects assign more opponents to their own

Table 1. Mean number of statements attributed or estimated as a function of attitude-based vested interest

Category	Assignment task		Frequency estimation	
	Against	For	Against	For
Supporters own university	8.87	10.71	8.97	11.83
Opponents own university	15.68	14.18	15.03	12.17
Supporters other university	11.13	9.29	10.95	11.13
Opponents other university	12.32	13.82	13.05	12.87

university and more supporters to the other university, than do supporters who have a low vested interest. In order to test for illusory correlation, a phi coefficient was computed from each subject's 2×2 contingency table which was converted to a Fisher's Z score. In each condition the mean transformed phi scores were compared to zero. As expected, for opponents the score differed significantly from zero on both tasks, $t(94) = 5.12$, $p < 0.001$ (assignment task), and $t(92) = 4.99$, $p < 0.001$ (frequency estimation), and supporters displayed no significant difference on the two tasks, $t(50) = -0.95$, n.s. (assignment task) and $t(52) = -1.30$, n.s. (frequency estimation). The hypothesis that illusory correlation is a positive function of attitude-based vested interest is supported on both tasks: $F(1,144) = 14.47$, $p < 0.001$ (assignment task) and $F(1,144) = 16.41$, $p < 0.001$ (frequency estimation).

Evaluative ratings

We expected that subjects would like students with the same attitude to English as the teaching language more than students with a different attitude, and that overall evaluative ratings of the students from the two universities should therefore reflect the pattern of illusory correlations obtained on the perceived distribution of these attitudes. First, we checked the differential evaluation as a function of attitude assumption by comparing the evaluative ratings of supporters and opponents in the stimuli, as a function of the subject's own attitude. The predicted interaction between these two factors was significant, $F(1,146) = 22.48$, $p < 0.001$. Further analysis confirmed that opponents liked the opponents more ($M = 6.13$) than the supporters ($M = 5.36$), $F(1,146) = 23.39$, $p < 0.001$. For supporters this pattern is reversed; they rate supporters more positively ($M = 5.81$) than the opponents ($M = 5.32$), $F(1,146) = 5.32$, $p < 0.05$.

The prediction based on this differential evaluation, was that opponents of the policy would rate students from their own university (Amsterdam) overall as more positive than the other university (Utrecht) whereas supporters would not (ratings of the universities form a within-subjects factor). This was supported by a significant interaction between attitude-based vested interest and ratings of the students from the two universities: $F(1,146) = 6.00$, $p < 0.05$. Opponents rated the Amsterdam students more positively ($M = 6.27$) than the Utrecht students ($M = 5.85$), $F(1,146) = 31.33$, $p < 0.001$. In line with the absence of illusory

correlation, supporters revealed no evaluative difference in ratings of the students from Amsterdam ($M = 5.83$) and Utrecht ($M = 5.72$), $F(1,146) = 1.26$, n.s.

Discussion

This study demonstrates that the motivational factor of attitude-based vested interest can produce illusory correlation effects, independent of prior expectancies concerning the distribution of these opinions across groups. At first sight it seems puzzling that expectancies did not affect the biased covariations because it is generally assumed that people bias their expectations to fit their motivations. One possibility is that the expectancy measure with only three levels of expectancy is not sensitive enough. Another possibility is that subjects are really unprejudiced in their expectancies about the number of opponents at the two universities, but still *hope* that they would not be affected by the plan, which suggests an unconscious information processing bias. Thus the mere perception of opinions by subjects defined as being high in vested interest (those who were against introducing English as the teaching language) seems sufficient to encourage biased perception of covariation when the perceivers are sufficiently against the outcome. On all three measures opponents displayed an illusory correlation effect, such that the perceived proportion of opponents to supporters of the policy was greater for their own university than for the other, and consistent with this pattern of illusory correlation they rated the students from their own university as more positive overall than those from the other university.

By contrast, subjects defined as having low vested interest, namely those who supported the introduction of English, displayed no significant illusory correlation. To the extent that covariation judgments might also be expected to reflect attitudes for this group, if anything a relative overestimation of supporters in the own university and opponents in the other university might have been predicted. However, the non-introduction of English could hardly be assumed to be negative or threatening for this group, because this represents the *status quo* and teaching in one's native language (and thus the easier study option). For these reasons, reinforced by our pilot research, we predicted that supporters of the policy would be characterized little or no vested interest in the outcome, and they indeed displayed no illusory correlation effect. Consistent with the absence of illusory correlation the supporters revealed no evaluative preferences in rating the target groups. However, there is another possible explanation for these results. We defined attitude-based vested interest in terms of *outcome relevance* or '*outcome involvement*', but this definition might be confounded with *value relevance* or '*issue involvement*' (Johnson & Eagly, 1990). That is, subjects in our pilot study considered the issue 'English as a teaching language' reasonably involving but it is possible that supporters may find this issue less involving. If this issue does not mean as much to supporters as to opponents, this may also help to account for a difference in illusory correlations between these groups (*cf.* Spears *et al.*, 1985, 1986). In that case, differences in biased covariations between supporters and opponents would not be caused by differential outcome involvement, used to define attitude-based vested interest, but by differential issue involvement. This possibility is checked in the second study.

The absence of an interaction between subjects' attitude and personal consequence tends to support our definition and usage of vested interest. In this respect we have extended Crano's (1983) definition of vested interest in terms of objective personal consequences, to the subject's own attitude toward a consequential proposal. The results of our study show that the perception of covariation in this case is not so much affected by personal consequence *per se* but rather by subjects' feelings about the consequential proposal. The strong influence of attitude could be due to the fact that subjects who would not be directly affected by the plan do not believe that the new lecture format will be delayed for two years believing that it will affect everybody very soon. Alternatively, subjects could think of friends and relatives who will have to endure then the new system. It is possible to argue that attitude-based vested interest can be considered as a group-level interest indicating that even though the proposal may not affect subjects personally, it does affect the members of the group to which a subject belongs. In other words and in line with our pilot research, the prospects of introducing English are apparently sufficiently negative or threatening to exert a vicarious motivational influence on opponents' judgments, and there were no differences between supporters as to whether they would be personally affected by the proposal.

To summarize, it would seem that a motivational factor such as attitude-based vested interest can produce self-serving covariation judgments when incomplete stimulus information is presented. However, this situation could impose fewer restrictions on covariation biases than if covariation judgments are based on complete sample information, that is when information is specifically linked to groups and when this covariation information indicates a zero correlation between group and attitude. Thus the critical question is whether the illusory correlation effects also occur when the contrary evidence of sample information is perceived. We investigate this issue in our next study which is closer in this respect to the classical illusory correlation paradigm.

STUDY 2

The present study tests whether vested interest biases covariation perception when subjects are provided with enough information to allow data-driven judgments of the distribution of attitudes across the two groups. In other words, subjects are presented with information about attitudes that are attributed to students from the two universities. Moreover, as in other illusory correlation studies there is no correlation between attitude and university in these stimuli. Although we predict a self-serving illusory correlation as in Study 1, it seems likely that the illusory correlation effects could be weaker here than in our first study because, unlike this first study, the tendency for illusory correlation is explicitly contradicted in the stimulus information. Kunda (1990) also showed that the ability to arrive at the desired conclusion is constrained by the ability to construct seemingly reasonable justifications for this conclusion. Thus the perception of contrary evidence would impose restrictions on these abilities.

Although the personal consequence manipulation did not affect the perceived covariation in the first study, we decided to examine this aspect of vested interest again in the present study. We did this in order to maintain comparability with the first study and to examine once more whether attitude-based vested interest is moderated by personal consequences when more complete sample information is provided.

Method

Subjects and design

Subjects were 114 first-year psychology students at the University of Amsterdam. Subjects were run in groups of no more than 10 persons per session. The design was the same as in Study 1 with two between-subjects factors: attitude (for versus against English as the teaching language) and personal consequence (affected or not by the proposed policy).

Stimulus materials and procedure

The materials and procedure were the same as those for Study 1, with the following exceptions². The experiment was conducted in a laboratory and subjects seated at individual terminals. They were presented with the same 48 statements, which now varied on two dimensions: attitude and university (14 opponents from the own university, 10 supporters from the own university, 14 opponents from the other university and 10 supporters from the other university). It can be seen that there is no relation between university and the attitudes of the students. The particular opinion statements were rotated between the universities within each condition whilst maintaining these distributions. After perceiving the statements subjects were asked to indicate their involvement concerning the issue 'English as the teaching language' on a 9-point scale, ranging from 'not at all' (1) to 'extremely' (9).

Independent measure

Subjects indicated their attitude by rating six attitude statements concerning the issue 'English as the teaching language' on 9-point scales, ranging from 'very strongly disagree' (1) to 'very strongly agree' (9).

²In this study we did not ask subjects to indicate their expectancies concerning the proportion of opponents at the two universities for several reasons. First, Study 1 did not reveal any influence of expectancies on the dependent measures. Second, we were concerned with the reactivity of such a question and in particular whether asking about expectancy might cause subjects to remain committed to these judgments on subsequent dependent measures. Clearly, asking this question after the dependent measures could not be considered independent from the predicted illusory correlation effects.

Results

Independent variables

The six attitude statements yielded a Cronbach's alpha of 0.96. Seven subjects indicated having a neutral attitude to English as the teaching language and were thus excluded from the analyses. As in Study 1 the personal consequence manipulation resulted in no significant main effects or interactions between this factor and subjects' attitude on all three measures of illusory correlation (all $ps > 0.15$). Collapsing across this factor resulted in the same design as in Study 1: opponents of English as the teaching language (high vested interest), and supporters of the policy (low vested interest).

Issue involvement

Both opponents and supporters considered the issue 'English as the teaching language' reasonably involving. Comparing the mean involvement scores of opponents ($M = 6.75$) and supporters ($M = 7.23$) resulted in a non-significant effect: $t(105) = 1.49$, n.s.

Assignment of statements to university and frequency estimates

Table 2 reports the means concerning the attribution of statements and frequency estimates of the pro and anti opinions from the two universities, for both conditions, with the actual numbers given in parentheses.

In line with our prediction and as in Study 1, opponents (high attitude-based vested interest) assign more opponents to their own university and more supporters to the other university, than do supporters (low attitude-based vested interest). However, on the frequency estimates task, opponents did not overestimate the number of statements expressed by opponents from the own university, although our equivalent prediction with regard to the number of statements expressed by supporters from the other university was supported. Comparing the mean transformed phi scores to zero resulted in a significant difference for opponents on both tasks: $t(58) = 3.57$, $p < 0.001$ (assignment task), and $t(58) = 3.72$, $p < 0.001$ (frequency estimation). As predicted, supporters revealed no significant difference from zero on the two tasks: $t(46) = 0.02$, n.s. (assignment task) and $t(47) = -0.51$,

Table 2. Mean number of statements attributed or estimated as a function of attitude-based vested interest

Category	Assignment task		Frequency estimation	
	Against	For	Against	For
Supporters own university (10)	9.47	10.96	10.51	11.21
Opponents own university (14)	16.36	15.00	13.46	12.79
Supporters other university (10)	10.53	9.04	12.07	10.98
Opponents other university (14)	11.64	13.00	11.93	13.02

n.s. (frequency estimation). Our hypothesis that illusory correlation increases as a positive function of degree of vested interest is also supported on both tasks: $F(1,104)=4.28$, $p<0.05$ (assignment task) and $F(1,105)=6.22$, $p<0.05$ (frequency estimation task).

These results are in line with those of Study 1. Our prediction that the illusory correlation effects in the present study will be weaker than in Study 1 is not supported. In comparing the mean transformed phi scores across studies, there was no significant main effect of study or interactions between study and subjects' attitude on the assignment task nor the frequency estimation task (all $ps>0.31$).

Evaluative ratings

As predicted and in line with Study 1, the interaction between the evaluative ratings of supporters and opponents in the stimuli and subjects' own attitude was significant, $F(1,105)=55.64$, $p<0.001$. Further analysis confirmed that opponents liked the opponents more ($M=6.37$) than the supporters ($M=5.10$), $F(1,105)=19.56$, $p<0.001$. Supporters rated supporters more positively ($M=6.42$) than the opponents ($M=5.42$), $F(1,105)=38.85$, $p<0.001$. Furthermore, the interaction between vested interest and ratings of the students from the two universities (within-subjects factor) was also significant: $F(1,105)=8.62$, $p<0.01$. Subjects with high vested interest attitudes (opponents) rated the Amsterdam students more positively ($M=6.46$) than the Utrecht students ($M=5.98$), $F(1,105)=13.90$, $p<0.001$. In line with the absence of illusory correlation, subjects with low vested interest attitudes (supporters) did not display an evaluative difference in the ratings of the students from Amsterdam ($M=6.13$) and Utrecht ($M=6.21$), $F(1,105)<1$, n.s.

These results replicate those of Study 1. Our prediction that the evaluative differences in the present study will be weaker than in Study 1 is not supported. There were no significant interactions between study and university (within-subjects factor) or between study, subjects' attitude and university (both $ps>0.27$).

Discussion and conclusions

This study rules out the alternative explanation that differences in biased covariations are caused by differences in value relevance or issue involvement, because both supporters and opponents showed a similar degree of commitment. It seems therefore that this study, like Study 1, supports our basic hypothesis that self-serving illusory correlations increase as a function of attitude-based vested interest. On both the frequency measure and the statement assignment measure there was a relation between the degree of vested interest and the perceived degree of illusory correlation. Opponents (high vested interest) displayed significantly more illusory correlation on both measures than supporters (low vested interest). Consistent with the absence of illusory correlation the supporters revealed no evaluative preferences in rating the target groups. Opponents rated the students from their own university as more positive overall than those from the other university, which was also consistent with the pattern of illusory correlation for this group. With respect to the

definition of vested interest, both studies support out definition indicating that attitude involvement on a consequential proposal (outcome involvement) is an important predictor of illusory correlations independent of their objective consequences for the person. However, it is possible that vested interest defined by personal consequences will produce effects on issues other than English as the teaching language for lectures.

The pattern of results in both studies seem to lend support to an interpretation in terms of vested interest and tends to rule out an ingroup bias interpretation. A simple ingroup bias effect could not parsimoniously explain why there is no illusory correlation or evaluative ingroup bias for subjects with a low attitudinal vested interest. The supporters of the policy rated students who shared their own attitude above opponents, just as opponents preferred those who shared their own views, but this did not lead supporters relatively to overestimate the preferred position in their university as was the case for opponents. One could argue that lack of illusory correlation and evaluative differences is due to the fact that supporters' attitudes were in a minority, both in reality, and in terms of the statements presented, so that subjects may have felt less representative of students at their university, and thus have less reason to identify and display ingroup bias. However, in Study 1 supporters did not know they were in a minority at their university, so they could have displayed an ingroup bias. Although they perceived fewer pro statements than contra statements, the identifying university was omitted, so they had the opportunity to assign most of the pro statements to their own university. However, inspection of the number of supporters from their own university in the low vested interest condition across studies, between Table 1 and Table 2, reveals hardly any differences on the assignment and frequency measure. Therefore, the argument that being in a minority causes the absence of an ingroup bias which reflects the absence of illusory correlation and evaluative differences between the two universities, seems not to be a plausible explanation for the present results.

Nor can such an ingroup bias explain why opponents on the frequency estimation measure in the second study did not overestimate the number of opponents in their own university, although the differential proportion of opponents to supporters was maintained, producing the predicted illusory correlation effect. If positive evaluation of attitudes congruent with one's own were to underlie such an ingroup bias effect, we would expect inflation of this category in particular. In sum, it would seem that degree of vested interest defined independently from this ingroup bias does make an important contribution in explaining the illusory correlations, and the evaluative differentiation based on them. However, it is important to note the possibility that the illusory correlation effects are not directly produced by attitude-based vested interest, but rather by some correlate of the existing attitude. That is, it could be possible that there are other differences (related to attitude) between opponents and supporters which produced the observed effects. Because attitude cannot be experimentally manipulated, it is difficult to rule this out.

Our prediction that biased covariation will be stronger when there is more scope for this bias, was not supported. There were no differences between the judgments of covariation whether they were based on stimulus information varying on two dimensions (attitudes linked to groups) or on just one dimension (attitudes). Inspection of the means in Table 1 and Table 2 shows that this finding could not be explained by a ceiling effect because opponents could have displayed even more bias

in their judgments. The absence of a difference between the biased covariations in the two studies could imply that subjects do not show a conscious strategic bias but a more subconsciously motivated bias. Furthermore, given that we gave our subjects in both studies no indication that by distorting their judgments they could change the nature of the outcome, there would have been little sense in knowingly employing a self-deluding judgmental strategy. For this reason there is little obvious reason to doubt the sincerity of the judgments subjects report here. If such judgmental biases do occur outside of awareness, they may be all the more influential in the sense that they are less likely to come under conscious control and be moderated.

Another explanation for the absence of a difference between the biased covariations in the two studies could be attributed to subjects' interpretation of the stimulus information in the second study. Although the selected statements did not differ in persuasiveness, it is possible that subjects change the meaning of the perceived statements such that they fit their vested interest. That is, opponents could interpret the contra statements made by Utrecht students as less convincing than contra statements expressed by students from their own university, and the reverse could occur for the pro statements. Thus this interpretation tendency will facilitate the differentiation between the groups. Berndsen, McGarty, Van der Pligt and Spears (1994) have provided some support for this process. In their experiments subjects were presented with positive and negative behaviours emanating from two groups in which the extent of positivity (or negativity) in the behaviours was identical. However, it was observed that subjects after perceiving the statements, adjusted the evaluations such that the contrast between the groups increased.

To summarize, the data from Study 1 in which the perception of attitudes was not linked to universities indicate that attitude-based vested interest, can produce self-serving illusory correlation effects independent of prior expectations. The data from Study 2 support this finding illustrating that judgments based on vested interest are strongly related to the functional outcome served by this judgment (although it remains possible that some correlate of the attitude produced this effect). Moreover, it would seem from both studies that vested interest, defined independently from an ingroup bias, does provide further support for the idea that motivational factors can play an important role in producing and *explaining* self-serving biases in covariation perception, as well as contributing to more cognitively based mechanisms of illusory correlation premised on the distinctiveness and differential processing of stimuli. The fact that such illusory correlations can occur despite the contrary evidence of sample information, as in the second study, arguably renders this effect even more convincing than similar self-generated biases which are less open to empirical disconfirmation. Given that social perceivers are typically not neutral with regard to the situations and decisions which confront them, but are often 'interested' in their own outcomes, the scope of such 'motivated' illusory correlations in everyday judgment and decision-making may be quite considerable.

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