Inferences about Actions Performed in Constraining Contexts: Correspondence Bias or Correspondent Inference?

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Prior studies of the correspondence bias reveal a tendency for people to base inferences on behaviors they observe, even when these behaviors are highly constrained by the social context in which they occur. Three processes may combine to sustain this effect: (a) an insufficient adjustment of initial estimates caused by the fundamental attribution error (FAE); (b) the reliance on intuitive estimates of the prevalence of traits, attitudes, and other dispositional characteristics in the general population; and (c) the assumption that few situations are so coercive that they negate all freedom of choice. These processes were differentiated in a modification of the Jones-Harris paradigm. Participants estimated a particular attitude's prevalence in the general population before reading an essay written under either high or low choice conditions and taking a probable or improbable position. Inferences were consistent with prior probabilities when the essay expressed a highly probable opinion and consistent with behavior when the essay expressed an unlikely opinion. These results suggest that perceivers make inferences by estimating the probability that the observed behavior reflects a dispositional characteristic and then revising their prior estimates of the probability of that characteristic accordingly.

Prior studies of ordinary personology, or the ways perceivers' come to understand themselves and others (Gilbert, 1998a), suggest that perceivers base their inferences about others' personal characteristics and preferences on the behaviors these observed individuals freely choose to undertake. The shopper who picks white bread over wheat bread is assumed to like white bread better. The teacher who gives men higher grades than women for similar work is assumed to be sexist. The graduate who takes a job that requires little contact with other people is thought to be an introvert rather than an extravert (Jones, 1990). But research also reveals a pervasive tendency for perceivers to draw conclusions even when environmental factors align to severely constrain the way people can act in a given situation. If, for example, an individual is asked to make a judgment about an essay-writer's attitude after being told the writer had no choice whatsoever in selecting the position taken in the essay, the perceiver still attributes essay-consistent attitudes to the writer (Gilbert & Jones, 1986; Jones, 1979, 1990; Jones & Berglas, 1976; Jones & Harris, 1967; Jones, Worchel, Goethals, & Grumet, 1971; Snyder & Jones, 1974).

Jones (1990) referred to this phenomenon as the correspondence bias and suggested that it stems from the tendency for behavior to engulf the perceptual field. As studies of stimulus salience and information processing suggest, behavior is such an arresting stimulus for perceivers that they spend more time examining, processing, and drawing inferences from it. The result: the "actor and his act form a natural cognitive, if not perceptual, unit," and perceivers end up overattributing attitude (Jones 1979, p. 115; Quattrone, 1982). Similarly, Gilbert's (1991; 1998a) three-stage correction model suggests that observers initially assume correspondence between behavior and attitude, and use their estimates of situational inducements in a separate correction stage. If the perceiver's subsequent revisions are insufficient, however, a correspondence bias results (Trope & Gaunt, 1999; Van Der Henst, Yang, & Johnson-Laird, 2002). Subsequent work has suggested, however, that a number of perceptual and cognitive processes contribute to the correspondence bias (Gilbert, 1998b; Krueger, 1998, 2001; Krull, 2001). Reeder (1997) and Reader, Fletcher, and Furman (1989), for example, suggest that observers' expectations about the commonness of the attitude or attribute in the general population influences perceivers' inferences. Similarly Ajzen suggests that an attribution of an essay-consistent attitude to an individual may be appropriate if the baserate for the attitude expressed in the essay is high (Ajzen, 1977; Ajzen, Dalto, and Blyth, 1979). If, for example, an actor is forced into writing an essay titled "The war against Iraq is just," attribution of an essay-consistent attitude to the actor would be logically justified if perceivers feel that most people think that the war is a just one. Even under conditions of high constraint attitude attribution should increase as observers' subjective probability estimates of the likelihood of this attitude in the general population approach unity (Trope, 1974; Trope & Burnstein, 1975). The baserate explanation also explains why the correspondence bias is more likely when the coerced speech or essay argues a typical, rather than atypical, position on an issue (Cantor, Pittman, & Jones, 1982; Jones & Harris, 1967; Jones, et al., 1971; Schneider & Miller, 1975; Snyder & Jones, 1974).

The bias may also be due, in part, to perceivers' belief that few situations are so constraining that they eliminate all choice (Miller, Ashton, & Mishal, 1990; Miller, Mayerson, Pogue, & Whitehouse, 1977). Although social psychologists routinely argue that behavior is more often the product of the setting than the person, individuals tend to underestimate the impact of social forces on behavior. Individuals who read about the obedient participants in Milgram's research, for example, tend to blame the participants, for they fail to realize that the Milgram situation created tremendous pressures to obey (Ross, 1977; Safer, 1980). Perceivers may assume that actions are freely chosen, and base this conclusion on cues they glean from the speaker's nonverbal cues or choice of words (Fleming & Darley, 1989). Indeed, Miyamoto and Kitayama (2002) discovered participants in the United States, were more likely to display the bias than those in Japan, but that the U.S. perceivers felt the essay-writer was less constrained by circumstances. Perceivers who correctly acknowledge the actor's lack of choice do not evidence the correspondence bias (Miller & Lawson, 1989; Miller et al., 1977).

The current investigation used Bayes theorem to describe the way subjective estimates are revised on the basis of newly acquired data. Applying Bayes theorem to the traditional essay-inference task, when a perceiver reads or hears an essay authored under high or low choice conditions, the perceiver's estimate of essay-writer's attitude is a function of the perceiver's subjective probabilities concerning (1) the likelihood that an actor with an essay-consistent attitude would write such an essay, (2) the overall likelihood that any person would write such an essay, and (3) the overall likelihood that any person would have essay-consistent beliefs. For positive (+) or negative (-) attitudes, the inferential process can be described as follows:

$$\frac{P(A+|B)}{P(A-|B)} = \frac{P(A+)}{P(A-)} \times \frac{P(B|A+)}{P(B|A-).}$$

In this equation p(A+|B) and P(A-|B) are the *posterior conditional probabilities* of positive or negative attitudes; the ratio of P(A+|B) to P(A-|B) represents the odds favoring a positive attitude toward the object after reading the essay. P(A+) and P(A-) are the *prior probabilities* of the two types of attitudes; as with posterior probabilities, the ratio of P(A+) to P(A-) represents the odds favoring a positive attitude before exposure to the essay. P(B|A+) and P(B|A-) are the subjective conditional probabilities of the behavior (writing the essay) given a positive or negative attitude; the ratio of these two probabilities is known as the *likelihood ratio* (LR) since it summarizes the information value of the essay in the given situation. This Bayesian model, as a normative analysis of decisional processes, offers several predictions about the relative contributions of prior probabilities (baserate data) and behavioral information. First, if perceivers recognize that the behavior they observe is constrained by the situation, then they should base their attributions exclusively on their prior probabilities. In Bayesian terms,

$$P(A+|B) = P(A+),$$
$$P(A-|B) = P(A-), \text{ or}$$
$$P(A+|B)/P(A-|B) = P(A+)/P(A-).$$

However, if perceivers feel that behavioral data nevertheless provide some indication of attitude then the conditional probabilities of the behavior given a positive versus a negative attitude should be unequal,

$$P(B|A+) \neq P(B|A-),$$

and the likelihood ratio in the pro-essay condition should differ significantly from the likelihood ratio in the con-essay condition. Also, if the initial probability estimates are revised so that an essay-consistent attitude is seen as more likely, then

$$P(A+|B) > P(A+) \text{ in the pro-essay condition and}$$
$$P(A-|B) > P(A-) \text{ in the con-essay condition.}$$

Lastly, if prior probabilities and conditional probabilities are significant components of attribution when behavior is constrained, then estimates of attribution derived from the model should closely correspond to participants' actual attributions of attitudes. These predictions were tested using the paradigm developed by Jones and Harris (1967). Participants first recorded their initial estimates of the baserate for attitudes about using seatbelts as part of an apparent opinion poll. Next, they were asked to read an essay that had supposedly been prepared by another student. To manipulate baserate expectancies, the speech took an unlikely position (anti-seatbelt use) or a highly likely position (pro-seatbelts) on the issue. To manipulate choice, some participants were told that the essay-writer was assigned which side to argue for, whereas others were told that the essay-writer had been free to choose the direction taken in the essay. After reading the essay participants then made attributions about the essay-writer's attitude and estimated the subjective probabilities identified in Bayes theorem.

METHOD

Participants

A total of 221 students—144 females and 69 males (52 blacks, 155 whites, 13 other)—recruited from introductory psychology classes participated in a study that was described as an investigation of how individuals formulate judgments on the basis of limited information. The experimental materials were administered by a male experimenter in sessions involving ten to 15 respondents, all of whom received course credit for participating.

Procedure

Each subject received a packet of materials containing an informed consent sheet, several questionnaires, and an essay allegedly written by another student. The consent form explained that the materials in the packet involved several different studies, including a survey of student attitudes, a correlational study of personality traits, and a study of how people form impressions of others.

Participants first responded to an attitude survey of five contemporary issues. Participants indicated their position on each issue by circling a digit placed along a line ranging from "In favor of" (9) to "Opposed to" (1). The form included items dealing with capital punishment, student government, and tuition, but the key item asked "Are you in favor of or opposed to seatbelts?"

Participants also estimated other students' attitudes on the issues. Because pretesting demonstrated that some individuals felt many students might be neutral on an issue, three prior probabilities were assessed with the following items:

- Out of 100 students, how many do you think favor seatbelts?
- Out of 100 students, how many do you think oppose seatbelts?
- Out of 100 students, how many do you think have no opinion?

The survey was followed by several personality scales that disguised the link between the attitude survey and the last questionnaire in the packet. This final set of materials was prefaced by directions based on Jones and Harris (1967). Supposedly several students "here at the university" had provided the researchers with a variety of personal materials. Participants were to study the information provided—which could be a short autobiographical sketch, a completed attitude survey, grade transcripts, a formal resume, or an essay on a current topic—and then record their perceptions.

In actuality, all participants read an essay attributed to NLM. Before reading the essay participants were told NLM had been free to choose the position argued in the essay (high choice) or that the position taken in the essay had been assigned (low choice). For approximately half of the participants, a pro-seatbelts essay was included that argued seatbelts are good and should be worn at all times. The remaining participants read an anti-seatbelts essay that took the position seatbelts are dangerous. The essays were of equal length, and both used three arguments to support their position.

After reviewing the essay, participants completed the following items: (a) checks of the manipulations; (b) a traditional measure of attitude attribution that could range from 1 (opposed to seatbelts) to 9 (in favor of seatbelts); (c) estimates of the likelihood that NLM is in favor of, opposed to, or is neutral toward seatbelts; and (d) estimates of the likelihood that a person with a favorable, unfavorable, or neutral attitude would write an essay like NLM's.

RESULTS

Participants' responses were examined in 2 (high vs. low choice) by 2 (pro–vs. con-essay) analyses of variance using a least-squares regression procedure to correct for unequal cell sizes. Following previous analyses (e.g., Ajzen, 1971; Trope, 1974), the logarithm of the probability ratios was used in all analyses to avoid extreme scores and promote ease of interpretation (probability estimates equal to 0 were set to .01 since the log of zero is undefined). Preliminary analyses that took into account sex of respondent yielded no differences, so this factor was not retained in subsequent analyses.

Manipulation Checks

The choice manipulation proved effective. All respondents were asked to indicate how much choice NLM had "in selecting which side of the issue to argue for" using a 9-point scale ranging from "very little choice" to "very much choice." Only a choice main effect, $F(1,217) = 71.51$, $p < .0001$, reached significance, indicating low choice respondents attributed less freedom to NLM than did high choice participants; the means were 3.3 and 6.3, respectively. The manipulation of the direction of the speech was also successful. Of the 112 participants who read an anti-seatbelt speech, 95.5% indicated that NLM's speech "was opposed to seatbelts." Conversely, 98.2% of the 109 participants in the pro-seatbelt condition indicated NLM's speech was "in favor of" seatbelts. Note, too, that a pro-seatbelt attitude was considered more likely, overall.

TABLE 1
Mean Judgments of Essay-Writer Attitudes and Probabilities When Pro-Essays (Likely) and Con-Essays (Unlikely) Were Written under High or Low Choice Conditions.

Variable	High Choice		Low Choice		Interaction *F*-ratio
	Pro	Con	Pro	Con	
n	55	52	54	60	
Attributed attitude	7.4_a	2.3_d	6.5_b	3.9_c	20.48***
P(A+|B)	77.1_a	18.3_d	66.5_b	38.4_c	17.45***
P(A-|B)	14.9_c	77.4_a	24.8_c	54.1_b	21.43***
$\text{Log} \dfrac{P(A+)}{P(A-)}$	2.9_a	2.1_a	2.9_a	2.9_a	.01
$\text{Log} \dfrac{P(A+|B)}{P(A-|B)}$	5.5_a	-5.3_d	2.3_b	-1.8_c	23.03***
$\text{Log} \dfrac{P(B|A+)}{P(B|A-)}$	4.9_a	-4.5_d	2.3_b	-1.9_c	14.13***
Predicted attitude attribution	7.8_a	-2.4_d	5.2_b	$.1_c$	8.54***
Deviations from Bayes	5.1_a	6.1_a	3.8_b	5.8_a	4.60*

*** $p < .0001$
 ** $p < .01$
 * $p < .05$
Note: For any single dependent variable, means with different subscripts differ at the .05 level by Duncans Multiple Range Test.

On the measure of prior probability of each type of attitude, participants indicated that more people were in favor of seatbelts rather than opposed to them; t(220) = 13.31, p < .001. The prior probabilities of a pro-seatbelt, anti-seatbelt, and neutral seatbelt attitude were 59.3, 26.2, and 17.2, respectively.

Attitude Attribution

   Table 1 presents the means for the significant interaction of choice and essay direction for the three measures of attitude. First, responses to the traditional item ("In

your estimation, what do you feel NLM's true attitude about seatbelts is?") indicated that attribution was strongest in the high choice condition, but that essay-consistent attitudes were still attributed to the actor when choice was low. Second, responses to the item "In your estimation, the chances are ___ in 100 that NLM favors seatbelts" revealed a similar effect of choice and essay direction, as did responses to the item assessing the probability of NLM opposing seatbelts. The comparability of these three items is reflected in their intercorrelations. The correlations between the traditional item and the two probability items were .84 and-.84. The two probability items were also highly related (r =-.92).

The Bayesian components. Table 1 also presents the means and *F*-ratios for the choice by essay-direction interactions on three logged ratios derived from Bayes theorem: the prior odds favoring a positive attitude [P(A+)/P(A-)], the posterior odds favoring a positive attitude [P(A+|B)/P(A-|B)], and the likelihood ratio [P(B|A+)/P(B|A-)]. Although no effects reached significance on the prior odds, both the posterior odds and the likelihood ratio revealed correspondent attributions. Attributional differences were more pronounced when choice was high rather than low, but under both conditions participants felt that (1) a positive attitude was more likely than a negative attitude when they read a pro-essay; (2) a negative attitude was more likely than a positive attitude when they read a con-essay; (3) a pro-essay was more likely to be written by someone with a positive attitude; and (4) a con-essay was more likely to be written by someone with a negative attitude.

The revision of baserates. The changes in low-choice participants' probabilities after exposure to the essay are summarized in Table 2. These results indicate that very little revision occurred when the prior baserates of the essay were high (a pro-seatbelts essay). When participants read an essay praising seatbelts (1) the prior probability of a positive attitude [P(A+)] was not significantly different from the posterior probability of a positive attitude [P(A+|B)]; (2) the prior probability of a negative attitude [P(A-)] was not significantly different from the posterior probability of a negative attitude [P(A-|B)]; and (3) the posterior odds favoring a positive attitude [P(A+|B)]/P(A-|B)] were not significantly greater than the prior odds [P(A+)]/[P(A-)].

Significant probability revision, however, occurred when participants read an unlikely, anti-seatbelt essay. These participants significantly revised the likelihood of both a positive attitude and a negative attitude and their posterior odds favoring a positive attitude were significantly less than the prior odds.

Likelihood ratios. The conditional probabilities indicate that, as expected, participants felt that the behavior was somewhat diagnostic even under low choice conditions (see Table 2); the conditional probability of the essay given a positive attitude [P(B|A+)] was not equal to the conditional probability of the essay given a negative attitude [P(B|A-)]. Referring back to Table 1, the logged likelihood ratio of +2.3 in the low choice/pro-essay condition suggests that individuals felt that the actor would be more likely to write the essay if s/he had a positive attitude toward seatbelts and the ratio of –1.9 in the low choice/con-essay condition indicates that participants felt that the actor's essay was more likely if s/he opposed seatbelts.

TABLE 2
Differences between Conditional Probabilities under Low Choice Conditions.

Test	Pro-Essay Condition			Con-Essay Condition		
	Mean	*t*-ratio	*p*-value[b]	Mean	*t*-ratio	*p*-value[b]
P(A+)	59.1			57.8		
vs.		-1.48	ns.		4.10	< .001
P(A+|B)	66.5			38.4		
P(A-)	23.5			26.1		
vs.		-0.32	ns.		-5.94	< .001
P(A-|B)	24.8			54.1		
P(A+)						
P(A-)	2.9			1.9		
vs.		.70	ns.		4.54	< .001
P(A+|B)	2.3			-1.8		
P(A-|B)						
P(B|A+)	69.6			45.1		
vs.		5.35	< .0001		-3.22	< .01
P(B|A-)	38.9			64.9		

[a] *df* = 106
[b] *df* = 108.

Components of Attribution

Regression analyses. To further contrast the predictive power of the prior probabilities and likelihood ratios, multiple regression analyses were carried out using attributed attitude as the dependent variable and the logged prior odds and the logged likelihood ratio as the predictor variables. An analysis of all participants' responses (*n*= 221) suggests that these two variables accounted for 37.5% of the variance in attributions. However, the likelihood ratio was a much more powerful predictor (*F* = 119.94) than the prior odds (*F* = 5.83). In fact, the likelihood ratio accounted for 95.5% of the explainable variance, whereas the prior odds accounted for only 4.5%.

The predictive power of the Bayesian model. By adding together the logged likelihood ratio and logged prior probabilities, the amount of attitude attribution predicted by Bayes Theorem could be calculated. As shown in Table 1, the interaction of choice and essay reached significance on this sum; the means follow the same pattern as the means obtained when attributions are assessed with traditional measures. Also, the correlation between predicted attribution and actual attribution (as measured by the traditional scale) was +.58 (*p* < .0001).

Other analyses suggest that Bayes Theorem was particularly accurate in the low choice/con-essay condition. The difference between what Bayes Theorem predicts and the actual posterior odds was calculated for each subject, and when these data were submitted to a 2 X 2 analysis of variance the interaction reached significance. As the means shown in Table 1 indicate, the smallest discrepancy between predicted and observed attribution occurred in the low choice/con-essay condition.

DISCUSSION

By examining the relationship among prior probabilities, conditional probabilities, and attribution, we were able to identify the cognitive factors that contribute to the correspondence bias. These results suggest that correspondent inference occurs, in part, because individuals rely on baserates to make inferences when behavior is constrained. Particularly when the essay took a popular position on an issue, participants did not go far beyond their baserate estimates when attributing attitudes. After reading the pro-essay, the average estimate of a pro-attitude was 66.5%, which is not significantly greater than the 60.0% baseline estimate. Hence, in the pro-essay conditions the attribution of attitude that did occur was not, strictly speaking, a bias: it was baserate attribution.

Baserates alone, however, cannot account for attributions in the con-essay condition. Participants in the low choice/con-essay condition began the study thinking that as few as 26% of the population in question opposed seatbelts, but after reading the essay their estimate that the actor opposed seatbelts jumped to 54%. Participants clearly revised their initial estimates to take into account the newly acquired behavioral data, for even when choice was low the likelihood ratios and the conditional probabilities of the essay differed depending on the direction taken in the essay. Because the Bayesian model takes both prior and conditional probabilities into account to predict attribution, the model provided a relatively good fit to the data (Villejoubert & Mandel, 2002). These findings clarify the causes of the so-called correspondence bias. As the pro–essay conditions reveal, attribution under conditions of constraint may, in some cases, be due to baserate estimates of attitudes. If perceivers feel that 80% of all people feel that X is good, they are logically justified in attributing a pro-X attitude to an actor even under conditions of low choice. However, the con-essay conditions revealed baserate revision. In this case individuals used the behavioral data as evidence concerning the actor's attitudes, apparently because they felt that it was not completely situationally-coerced. However, even though regression and correlational analyses indicated that the components of the Bayesian formula accounted for approximately 33% of the variance in attitude attributions, a substantial portion of variance remained unexplained—particularly in the low choice conditions. Granted, other cognitive factors unexamined and unmeasured in the current research, and the manner in which probabilities were assessed (Gigerenzer & Hoffrage, 1995) may account for some of this variance, but the basic perceptual processes suggest by Jones (1990) in his engulfing hypothesis may lie at the root of this final component of attitude attribution.

These findings also suggest that what at first seems to be an inappropriate attribution based on constrained behaviors may not, in a strict sense, be a bias. Just as recent reanalyses of heuristic thinking and other social cognitive processes indicate that these processes increase, rather than decrease, accuracy in social perception, correspondent inference is in many cases justified by baserates (Klayman & Ha, 1989; Smith & Kida, 1991). In a strong test of the "bias" hypothesis however, we did find that attributed attitude went beyond the level suggested by perceivers' baserates in some conditions. Furthermore, these findings suggest that overattribution is more likely when the behavior is unexpected. Speculating, this finding may be due to the greater salience of unexpected behaviors and the greater magnitude of engulfment produced by this salience (Reeder et al., 1989). In addition, the relationship between baserates and attribution may also occur because unexpected events tend to instigate attributional processing (Weiner, 1985). The current findings, however, clearly suggest that attributions that go beyond those warranted by baserates is most likely to occur when the attributor is trying to explain an unexpected, low probability behavior.

NOTES

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