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MARK P. ZANNA
DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF WATERLOO
WATERLOO, ONTARIO, CANADA

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ON THE PERCEPTION OF SOCIAL CONSENSUS

Joachim Krueger

As social creatures, humans continually perceive others and predict what these others think, feel, and, most importantly, what they will do. Without predictions of this sort, society quite literally might not be possible. Various branches of social psychology have addressed questions posed by this basic need for prediction. Among the relevant topics are impression formation, interpersonal relations, and group stereotypes. To varying degrees, these topics involve social perceptions and predictions that must be reasonably accurate to be effective. Like perceptions of the object world, perceptions of the social world can become destructive if they are grossly distorted. Perhaps because of this, social psychologists have dedicated considerable effort to the study of inferential errors and illusions (Nisbett & Ross, 1980). The guiding hope has been that understanding bias will lead to improvements in accuracy (Nisbett, 1993). Some of the most prominent biases are self-related. The perceivers' own behaviors, values, or simply their visual perspective uniquely affect their judgments. Such egocentric variations underscore the subjectivity of social perception. If perceptions were objective, they might contain some random variation, but no systematic variation across perceivers.

The goal of this chapter is to examine egocentric distortions in perceptions of social consensus. The perception of social consensus is the idea that the thoughts, feelings, and actions of others are similar to one's own. *Social projection* will serve as an umbrella term for the various forms of perceived consensus. A brief review of the history of projection research will establish that interest in this phenomenon is old and that it has intrigued investigators of widely differing theoretical persuasions. Then, the properties and the output of three current research paradigms will be examined in detail. The first paradigm conceives of projection as a fallacious inference strategy arising from higher mental processes; the second conceives of projection as

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a strategy of inductive reasoning that is consistent with normative statistical principles; and the third conceives of projection as egocentric perception that may lead to both accurate and erroneous judgments. In the concluding section, projection is placed in a broader social-psychological context.

I. The Historical Roots of Research on Projection

Empirical evidence for social projection goes as far back as evidence for any social psychological phenomenon. When Katz and Allport (1931) surveyed students' attitudes at Syracuse University, they found that the more students admitted to cheating on exams, the more they expected others to cheat. Katz and Allport offered little speculation about the sources of this correlation, but by labeling this correlation "social projection," they framed the perceptions of an entire field. The term social projection stuck, and with it three implicit assumptions. The first assumption, *correlation,* is simply that people's own responses to a stimulus are linearly related to their estimates concerning the responses of others. The second assumption, *causation,* is that people's own responses cause their consensus estimates rather than vice versa. The very meaning of the word embodies this view. To "project" means to throw forth, to attribute, or to generalize a personal piece of data to the outside world. Its opposite is to "introject," which means to throw inside, to assimilate, or to conform. The third assumption, *exaggeration,* is that people project too much. It suggests that people should refrain, at least in part, from projection. Almost without exception, theories of projection have embraced these assumptions, but have kept them largely implicit, thus protecting them from scrutiny. One purpose of this chapter is to make these assumptions explicit and to report some progress toward a systematic examination of their validity.

Over the decades, theories of projection have come and gone, but the phenomenon has remained. Early theorists sought to go beyond the contradictory notions of Freudian defense mechanisms. To Horney (1939), projection was "not essentially different from the tendency to assume naively that others feel or react in the same manner as we ourselves do" (p. 26). Cattell (1944) too saw naiveté at the heart of the matter. To him, projection was a "Naive Inference from Limited Personal Experience" (p. 180). During this period, most empirical work was either atheoretical or loosely linked to learning theories. Some of the studies of that time are still intriguing today because of the stimulus materials that were used. For example, raters' self-reported happiness predicted ratings of the happiness of photographed

individuals (Goldings, 1954); and the age of participating children predicted the age they attributed to Peter Pan (Mintz, 1956).

Just when Murstein and Pryer (1959) bemoaned the theoretical infertility of the field, consistency theories breathed new life into the study of projection. Heider's (1958) ideas on cognitive balance inspired the notion of attributive projection, and cognitive dissonance theory spawned many ingenious experiments (e.g., Bramel, 1962). This work was, in part, a response to Murstein and Pryer's call for a return to the study of ego-defensive mechanisms. Yet, there was nothing Freudian about these theories. Whereas Freudian theory emphasized the projection of traits whose existence was unconsciously denied in the self, experimental research failed to support this claim. In his influential review, Holmes (1968) considered it essential that "the individual has a fully conscious attitude or belief" (p. 249). Then, "because of his naiveté or lack of information about other persons, he believes that they feel or think as he does" (p. 249). Once again, the three assumptions leap from the page.

In the seventies, consistency theories lost momentum, but replications of projection effects continued in increasingly diverse and creatively designed studies. People's own behavioral preferences for competition or cooperation predicted how they would expect others to behave (Dawes, McTavish, & Shacklee, 1977); their opinions predicted their "looking-glass perceptions" of public opinion (Fields & Schuman, 1976); and their affect predicted the kind of affect they detected in others (Nasby, Hayden, & DePaulo, 1980). The need for a fresh paradigm became urgent, and attribution theory was the most promising candidate.

II. Projection as False Consensus

A. ATTRIBUTION

Initially, attribution theorists assumed that most people, like scientists, infer the causes of behavior through the rational analysis of relevant data. The central question was whether a behavior revealed more about the characteristics of the person who engaged in the behavior or about the characteristics of the situation in which the behavior occurred. Kelley (1967) proposed that consensus information is one of the cues that provides an answer. Consensus is the percentage of people who engage in a certain behavior. If percentages markedly differ from 50%, consensus is high and attributers may conclude that the situation had a powerful effect on the behavior of the majority. The minority behaving differently would appear to have resisted the pull of the situation. Attributers may conclude that the cause of this resistance lay in the individual members of the minority rather than in the situation (Jones & McGillis, 1976). Thus, if consensus for a behavior is low, attributers have, in theory, a cue for personal causation. In laboratory studies, attributers received prepared consensus information in the form of percentages (McArthur, 1972), but in real life they rarely possess such data. Instead, they need to estimate social consensus on their own. This is where projection comes into play.

By the time of McArthur's study, the metaphor of social perception as intuitive science was beginning to crumble. Ross, Greene, and House (1977) raised the specter of the well-intentioned but fallible scientist by suggesting that "laymen tend to perceive a 'false consensus'—to see their own behavioral choices and judgments as relatively common and appropriate to existing circumstances while viewing alternative responses as uncommon, deviant, or inappropriate" (p. 280). Like the original scientist metaphor, the revised metaphor itself had a projective element. It assumed that laypeople think like scientists do, rather than that scientists think like laypeople do. The use of scientific reasoning as the gold standard for everyday inferences also suggests a modicum of egocentric enhancement on the part of the scientists.[1]

1. The Method

The test of the false consensus effect (FCE) can be illustrated with a study that was conducted long before the paradigm was fully articulated. Students read several questions (e.g., Will the U.S. go to war with Germany by year's end?) and they indicated their own responses (yes or no). They also estimated the percentage of students who would answer yes to each question (Wallen, 1943). The FCE is the difference between the mean estimate of the agreeing and the disagreeing students (56% − 35% = 21%). Regardless of their own response, most students believed themselves to be in the majority. The perceived consensus for one's own response is an index of projection (Crano, 1983). The FCE can be recovered from the two projection indices by summing them and subtracting 100% (56% + 65%−100% = 21%).

In the false-consensus paradigm, raters' own responses are the independent variable and their consensus estimates are the dependent variable. The actual percentage of agreement with the judgment item, that is, the criterion of the consensus estimates, is ignored and the presumed falsity of the consensus effect is appraised without reference to the accuracy of the estimates. Usually, the difference in the average consensus estimates between groups serves as a measure of bias, and individual differences within groups are discarded as error variance. Unlike most subsequent investigators, Wallen computed point-biserial correlations between own responses and consensus estimates across raters ($M = .47$). These correlations serve as a reminder that most FCE studies, despite their trappings (between-groups comparisons by t tests), are not experimental by design.

[1] Scientists are not immune to projection. Reviewers of submitted manuscripts tend to overestimate the degree to which other reviewers will agree with their judgments (Mahoney, 1977).

2. The Findings

Ross et al. (1977) demonstrated the FCE in four studies. Consensus estimates varied with the raters' own response for a variety of traits (e.g., shy), preferences (e.g., to be alone), demographics (e.g., urbanite), problems (e.g., depressed), activities (e.g., play tennis), and personal (e.g., early death) and political expectations (e.g., reduction of poverty). The few (2%) reversals were small in size. In the most memorable demonstration, students decided whether they would assist in a communication study by carrying a sandwich board around campus. The message was either "Eat at Joe's" or the more ominous "Repent!" The FCE emerged regardless of whether the students' decisions were hypothetical or real. The sandwich board study is now a classic in research (Mullen, Atkins, Champion, Edwards, Hardy, Story, & Vanderklok, 1985) and teaching (Clement, Sinha, & Krueger, 1997).

3. The Relevance

Ross et al. (1977) suggested that the falsity of self-generated consensus may trigger incorrect and potentially unfair trait attributions. In particular, the FCE may help explain why most people attribute more stable personality traits to individual others than to themselves. Their studies demonstrated that raters were most inclined to attribute a target person's behavior to a (mostly negative) personality trait if that behavior differed from their own. In other words, projection facilitated both the actor–observer bias in trait attribution (Jones & Nisbett, 1971; Krueger, Ham, & Linford, 1996) and the enhancement of the self (Krueger, in press). Given their egocentric consensus estimates, raters are incredulous when they encounter someone who acts differently than they themselves would. Coupled with dispositional attributions, the "I-can't-believe-you-did-that" attitude stokes interpersonal conflicts (Krueger & Clement, 1994). However, the FCE may also be associated with trait attributions based on desirable behaviors. In a field study, raters who endorsed negative environmental behaviors felt that positive behaviors were relatively rare and they attributed them to positive correspondent traits (van der Pligt, 1984). The effects of self-generated consensus estimates on trait attribution are particularly remarkable in light of researchers' frequent failures to get raters to attend to explicitly provided consensus information (Koehler, 1996; Krueger, 1996a).

4. The Impact

The method established by Ross et al. (1977) became the model for hundreds of studies. The design was easy to implement and yielded replicable results. Reversals of the FCE were rare. Sufferers of panic attacks, for example, believed panic attacks to be *less* common than did nonclinical controls (Suls, Wan, Barlow, & Heimberg, 1990); Dutch Christians believed their own religious group to be smaller than did unaffiliated controls (Bosveld, Koomen, & van der Pligt, 1996). Although it is tempting to speculate about possible "false uniqueness effects," it is important to realize that a few reversals of the FCE can be expected by chance alone (Krueger & Clement, 1997). The meta-analytic effect size of the FCE is modest and only part of its variability across studies is systematic (Mullen et al., 1985). Not surprisingly, items addressing experience with panic attacks or Christian beliefs did not show false uniqueness effects in a recently attempted replication (Krueger, unpublished raw data).

How credible is this robustness of the FCE? One possible concern is that publication practices may have slowed the appearance of contradictory evidence. Perhaps the flow of replications developed a momentum that led researchers or editors to prefer "successful" replications over unsuccessful ones. It is difficult to estimate the magnitude of a file-drawer problem from the published record (Rosenthal, 1979), but dozens of tests of the FCE conducted in our laboratory tell an unambiguous story. Over 90% of all published and unpublished tests performed between 1991 and 1996 showed the FCE. Studies were run by about a dozen different individuals, and have included a wide range of different types of judgment items. To challenge the conclusion that the FCE is reliable, given the evidence, one would have to assume that hundreds of unsuccessful studies are languishing in file drawers.

Another concern is the possibility that the FCE may be inflated by measurement artifacts. Because the same raters provide item endorsements and consensus estimates on similarly keyed scales, correlations between the two may, in part, reflect shared method variance. To examine this possibility, a study was conducted in which half the raters used the conventional ratings format for both sets of judgments.[2] The other half used an inverted format for one of the judgments (e.g., they decided whether they agreed with the item and estimated the percentage of people who *disagreed* with it). In the first condition, the effects of projection and shared method variance worked in the same direction; in the second condition, they were pitted against each other. Analyses showed reliable FCEs in both conditions (*Ms* = 14 and 9%, in the matched and mismatched condition, respectively) and the means were not reliably different. Although these results did not establish unequivocally that shared method variance is irrelevant in the measurement of projection, they strongly indicated that projection arises from genuine psychological mechanisms. But what are these mechanisms?

[2] These data have not been published elsewhere. They are available from the author.

B. PSYCHOLOGICAL PROCESSES

The most enduring legacy of the Ross et al. (1977) article was the lineup of plausible and testable hypotheses concerning the causes of projection. Like other researchers at the time, Ross et al. attributed judgmental biases to limitations of people's information processing capabilities or to their self-interest. Although somewhat arbitrary, the distinction between cognitive and motivational processes was an effective means to organize a variety of human inference phenomena. Crucial experiments between "cold" and "hot" processes were often deemed futile, however, and thus rarely attempted. Many of the available social-cognitive data fit both perspectives (Tetlock & Levy, 1982). Yet, a general preference for cognitive explanations prevailed, probably fueled by the belief that cognitive explanations are more parsimonious, less ambiguous, and easier to demonstrate than motivational explanations.

1. The Lineup

Against this philosophical backdrop, Ross et al. (1977) proposed two cognitive explanations and one motivational explanation. The first cognitive explanation was a blend of selective exposure to similar others and heightened availability of one's own behaviors. The idea of *selective exposure* followed from the metaphor of people as fallible intuitive scientists. To make inferences about populations, professional scientists sample these populations, trying to avoid selectivity. Survey researchers in particular, whose goal it is to measure actual consensus in a society, use sophisticated tools to minimize sample bias (Schuman & Kalton, 1985). By analogy, the metaphorical intuitive scientist needs to form impressions about the prevalence or popularity of various attributes and choices in society. In contrast to the professional, the layperson has to resort to convenience samples consisting of those people who are around and whose actions have been observed. Because within a population people are rarely categorized randomly into subgroups, convenience samples tend to be biased by the person's own position in society. People associate with others who are like themselves. To some extent they do this by choice because similarity is reassuring; to some extent they do this by societal design (Newcomb, 1961). If selective exposure could be avoided, projection might decrease. This goal may be unrealistic, however. A more practical question is whether people can mentally correct the biases found in their samples of observations.

The idea of *availability* is closely related to the idea of selective exposure (Tversky & Kahneman, 1973). Projection may occur because the person's own behaviors and those of similar others come to mind more easily than the behaviors of dissimilar others. If so, consensus for one's own behaviors in the population would be overestimated. Again, the proximal cause of bias is the failure to correct for the biased availability of relevant data. A similar argument involves the more contemporary notion of accessibility. According to this view, the recency and frequency of their past activation predicts the speed and ease with which ideas come to mind (Bargh, Bond, Lombardi, & Tota, 1986). Because of its heightened accessibility a person may count his or her own response several times and thus unwittingly grant it equal status with multiple independent observations of the responses of others. This is particularly likely under conditions of high cognitive load (Rothbart, Fulero, Jensen, Howard, & Birrell, 1978). In sum, the selective exposure and availability hypotheses suggest troubles with mental accounting. Projection occurs because the mental database contains unrepresentative and uncorrected data about the social world.

The second cognitive explanation focused on the *resolution of ambiguity*. This idea acknowledges the fact that many social events are poorly defined and open to multiple interpretations (Griffin & Ross, 1991). Ross et al. (1977) speculated that the FCE occurs in part because people define ambiguous social stimuli egocentrically and assume projectively that others share their construal. For example, students who envision a walk with the sandwich board to be a humiliating experience will decline to participate in the communication study. They will also probably assume that other students share their assessment that a walk with the board would not be gratifying. As a consequence, their consensus estimates for compliance will be low.

The *motivational* explanation offered by Ross et al. (1977) was also rooted in attribution theory. Consistent with the actor–observer bias, they reasoned that people, as actors, consider their own behaviors and choices to be rational and appropriate responses to situational requirements. If most others respond likewise, the power of the situation is confirmed and the actor's own behavior justified. This view implies that the actor–observer effect causes the FCE. Ross et al. also recognized other, more traditional motivational sources of projective bias. These sources involved various forms of ego enhancement and ego protection that had intrigued earlier researchers (Holmes, 1968).

2. *Strategy of Identification*

> It's a good morning exercise for a research scientist to discard a pet hypothesis every day before breakfast. It keeps him young.
>
> (Konrad Lorenz, *On Aggression*)

The lineup of possible causes of projection provided a blueprint for research. The question to be answered was clear: Why do people project? Most investigators responded by examining one possible cause at a time. After the first 10 years of research, Marks and Miller (1987) concluded that "the findings indicate that these biases are influenced by a host of variables and that no single explanation can account for the range of data [and that] in fact, there are almost as many explanations of the effects as there are empirical studies of the phenomena" (p. 72). Given the amount of effort that had been invested, this conclusion was disappointing. The literature buckled under the weight of positive results, and the goal of a unified theoretical understanding of projection had become remote. Projection had become overexplained. Overexplanation occurs when experiments demonstrate many sufficient causes, but in the end "nothing definite has been learned, as [the phenomenon] is accounted for by many possible factors" (Zuckermann et al., 1988).

What was the problem? Formally, to show that condition C predicts effect E is to support a hypothesis that is modeled after the logical inference of *modus ponens* ($C \rightarrow E$). The hypothesis is supported probabilistically if E is more likely to occur after C than after the absence of C (Cheng, 1997). Modus ponens is confirmatory and thus weak. Its inverse ($E \rightarrow C$) is not logically valid. If it is found, for example, that availability biases can produce the FCE, it does not follow that a particular observed FCE was caused by an availability bias. The success of the individual confirmatory studies weakened the conclusions drawn from the research program as a whole. The more causes were shown to be sufficient to produce projection, the more difficult it was to identify any particular necessary cause. Inasmuch as multiple causes covary or interact with one another, they obscure the unique contribution of any particular one. Coffee drinking, for example, may appear to cause lung cancer if the covariation between coffee drinking and smoking is not controlled (Spellman, 1996). A confirmatory test strategy does not supply criteria for discriminating between relevant and irrelevant sufficient causes, and it never provides certainty that all relevant causes have been identified. No matter how many sufficient causes have been found, still others may be awaiting confirmation. The strength of the FCE may be correlated with many variables. The question is whether "discoveries" of these correlations pave the way to theoretical progress or whether they merely catalogue the "crud factor" in social science (Meehl, 1990).

It is a stronger testing strategy to ask whether a potential cause is both necessary and sufficient. The premise is that a cause must be present for the effect to occur ($E \rightarrow C$), and a testable hypothesis is modeled after the logical inference of *modus tollens*: The effect will disappear when the cause is removed ($-C \rightarrow -E$).[3] There should be no projection ($-E$) when a necessary cause is eliminated ($-C$). If the effect does not disappear, the cause is not necessary. This strategy of trying to falsify a hypothesis by ruling out a potential cause (modus tollens) promises greater theoretical advances than a strategy of trying to confirm a hypothesis by ruling in a cause (modus ponens; Platt, 1964).[4] Projection can then be attributed to those causes whose elimination also eliminates projection. The following review revisits the distinction of cognitive and motivational causes by asking whether studies involved appropriate experimental designs, and, if so, whether they eliminated unnecessary causes.

3. *Troubles with Sampling: Selective Exposure and Availability*

Many prominent explanations of projection stress the role of *selective exposure* and retrieval, and therefore these variables will be examined in detail. Marks and Miller (1987) concluded that "despite the absence of data delineating the complete mediating process, we believe that selective exposure is the primary factor generating misperception of the commonness of one's preferred position" (p. 77). What evidence led to this conclusion and what is its status after another decade of research? Is the mediating process now fully understood?

[3] The Latin phrase is too nice to be omitted: Sublata causa, tollitur effectus.

[4] Consider the impact of the falsification strategy on the progress of social psychology. In Milgram's (1974) obedience studies, for example, observers expected the probability of lethal shocking to be very low (Bierbrauer, 1979). Even Milgram's colleagues, who read descriptions of the high-impact experiment (Yale experimenter in lab coat, remote victim), thought that only a few sociopaths might deliver lethal shocks. The experimental situation in the maximum-impact study had many converging features eliciting obedience. After Milgram had demonstrated that these features in conjunction were sufficient to produce surprising levels of obedience, he gradually stripped them away to determine a minimum set of obedience-producing features. Similarly, research on the causes of in-group favoritism advanced by excluding rather than including potential causes (Rabbie & Horwitz, 1969; Tajfel, 1970).

The idea that selective exposure affects consensus estimates is almost as old as research on projection. Wallen (1943) considered this idea but ultimately rejected it as implausible. Consistency theorists revived interest in selective exposure. They treated it as an independent variable to explain the formation of attitudes, values, and habits. They also treated it as a dependent variable by showing that people selectively seek supportive information for their choices or changes of mind (Frey, 1986). As Marks and Miller (1987) suggested, however, the role of selective exposure is that of a mediator variable if it is to explain projection. Mediation involves two processes. First, by relying on small samples of observable behaviors of others, the perceiver faces a biased data base. Second, mental corrections of sampling bias are difficult and tend to be incomplete.

The first process is plausible on sociological and psychological grounds. Voluntary and involuntary forces co-act so that most social contacts involve people who are more similar to one another than could be expected if people were paired randomly (Ennett & Bauman, 1994). The degree of sample bias may vary, however, with the type of characteristic. Whereas it is easy to imagine how people selectively associate with others who have similar occupational roles, political attitudes, or leisure interests, it is harder to imagine how exposure could be selective in the more private domains of thoughts or feelings. How likely is it, for example, that lovers of sauce Bernaise associate primarily with others who share this culinary preference? The famous sandwich board study illustrates this problem. Could it be argued that students who agreed to encourage others to "repent" had been selectively exposed to other students who would do the same? Assuming that the majority of the students encountered the request for the first time in the laboratory, it is unlikely that they had prior opportunities to associate selectively with similar others. To remain plausible, the selective-exposure hypothesis requires ad hoc adjustments. Perhaps students had selectively exposed themselves to others whose general behavioral tendencies were similar to their own. The compliant students may have been around others who were overall more compliant than students who refused to comply. Unfortunately, the use of such post hoc flexibility also introduces a logical weakness. Whereas it is likely that biased sampling leads to biased estimates, the inverse is far less certain. It would be fallacious to assume that exposure must have been selective whenever projection is observed.

The second process is the failure to recognize and correct sample bias. Early research in the heuristics-and-biases tradition showed that many people with and without scientific training make hasty decisions based on small (Tversky & Kahneman, 1971) and unrepresentative samples (Hamill, Wilson, & Nisbett, 1980). More recent evidence has shown, that in some contexts raters are sensitive to sample size and sample bias. Inferences from uniform samples (where all X are Y) become more extreme the larger the sample is (Krueger & Clement, 1994; Nisbett, Krantz, Jepson, & Kunda, 1983), and inferences about group characteristics depend on the typicality of encountered members. Typical group members come to mind more readily than atypical members do, and the characteristics of typical members are the best predictors of the characteristics that form the group stereotype (Rothbart, Sriram, & Davis-Stitt, 1996). Even in stereotyping, people are sensitive to sample bias.

Given this evidence for the potential adequacy of inductive inferences, the presence of an FCE is insufficient grounds for the conclusion that a selective-exposure bias must have operated. To explain projection, selective exposure needs to be shown prior to the assessment of projection. The prevalent research strategy has been relatively weak, however. In a typical study, participants rate how many of their friends share a certain characteristic (Sherman, Presson, Chassin, Corty, & Olshavsky, 1983). The reported numbers are correlated with the participants' own responses and their consensus estimates (Bosveld et al., 1996; Deutsch, 1988; Koestner, Losier, Worren, Baker, & Vallerand, 1995). These correlations are typically treated as support for the hypothesis that selective exposure mediates projection. The top panel in Figure 1 illustrates this view. People generalize the responses of individual others to the group. Because these others are a biased sample of the group and because people fail to correct this bias, the correlation between self and consensus estimates for the group is positive. Indeed, the selective exposure hypothesis implies that the projection correlation is spurious. It should be eliminated when the mediating effect of the sample observations were controlled.

The bottom panel of Figure 1 shows that a process of unmediated projection may also fit the data pattern. Descriptions of the individual others themselves may be projective (Murray, Holmes, & Griffin, 1996). That is, correlations between descriptions of the self and descriptions of one's friends involve both real and perceived similarities. Furthermore, when making consensus estimates for the group, people may rely more heavily on their own responses than on the perceived responses of their friends. Should this be the case, the correlation between the descriptions of one's friends and the descriptions of the population may be inflated. Tantalizing evidence for this possibility comes from a Dutch study (van der Pligt & van Schie, 1989; cited in Bosveld, Koomen, & van der Pligt, 1994). The responses ascribed to individual friends ceased to predict consensus estimates when raters' own responses were controlled. These findings suggest that the responses ascribed to one's individual friends and the responses ascribed to the group at large are correlated because both result from the rater's projections.

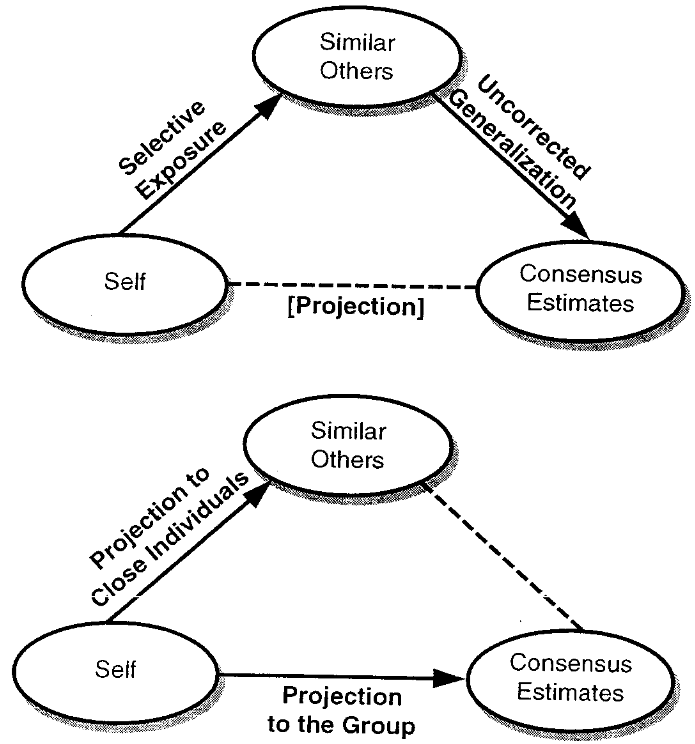


Fig. 1. Selective exposure effects: mediation (*top*) and projection (*bottom*).

Bosveld et al. (1994) recorded spontaneous references to similar and dissimilar others to examine whether the degree of (reported) selectivity predicted the size of the FCE. Both majority and minority members reported greater exposure to majority members when majorities were large (>70%), but reported exposure was similar for slight majorities. Consistent with the idea that selective exposure is a sufficient cause of projection, the FCE was larger among those participants who mentioned similar others than among those who did not. Yet, this evidence did not establish the necessity of selective exposure as a cause of projection because FCEs emerged even among raters who reported exposure to dissimilar others. A study on political preferences and predictions yielded similar results (Babad, Hills, & O'Driscoll, 1992). Overall, predictions of a party's electoral success were more favorable among the party's supporters than among its opponents. This effect was reduced but not eliminated among voters who resided in districts traditionally opposed to their own preferences. In other words, projection prevailed even when selective exposure effects worked against it. Some samples are so unrepresentative that their bias should be evident, and raters should abstain from generalization. However, even psychiatric patients were no less likely than college students to see themselves as similar to the average person (Brabender & Deutsch, 1993). Patients actually saw greater similarities between their peers and the average American than students did (see also Yinon, Mayraz, & Fox, 1994).

A strong test of the selective-exposure hypothesis requires an attempt to rule out its effects. If projection occurs even when there are no sample observations of the behaviors of others, selective exposure is not a necessary cause. The great generality of the FCE across different types of items casts doubt on this possibility. Many items refer to novel, unusual, or private behaviors. It is not likely that people selectively expose themselves to others who share their response to an item such as "I sweat very easily even on cool days" (Krueger & Clement, 1994). Confidence in the necessity of selective exposure further decreases when one considers that the same raters project on several unrelated items of this kind (e.g., "I enjoy reading love stories"). The greater the number of these items is, the less likely it is that a rater could maintain multiple social networks that would selectively support projective estimates for each of the items.

The most direct way of reducing a rater's ability to evoke memories of similar others is to isolate them in the laboratory and to control their responses. Sherman, Presson, and Chassin (1984) did just that by providing arbitrary feedback on participants' ability to distinguish real from false suicide notes. Most participants believed that their individual outcomes (success or failure) were those of the majority (see also Agostinelli, Sherman, Presson, & Chassin, 1992; Alicke & Largo, 1995). Taking arbitrary manipulations further, Clement and Krueger (1997) gave participants a pseudopsychological test and classified them as either "Figurers" or "Grounders." After reading descriptions of these unfamiliar psychological types, participants estimated that their own type was the most common one. That is, projection occurred for an unfamiliar attribute for which there was no sample information.

Selective exposure is a sociological variable because it depends on the presence of others in the person's social network. By contrast, selective retrieval (i.e., *availability* bias) is a psychological variable. Through biased retrieval of one's own behaviors and those of similar others, people may come to project even if exposure itself is unbiased. There has been no research trying to examine the role of availability biases independent of the selective-exposure hypothesis. Thus, the critique of this hypothesis is largely the same.

4. Biased Thinking: Attention and Attribution

According to the salience hypothesis, people's own responses are perceptually salient relative to alternative responses that did not occur. In a choice situation, for example, the chosen alternative dominates the rejected one. The choice (e.g., I bought the BMW) and the cues and consequences that are associated with it (The BMW is parked in the driveway) are more immediate and proximal than their alternatives (The Volvo that I didn't buy is not parked in the driveway). With this attentional focus, people become more likely to imagine their own responses more vividly and to explain why they occurred. Imagination and explanation then lead to increased probability estimates (Gregory, Cialdini, & Carpenter, 1982; Hoch, 1984; Sherman, Zehner, Johnson, & Hirt, 1983).

Experimental tests of the salience hypothesis meet the sufficiency criterion. Increases in salience lead to increases in consensus estimates (Zuckermann, Mann, & Bernieri, 1982). Marks and Duval (1991) performed a stricter test by asking whether projection would still occur if raters focused on the *rejected* response option. Participants made a behavioral choice (e.g., between "going to the beach," or "riding a bike") and then imagined themselves performing either the chosen or the rejected activity. Even raters who focused on the rejected activity projected ($M = 55\%$), albeit less so than raters who focused on their chosen activity. This effect was not contaminated by changes in participants' preferences. Few participants embraced the rejected activity after they had focused on it. These findings rule against the idea that salience is a necessary cause of projection.

Marks and Miller (1987) suggested that differences in response certainty indicate differences in salience. Higher levels of certainty are associated with greater projection (e.g., Marks & Miller, 1985; van der Pligt, van der Linden & Ester, 1982), but the question remains whether differences in certainty (and thus salience) cause differences in projection. Until this is demonstrated conclusively, a simpler interpretation may suffice. The certainty effect could be an artifact of the typical measurement of endorsements as categorical decisions. Table I illustrates this view with the kind of data one might find in attitude measurement. The graded responses of 40 raters form a symmetrical and unimodal distribution ranging from extremely Con to extremely Pro. Consensus estimates for the Pro position reveal an FCE (M[yea-sayers] − M[nay-sayers] = 33%). If categorical endorsements are used to assess projection, much of the variance in both the consensus estimates and in the graded endorsements is lost. In this example, these two variables are perfectly correlated even among raters whose categorical endorsements are the same. The example also shows the typical pattern of certainty ratings in attitude judgment. Raters with extreme atti-

TABLE I
HYPOTHETICAL DATA ILLUSTRATING THE EFFECTS OF RESPONSE FORMAT

Rater's number	1	2	3	4	5	6	7	8
Number of raters	1	2	7	10	10	7	2	1
Categorical endorsement	0	0	0	0 (No)	1 (Yes)	1	1	1
Graded endorsement	1	2	3	4	5	6	7	8
Consensus estimate	10%	20%	30%	40%	60%	70%	80%	90%
Certainty	9	5	2	1	1	2	5	9

tudes also tend to feel more strongly (i.e., be more certain) about their beliefs than do raters with moderate attitudes. Thus, certainty ratings are correlated with consensus estimates and with graded endorsements within each group of raters ($r = .94$ each). They would not improve the prediction of consensus estimates if graded endorsements were controlled.[5] Data reported by Babad et al. (1992) were similar to the sanitized hypothetical data shown in Table I. These authors found that confidence ratings (i.e., certainty) improved the prediction of group-related estimates only slightly when raters' own responses were controlled ($r^2 = .14$ versus .09).

The dichotomization of one variable tends to attenuate its correlation with a continuous one (Hunter & Schmidt, 1990), and thus, the use of categorical endorsements tends to underestimate the strength of projection. In the hypothetical data set, consensus estimates are correlated less highly with categorical ($r = .90$) than with graded endorsements ($r = 1$). Moreover, no rater can be expected to give perfectly reliable endorsements. If the scale is graded, any unreliability has less of an effect than when the scale is categorical. A rater with a true graded endorsement value of 7, for example, may mistakenly check a 6 or an 8. Either way, however, the response would indicate endorsement in the categorical sense. In contrast, a rater with a true rating of 5 may occasionally check a 4, which would then falsely be categorized as a rejection. Results by Koestner et al. (1995) are consistent with this analysis. These authors assessed salience effects by asking raters to indicate how long it took them to make up their mind about a political issue and how often they changed their mind during the past month. Projection was greatest among raters who reported that they had made up their minds fast and did not change it.

The final cognitive explanation offered by Ross et al. (1977) involves differences in causal *attribution*. The initial idea was that projection facili-

[5] With this set of numbers, the partial correlation r(certainty with estimates by ratings) is not defined because the perfect correlation between estimates and ratings produces a 0 in the denominator. If that correlation approaches 1, however, the partial correlation approaches 0.

tates situational attributions for the self and dispositional attributions for the other, but later investigators suggested that consensus estimates *follow* from attributions. The explanatory power of this argument is limited, however. It is true by definition that a stimulus attribution reduces the relevance of individual differences, whereas a dispositional attribution enhances it. Heider (1958) suggested that people who enjoy an object tend to make stimulus attributions. "There is something enjoyable about the object. The attractiveness is a quality of the object, just as is the sweetness of a fruit or the roughness of a terrain. Consequently, p's expectations, and therefore beliefs, refer not only to his own reactions to x on future occasions, but also to the reactions of the other people" (p. 158). Consensus estimates for stimulus-appropriate behavior must be high if the situational attribution is to have any meaning. The crucial question is whether projection remains when stimulus attributions are eliminated. Except for one experiment, however, this was not the case (Gilovich, Jennings, & Jennings, 1983, Experiment 1). Projection, though reduced, affected consensus estimates even when raters attributed their behavior to their own dispositions.

5. *Motivated Projection: Ego Protection and Ego Enhancement*

The theme of motivational explanations is the gratification of a psychological need. Consistent with the attributional framework, Ross et al. (1977) suggested that people "desire to forestall trait inferences" (p. 297). To this end, they consider stimulus attributions, which are implied by high consensus estimates, to be more rational than dispositional attributions. Although it is true that people are more reluctant to ascribe personality traits to themselves than to others (Krueger et al., 1996; Robins, Spranca, & Mendelsohn, 1996), they use traits more liberally in self-descriptions than other kinds of descriptors (e.g., physical characteristics, attitudes, or group memberships). This tendency is especially pronounced in individualistic cultures such as North America (Rhee, Uleman, Lee, & Roman, 1995). Moreover, trait inferences come to mind rapidly and with little effort (Uleman, 1989), and when compared with normative inferences about the self, they tend to be too strong (Gilbert & Malone, 1995).

How can this preference for trait terms in self-descriptions be reconciled with a motivation to forestall trait attributions? In particular, why would people try to avoid ascribing positive traits to themselves? Most people are eager and quick to attribute positive outcomes to their own dispositions (Miller & Ross, 1975). Perhaps it is more realistic to assume that people merely desire to forestall negative trait inferences. If they did, this could be evidence for the operation of *ego-protective* mechanisms. Such mechanisms were studied extensively in the cognitive dissonance paradigm. Cognitive dissonance arises when a person is (mis)informed of having an undesirable characteristic. Dissonance dissipates when the person can attribute the characteristic to others (Bramel, 1962). The problem with this approach was that participants did not receive positive feedback. More recent work has shown that people project at least as much after positive feedback as after negative feedback (Agostinelli et al., 1992; Alicke & Largo, 1995; Sherman et al., 1984). These findings cast doubt on the idea that it is necessary to invoke ego-protective motives to explain the projection of negative characteristics.

An alternative perspective on motivated projection is that people tend to overestimate consensus for their undesirable characteristics and underestimate consensus for their desirable characteristics (Mullen & Goethals, 1990). According to this view, only the overestimation of actual consensus constitutes projection, whereas the underestimation of actual consensus constitutes a uniqueness bias. The two errors may then be attributed to two distinct motives. The projection of negative characteristics protects the ego, whereas a uniqueness bias for positive traits enhances it. If, as stated in a popular textbook, "people see their failings as normal, their virtues as rare" (Myers, 1996, p. 58), their sense of self-worth should be maximized. Again, however, a note of caution must be injected. The viability of this motivational view depends on whether it can be shown that ego-related motives are necessary to explain over- and underestimation of actual consensus. Unfortunately, this may be difficult to demonstrate because a simple regression effect can account for the same pattern. Two well-documented facts make regression effects highly likely in this domain. First, actual consensus rates increase with the desirability of the judgment item because most people have positive self-images (Brown, 1986; Krueger, in press; Krueger & Heckhausen, 1993). Second, consensus estimates are not very accurate. Low correlations between estimated and actual consensus mean that the estimates are regressive (Fiedler, 1991). Suppose, for example, the actual consensus of ascribing a desirable trait such as "honest" to oneself is 80%. The mean of the consensus estimates is probably below this value, in part simply because raters have more room for underestimation than for overestimation. In contrast, suppose the actual consensus of ascribing an undesirable trait such as "selfish" to oneself is 20%. In this case, there's more room for overestimation than for underestimation.

To test whether the desirability of the judgment item mediates the degree of projection, it is necessary to correlate desirability ratings with consensus estimates for own responses while holding actual consensus constant. To do this, data from a previous study (Krueger & Clement, 1994) were reanalyzed. Actual consensus rates for own response, mean consensus estimates for own response, and the mean desirability ratings were correlated across 40 MMPI-2 items. As predicted, desirable items received more endorsements than undesirable items [$r(38) = .62, p < .01$] and the accuracy of the consensus estimates was low ($r = .03$). Contrary to the motivational view, desirability ratings predicted consensus estimates for own responses neither before nor after actual consensus rates were partialed out (both $rs = -.06$). The most parsimonious interpretation of these findings is that people see their own characteristics as normal, be they failings or virtues. Overestimation errors in the case of failures and underestimation errors in case of virtues simply result from differences in actual consensus (Krueger & Clement, 1997).

The idea that projection protects the ego implies that people feel better once they have assumed that others share their undesirable characteristics. That is, the negative feelings evoked by the possession of undesirable characteristics should be self-eradicating. If, for some reason, projection fails, consensus information might be helpful if someone else provides it. Nisbett, Borgida, Crandall, and Reed (1976) did this for some of their participants by giving them information about the experiences of others who were in the same stressful situation (e.g., spending lonely Sundays in a campus dorm or suffering the hardships of a first-year faculty member). Surprisingly, the provided consensus information failed to humor the depressed or relax the stressed, which makes it doubtful that spontaneous projections of consensus could.

Desirability is not the only item characteristic that has been assumed to affect projection. Other proposed variables revolve around the relevance of the issue for the rater. If projection springs from a motivation to fabricate consensus for one's own attitude, projection should be especially strong for attitudes in which the ego is involved. Crano (1983) examined the role of "vested interest." Consensus estimates for own responses were greater when the attitude referred to events that were relevant to the self (M = 72%) than when they were not (M = 59%). Again, vested interest is a variable sufficient to increase projection, but it is not necessary to create it. A similar variable, attitude importance, was altogether unrelated to the strength of projection (Fabrigar & Krosnick, 1995).

Whereas most claims about the role of ego protection involve differences in characteristics of the judgment items, claims about the role of *ego enhancement* typically involve differences in the characteristics of the target groups. People tend to project more to attractive or similar others than unattractive or dissimilar others. This preference is consistent with theories of social identity and self categorization (Oakes, Haslam, & Turner, 1994). To the extent that social identity derives its positive character from membership in valued groups, a person can boost the ego by assuming that other group members share desirable characteristics. A similar prediction follows from balance theory. "Cognitive balance is achieved when a person who sees him- or herself favorably perceives that favorable others hold positions on opinion issues that are similar to one's own positions" (Marks & Miller, 1987, p. 81). The finding that people project to similar others is not surprising. It simply means that they assume similar others to be similar. Most people ascribe positive rather than negative attributes to themselves, and thus view attractive others to be more similar to themselves than unattractive others (Marks & Miller, 1982). Unique effects of target similarity can be demonstrated only if the items used to assess projection are unrelated to the attributes used to assess the similarity between raters and the targets. If a motive of ego enhancement were a necessary cause of projection, projection should disappear when the favorability of raters' self-images, the favorability of the target group, and the similarity between the two are controlled.

Ego-enhancement is suggested by desirable outcomes of projection. If people feel that most others see things as they themselves do, they feel entitled to favor majority rule (Miller, 1993) and to escalate conflicts (Russell & Arms, 1995). Although it is intruiging, this correlation between social projection and political intransigence need not result from a motivational cause. Strict tests of the motivational hypothesis involve attempts to eliminate or reverse projection by introducing opposing motives. One such motive is to deliver accurate percentage estimates. However, even when raters were stimulated by cash rewards for accuracy, projection persisted (Koestner et al., 1995; Mullen, 1983). Did the countervailing motivation fail because raters did not understand their own projective tendencies and did not know how to overcome them? Krueger and Clement (1994, Experiment 1) described the nature of projection to some of their raters and warned them not to succumb to it. Other raters received feedback on their accuracy (or lack thereof) after every consensus estimate they made. Still others received both forms of support. These interventions did not reduce projection relative to the no-intervention control group (see also Babad et al., 1992).

6. *Shifting Paradigms*

After 20 years of research, the returns of the false-consensus paradigm have begun to diminish. Research designs have been plagued with a lack of control over independent variables, and many correlational findings led to premature claims about the causes of projection. The experimental studies have yielded some insights about which cognitive and motivational factors are sufficient to increase projection, but the most significant insight has been that no cause has emerged as both necessary and sufficient. Among other things, people project even when no biased sample of others is present, when they imagine alternative responses, and when they are motivated to avoid projection.

Since Marks and Miller's (1987) review, two alternative paradigms for the study of projection have evolved. Both paradigms offer parsimonious assumptions about the necessary and sufficient causes of projection. Yet, they make radically different assumptions about the nature of the relevant psychological processes. In the first paradigm, projection is viewed as a form of *inductive reasoning,* and the key assumption is that false consensus is not necessarily false. Instead, it may reflect a rational inductive inference. The goal of research in this paradigm is to identify the statistical properties of inductive reasoning and highlight their similarities with intuitive probability estimates. In the second paradigm, projection is viewed as a form of *egocentric perception.* The key assumption is that the psychological processes underlying projection are primitive and irrational, yet adaptive. They may lead fortuitously to consensus estimates that are similar to the outcomes of normative inductive reasoning.

III. Projection as Induction

When Marks and Miller (1987) reviewed the false-consensus paradigm, Hoch (1987; 1988) attacked the very foundations of that paradigm. He suggested that projection is a special case of inductive reasoning; therefore the FCE is not necessarily false and need not be attributed to faulty psychological processes.

A. THEORY: THE RATIONALITY OF GENERALIZATIONS

I generalize with intrepidity from single cases. It's a tourist custom.
(Mark Twain, *Mark Twain's Notebooks and Journals*)

1. *Most Single Observations Are Diagnostic*

The premise of the false-consensus paradigm is that consensus estimates are false if the means of the estimates differ depending on the rater's own response.[6] False consensus is indeed a sufficient condition of inaccuracy

[6] Ross et al. (1977) did not make this premise explicit, and they did not state how much mean estimates would have to differ to be considered false. The strategy of testing projection by t tests favors the discovery of "false" consensus effects because it equates rational inference with the truth of the null hypothesis ($r = 0$). Any increase in statistical power makes it more likely that raters will be found guilty of false reasoning.

because not everyone can be right (modus ponens). Stated differently, there would be no FCE if all estimates or at least their means were accurate (modus tollens). It is not true, however, that the absence of the FCE implies accurate consensus estimates, or that inaccuracy implies the FCE (this might be called "modus nonsense"). There are numerous ways in which estimates can be inaccurate despite perfect agreement between item endorsers and nonendorsers. Studies on "pluralistic ignorance," for example, show that people, regardless of their own responses, drastically over- or underestimate consensus for certain behaviors (e.g., Prentice & Miller, 1993; Toch & Klofas, 1984). What is questionable is the suggestion that raters should ignore their own responses in order to increase the accuracy of their consensus estimates. There would be no FCE if raters did that, but inaccuracies would not necessarily disappear. The suggestion that a sample of one should be ignored has no logical or statistical basis. If samples of one were ignored, there would be no reason to respect samples of any size (Dawes & Mulford, 1996). A rater who dismisses single-case samples must dismiss all samples in order to be consistent.

To illustrate the consequences of prejudice against single-case samples, suppose a rater samples 100 colored chips from an urn of 1000 chips. A sample of this size inspires confidence in the reliability of estimates about the percentage of chips of a certain color. If, for example, 2/3 of the sampled chips are blue and 1/3 are red, this distribution appears to be an excellent estimate for the population distribution in the urn. Now suppose the rater goes back in time to the point where only 99 chips had been sampled. The reliability of this sample would be a bit lower than the reliability of the full sample and it would further decrease with every imaginary step back in time. The more the sample size approaches 0, the greater is the loss of information, although there is no point at which the sample becomes entirely uninformative. Unless sample size is 1, the rater could not conclude that N observations would be diagnostic but that $N - 1$ observations would not be. If looked at in the direction of increasing sample size, this means that the first observation is the most valuable. Each subsequent one increases the reliability of the sample by a smaller increment.

Another way of appreciating the diagnostic value of a single observation is to compare a deductive perspective with an inductive perspective. Suppose an urn contains 80% blue chips. When asked to predict the color of the first chip before it is drawn, it is a simple matter to deduce that the chip will probably be blue (Tversky & Edwards, 1966). Now suppose there are two urns, one with 80% blues and one with 20% blues. When a blue chip is drawn randomly from one of the two urns, one can infer by induction that the chip was probably drawn from the predominantly blue urn. Most induction tasks are formally equivalent to this task but are far more ambiguous. Instead of 2 urns with different percentages, there may be 101 urns, each one representing a different hypothetical percentage. If a sample of one has become available, the question is how common the sampled characteristic is in the population. Whatever the probability of this characteristic was before sampling, it has now increased. After an urn of unknown contents has yielded a blue chip, the probability of blue increases. After the draw of a second chip that is also blue the probability of blue rises further, but with a smaller increment than after the first draw. By the same logic, the rater's own response is a single piece of sample data, and it should be used. If the rater learns about the response of another individual, both responses should be used, but their average weight should be less than the weight of the rater's own response when considered alone.

In contrast to this analysis, the false-consensus paradigm implied that raters should ignore their own responses. This recommendation amounts to a *conservatism bias* on the part of the researchers. Conservatism is common in probability estimation tasks not involving own responses. Raters typically place insufficient weights on small samples (Edwards, 1982), and many reject the idea that a single observation has any value for predicting the characteristics of its parent population. By the same token, many researchers seem to believe that the behavior of a single rater is unrelated to the prevalent behavior in the group, and they—projectively—expect the participants in their studies to share this false inference.[7] In other words, researchers evaluate the raters' rationality against a normative standard, which is itself irrational. As Dawes and Mulford (1996) so mordantly suggested, the "belief in these particular systematic limitations of judgment arises not from the irrationality of experimental subjects who allegedly demonstrate their existence, but from the cognitive limitations of the psychologists studying these subjects" (p. 201).

The implications of the induction paradigm for projection research can be summarized as follows: Induction produces FCE-like data because the presence of the rater's own response is a necessary and sufficient condition for projection. In the typical study, projective bias is confounded with normative induction. If the estimates made by endorsers and nonendorsers did not differ one could be certain that raters underprojected. To be able to evaluate overprojection (i.e., bias), it is necessary to identify the optimal weights raters should assign to their own responses.

2. *A Bayesian Induction Rule*

One way to derive optimal weights is to think of consensus estimation as a revision of probabilities. This view implies that a response has an

[7] In contrast to the prevailing metaphor, this is a case in which scientists think like laypeople.

estimated probability to occur in the group even before raters consider their own responses as relevant data. Then, when raters consider their own responses, they estimate the posterior probability of the response in the group. The difference between the prior and the posterior probability is the degree of revision. All revisions are in the direction of the data, that is, in the direction of the raters' own responses. Thus, the resulting consensus estimates may *appear* to be biased.

The first question is "What is the prior probability of the response, $p(\mathrm{R})$?" To illustrate the mathematical logic of this problem, consider the 101 steps of the percentage scale as mutually exclusive and exhaustive hypotheses (Hi) concerning $p(\mathrm{R})$. The hypotheses range from the expectation that no one shows the response, $p(\mathrm{R}|\mathrm{H}_0) = 0$, to the expectation that everyone shows the response, $p(\mathrm{R}|\mathrm{H}_{100}) = 1$. In other words, each hypothesis is a conditional probability that the response will occur. Each hypothesis also has a base rate probability of being true, $p(\mathrm{Hi})$, and the sum of these is 1. The aggregate prior probability of the response is obtained by first multiplying each conditional probability of R with the base rate probability of its respective hypothesis and then summing the products, that is,

$$p(\mathrm{R}) = \Sigma[p(\mathrm{R}|\mathrm{H}_i)p(\mathrm{H}_i)].$$

The second question is "What is the posterior probability of the response, after an individual response has been observed, $p(\mathrm{R}|\mathrm{Rzi})$?" The first effect to note is that the probability of each hypothesis needs to be revised. All hypotheses stating that $p(\mathrm{R}) < .5$ a priori have become less likely after one response has occurred, and the hypothesis stating that $p(\mathrm{R}) = 0$ now has a probability of 0. All hypotheses stating that $p(\mathrm{R}) > .5$ have become more probable. Bayes's rule gives the posterior probability of each hypothesis as the product of its prior probability and the probability that R would occur under that hypothesis divided by the prior probability of the response, or

$$p(\mathrm{H}_i|\mathrm{R}_i) = \frac{p(\mathrm{H}_i)p(\mathrm{R}|\mathrm{H}_i)}{p(\mathrm{R})}.$$

After the first observed response, the posterior probability of R is obtained in a two-step procedure. The posterior probability of each hypothesis is multiplied with the probability that the response would occur under that hypothesis. These products are then summed, that is,

$$p(\mathrm{R}|\mathrm{R}_i) = \Sigma[p(\mathrm{H}_i|\mathrm{R})p(\mathrm{R}|\mathrm{H}_i)].$$

For successive revisions of $p(\mathrm{R})$, this procedure can be repeated after each additional sample observation. Although this approach only involves simple mathematical operations, its usefulness as a psychological model is limited. The average person can hardly be expected to compute, revise,

and aggregate 101 probabilities. To obviate the need for prior knowledge of discrete hypotheses and to simplify calculations, Dawes (1989) used Laplace's "Principle of Insufficient Reason," which states that all possible hypotheses may be considered equiprobable in the absence of data. A rater who temporarily sets aside knowledge of his or her own response has no idea whether consensus is 0%, 1%, 2%, or any other percentage. In other words, the rater is in a state of ignorance. Not only is the level of social consensus uncertain, but the degree of uncertainty is itself uncertain (Einhorn & Hogarth, 1985). Then, when the rater considers individual responses as pieces of data, the revision of the consensus estimate is simply

$$p(\mathrm{R}|\mathrm{R}_i) = \frac{K+1}{N+2},$$

where K is the number of observed responses of a certain kind (e.g., "yes"), and N is the total number of observed responses. If own response is the only piece of data available, both K and N are 1, and the posterior probability of R is .67. If item endorsers and nonendorsers apply this induction rule, both will believe their own response to be the response of the majority. That is, members of both groups will project. The size of the resulting FCE (33% = 67% × 2 − 100%) is surprisingly similar to the effect obtained in classic studies (Ross et al., 1977; Wallen, 1943).

The next question concerns the implications of Bayesian induction for the accuracy of consensus estimates. The answer requires knowledge of the actual consensus rates or at least assumptions about their distribution. Under the assumption that actual consensus has a uniform probability distribution (as was assumed for the prior consensus estimates), the size of the average majority is 75% and the size of the average minority is 25%. If raters apply the Bayesian induction rule, those raters whose response is the majority response will slightly underestimate their own actual consensus (67% − 75% = −8%). In contrast, raters whose response is the minority response will greatly overestimate their consensus (67% − 25% = 42%). The combined absolute estimation error is the sum of these two errors, where each is weighted by its probability of occurrence. Because there are, by definition, more majority members than minority members, the aggregate error is relatively small (8% × .75 + 42% × .25 = 16.5%). Through projection, members of both groups believe themselves to be in the majority, but only minority members are incorrect in this belief. It is important to note that the estimation error produced by the Bayesian induction rule is smaller than the error that would result if there were no projection. If both majorities and minorities estimated the consensus for their own response to be 50%, the combined error would be 25%. In other words, *projection tends to increase rather than decrease accuracy.*

B. MEASUREMENT: WITHIN RATERS

As the foregoing analysis has shown, the false-consensus paradigm created two problems. The first problem was the overly restrictive standard for rational inference. The paradigm does not recognize that people *should* project when they are uncertain about the actual prevalence of a response. Doing this, they will more likely be right than wrong because most responses *are* the responses of the majority. The second problem was that the treatment of individual differences as error variance obscured systematic individual differences in projection. At worst, a reliable FCE prompts the stereotypic conclusion that all people are biased. At best, it may be conceded that some people are not biased. The identity of these unbiased individuals remains unknown, however. It also remains unknown whether some raters make more accurate estimates than others and whether the responses of some raters are indeed more valid predictors of actual consensus rates than are the responses of others. To remedy these shortcomings, Hoch (1987) developed a method where each rater responds to multiple judgment items. From three primary variables (item endorsements, consensus estimates, actual consensus rates), three secondary variables are derived as within-rater correlations (projection, validity, accuracy). The following section presents an elaboration of Hoch's method.

1. *Primary Variables*

The first variable, *endorsement,* indicates whether a rater agrees with a statement, states a preference, or ascribes a personality trait to him- or herself. It can be assumed with good reason that a person's endorsements vary across items. Rarely do people uniformly agree or disagree with all options laid before them. Endorsements can be assessed on graded scales, but for simplicity and despite its problems noted earlier (Section IIB), the binary response format will be retained. The second variable, *estimated consensus,* indicates a rater's perception of whether the majority of people in a group endorses an item. Again, there is variability because people understand that majorities do not uniformly endorse or reject judgment items. In most studies, raters estimate consensus on a percentage scale but binary data will suffice for initial analyses. The third variable, *actual consensus,* indicates whether the majority endorses or rejects the item. The data pertinent to this variable can be derived from normative population statistics, or, if the group of raters is large, from the aggregated endorsements in the group being studied. Again, it is highly unlikely that actual consensus is uniform across items.

2. *Secondary Variables*

When correlated with one another, the three primary variables yield three within-rater Φ coefficients as secondary variables (depicted in Figure 2). The first of these variables is *projection.* The correlation between endorsements and estimated consensus indicates the degree of similarity the rater expects between him- or herself and the group. As noted earlier, theories of projection interpret this correlation with a unidirectional causal assumption in mind. The validity of this assumption will be examined later in this chapter. For now, it is assumed to be correct.

Another secondary variable is *validity.* The correlation between endorsement and actual consensus indicates the degree of similarity that actually exists between the rater and the group. A validity correlation thus expresses the typicality of the rater's responses. Some people's responses are more typical than are others', but for statistical reasons alone, positive validity coefficients are more likely than negative ones. The responses of most individual raters are positively correlated with the group scores because the group comprises these individuals. Even in the unlikely case that a person's responses are uncorrelated with the responses of any other group member, the person's validity coefficient is probably positive because it is a part–whole correlation (Cohen & Cohen, 1983). The size of the coefficient depends on the homogeneity of the group as represented by the average extremity of the actual consensus rates across items. Groups become more homogeneous and positive validity coefficients become more likely as the majority responses approach 100%. To illustrate the important relationship between group homogeneity and individual validity, suppose raters respond to four items, and suppose further that the responses to these items are independent of one another. A heterogeneous group may be characterized

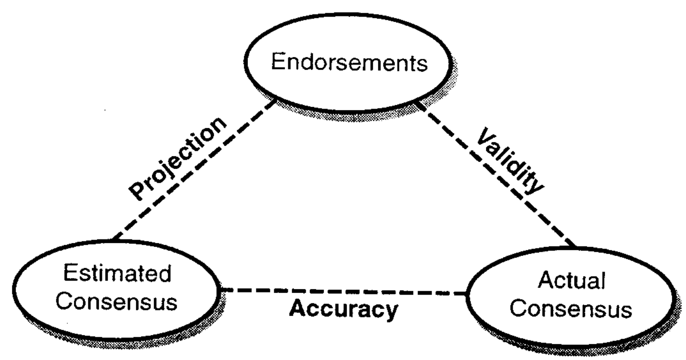


Fig. 2. Variables in the induction paradigm.

by the actual consensus rates of 47, 49, 51, and 53%, whereas a more homogeneous group would be characterized by rates of 2, 34, 66, and 98%. In the first case, the stepwise difference between consensus rates is 2%; in the second case it is 32%. Figure 3 shows the average validity coefficients (as mean *Z*s and mean *r*s) for these 2 cases and 14 others ordered by increasing homogeneity.

The final secondary variable is predictive *accuracy.* The correlation between estimated consensus and actual consensus is a straightforward measure of the rater's ability to predict the group responses. Accuracy cannot be unambiguously classified as a psychological variable, like projection, or as a sociological variable, like validity. One of its constituent variables (estimated consensus) is generated by the person, whereas the other (actual consensus) is generated by the aggregate of group members. Thus, accuracy

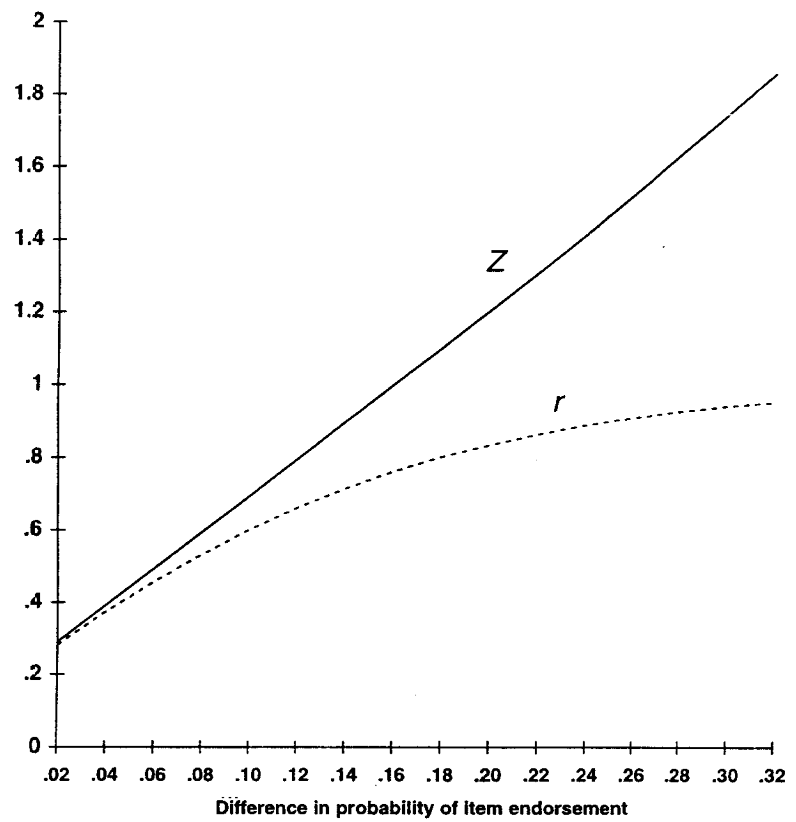


Fig. 3. Validity as a function of group homogeneity.

may increase or decrease by changes in estimated consensus alone, changes in actual consensus alone, or by changes in both.

C. CONSEQUENCES: THE BENEFITS OF PROJECTION

If projection is a form of induction, the desirable outcomes of induction should occur. Using, rather than ignoring, sample observations—no matter how few they may be—should reduce errors of prediction. To examine the potential benefits of projection, one may ask whether projection serves as a mediator or possibly as a moderator variable of accuracy.

1. Mediation and Moderation

The *mediation hypothesis* is that raters maximize accuracy if they project their own—mostly valid—responses to the group. Accuracy should fall when endorsements are controlled. Mediation should be especially strong if the estimation task is highly uncertain, that is, if raters have no other information than their own endorsements. The *moderation hypothesis* is that the correlation between projection and accuracy varies with the validity of the endorsements. Most validity coefficients are positive, and thus accuracy should increase with projection. The higher the validity coefficient, the higher should be the correlation between projection and accuracy. Moderation, like mediation, should be strongest when raters know only their own but not other individuals' endorsements. In such a situation, the mean validity coefficient should be the ceiling value for the mean accuracy coefficient.

Data from a previous study (Krueger & Clement, 1994) were re-analyzed to test these hypotheses. The means of the secondary variables were greater than zero and different from one another (projection: M = .35; validity: M = .18; accuracy: M = .07; all *p*s <.01). Consistent with the *mediation hypothesis,* accuracy correlations disappeared when endorsements were partialed out (M = .01). Consensus estimates would have been less accurate had raters not projected. The *moderation hypothesis* was supported when projection and accuracy coefficients were correlated separately across raters with positive validity [$r(94) = .32$, $p < .01$] and across raters with negative validity group [$r(24) = -.54$, $p < .01$]. Hoch's (1987) data tell a similar story. Target groups varied in inclusiveness (spouses, peers, and consumers), raters who made consensus estimates for spouses or peers had considerable validity (*M*s = .49 and .43), their projection coefficients were positive (*M*s = .47 and .52), and accuracy was high (*M*s = .51 and .53). Raters who made consensus estimates for consumers had no validity (M =

−.01),[8] and therefore their projections (M = .26) did not lead to accuracy (M = .08).

These findings demonstrate how much the study of projection can be furthered by giving more attention to the implications of actual consensus rates. Within raters, projection mediates accuracy so that accuracy declines when endorsements are controlled. Across raters, validity moderates the correlation between projection and accuracy. The greater the average validity in a group of raters, the more accuracy benefits from projection. In sum, projection appears to be a rational inference strategy and its benefits increase with the homogeneity of the target group. Because the web of psychometric relationships is complex and because there is not much relevant research yet, some key predictions of the induction paradigm are now examined with hypothetical data and then replicated with new empirical data.

2. *Hypothetical Data*

One way of predicting the interrelations among the primary and the secondary variables is to examine the properties of a random model. Suppose independent coin flips determine the raters' endorsements, their consensus estimates, and the endorsements by the actual majority for each item. In other words, both the primary and the secondary variables are random and independent of one another.[9] In such a data set, projection mediates accuracy. When projection and the validity coefficients have the same sign, correlations between estimated and actual consensus (accuracy) decline when endorsements are controlled. Moreover, validity moderates the correlations between projection and accuracy coefficients across raters. Increases in validity lead to increases in the correlations between projection and accuracy. When endorsements are perfectly correlated with the majority responses (prefect validity), perfect accuracy requires perfect projection. Decreases in projection lead to decreases in accuracy. When computed across raters with perfect validity, the correlation between the projection and accuracy is also perfect. Raters with negative validity have to project negatively to reach accuracy. The more they project, the *lower* the accuracy of their estimates is. Across these raters, the correlation between projection and accuracy is perfectly negative. For raters whose responses have no validity, the level of projection is irrelevant. Across these raters, projection and accuracy are uncorrelated.

[8] Mean validity coefficients can be near or below zero when raters are not a representative sample of the target group.

[9] Note that in this model the aggregated individual endorsements are independent of the actual consensus rates, whereas they are positively correlated in a large sample of actual raters.

The principle is that *across cases of equal validity, the correlation between projection and accuracy coefficients is identical to the validity coefficient.* To examine this principle, the random model was simulated by a computer program. Each simulated case consisted of 20 items, where each item had a value for each of the three primary variables. The probability of 1s (endorsements by rater, estimated endorsement by the majority, or actual endorsement by the majority) varied randomly and independently for each variable from p = .1 to .9 in steps of .1. The probabilities of 0s (rejections) were the complements of the probabilities of 1s. There were 10 simulations with 1000 cases each. The distributions of Z-scored correlations were approximately normal with few outliers below −.5 or above .5.

The *moderation hypothesis* was evaluated after these outliers had been discarded. The correlations between projection and accuracy were regressed on the validity coefficients. Figure 4 shows the scatterplot and the regression line (.92 × Validity + .008, r^2 = .78). The most important characteristic of this bivariate distribution was that the correlation between projection and accuracy increased linearly with the level of validity. When projection was perfect (r = 1), the level of attained accuracy approached the level of validity. The figure also shows that the correlations between projection and accuracy became less predictable as validities departed from zero. The likely reason for this was that the simulation produced only few cases with highly negative or highly positive validities. (The number of cases for each validity correlation is shown in the second row from the bottom. The standard deviations of the ten data points for each validity correlation are in the bottom row.)

It is important to reiterate that the simulation reduced the complexity of real judgments by assuming random and independent primary variables. The simulation ignored the possibility that raters possess valid information about actual consensus beyond the knowledge of their own endorsements. The simulated raters only accidentally attained accuracy coefficients larger than the ones predicted from their validity and projection coefficients. Real raters, in contrast, may posses and use other valid knowledge. By and large, of course, other valid knowledge is consistent with the rater's own responses. Only atypical raters, who are rarer than typical raters, should ignore their own endorsements when they have observed the responses of a sample of other individuals. *By and large, the safest strategy is maximum projection* (r = 1).

The simulation of the random model suggested that high levels of predictive accuracy follow, at least in part, from two simple principles, one psychological and one sociological. According to the psychological principle, most people project their own responses to others; according to the sociological principle, most people are typical of the groups to which they belong. An

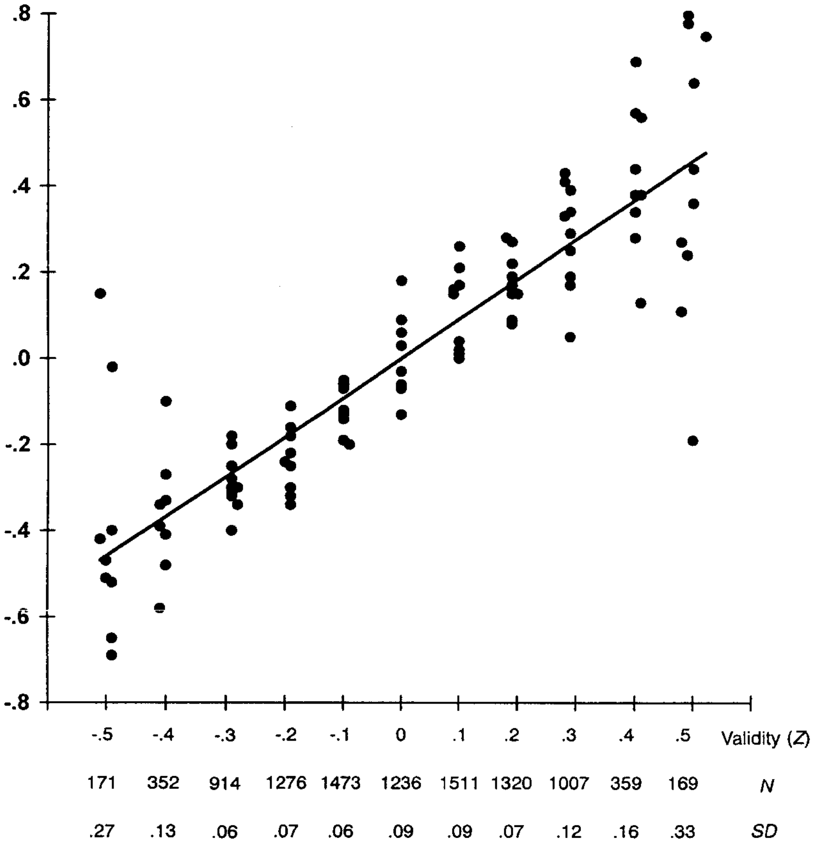


Fig. 4. The relationship between projection and accuracy in simulated data.

empirical study was conducted as a further test of the effects of projection on accuracy. Its first goal was to test the *group-size hypothesis,* which stated that projection, validity, and accuracy would, on average, be greater for small than for large target groups. The second goal was to see whether the *mediation* and the *moderation hypotheses* would hold under realistic circumstances in which raters have some valid knowledge of group responses other than their own endorsements. The third goal was to lay the groundwork for the study of a tertiary variable, which will be called *sensitivity*. Raters are sensitive if they can discriminate between the items on which they give the majority response and the items on which they give the minority response. Sensitivity differs from predictive accuracy because it is a joint function of all three primary variables (endorsements, estimated consensus, and actual consensus).

3. *Empirical Data*

Raters ($N = 152$) made endorsement decisions for each of 18 MMPI-2 statements, and they estimated whether most people would agree with each item. Half of the items were indeed endorsed by the majority of the normative MMPI-2 sample of adult Americans (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). Similarly, half of the items were endorsed by the majority of Brown University students, as determined in a previous study (Krueger & Clement, 1994). These two sets of actual consensus data were highly correlated ($r = .82$). About half of the raters made consensus estimates for the population at large ("People in the USA"), whereas the other made estimates for a local group ("Students in this class").

The *group-size hypothesis* was derived from previous studies using multiple items per rater. These studies showed that raters projected more to small than to large groups (Hoch, 1987; Krueger & Zeiger, 1993). Group size might affect validity coefficients in much the same way. Small self-selected groups tend to be more homogeneous than large populations. Therefore, the average participant's responses should be more highly correlated with the group responses than with the population responses. These expected differences in projection and validity have an important implication for predictive accuracy. The simulation showed that accuracy is a multiplicative function of projection and validity. If, as expected, projection and validity are greater in the group condition, accuracy is also expected to be greater in the group condition than in the population condition. The *mediation hypothesis* was that within-raters accuracy correlations would decline when endorsements are partialed out. The *moderation hypothesis* was that the correlation between projection and accuracy would depend on the validity of the raters' responses.

Results pertaining to the within-raters analyses are presented in Table II. Consistent with the group-size hypothesis, the coefficients for all three secondary variables were higher in the group condition than in the population condition (all $ps < .01$). Consistent with the claim that validity provides a ceiling for accuracy, accuracy coefficients tended to be smaller than validity coefficients. Because projection and validity were assumed to combine multiplicatively to yield accuracy, it was also expected and found that the differences in accuracy between conditions were greater than the differences in projection or validity. Consistent with the mediation hypothesis, accuracy declined in both conditions when endorsements were partialed out (both $ps < .001$). Had raters not projected, their consensus estimates would have been less accurate. In contrast to the hypothetical data, however, partial accuracy was greater than zero, indicating that raters used some valid knowledge other than their own endorsements. Not surprisingly, raters

TABLE II
PROJECTION, VALIDITY, AND ACCURACY: MEAN WITHIN-RATER ϕ COEFFICIENTS AND THE INTERRELATIONS OF THESE COEFFICIENTS ACROSS RATERS

		Within raters		
Condition	Projection	Validity	Accuracy	Partial accuracy
Population	.25	.38	.18	.12
Group	.41	.50	.47	.31

	Across raters	
Population (df = 73)	Projection	Validity
Validity	.05	
Accuracy	.39	.12
Group (df = 75)		
Validity	.28	
Accuracy	.39	.34

Note. $p < .05$ for $r > .22$, $p < .01$ for $r > .29$, $p < .001$ for $r > .37$.

had more such knowledge when making consensus estimates for the group than when making estimates for the population.

Results pertaining to the across-raters analyses are also presented in Table II. Consistent with the model, the correlations between projection and accuracy were similar to the average validity coefficient of the group. Whereas the coefficients were not identical—as they were for the hypothetical data—their similarity is striking. Scatterplots and regression lines are shown in Figure 5. The top panel shows the regression of individual accuracy coefficients on projection coefficients in the population condition (.26 × Projection + .12); the bottom panel shows the data for the group condition (.34 × Projection + .37).[10] To test the moderation hypothesis within each condition, a median split separated raters with low validity from raters with high validity. Across raters with high validity, the degree of projection was strongly related with the degree of accuracy ($r = .68$, $p < .001$, and $r = .53$, for the population and the group condition, respectively both $p = .05$, one-tailed). Across raters with low validity, however, these correlations were negligible, ($r = -.07$ and .20, for the population and the group condition, respectively).

4. Sensitivity

A perfectly accurate rater would know which of his or her own item endorsements are shared by the majority. Such a rater would know when to

[10] Tests for nonlinearity (McNemar, 1962) were not reliable, $F < 1$.

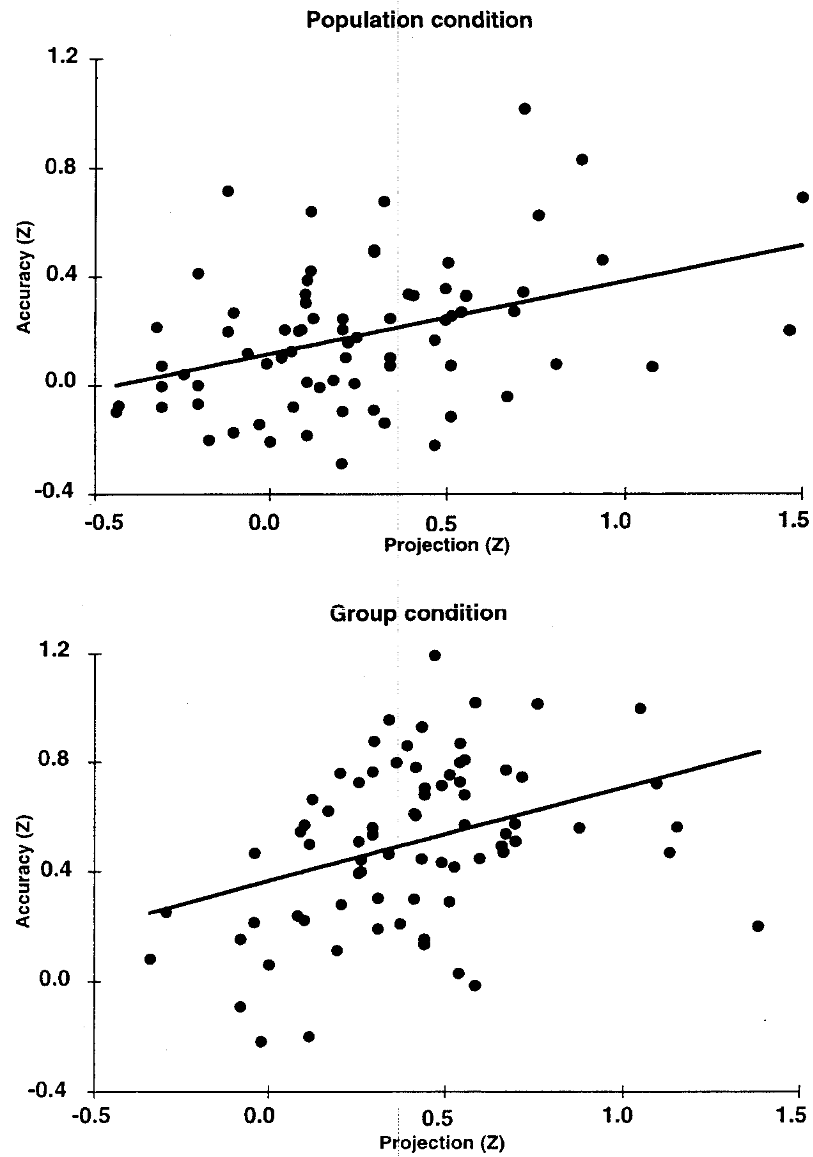


Fig. 5. The relationship between projection and accuracy in empirical data.

project. When accuracy is intermediate or low—as is usually the case—the question is to what extent raters are able to identify those items where their own response is that of the majority. In the parlance of signal-detection theory, this ability is the rater's *sensitivity*. The degree of sensitivity depends on the relative frequency of four types of data. The top panel of Figure 6 shows a decision matrix in which a Hit (H) occurs when a rater correctly believes that his or her own endorsement is the majority response. A Miss (M) occurs when a rater incorrectly believes that his or her own endorsement is the minority response; a False Alarm (FA) is an incorrect attribution to the majority; and a Correct Rejection (CR) is a correct attribution to the minority. A perfectly sensitive rater produces only Hits and Correct Rejections ($\Phi = 1$); a perfectly insensitive rater produces only Misses and False Alarms ($\Phi = -1$). Replicating earlier research (Dawes & Mulford, 1996), sensitivity was of medium size in both conditions (population: $M = .37$; group: $M = .33$, both $ps < 001$).

The question of greater interest was whether the variables of the induction model could predict individual differences in sensitivity. Before the role of projection and validity is examined, it is important to note that sensitivity was only weakly related to accuracy $r[73; \text{population}] = .18$; $r[75; \text{group}] = .07$, which shows that sensitivity is a distinct construct—and skill. Therefore, projection and validity may not affect sensitivity in the same

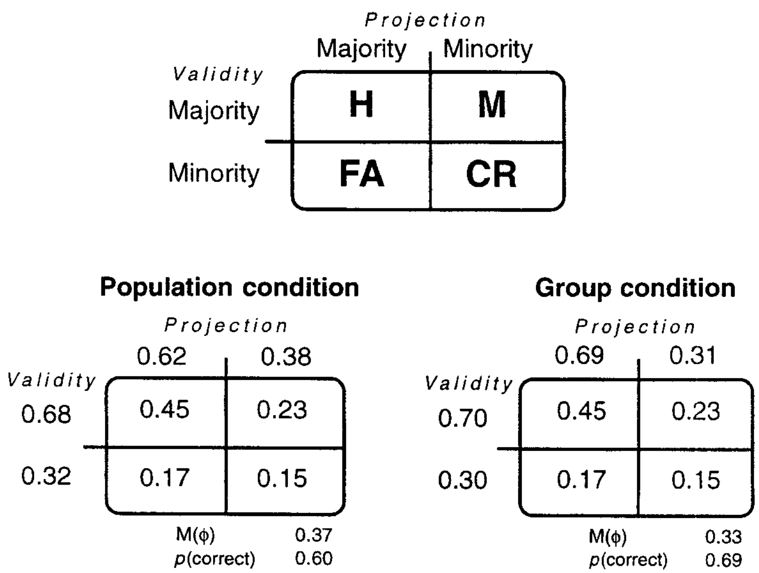


Fig. 6. Sensitivity to own majority–minority status as a function of projection and validity.

way as they affect accuracy. When the data are tabulated in a two-by-two decision matrix, a rater's projection index is the probability with which he or she attributes own endorsements to the majority. This is the sum of Hits and False Alarms divided by the sum of all responses ([H + FA]/[H + FA + M + CR]). The validity index is the probability that own endorsements are actually shared by the majority. This is the sum of Hits and Misses divided by the sum of all responses ([H + M]/[H + M + FA + CR]).[11]

It is instructive to consider how the variables can be expected to be interrelated on mathematical grounds alone. Suppose projection and validity are independent so that the four cell probabilities are the products of the row margins and the column margins of the decision matrix. Although there is no sensitivity in this case, the probability of responding correctly ([H + CR]/[H + M + FA + CR]) is greater than .5 as long as both projection and validity are greater than .5. As either of these marginal indices increases, so does the probability of a correct judgment. With perfect projection ($p = 1$) the probability of a correct judgment would be equal to the validity index. In other words, there is a mathematical necessity that the probability of judging correctly increases with projection whenever validity is positive (>.5). Changes in the marginal probabilities alone do not lead to changes in sensitivity. Whether a relationship exists between projection and sensitivity is an empirical question. Validity, however, can be expected to predict sensitivity. As shown earlier, most raters believe their own responses to be valid indicators of the majority responses, regardless of the validity of their own responses. For the valid raters, this means that projection produces sensitivity; for the invalid raters, this means that the same process produces insensitivity.[12]

The empirical findings are displayed in the bottom panel of Figure 6 as the mean probabilities (averaged across raters) for each condition. Validity indices were positive (>.5) in both conditions and projection indices were greater in the group condition than in the population condition. Means for probability correct were larger in the group condition than in the population condition. To examine the relationships between projection and validity on one hand and sensitivity and probability correct on the other hand, these variables were correlated across raters within each condition. Table

[11] A probability index of .6, for example, is equivalent to a Φ coefficient of .2 when the two constituent variables (e.g., own endorsements and estimated majority response in the case of projection) have equal proportions of "yes" and "no" responses (see Rosenthal & Rubin, 1982, for the relationship between probabilistic and correlation indices). Empirically, the probabilistic indices of projection and validity were highly correlated with the correlation coefficients ($rs = .97$ and $.87$ for projection and validity, respectively).

[12] I am indebted to an anonymous reviewer for pointing out this relationship.

TABLE III
INTERRELATIONS BETWEEN PERCEPTION (PROJECTION), REALITY (VALIDITY), SENSITIVITY, AND PERCENT CORRECT: CORRELATIONS ACROSS RATERS

	Projection	Validity	Sensitivity
Population condition			
Validity	.06		
Sensitivity	−.17	.86	
Probability Correct	.37	.11	−.19
Group condition			
Validity	.38		
Sensitivity	−.06	.80	
Probability Correct	.34	.40	.02

Note. $p < .05$ for $r > .22$, $p < .01$ for $r > .29$, $p < .001$ for $r > .37$.

III shows the results. As expected, projection predicted probability correct but not sensitivity.[13] Moreover, sensitivity and probability correct were independent. Also as expected, validity predicted sensitivity. Finally, projection and validity were independent in the population condition, but correlated in the group condition.[14]

D. LOOKING BACK: FALSE CONSENSUS AND INDUCTION

The views of projection as false consensus and projection as induction share the first two of the original assumptions. Both models postulate positive correlations between endorsements and consensus estimates. Whereas the false-consensus model examines correlations within items and across raters (via *t* tests), the induction model examines correlations within raters and across items. When both methods are used, the results are similar (Dawes & Mulford, 1996; Krueger & Zeiger, 1993). Both models also assume that endorsements cause consensus estimates. Whereas false consensus implicates multiple and poorly differentiated causes, induction implicates a single necessary and sufficient cause: People generalize from samples of 1. The two models do not share the third assumption. Whereas the false-consensus paradigm implies that projection is exaggerated, the induction paradigm points to the substantial inferential benefits accruing from projection. The accuracy of consensus estimates increases and so does the probability that raters identify the majority–minority status of their own responses. Although projection does not offer greater sensitivity to the rater's majority–minority status, it does not diminish it either.

[13] Analyses using procedures recommended by Snodgrass and Corwin (1988) corroborated these conclusions. In the framework of Two-Threshold Theory, sensitivity is expressed by the difference between the Hit Rate and the False Alarm Rate, H/(H + FA) − FA/(FA + CR). Projection is a measure of bias, which is expressed by the ratio of the False Alarm Rate over 1 − (Hit Rate − False Alarm Rate).

[14] These correlations, which involved the probabilistic indices, closely replicated the correlations involving within-raters correlation coefficients (see Table II). All bivariate distributions were plotted and examined for systematic nonlinear relationships. None were found.

IV. Projection as Egocentrism

A. THE NEED FOR A NEW PARADIGM

Given the evidence supporting the induction paradigm, the question is whether the evidence is good enough. Does the paradigm possess satisfactory explanatory power, or does it fail to account for significant aspects of projection? One obvious deficit of the paradigm is that it does not elucidate the nature of the mental processes underlying projection. Instead, the goal has been to demonstrate the statistical adequacy of projection and thereby question the assumptions made within the false-consensus paradigm. Yet, a psychological analysis must ask questions about process. The Bayesian analysis, which served as a mathematical model of induction, is not useful as a descriptor of psychological processes. It does not seem plausible that people can mentally set aside their own responses, aggregate prior probabilities, and then consider their own responses to compute posterior probabilities. It seems more likely that they make judgments using crude heuristics (Davis, Hoch, & Ragsdale, 1986). The shortcomings of judgmental heuristics have been amply cataloged (Kahneman, Slovic, & Tversky, 1982), but it has also become clear that many heuristics produce more accurate judgments than unprincipled or random responding (McKenzie, 1994). When intuitive and normative judgments resemble each other, it cannot be concluded that raters reasoned optimally because they may have been right for the wrong reasons. To determine whether this was the case requires experimental studies of the reasoning process.

1. *Egocentric Perception*

The third and most recent paradigm seeks to identify a psychological process that is necessary and sufficient to cause projection (Krueger & Clement, 1994). Like its two predecessors, the egocentrism paradigm conceives of projection as a correlation representing a unidirectional causal path. Like false consensus, but unlike induction, egocentrism implies that perceptions of consensus are exaggerated. Like induction, but unlike false consensus, egocentrism does not focus on differences in projection across different types of items. The essence of this paradigm is the assumption that projection is a perceptual rather than a cognitive-motivational phenomenon. The perception of consensus is assumed to be part of the initial encoding of the stimulus rather than the outcome of subsequent higher level processes (von Hippel, Sekaquaptewa, & Vargas, 1995).

The goal of this section is to elaborate the perceptual foundations of projection and then to evaluate specific questions related to the three pervasive assumptions. The first question is concerned with the presumed unidirectionality of projection *correlations*. The second question is concerned with the degree to which the perceptual *causes* of projection might operate in an automatic fashion. The third question is concerned with the possibility that projection indeed involves *exaggerations*.

2. *The Power of the Stimulus*

Heider (1958) saw great similarities between object perception and social perception. One such similarity is that people prefer stimulus attributions to explain their own responses to objects and to persons. Stimulus attributions are perceptual in nature. Sour taste is experienced as a property of the lemon and not as a property of one's own taste buds. Similarly, attraction to a stranger is experienced as a response to the stranger's desirable characteristics and not as a result of one's own needs or expectations. In both cases, perceivers expect the stimulus to elicit similar responses from other individuals.

Despite the similarities, object perception and social perception vary in the degree of consensus that stimuli can elicit. The taste of a lemon is a powerful stimulus. It elicits the same grimace from nearly every perceiver. The attractiveness of a stranger is less powerful as it elicits a less extreme majority response. Yet some social stimuli are more powerful than others. Some ideological tenets ("A free-market economy is good"), prescriptions ("Return a favor"), or proscriptions ("Don't lie") are accepted uncritically and consensually (McGuire, 1964). Some collective beliefs and stereotypes ("Americans are materialistic") elicit intermediate levels of consensus (Krueger, 1996c). Finally, many of the items popular in consensus estimation research have little eliciting power, and thus consensus tend to be the least extreme (e.g., preferences for behaviors ["I like skiing"] or descriptions of one's own personality ["I am shy"]). As the stimulus loses power, the size of the majority response approaches 50%, and one's own responses become less valid cues for the group response. Even if a stimulus is entirely powerless, however, people's responses are likely to form a majority and a minority. A random binomial process is an extreme example. Suppose a stimulus

elicits a certain response (e.g., attraction) with $p = .5$. If nine people respond randomly, an individual can still conclude that his or her own response is the response of the majority with $p = .64$. As the group increases, the probability of being in the majority approaches .5 (e.g., if $N = 100$, then $p = .54$).[15] Therefore, perceivers who assumes to be in the majority stand on firm ground. Although the power of social stimuli tends to be lower and more variable than the power of physical stimuli, it nevertheless produces majority and minority responses, and an individual's responses still predict group responses (Section IIIA; or Kenny, Bond, Mohr, & Horn, 1996).

The perceptual hypothesis does not assume that people have insight into the fact that their own responses are likely to be in the majority. Instead, the perception of consensus may be part of the encoding of the stimulus and independent of variations in the actual power of the stimulus to elicit consensus. Even if people's responses could be described by a binomial model, they may perceive them as mandated by the stimulus. The perceived consensus for one's own attraction to a stranger, for example, may arise from the same process that creates perceived consensus with one's own gustatory sensations. This hypothesis is consistent with the low correlations between projection and validity discussed earlier. Outside observers, and social psychologists in particular, may be puzzled by the perceiver's lack of distinction between social and nonsocial objects. They may consider the projection of a taste sensation to be justified but consider the projection of an interpersonal feeling to be irrational. Someone who encourages others to taste the juice for themselves is suspect for not trusting his or her senses. In contrast, someone who asks friends whether they too are attracted to the stranger seems wise for seeking social validation. The perceivers themselves may adopt the observer's perspective only with difficulty. This self–other asymmetry is the mark of an egocentric process.

3. *Developmental Roots*

The perceptual hypothesis stems from the idea that social perception evolved from sense perception without significant modification. Both varieties of perception evolved before the capacity for reflection (Gilbert, 1991). To recognize a large furry animal as a mammoth does not require reflections on whether others perceive a mammoth too. Similarly, to perceive a stranger as threatening may trigger the perception that others will feel threatened too. The (limited) ability to take the others' perspective and to reflect

[15] The two example probabilities of being in the majority were computed by using the binomial expansion to determine the prior probability of each possible response distribution (Hays, 1994), and then by using the Bayesian revision of these probabilities given the rater's own response (Section IIA).

on whether they might disagree with one's own perceptions was a later evolutionary development. The cognitive development of the individual recapitulates the incomplete evolution toward perspective taking. Infantile egocentrism precedes the ability to see things the way others do (Taylor, Cartwright, & Bowden, 1991). Little boys and girls are surprised to discover each other's sexual organs (Cattell, 1944). With learning and maturation, the egocentric perspective weakens, but it hardly disappears. Contrary to Cattell's prediction, projection "arising from youth, thoughtlessness, or inexperience" (p. 180) fades only a little. It is almost as prevalent among the elderly as among young adults (Heckhausen & Krueger, 1993; Yinon et al., 1994).

B. FROM CORRELATION TO CAUSATION

Before the unique properties of the perceptual hypothesis can be examined further, the assumption of causation requires attention. Like the earlier paradigms, the egocentrism paradigm assumes that the raters' own responses cause them to make correspondingly high or low consensus estimates. Most of the data are correlational, however, and thus have no bearing on the truth of this claim. It is also possible that correlations between endorsements and consensus estimates indicate conformity. Perhaps raters *intro*ject the responses of the perceived majority rather than *pro*ject their own responses to the group. It is of vital interest to any theory of projection to ascertain the degree to which conformity effects explain correlations between endorsements and consensus estimates.

There is no question that social influence shapes the responses of individuals and thus tends to homogenize human groups. Sometimes people conform with a majority that is not even physically present (Crutchfield, 1955; Griffin & Buehler, 1993). In the parlance of the induction paradigm, most individual validity coefficients would be smaller without social influence. The question is what is the impact of projection relative to that of conformity and under what conditions will either effect predominate? Experiments using bogus-stranger procedures shed light on this question. In these studies, participants learn about the response of another person (or persons) ostensibly drawn at random from a pool of people before they make their own responses. Single bogus strangers have negligible effects on raters' own endorsements (Krueger & Zeiger, 1993; Zuckerman et al., 1982). The largest number of uniformly responding others was 20, but despite the magnitude of this ostensible agreement among others, the size of the conformity effect was modest (a 12% increase in endorsements; Krueger & Clement, 1994). These findings evoke Asch's (1956) original work on group pressure and

recent studies on social impact, which show that only fairly large and unified majorities become even larger through the conversion of minority members (Nowak, Szamrej, & Latané, 1990).

Longitudinal designs offer opportunities to identify unique effects of projection and conformity. In a study on alcohol use, adolescents rated their own drinking behavior and their perceptions of the drinking behavior of others at two times (Marks, Graham, & Hansen, 1992). Projection was indicated by the correlation between behavior at Time 1 and estimates at Time 2, which controlled for estimates at Time 1 (partial $r = .12$). Conformity was indicated by the correlation between estimates at Time 1 and behavior at Time 2, which controlled for behavior at Time 1 (partial $r = .17$). These analyses revealed only those effects whose impact unfolded between tests. Marks et al. cautioned that projection effects more than conformity effects were likely to be underestimated because projection requires less time than does conformity. Thus, the cross-sectional correlations between behaviors and estimates were more likely to represent projection than conformity.

The idea that projection is faster than conformity implies that a stimulus item elicits the person's own response before the estimated majority response. Indeed, the causal path postulated by projection theories requires that endorsements precede estimates. In one study, where participants rated trait adjectives, judgments of whether the traits described the self were correlated with judgments of whether they described most people ($M = .16$). Most importantly, ratings of the self were more efficient (i.e., faster, easier, and made with greater confidence) than ratings of the group (Clement, Krueger, & Levy, 1997).

The effects of conformity, though small, require that projection correlations be interpreted with restraint. Projection is not a necessary condition for these correlations to occur. Several experiments have demonstrated, however, that projection is a sufficient condition when conformity effects are ruled out. In these experiments, participants had no choice in their own response. In some studies already discussed, participants received arbitrary feedback on their performance, and their subsequent consensus estimates showed that they considered their own performance outcome to be the common one (Agostinelli et al., 1992; Alicke & Largo, 1995; Sherman et al., 1984). Other investigators found projection for unfamiliar attributes that they had ascribed to the participants (Cadinu & Rothbart, 1996; Krueger & Clement, 1996). A field study with kidney patients corroborated these results because it involved a change in the participants' status over time. Patients with a successful transplant rated the success rate of that procedure to be higher than patients returning to dialysis (McCauley, Durham, Copley, & Johnson, 1985).

Although consensus estimation studies cede only a limited role to conformity, the findings of the classic conformity experiments stand. A significant percentage of individuals yields to the pressure of being outnumbered by a united majority. Note that the behavior of the majority members is never in doubt in conformity experiments, whereas their behavior is imagined (to wit, estimated) in consensus studies. It would indeed be astounding if people conformed to a self-generated imaginary majority as much as they conform to a real majority. The evidence for the prominent causal role of raters' own responses supports all paradigms of projection. It is now time to consider the unique hypotheses of the egocentrism paradigm.

C. CAUSAL PROCESSES

The view that social perception shares important characteristics with sense perception suggests that projection is highly automatic. In particular, projection may result from the joint operation of two mechanisms. First, exposure to a stimulus may trigger automatic *access* to the person's own response. Second, one's own response, once activated, may automatically be *associated* with a correspondent consensus estimate, so that endorsements lead to high consensus estimates and rejections lead to low consensus estimates. The picture is complicated by the fact that automaticity is not a unitary characteristic of mental processes. The degree of automaticity depends on a family of related criteria. Bargh (1994) identified awareness, efficiency, controllability, and intention as the "four horsemen" of automaticity. A highly automatic process unfolds without awareness, efficiently, uncontrollably, and unintentionally. How do the processes of access and association stack up against these criteria?

1. Awareness

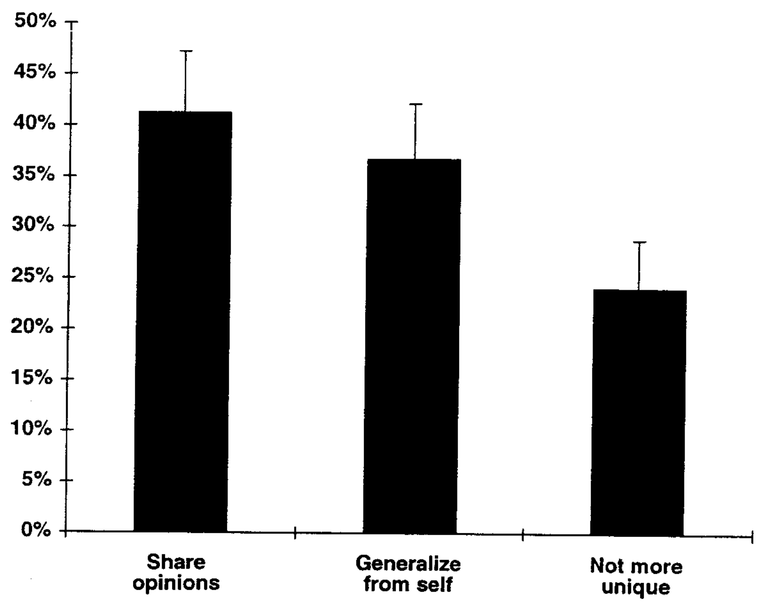
In studies on consensus estimation, the presentation of stimulus items is supraliminal and thus raters have easy *access* to their own responses. Although they can make conscious judgments as to whether they endorse or reject the item, they seem less aware of *how* they make these judgments (Nisbett & Wilson, 1977). This limitation of self-knowledge has two important consequences. The first is that people underestimate how changeable their perceptions are over time. They tend to overestimate the stability of their attitudes (Goethals & Reckman, 1973), emotions (Levine, 1997) and personality traits (Woodruff & Birren, 1972). One might say that recollections of past responses and predictions of future ones are projections of current ones. The hindsight bias illustrates projection to the past. Once

people are informed whether a certain event occurred, they tend to believe that they predicted the event before it happened (Fischhoff, 1975). In other words, current perceptions distort retrieved perceptions. The illusion of invulnerability illustrates projection to the future (Quadrel, Fischhoff, & Davis, 1993). To assess a risk is to estimate the probability that a negative event will happen to the self. Because the event has not happened, projection of the current (unafflicted) state leads to an underestimation of risk.

The second consequence of limited self-knowledge is that people underestimate the degree to which subjective interpretations shape their perceptions (Keysar, 1994). Perception involves a construal of what a stimulus means (Asch, 1948). Individual experiences and expectations differ and so does what people make of a stimulus. But they fail to realize how idiosyncratic their own construals are. With maturation across childhood, some appreciation of the subjectivity of perception does develop, but it rarely becomes complete (Flavell, 1988; Wellman, 1990). Even as adults, people tend to assume that another person's self-perception is similar to the way they perceive the person (Krueger et al., 1996), and they expect another person to agree with them in their perception of a third individual (Chapdelaine, Kenny, & LaFontana, 1994). These assumed judgmental similarities suggest that they "have considerable difficulty trying to partial out the effects of their idiosyncratic knowledge when attempting to take the perspective of others" (Gilbert & Malone, 1995, p. 26). The consequence of this naive realism is that people "assume that others base their judgments on this same 'objective' reality" (Keltner & Robinson, 1996, p. 101). When the perception of another person is different from their own, people fail "to understand that the other's point of view is as real to him or her as mine is to me, or yours to you" (Pratto, 1992, p. 185).

If idiosyncratic construals occur at an early perceptual level, it is likely that the *association* between own and other's responses occurs without awareness. Fischhoff's (1975) hindsight experiment demonstrated this strikingly. Participants not only overestimated the predictability of an event once it occurred, they also believed that other people could have predicted the event even though these others did not have outcome information. This indicates that participants were unaware of their own hindsight bias. Had they realized how outcome information affected their own perceptions, they would hardly have expected similar postdictions from others who did not know the outcome. Jacoby and Kelley (1987) reported similar findings. Participants' own experienced difficulty with solving anagrams (as measured by solving time) was highly correlated with the difficulty they expected others to experience. Most importantly, participants who were initially presented with the solutions experienced less difficulty, but nevertheless expected other, uninformed subjects to experience less difficulty too.

A recent study directly probed into participants' awareness of their projections (Krueger, unpublished data). Participants rated their agreement with each of the following three statements: "I think most people share my opinions," "I tend not to generalize from myself to others," and "I am a more unique person than most others." Raters also estimated the percentage of students who would agree with each statement, and they completed a standard assessment of projection on a set of unrelated items. Three types of analyses were conducted and they all indicated lack of awareness. The findings, which are displayed in Figure 7, show that first, for all three questions, fewer than 50% of the participants acknowledged their projections. Second, consensus estimates for these same items were projective as shown by the positive correlations between raters' own responses and their consensus estimates. Most raters claimed they were more unique than most others, but they thought that most others would also claim to be more unique. Third, the responses to these "awareness" questions did not predict how much raters would project on other judgment items. A



	Share opinions	Generalize from self	Not more unique
FCE (r)	.17	.24	.10
r with projection	-.04	-.04	.14

Fig. 7. Percent of raters claiming not to project and actual projection scores.

rater who claimed not to generalize from the self to others was just as likely to project as a rater who admitted to such generalizations (see bottom row of correlations in Figure 7). Taken together, these findings suggest that people have conscious access to their own responses, but remain unaware of the subjective nature of their stimulus construals and the associations between their own responses and those they expect from others.

2. *Efficiency*

Access to one's own endorsements should be most efficient for items that are chronic components of the self-concept. As one's own name is audible above the din, other well-rehearsed characteristics of the self require little processing capacity (Bargh, 1984). This advantage of the highly familiar should obtain for positive and negative characteristics alike. Even when familiarity is low, access to one's own endorsements may still be efficient to the extent that it requires only an affective response. An endorsement signals the tendency to approach the stimulus item, whereas a rejection signals avoidance. The student who decides to carry the sandwich board does so because this act appears to be more attractive than its alternative. Affective reactions efficiently disclose the position of the self (Bargh, Chaiken, Govender, & Pratto, 1992).

If the *associations* between endorsements and consensus estimates are highly efficient, either type of judgment should be made faster when preceded by the other type of judgment than when preceded by unrelated control judgments. In a study using a task-facilitation paradigm, each participant made two of the following three ratings about a series of trait adjectives: whether the trait described the self, whether it described most people, and whether it contained the letter "S" (Clement, Krueger, & Levy, 1997). The shorter response latencies for endorsements than for consensus estimates corroborated the idea that self-relevant information precedes projective associations (Section IVA). Further, consensus estimates were made faster when preceded by endorsements than when preceded by control judgments (M[difference] = 351 ms). Endorsements were made faster when preceded by estimates than by control judgments (M[difference] = 143 ms). These results suggested mutual facilitation of endorsements and consensus estimates. The mere presentation of the stimulus item did not appear to trigger automatic access to own endorsements when raters were engaged in a qualitatively different judgment task (e.g., scanning for a particular letter). If endorsements had been accessed efficiently regardless of instructional set, the latency of the consensus estimates would not have varied with the nature of the preceding task. The finding that the facilitation effect of the endorsements was greater than the facilitation effect of the consensus estimates ($p < .05$, one-tailed) further corroborated the view that the association between the two is directional. Projection means that consensus estimates follow from and are facilitated by endorsements. The opposing process, conformity, would imply the opposite pattern.[16]

3. Controllability

To be able to control a mental process is to be able to inhibit or abort it. To eliminate projection, it would be necessary to control either access to own responses or associations between responses and correspondent consensus estimates. Control over the *access* process is a special case of thought suppression. Thought suppression tends to be successful, at least temporarily, when appropriate distractors are at hand. When suppression is lifted, however, or when distractors fail for other reasons, the rejected thoughts recur, often with a vengeance (Wegner, 1994). Therefore, raters who try not to think about one of their personal characteristics are more likely to project this characteristic to others (Newman, Duff, & Baumeister, 1997). Control over the *association* process has been attempted in studies discussed earlier (Section IIB). The common theme was to discourage raters to project, while they were still allowed to contemplate their own responses. However, neither feedback on accuracy, nor cash prizes, or exhortations to avoid bias provided sufficient help.

4. Intentionality

To intend for a mental process to occur is to be able to initiate it at will. Processes that are automatic in this sense can occur without being intended. The evidence showing that people are unaware of their own projection and that they are unable to stop it also suggests that projection can occur without intention. There have been no studies examining whether intentionality is necessary for projection to occur. There is some evidence, however, that intention is sufficient to produce projection. This idea has been examined in studies on people's predictions about projection among other individuals.

An anecdote may illustrate that people have no difficulty inferring another person's endorsements from that person's consensus estimates. One social psychology text opens its discussion of projection with Penthouse publisher Bob Guccione's reaction to survey data that showed that 83% of adults reported fewer than two sexual partners in the past year. To Guccione, these data were "positively outrageously stupid and unbelievable. I would say five partners a year is the average for men" (Myers, 1996, p. 58). Guccione's comment is amusing not because it is unequivocal evi-

[16] The same insightful reviewer offered this interpretation.

dence for projection (it is not), but because students infer projection from incomplete data. They infer—probably correctly—Guccione's sexual activity from his consensus estimates. Such inferences about another person's behaviors from his or her consensus estimates are highly systematic in the lab; moreover, the certainty of the inference increases with the extremity of the other person's consensus estimates (Krueger & Zeiger, 1993, Experiments 2 and 3). Raters also make the opposite inference. In a simulation of the "Eat at Joe's" version of the sandwich board study, participants predicted the consensus estimates of a randomly selected Stanford student from the student's behavioral choice (Krueger & Zeiger, 1993, Experiment 4). The size of the predicted FCE (15.7%) was nearly identical to the effect size observed in the original study (17.5%; for a replication with a different item see Krueger & Clement, 1994, Experiment 2).

The evidence for these highly valid bidirectional inferences suggests that people have intuitive theories of projection that they apply intentionally to other individuals. It is ironic that they seem unaware of their own projections. In the sandwich board simulation, predictions of the other students' consensus estimates did not depend only on the behavior of the Stanford student but also on the raters' own hypothetical behavior. The results displayed in Figure 8 show these two additive effects. As in the study on the projected hindsight bias, raters seemed to presuppose that the target person was privy to knowledge that only they themselves had. The intrusion of one's own knowledge into predictions of the behavior of others is probably unintended.[17]

To examine egocentric intrusions more systematically, a study was conducted in which each rater received an entire profile of responses ostensibly obtained from another student (Clement, Krueger, & Levy, 1997). Raters then made their own item endorsements and consensus estimates, and they predicted the other student's estimates. The mean correlations are displayed in Table IV. Three of the findings were not surprising, but they provided the relevant background. First, participants projected their own endorsements to the group ($M = .46$); second, their own endorsements were not related to the other person's putative endorsements ($M = .03$); and third, they used the other person's endorsements to make predictions about that person's consensus estimates ($M = .26$). What was more surprising and more revealing about participants' thinking was the following pair of findings. On one hand, participants' own endorsements were related to their predictions of the other person's consensus estimates ($M = .21$), but on the other hand, the other person's endorsements were not related to partici-

[17] It is possible, however, that raters assume their own consensus estimates to be accurate. If they also assume that actual consensus is fairly obvious to others, predictions of others' estimates are a compromise of expected projection and expected accuracy.

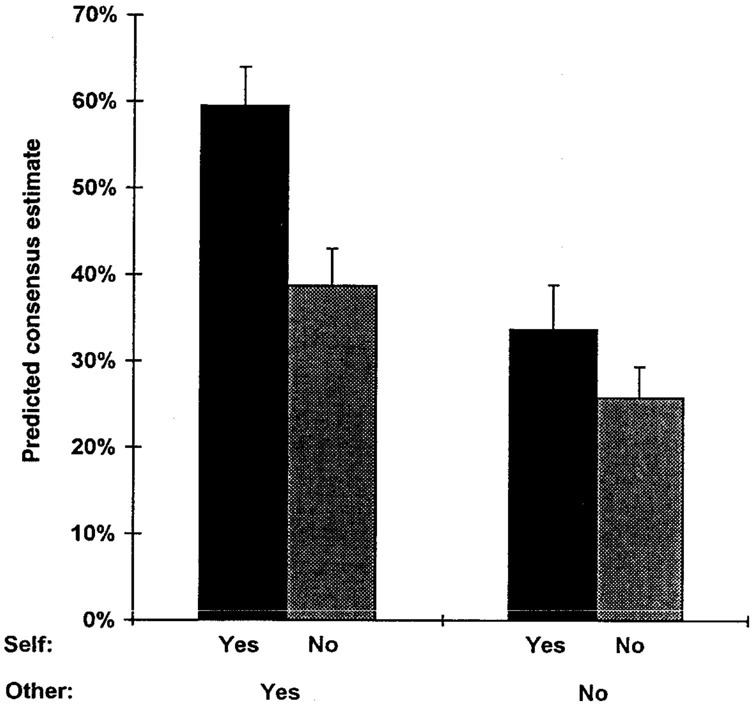


Fig. 8. Predicted consensus estimates as a function of own and others' behavior. (Data compiled from Krueger and Zeiger, 1993, Experiment 4.)

pants' own consensus estimates ($M = .05$). In other words, when making their own consensus estimates, participants failed to consider the other person's endorsements as relevant data, but they expected the other to consider their own, the participant's, endorsements. Partial correlations further revealed that the consensus estimates mediated the correlations

TABLE IV

OWN PROJECTION AND PREDICTED PROJECTION: MEAN WITHIN-RATER CORRELATIONS

	Target's Endorsements	Predicted Estimates	Participant's Endorsements
Predicted estimates	.26		
Participant's endorsements	.03	.21	
Consensus estimates	.05	.51	.46

Note. $p > .05$ for $r < .10$, $p < .001$ for $r > .20$.

between own endorsements and predicted consensus estimates ($M = .06$).[18] Finally, this data set supported the view that participants were unaware of their own level of projection. Across raters, the strength of own projection was unrelated to the strength of projection expected of others ($r = .06$).

D. BIAS AS EXAGGERATION

The egocentrism paradigm assumes that people project too much. Given the high degree of automaticity, one might expect projection to be nearly perfect. Similarly, the induction paradigm suggests that strong projection is most beneficial for predictive accuracy. Empirically, however, perfect projection is rare. In the data collected for this chapter, 65% of the consensus estimates indicated that the rater believed his or her response was the response of the majority. This finding raises two related questions. First, did raters underproject? In other words, did they project less than normative induction or automatic egocentrism would suggest? Second, if there is a genuine projective bias, how can overprojection best be measured?

1. Limits to the Strength of Projection

Three factors argue against the possibility that many raters projected too little. First, neither the psychological processes producing projection nor the measurement techniques designed to capture them are perfectly reliable. Any random error associated with endorsements or consensus estimates would deflate projection indices (Davis et al., 1986). Second, some raters projected negatively ($r < 0$) but some of these also gave responses with negative validity. For this group, negative projection would be the right strategy to maximize accuracy. Third, even raters with highly valid responses may have realized that some of their responses reflected the minority position. If they did not know *which* of their responses were minority responses, they faced a dilemma. They could either project perfectly or they could try to guess which of their responses reflected the minority position. If they projected perfectly, they would attain high but imperfect accuracy. If they guessed, they would most likely decrease the accuracy of their estimates but would retain a small chance of being perfectly accurate (Einhorn, 1986).

Prospect theory may explain preferences for guessing (Kahneman & Tversky, 1984). Losses are more aversive when they are certain than when they are merely probable (even when their expected disutility is the same).

[18] The correlations between consensus estimates and predictions remained high when endorsements were controlled ($M = .50$).

Therefore, people seek risks when they focus on the negative consequences of their choices. Perfect projection is a risk-averse strategy that entails a certain loss of accuracy. Moderate projection combined with guessing is a risk-seeking strategy that offers a small chance of eliminating all errors but most likely yields greater inaccuracies than perfect projection. Just what is the mix of projection and guessing that raters prefer most? In the present data set, the percentage of perceived majority status was the same as the percentage of actual majority status (69%), which suggests that raters attempted to make accurate estimates through probability matching (Tversky & Edwards, 1966). They may have known how valid the average person's responses were for the responses of the group, but they did not know which of their responses were the responses of the majority (limited sensitivity).[19] Thus, the finding that projection was less than perfect need not imply that raters underprojected or that they lacked egocentrism.

The detection of projective bias was further limited by the binary-response format, which constrains the data more than the traditional percentage-estimation format does. In the percentage-estimation format, a rater may show projective bias even when the correlation between own endorsements and consensus estimates is less than perfect. Recall that according to the Bayesian induction rule, a consensus estimate of 67% for one's own response is optimal. A rater whose estimates are greater than that is egocentrically biased; a rater whose estimates are lower would evidently be underprojecting. Because the Bayesian rule makes the fairly rigid assumption of uniform priors, however, it is not clear to what extent estimates of exactly 67% can be used as benchmarks of optimal consensus estimation. In response to this difficulty, investigators have proposed several psychometric indices to capture projective bias. All of these indices were inspired by Hoch's (1987) insight that bias is best detected when raters respond to multiple judgment items.

2. *Measures of Projective Bias*

Work in the induction paradigm showed that statistically normative generalizations produce correlations between sample characteristics and assumed group characteristics (accuracy). Thus, projection correlations by themselves are insufficient evidence for bias. Among the investigators who have proposed methods to disentangle bias from normative induction there is little agreement as to how this could best be accomplished. An early proposal was that projection is too strong when consensus estimates are more highly correlated with the rater's endorsements than with actual

[19] Because probability matching need not be fully conscious strategy, and because projection is not fully automatic, these two sets of explanation are not in conflict.

consensus (e.g., Freedman, Carlsmith, & Sears, 1974). It is indeed a common finding that projection surpasses accuracy, but as the foregoing analysis has shown, accuracy would likely increase with further increases in projection. Stated differently, accuracy would diminish if projection were reduced to the initial level of accuracy. Therefore, the difference between the projection and the accuracy correlations is not a useful index of bias. Recently, five other measures have been proposed.

The first measure of projective bias is the difference between the projection and the validity coefficient (Hoch, 1987). A person, for example, whose responses correlate at $r = .4$ with the responses of the group (validity) would be advised to project at $r = .4$, but no more. The empirical evidence for this *Projection-Validity* measure is mixed. The studies conducted in the induction paradigm, which were reviewed earlier, showed projection bias when this measure was applied. In the present data, however, projection was lower than validity (see Table II). Hoch himself cautioned that many raters could have improved their predictive accuracy had they projected more.

The second measure of bias is the correlation between the rater's endorsements and his or her estimation errors (i.e., the differences between estimated and actual consensus). A positive correlation is an index of a "Truly False Consensus Effect" (*TFCE*; Krueger & Zeiger, 1993). The inverse relationship between the TFCE and predictive accuracy suggests its usefulness as an index of bias. When there is no accuracy, the TFCE is similar to the projection correlation. As accuracy increases, the TFCE decreases. If estimated and actual consensus are perfectly correlated, and if the variances in both these variables are the same, the TFCE is 0. If the variance of the consensus estimates is greater than the variance of actual consensus, however, the TFCE may still be positive. In studies where raters responded to MMPI-2 statements, mean TFCE coefficients were around .3 (Krueger & Zeiger, 1993; Krueger & Clement, 1994, 1996). In contrast, ratings of trait adjectives did not show the TFCE, although projection was reliable (Krueger, unpublished raw data). Construals of trait adjectives may be less ambiguous and less strongly linked to the influence of external stimuli than are construals of inventory statements (Gilovich, 1990). A second study that yielded projection but no TFCE was a study designed specifically to minimize projection (Clement, Krueger, & Levy, 1997). To do this, only such items from previous studies on the "false uniqueness effect" were used (e.g., "I am well organized," or "I have had panic attacks," Campbell, 1986, and Suls et al., 1990, respectively). Nearly all raters projected (97%), but only half of them showed the TFCE.

The third measure of bias is a variant of the previous one. Instead of relying on subtracting actual from estimated consensus, this measure partials out actual consensus from the correlation between the rater's endorsements and his or her consensus estimates (see Murray et al., 1996, for a path-analytic version of this *Partial TFCE* measure). It can be expected that this measure yields results similar to the TFCE.

The fourth measure is also a partial correlation. Specifically, the rater's consensus estimates are partialed out from the correlation between the rater's endorsements and actual consensus. According to Dawes and Mulford (1996), a *negative Partial Validity* correlation indicates that the rater overweighted his or her endorsements. In their study, most coefficients were positive ($M = .23$), suggesting that projection was insufficient, and that consensus estimates were less accurate than they could have been. Using hypothetical data, Dawes and Mulford showed that a negative partial validity coefficient can coexist with a positive TFCE, thus yielding contradictory implications for the direction of bias.

The fifth measure departs from the previous ones by evaluating the adequacy of a rater's estimates not relative to actual consensus, but relative to other raters' consensus estimates. Campbell (1986) pioneered this approach by subtracting each rater's consensus estimate from the average estimate of all those who disagreed with the rater. Unfortunately, this difference conflates various aspects of profile similarity (Cronbach & Gleser, 1953). To limit the focus on correlational similarity, the measure can be recast as the partial correlation between endorsements and consensus estimates where the group averages of these two variables are partialed out. This *Partial Projection* measure was used in a study on racial stereotypes. Black and White participants rated their personal beliefs about the characteristics of Black and White Americans, and they rated their perceptions of the cultural stereotypes of the two groups (Krueger, 1996b). On the average, the partial correlations were positive for both groups of raters and both groups of targets (*M*s from .15 to .34), suggesting that cultural stereotypes were, in part, derived through projection from raters' own racial beliefs.

These indices of projective bias have not been examined concurrently. To remedy this, all indices were computed for the same data set (Krueger & Clement, 1994). *Z* scores were then intercorrelated across raters together with the coefficients of projection, validity, and accuracy. Table V shows the results. The signs of the Partial-Validity coefficients were inverted so that positive coefficients indicated overprojection. The italicized correlations in the right half of the table indicate to what extent the various measures would lead to similar conclusions concerning bias. With the exception of the Partial-Validity measure, the indices of bias were highly intercorrelated, suggesting that they tapped the same underlying bias.

TABLE V

INTERRELATIONS BETWEEN FIVE MEASURES OF PROJECTIVE BIAS AND THE THREE SECONDARY VARIABLES: CORRELATIONS ACROSS RATERS

	1.	2.	3.	4.	5.	6.	7.
Secondary variables							
1. Projection	—						
2. Validity	.00	—					
3. Accuracy	.20	.28	—				
Measures of projective bias							
4. Projection Validity	.76	−.66	−.03	—			
5. TFCE	.79	−.58	.03	*.98*	—		
6. Partial TFCE	.97	−.05	.03	*.77*	*.80*	—	
7. Partial Validity	−.04	.01	−.92	*−.04*	*−.07*	*.12*	—
8. Partial Projection	.82	.17	.41	*.51*	*.54*	*.75*	*−.22*

Note. $p < .05$ for $r > .17$, $p < .01$ for $r > .22$, $p < .001$ for $r > .29$.

One might expect that projective bias would be positively correlated with projection itself and negatively correlated with validity. The more a person projects, and the lower the person's validity is, the more likely it is that projection is exaggerated. The Projection-Validity measure and the TFCE measure showed this pattern of correlations.[20] In contrast, the Partial TFCE was correlated with projection but not with validity. The Partial-Validity and the Partial-Projection measures were correlated with neither projection nor validity. It is less clear what sort of correlations should be expected between bias and accuracy. Most measures were unrelated to accuracy. This seems reasonable because projection itself is only modestly related to accuracy and because both directions of bias (overprojection and underprojection) may reduce accuracy.

The present analysis has been a first step toward a systematic exploration of the properties of various indices of projective bias. Although these initial findings are preliminary, they support a key claim of the egocentrism paradigm, namely that projection tends to be exaggerated. This view differs from the view implicit in the false-consensus paradigm, which is that all projection is by definition biased. It also differs from the view implicit in the induction paradigm, which is that projection is a form of normative statistical reasoning. The next question is whether the psychometric indices capture the full extent of projective bias, or whether they might be conservative.

[20] For the Projection-Validity measure, this pattern was true a priori because difference scores are positively and negatively correlated with the positive term and the negative term of the difference, respectively.

3. Experimental Measures of Bias: Egocentric Weights

Suppose a rater has a high projection coefficient but the various coefficients of bias are near zero. It is tempting to conclude that this rater did not succumb to egocentric perceptions, but instead understood and applied normative principles of inductive reasoning. It is true that a rater who thinks normatively will produce optimal projection scores, but it does not follow that optimal projection scores can result only from normative induction. Egocentric perceptions, by definition, are limited to self-related information. Unlike normative induction, such perceptions might discriminate against the behaviors or characteristics of other individuals. The success of normative induction is predicated on treating sample observations as interchangeable if they were obtained through equivalent sampling procedures. Unbiased sampling does not discriminate between self-related and other-related observations. If people reasoned normatively, they would honor the equivalence of different single-case samples. If, however, they perceived consensus egocentrically, they would generalize their own responses to the group but discount the responses of other individual group members.

In several bogus-stranger experiments, the effects of the responses of other individuals on the rater's consensus estimates were examined.[21] Raters were either free to provide their responses (e.g., Goethals, 1986; Krueger & Clement, 1994) or their responses were experimentally controlled (e.g., Alicke & Largo, 1995; Sherman et al., 1984). The findings in most of these experiments were similar to the findings in the study by Clement, Krueger, & Levy (1997) reported earlier (Section IVC). The weight raters assigned to their own responses outstripped the weight assigned to the responses of others (but see Zuckerman et al., 1982, Experiment 1). The most drastic evidence for egocentrism was observed in a simulation of the sandwich board study (Krueger & Clement, 1994, Experiment 3). Participants read a detailed description of the study and estimated the percentage of students who complied. Then they received information that a randomly selected participant in the Stanford study had complied and they entered a new consensus estimate. This procedure was repeated twice, first with an ostensible sample of 3 compliant students and then with a sample of 20. Raters also indicated how they themselves would have responded to the experimenter's request. Figure 9 displays the results for the four total sample sizes. A sample of four, for example, means that the participant either agreed or disagreed with the three uniformly compliant

[21] Most of these experiments were conducted in the false-consensus paradigm. Single-item analyses are sufficient for these tests of the egocentrism hypothesis because only the self–other difference is of interest. Comparisons with normative inductive weights are not at issue.

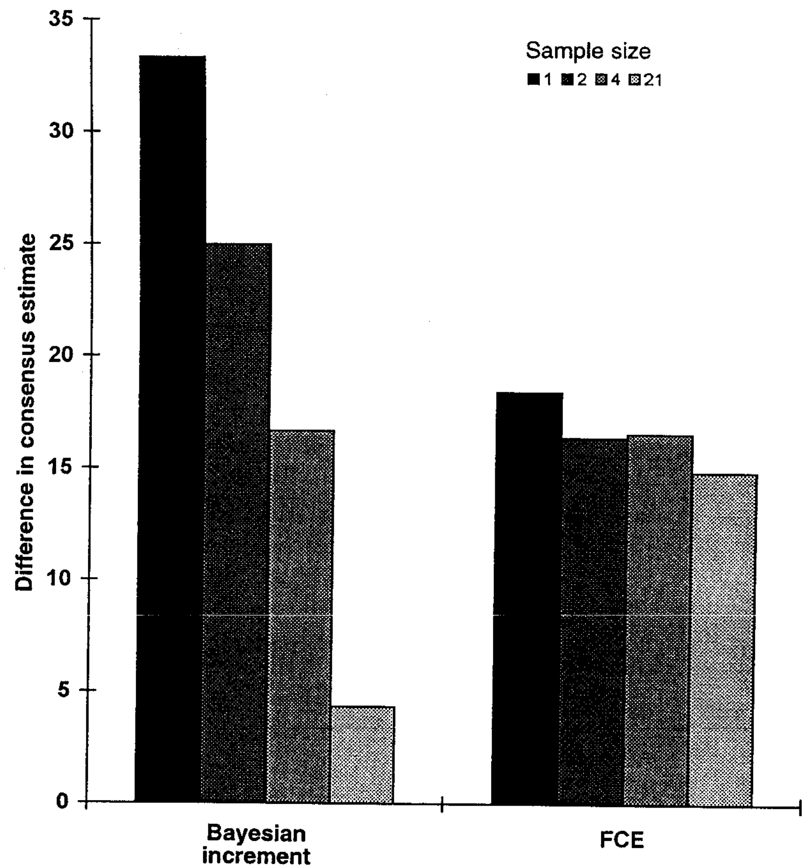


Fig. 9. Normative induction and egocentric projection as a function of sample size. (Data adapted from Krueger and Clement, 1994, Figure 1.)

three Stanford students. The FCE survived even in the face of overwhelming evidence that most Stanford students had behaved in the same fashion (right half of figure). In contrast, normative rules of induction assign diminishing effects to individual observations as the size of an otherwise unanimous sample increases (left half of figure). Similar results were obtained in a multiple-trial study in which participants predicted a target person's esthetic preferences (West, 1996). After each prediction, participants received feedback concerning the target's actual preference. Although this feedback gradually increased predictive accuracy, projection was slow to diminish and it disappeared only when the target's preferences were different from the participant's.

Information about the responses of strangers creates selective exposure by force of experimental design, yet its effects are insufficient. Consider the situation of the raters who would agree to carry the board. At the time of the first consensus estimate, these raters were in an almost Laplacian state of ignorance. They had only their own imagined responses as relevant data. By the end of the experiment, they had their response either validated or marginalized by the unanimous responses of the other sampled individuals. Yet, the raters paid little heed to that sample, and the FCE was only modestly reduced.

Most likely, the difference in the weights placed on self-related and other-related information arises from a combination of overweighting self-related data and underweighting of other-related data. The psychometric measures discussed previously capture only egocentric overweighting. Allocentric underweighting may be conditional on the absence of self-related information. When only other-related information is available, raters use it as much as self-related information (Cadinu & Rothbart, 1996).

It is important to note that differences in the weighting of one's own and others' responses have so far been demonstrated only with bogus strangers. Bogus strangers are by design unfamiliar and not particularly individuated. Research on other ego-related biases has shown that bias tends to diminish as the other person becomes more familiar and individuated (Prentice, 1990). To reduce self-enhancement bias in self–other comparisons, for example, it is sufficient to show the back of the other person's head (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995). In the extreme, a highly familiar, individuated, and loved person may become a functional part of the self (Aron, Aron, Tudor, & Nelson, 1991). At that point, it may become difficult to detect self–other differences in projective weights.

4. *Egocentric Causation*

It will be recalled that the induction paradigm presented an improvement over the false-consensus paradigm by providing a rational rationale for the correlation between raters' own responses and their consensus estimates. As a psychological model, however, the induction paradigm was thin. The evidence for the automaticity, exaggeration, and egocentricity of consensus estimates suggests that the similarities between normative and observed consensus estimates are accidental. The central difference between the induction paradigm and the egocentrism paradigm is that the former refers to prediction, whereas the latter refers to causation. Normative induction allows perceivers to consider their own behaviors to be *diagnostic* of the behaviors of the group (prediction); egocentric projection, by contrast, has

perceivers *generate* consensus (causation). The so-called voter's illusion illustrates this difference. Even when they cannot communicate with others, many voters assume that their own behaviors (vote vs. abstain) affect the behavior of others and thus election outcomes (Quattrone & Tversky, 1984).

V. Projection in Social Context

This section is focused on two new directions in projection research. The first is interest in the moderating effect of social categorization; the second is the need to reveal the contribution of projection to the genesis of research hypotheses. The significance of these issues is that they provide opportunities to strengthen the link between basic research and enduring concerns of applied social psychology. Understanding the connection between projection and social categorization may shed light on the formation of social stereotypes, and understanding the connection between projection and hypothesis generation may shed light on some limitations but also some opportunities for theory development in social psychology.

A. SOCIAL CATEGORIZATION

Groups are a central focus of social psychology, and projection is one of the mechanisms by which a person infers the characteristics of groups. Like other categories, groups vary in size, homogeneity, and distinctiveness. A crucial property of a group is whether it includes the self. Through self-categorization a person is placed within a web of group memberships that offer a sense of social identity (Oakes et al., 1994). The social web consists of overlapping taxonomies of groups. Each taxonomy is hierarchically organized with a vertical and a horizontal axis. Along the vertical axis, groups vary in generality or specificity. The few groups that are located at the top of the taxonomy are large (e.g., women, Americans), whereas the many groups located at the bottom are small (e.g., psychology majors, residents of International House). Along the horizontal axis, groups of similar generality lie side by side (e.g., men and women). Because social categorization is not random (Section IIB), individual members tend to be more similar to fellow group members than to members of outgroups. By maximizing metacontrasts (i.e., the ratio of between-group differences to within-group differences), effective categorization maximizes the validity of most members' responses within their group and minimizes their validity across group boundaries. In other words, most group members have reason to believe that ingroup members share their own responses more than outgroup members do. Thus, the taxonomic nature of social categorization supplies the basis for ingroup–outgroup asymmetries in social projection. If people understand this, they can be expected to project more to ingroups than to outgroups.

1. Vertical Categorization

Both the induction paradigm and the egocentrism paradigm consider the person's group membership to be relevant for projection but not the size of the target group. From the perspective of induction, the validity of a person's responses depends only on the homogeneity of the group, not on its size. As long as validity is positive, projection should occur. Similarly, from the perspective of egocentrism, a person merely needs to decide if he or she belongs to the group. Once this decision is made and one's own response is accessed, projection may follow automatically. This means that, according to the two major paradigms, the vertical axis of taxonomies of social groups is irrelevant to projection. Consistent with this idea, a meta-analysis suggested that the FCE does not vary with the size of the target group (Mullen et al., 1985). More recent research conducted with within-raters measures, however, has shown an inverse relationship between group size and projection (*M*s = .34 and .46 for "people" and gender ingroups, respectively; Krueger & Zeiger, 1993; see also present findings in Table II).

A plausible explanation for reduced projection to superordinate groups is that some raters do not consider large groups to be relevant ingroups. This should be especially likely when more specific categorizations are available. To examine this idea, Krueger and Clement (1996, Experiment 2) created social categorization in the lab and varied the time at which participants made consensus estimates about the general population. All participants completed a personality inventory and received arbitrary feedback concerning their diagnosed personality type. Endorsements and consensus estimates were then collected on a series of MMPI statements. Participants made consensus estimates for the population either before they were classified into a specific personality type, after they had been classified, or after they had been classified and had made estimates for their specific ingroup. Whereas projection to the specific ingroup was uniformly high across conditions ($M = .61$), projection to the population was weaker among participants who had been confronted with the more specific categorization first (*M*s = .51, .40, and .18, for the three conditions). A longitudinal study replicated this pattern in a field setting. At the beginning of the semester, students in a popular and cohesive course on public speaking projected their own questionnaire responses to other students in their class

and to university students in general. By the end of the semester, projection to the superordinate group had decreased, whereas projection to the classmates remained the same (Krueger & Clement, 1996, Experiment 3). Because no decrease in projection occurred among students in a less cohesive course, it seems that it was the experience of group formation that reduced participants' tendency to see themselves as members of the general student population.

2. Horizontal Categorization

Judgments about groups of similar size offer a direct test of ingroup–outgroup differences in projection. Men and Women, Blacks and Whites, the Young and the Old are mutually exclusive groupings that fall along the same horizontal axis within their respective taxonomy of social categorization. Through self-categorization, a person acquires an ingroup perspective on one of the groups and an outgroup perspective on the other. Prior to making any particular estimates, the person may believe that the characteristics of the two groups are not the same. If social categories are formed like object categories or categories of natural kinds, their members will cluster so that intragroup similarities are maximized and intergroup similarities are minimized (Rosch, 1978). Social stereotypes reflect this view by stressing intergroup differences (Krueger, 1992). For most individuals, self-categorization implies the recognition of greater similarity with the ingroup than with the outgroup.

In an early demonstration of ingroup–outgroup differences in projection, Bramel (1963) induced fear of latent homosexuality in some students but not in others. Subsequently, the worried participants ascribed more homosexuality to other students (ingroup) than did the participants who had not received the feedback. The two groups did not differ in their ascriptions of homosexuality to penitentiary inmates (outgroup). Numerous studies replicated this asymmetry (e.g., Bosveld, Koomen, van der Pligt, & Plaisier, 1996; Spears & Manstead, 1990). In one set of false-consensus experiments, year in college, university affiliation, and political orientation were the bases for categorization (Mullen, Dovidio, Johnson, & Copper, 1992). The average size of the FCE was 25% for ingroup judgments and −5% for outgroup judgments. Similar effects have been reported for estimates for gender ingroups and outgroups (Brown, 1996; Brown & Shuman, 1994). In a multiple-item study, ingroup ratings showed the familiar pattern of projection coupled with positive validity and accuracy (see Figure 10). In contrast, outgroup ratings showed no projection or validity, but modest accuracy (Krueger & Zeiger, 1994, Experiment 1). The high familiarity

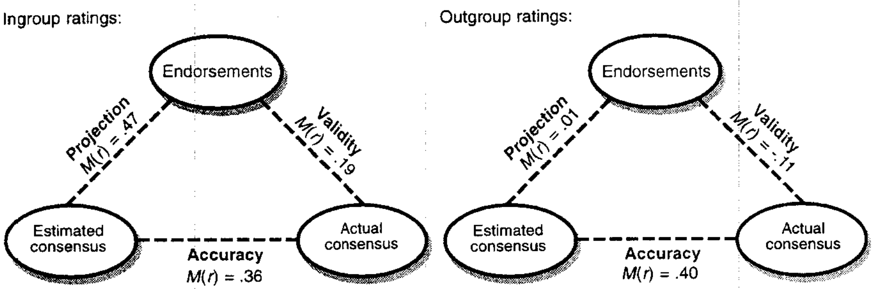


Fig. 10. Projection and social categorization by gender. SEMs of the Z scores are approximately .04 (Data computed from Krueger and Zeiger, 1993, Experiment 1.)

between the sexes may explain why outgroup estimates were as accurate as ingroup estimates.

The induction paradigm and the egocentrism paradigm offer similar explanations for the ingroup–outgroup asymmetry. Normatively, a sample observation is diagnostic of the characteristics of the category from which it was drawn, but it is not necessarily diagnostic of other, unrelated categories. Suppose either a red or a blue chip is drawn from one of two urns. The color of the sampled chip should affect estimates of the proportions of these colors in *that* urn, but not in the other, unsampled urn.[22] In the gender-categorization study, the actual consensus rates for men and women were uncorrelated. Therefore, the raters' responses tended to be valid predictors of ingroup responses but not of outgroup responses. Again, however, the fit of the results with the normative model does not guarantee that raters reasoned like statisticians. Egocentric perceptions would yield similar results. If self-categorization is an important feature of social categorization, the criterion of own membership will be paramount in the perception of groups (Simon, 1993). Once ingroups are distinguished from outgroups, the processes of projection may—selectively—unfold for ingroups. This view implies that *judgments about ingroups will differ from judgments about outgroups even when the two groups have similar characteristics*. If people do not project to outgroups whose characteristics are similar to ingroup characteristics their perceptions of the outgroup are liable to be distorted. In other words, they would be stereotyping.

The findings of an early study illustrate this effect. Participants' own height predicted their estimates of the average height of their own but not the other sex (Ward, 1967). Inspired by Brown's (1953) famous psychophysical experiment on judgments of weights, Ward speculated that raters per-

[22] It is assumed that the contents of the two urns were put together independently.

ceived their own height as a relevant anchor only for judgments about their own sex. The question is "Why didn't they anchor their judgments about the opposite sex on their own height?" Let's make the plausible assumption that men of any height know that women tend to be shorter than men. They could then predict the height of the average woman by subtracting the presumed sex difference (a constant) from their projected estimate for the height of men (a variable). If they reasoned this way, their estimates for *both* sexes would be correlated with their own height. Instead, Ward found that the male raters ignored their own height in judgments about the height of women, and so tall men overestimated the sex difference while short men underestimated it.[23] In other words, ingroup projection moderated perceived intergroup differences. This may seem unremarkable, but suppose the participants were categorized into two groups that do not differ in average height. The average height of optimists, for example, might be judged to be greater by tall than by short optimists. Yet the average estimated height of pessimists might not differ. Such a pattern would expose the arbitrariness of the categorization effect. The point is that the difference between the group averages (be it zero or whatever) is irrelevant because it is independent of the ranking of group members. Of two people of different height, the taller one has a higher rank than the shorter one regardless of the group they judge.

Although projection to the ingroup may be egocentric, automatic, and insufficiently regressive (i.e., too strong), the *failure to project* to (correlated) outgroups constitutes an equally important bias. The problem amounts to a neglect of base rates. All members of social groups are, after all, human beings. Projection to the ingroup and to the overall population implies a perceived correlation between ingroup estimates and population estimates (base rates). Lack of projection to the outgroup implies the lack of a correlation between outgroup estimates and base rates. To consider only the ingroup but not the outgroup as being similar to the population is ethnocentric. In extreme cases, ethnocentrism implies the identification of the tribe with humanity and the rejection of outgroups as quasi-, sub-, or nonhuman (Sumner, 1906). No totemic motif need be invoked to explain ethnocentrism. Sampling from correlated urns reveals the same fallacy. In one study, participants viewed a graphic display of a mother urn on a computer screen and saw the urn divide into two baby urns (Krueger & Clement, 1996, Experiment 1). Instructions stated that each of the two baby urns inherited half of the chips by random distribution. After sampling one of the baby urns, participants revised their estimates of the proportions

[23] Women raters also showed the ingroup–outgroup difference in projection, but the effect was smaller.

of reds and blues for the urn. By failing to revise their estimates for the nonsampled urn, they ignored the parental base rate. If most of the chips were blue in the sampled urn, they virtually had to be frequent in the other urn as well.

The social-psychological analogue of the statistical chips-and-urn paradigm is the minimal-group paradigm (MGP). In the MGP, social reality is stripped of its complexity and is re-created in the laboratory. Group membership is left as the skeleton of social categorization after all other variables are eliminated (cohesion, contact, similarity, etc.). Studies in the MGP have produced consistent and asymmetric projection patterns. Raters expect ingroup members but not outgroup members to share their attitudes (Allen & Wilder, 1979; Wilder, 1984) and behaviors (Messé & Sivacek, 1979). The lack of projection to the outgroup constitutes a false inference because both groups share common base rates. In particular, characteristics unrelated to the categorization variable should be similar across the two groups. In contrast, raters seem to assume that if two groups have been established by *some* variable, then *all* variables will be uncorrelated between groups (Cadinu & Rothbart, 1996; Krueger & Clement, 1996).

Clement (1995) took the MGP even further. Whereas in the initial studies raters made consensus estimates for either the ingroup or the outgroup, Clement asked if individual raters would show the ingroup–outgroup asymmetry in projection, and if the asymmetry might change over time. Changing social categorizations occasions social mobility. Outgroups turn into ingroups and ingroups turn into outgroups. If asymmetric projection depends on the person's *current* self-categorization, projection should change when group memberships change. To examine these ideas, Clement devised a two-phase procedure. In Phase 1, participants read "Barnum" personality sketches and rated how well each described them. Then they made the standard projection ratings for a series of inventory statements. One set of ratings referred to the self-selected ingroup, all people described by the personality sketch that participants found most descriptive of themselves. The other set of ratings referred to people described by one of the other sketches (i.e., an outgroup). In Phase 2, participants completed the Myers–Briggs Type Indicator. Arbitrary feedback about their test scores confirmed the initial self-categorization for some participants, whereas it disconfirmed the categorization of others. Participants in a control group received no feedback. That is, one-third of the participants experienced experimental social mobility. What they thought to be the ingroup became the outgroup and vice versa. Again, all participants rated how well the sketches described them, and they completed projection ratings for a new set of statements. The data in Figure 11 show that at both times, confirmed raters and controls projected to the ingroup but not to the outgroup. Disconfirmed raters,

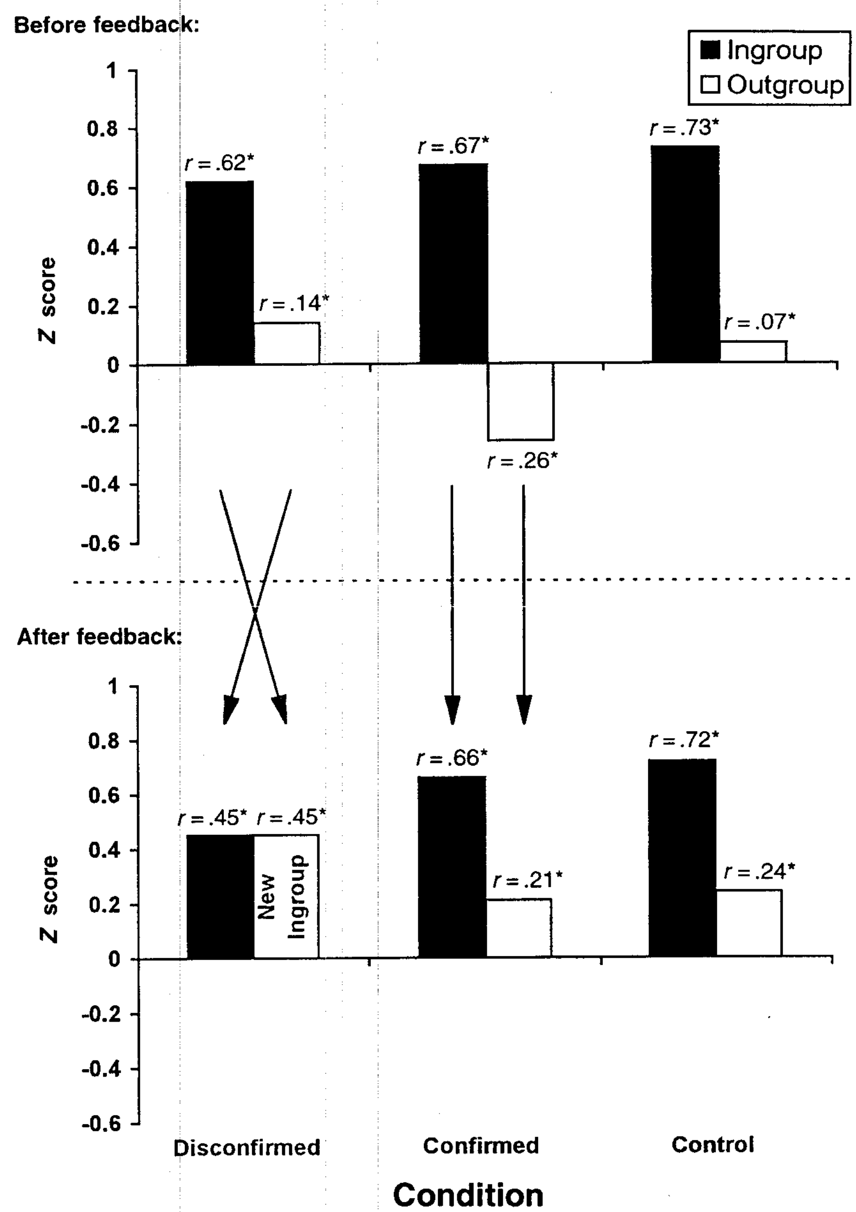


Fig. 11. Asymmetric projection with reversals of ingroup–outgroup status.

however, changed their pattern of projection by projecting more to a former outgroup, and by projecting less to a former ingroup.

The findings obtained in the MGP demonstrate the power of social categorization to moderate projection. The ingroup–outgroup asymmetry fosters stereotyping because it creates perceptions of intergroup differences where none exist. Ingroup favoritism is a case in point. Most people ascribe positive rather than negative characteristics to themselves and, consequently, projection leads to positive descriptions of ingroups. Descriptions of outgroups, which do not enjoy the benefits of projection, are more neutral. When self-ratings are controlled, ingroup favoritism is drastically reduced (Clement & Krueger, 1997). In other words, ingroup favoritism is not only ethnocentric but also egocentric in nature.

The lack of projection to specific outgroups is problematic because people perceive only ingroups as being similar and thus representative of humanity at large (Krueger, 1996c). This ingroup–outgroup difference is equivalent to the asymmetry between self-perception and other perception. Because of projection, people may perceive those individual others who do not share their own characteristics as strange or deviant (Ross et al., 1977). In the same way, outgroups whose characteristics differ from those of the ingroup appear peculiar and perhaps threatening (Stephan & Stephan, 1985). After all, these characteristics challenge the perception of what is normal on the human scale. Horney's (1937) description of projective ethnocentrism characterizes the findings: "Every culture clings to the belief that its own feelings and drives are the one normal expression of 'human nature,' and psychology has not made an exception to this rule" (p. 16). Horney's unsparing afterthought on projective thinking in psychological research raises the question of where our hypotheses and ultimately our knowledge come from.

B. THE ORIGIN OF (SOME) HYPOTHESES

> In psychology there is more at stake than the truth or falsity of this or that research hypothesis. We might dutifully pretend that our own uncertainties are not within the purview of our professional responsibilities or our science, but these pretensions are contradicted by the degree of concern that takes hold of us every time when some "other" psychology questions our image of humans anew. Hofstätter (1972, p. 7; translation by the author)

It is an enduring dilemma of psychological research that its theories and methods are culture bound, yet most of its claims are universal. As the previous section suggested, many of the universal claims may be justified; yet, cautious generalization requires vigilance to the possibility of cultural differences (Dawes, 1992). Cultural idiosyncrasies not only constrain the

generalizability of some phenomena, but more importantly, constrain the types of questions that are asked in the first place. North American social psychology, for example, has always had a distinctly individualistic cast (Allport, 1924). The study of egocentric biases would not even be undertaken with such enthusiasm in more collectivist cultures, and when replications are attempted, some of them fail (Heine & Lehman, 1995).

Just as culture channels the accumulation of knowledge, so does the scholar's personal perspective. William James observed that "a philosophy is the expression of a man's intimate character."[24] It is not known if James applied this insight to his own philosophy. But he did feel, perhaps projectively, that the public also tends to link the features of a scientific theory to the features of its originator. With respect to psychoanalysis, James felt that "the public generally provided itself with an alibi regarding Freud's sexual theories by saying that he was projecting his own earthy mind" (cited in Cattell, 1944, pp. 179–180). But then again, the public may have been correct, thus proving James's original point. Many of the crucial building blocks of the psychoanalytical edifice emerged from Freud's celebrated self-analysis, which began in the summer of 1897. To his own surprise, Freud discovered in his dreams that he hated his father, and he anchored his claim of the universal Oedipus complex on this experience. His biographer Ernest Jones considered these projections essential for theoretical progress.

> When, for example, Freud found in himself previously unknown attitudes toward his parents, he felt immediately that they were not peculiar to himself and that he had discovered something about human nature in general. . . . That is the way Freud's mind worked. When he got hold of a significant fact, he would feel, and know, that it was an example of something general or universal, and the idea of collecting statistics on the matter was quite alien to him. It is one of the things for which other, more humdrum, workers have reproached him, but nevertheless that is the way the mind of a genius works. (Jones, 1953, p. 66)[25]

Because actual consensus is, alas, a variable rather than a constant, the genius of hypothesis generation is hobbled without the more humdrum

[24] Cited by T. Lutz. "Macho men." *New York Times Book Review* (January 5, 1997, p. 16).

[25] Jones's conception of genius was the one suggested by Schopenhauer (1891) who held that "always to see the universal in the particular is precisely the fundamental character of genius" (Vol. 2, p. 386). Freud however, was aware of the limits of his projections: "The great question that has never been answered, and which I have not been able to answer, despite my thirty years of research into the feminine soul, is 'What does a woman want?' (Quoted in: E. Jones. *Sigmund Freud: Life and Work*, Vol. 2, Pt. 3, Ch. 16, 1995. As the foregoing empirical review indicated, the failure to project across salient group boundaries is no longer a mystery. To understand outgroups, it is necessary to be both egocentric (i.e., to consider one's own responses) *and* to be allocentric (i.e., to be willing to acknowledge the informative value of others' responses). When seeking to understand women, Freud apparently listened to neither himself nor his female clients.

genius of experimental design and analysis. Some of social psychology's most distinguished contributors recognized their own projections as what they were: intriguing hypotheses requiring empirical tests. Floyd Allport's (1924) original discussion of projection itself was projective in tone. Allport was interested in the real and imagined homogeneity of behavior in crowds. The key to this homogeneity, he felt, lay in the audience's response to the leader. "We ourselves accept and respond to the words of the leader; and therefore we believe and act upon the assumption that others are doing so too" (p. 306). His usage of the personal pronoun suggests that Allport drew on personal experience. A few years later, he presented humdrum but reliable statistical evidence for projection (Katz & Allport, 1931). Solomon Asch's (1956) studies on independence and conformity were, in part, a re-creation of a boyhood experience (Myers, 1996). At a Seder, young Asch's uncle explained that the prophet Elijah would visit, invisibly, and have a sip of wine. Asch stared at the glass all night and became convinced that the wine went down a little. Years later, he studied the effects of social consensus on perceptions of physical reality.

Not all research endeavors reveal the investigator's personality. Not everyone studies what he or she is, or becomes what he or she studies. Stanley Milgram was not homicidal and Amos Tversky did not believe in the law of small numbers. The contributions of these scholars demonstrate, however, the paradoxical effects of projection on the longevity of research findings in the public's eye. Editors, reviewers, and students are more intrigued by surprising findings than by "obvious" ones. At the same time, however, the nonobvious findings are those that contradict their own projective intuitions. Classic research is that which overcomes the resistance of pluralistic ignorance; research, in other words, that demonstrates the falsity of widely held beliefs.

VI. Conclusions

The present chapter began with a falsificationist challenge to research in the false-consensus paradigm. Most of the claims of this paradigm could indeed be rejected as unnecessary for the explanation of projection. Next, the induction paradigm was subjected to the same scrutiny, and its limitations were exposed. The egocentrism paradigm was then developed as an alternative attempt to explain a phenomenon that won't go away. The paradigm offers opportunities to study projection in a new light. Now that the three basic assumptions (correlation, causation, exaggeration) are solidly justified, attention may turn to questions such as "Can the degree of automaticity in projection be changed?" "Is the lack of projection to outgroups automatic or does it result from effortful inhibition of projection that would otherwise occur?" "What, beyond the anecdotal evidence, are the effects of projection on psychological research?" Without a doubt, a future review will closely examine whether the egocentrism paradigm has fulfilled its promise.

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Correspondence may be addressed to Joachim Krueger, Department of Psychology, Brown University, Box 1853, Providence, RI 02906. E-mail: Joachim–Krueger@Brown.edu.

References

Agostinelli, G., Sherman, S. J., Presson, C. C., & Chassin, L. (1992). Self-protection and self-enhancement biases in estimates of population prevalence. *Personality and Social Psychological Bulletin, 18,* 631–642.

Alicke, M. D., Klotz, M. L., Breitenbecher, D. L., Yurak, T. J., & Vredenburg, D. (1995). Personal contact, individuation, and the better-than-average-effect. *Journal of Personality and Social Psychology, 68,* 213–226.

Alicke, M. D., & Largo, E. (1995). The role of self in the false consensus effect. *Journal of Experimental Social Psychology, 31,* 28–47.

Allen, V. L., & Wilder, D. A. (1979). Group categorization and attribution of belief similarity. *Small Group Behavior, 10,* 73–80.

Allport, F. H. (1924). *Social psychology.* Boston, MA: Houghton Mifflin.

Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology, 60,* 241–253.

Asch, S. E. (1948). The doctrine of suggestion, prestige, and imitation in social psychology. *Psychological Review, 55,* 250–277.

Asch, S. E. (1956). Studies of independence and conformity: A minority of one against a unanimous majority. *Psychological Monographs, 70* (9, Whole No. 416).

Babad, E., Hills, M., & O'Driscoll, M. (1992). Factors influencing wishful thinking and predictions of election outcomes. *Basic and Applied Social Psychology, 13,* 461–476.

Bargh, J. A. (1984). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology, 43,* 425–436.

Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In R. S. Wyer, Jr., & T. K. Srull (Eds.), *Handbook of social cognition* (Vol. 1, pp. 1–40). Hillsdale, NJ: Erlbaum.

Bargh, J. A., Bond, R. N., Lombardi, W. J., & Tota, M. E. (1986). The additive nature of chronic and temporary sources of construct accessibility. *Journal of Personality and Social Psychology, 50,* 869–878.

Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude effect. *Journal of Personality and Social Psychology, 62,* 893–912.

Bierbrauer, G. (1979). Why did he do it? Attribution of obedience and the phenomenon of dispositional bias. *European Journal of Social Psychology, 9,* 67–84.

Bosveld, W., Koomen, W., & van der Pligt, J. (1994). Selective exposure and the false consensus effect: The availability of similar and dissimilar others. *British Journal of Social Psychology, 33,* 457–466.

Bosveld, W., Koomen, W., & van der Pligt, J. (1996). Estimating group size: Effects of category membership, differential construal and selective exposure. *European Journal of Social Psychology, 26,* 523–535.

Bosveld, W., Koomen, W., van der Pligt, J., & Plaisier, J. W. (1996). Differential construal as an explanation for false consensus and false uniqueness effects. *Journal of Experimental Social Psychology, 31,* 518–532.

Brabender, V., & Deutsch, F. M. (1993). Generalizability of the false consensus effect in chronic psychiatric patients. *Journal of Social Psychology, 133,* 215–223.

Bramel, D. (1962). A dissonance theory approach to defensive projection. *Journal of Abnormal and Social Psychology, 64,* 121–129.

Bramel, D. (1963). Selection of a target for defensive projection. *Journal of Abnormal and Social Psychology, 66,* 318–324.

Brenner-Golomb, N. (1993). R. A. Fisher's philosophical approach to inductive inference. In G. Keren & C. Lewis (Eds.), *A handbook for data analysis in the behavioral sciences: Methodological issues* (pp. 283–307). Hillsdale, NJ: Erlbaum.

Brown, C. E. (1996). False consensus bias and gender: The case of judge Clarence Thomas. *Psychological Reports, 78,* 144–146.

Brown, C. E., & Shuman, V. L. (1994). False consensus bias and gender: Presidential preferences and the right to choose. *Psychological Reports, 75,* 1601–1602.

Brown, D. R. (1953). Stimulus-similarity and the anchoring of subjective scales. *American Journal of Psychology, 66,* 199–214.

Brown, J. D. (1986). Evaluations of self and others: Self-enhancement biases in social judgments. *Social Cognition, 4,* 353–376.

Butcher, J. N., Dahlstrom, W. G., Graham, J. R., Tellegen, A., & Kaemmer, B. (1989). *MMPI-2 manual for administration and scoring.* Minneapolis, MN: University of Minnesota Press.

Cadinu, M. R., & Rothbart, M. (1996). Self-anchoring and differentiation process in the minimal group setting. *Journal of Personality and Social Psychology, 70,* 661–677.

Campbell, J. (1986). Similarity and uniqueness: The effects of attribute type, relevance, and individual differences in self-esteem and depression. *Journal of Personality and Social Psychology, 50,* 281–294.

Cattell, R. B. (1944). Projection and the design of projective tests of personality. *Character and Personality, 12,* 177–194.

Chapdelaine, A., Kenny, D. A., & LaFontana, K. M. (1994). Matchmaker, matchmaker, can you make me a match? Predicting liking between two unacquainted persons. *Journal of Personality and Social Psychology, 67,* 83–91.

Cheng, P. W. (1997). From covariation to causation: A causal power theory. *Psychological Review, 104,* 367–405.

Clement, R. W. (1995). *Egocentrism as a mechanism of social projection.* Doctoral dissertation, Brown University.

Clement, R. W., & Krueger, J. (1997). *Perceived differences between groups: The contribution of social projection.* Under review.

Clement, R. W., Krueger, J., & Levy, J. L. (1997). *Automatic egocentrism: The primacy of self in social projection.* In preparation.

Clement, R. W., Sinha, R. R., & Krueger, J. (1997). A computerized demonstration of the false consensus effect. *Teaching of Psychology, 24,* 131–135.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences.* Hillsdale, NJ: Erlbaum.

Crano, W. D. (1983). Assumed consensus of attitudes: The effect of vested interest. *Personality and Social Psychology Bulletin, 9,* 597–608.

Cronbach, L. J., & Gleser, C. G. (1953). Assessing similarity between profiles. *Psychological Bulletin, 50,* 456–473.

Crutchfield, R. S. (1955). Conformity and character. *American Psychologist, 10,* 191–198.

Davis, H. L., Hoch, S. J., & Ragsdale, E. E. (1986). An anchoring and adjustment model of spousal predictions. *Journal of Consumer Research, 13,* 25–37.

Dawes, R. M. (1989). Statistical criteria for a truly false consensus effect. *Journal of Experimental Social Psychology, 25,* 1–17.

Dawes, R. M. (1990). The potential nonfalsity of the false consensus effect. In R. M. Hogarth (Ed.), *Insights in decision making: A tribute to Hillel J. Einhorn* (pp. 179–199). Chicago: University of Chicago Press.

Dawes, R. M. (1991). Probabilistic versus causal thinking. In D. Cicchetti & M. Grove (Eds.), *Thinking clearly about psychology* (Vol. 1, pp. 235–264). Minneapolis: University of Minnesota Press.

Dawes, R. M. (1992). Quandary: Correlation coefficients and contexts. In L. Montada, S.-H. Filipp, & M. J. Lerner (Eds.), *Life crises and experiences of loss in adulthood* (pp. 521–528). Hillsdale, NJ: Erlbaum.

Dawes, R. M., McTavish, J., & Shacklee, H. (1977). Behavior, communication, and assumptions about other people's behavior in a commons dilemma situation. *Journal of Personality and Social Psychology, 35,* 1–11.

Dawes, R. M., & Mulford, M. (1996). The false consensus effect and overconfidence: Flaws in judgment, or flaws in how we study judgment? *Organizational Behavior and Human Decision Processes, 65,* 201–211.

Deutsch, F. M. (1988). When friends lead us astray: Evidence for the selective exposure hypothesis. *Journal of Social Psychology, 128,* 271–273.

Deutsch, F. M. (1989). The false consensus effect: Is the self-justification hypothesis justified? *Basic and Applied Social Psychology, 10,* 83–99.

Edwards, W. (1982). Conservatism in human information processing. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 359–369). Cambridge, MA: Cambridge University Press.

Einhorn, H. J. (1986). Accepting error to make less error. *Journal of Personality Assessment, 50,* 387–395.

Einhorn, H. J., & Hogarth, R. M. (1985). Ambiguity and uncertainty in probabilistic inference. *Psychological Review, 92,* 433–461.

Ennett, S. T., & Bauman, K. E. (1994). The contribution of influence and selection to adolescent peer group homogeneity: The case of adolescent cigarette smoking. *Journal of Personality and Social Psychology, 67,* 653–663.

Fabrigar, L. R., & Krosnick, J. A. (1995). Attitude importance and the false consensus effect. *Personality and Social Psychology Bulletin, 21,* 468–479.

Fiedler, K. (1991). The tricky nature of skewed frequency tables: An information loss account of distinctiveness-based illusory correlations. *Journal of Personality and Social Psychology, 60,* 24–36.

Fields, J. M., & Schuman, H. (1976). Public beliefs about the beliefs of the public. *Public Opinion Quarterly, 40,* 427–448.

Fischhoff, B. (1975). Hindsight ≠ foresight: The effect of outcome knowledge on judgment under uncertainty. *Journal of Experimental Psychology: Human Perception and Performance, 1,* 288–299.

Flavell, J. H. (1988). From level 1 to level 2 knowledge about the mind. In J. Astington, P. Harris, & D. Olson (Eds.), *Developing theories of mind* (pp. 244–267). New York: Cambridge University Press.

Freedman, J. L., Carlsmith, J. M., & Sears, D. O. (1974). *Social psychology* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Frey, D. (1986). Recent research on selective exposure to information. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 41–80). New York: Academic Press.

Gilbert, D. T. (1991). How mental systems believe. *American Psychologist, 46,* 107–119.

Gilbert, D. T., & Malone, P. S. (1995). The correspondence bias. *Psychological Bulletin, 117,* 21–38.

Gilovich, T. (1990). Differential construal and the false consensus effect. *Journal of Personality and Social Psychology, 59,* 623–634.

Gilovich, T., Jennings, D. L., & Jennings, S. (1983). Causal focus and estimates of consensus. *Journal of Personality and Social Psychology, 45,* 550–559.

Goethals, G. R. (1986). Fabricating and ignoring social reality: Self-serving estimates of consensus. In J. Olson, C. P. Herman, & M. P. Zanna (Eds.), *Ontario symposium on personality and social psychology* (Vol. 4: Relative deprivation and social comparison, pp. 135–157). Hillsdale, NJ: Erlbaum.

Goethals, G. R., & Reckman, R. (1973). The perception of consistency of attitudes. *Journal of Experimental Social Psychology, 9,* 491–501.

Goldings, H. J. (1954). On the avowal and projection of happiness. *Journal of Personality, 23,* 30–47.

Gregory, W. L., Cialdini, R. B., & Carpenter, K. M. (1982). Self-relevant scenarios as mediators of likelihood estimates and compliance: Does imagining make it so? *Journal of Personality and Social Psychology, 43,* 89–99.

Griffin, D., & Buehler, R. (1993). Role of construal processes in conformity and dissent. *Journal of Personality and Social Psychology, 65,* 657–669.

Griffin, D. W., & Ross, L. (1991). Subjective construal, social inference, and human misunderstanding. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 319–359). New York: Academic Press.

Hamill, R., Wilson, T. D., & Nisbett, R. E. (1980). Insensitivity to sample bias: Generalizing from atypical cases. *Journal of Personality and Social Psychology, 39,* 578–598.

Hays, W. L. (1994). *Statistics* (5th ed.). Ft. Worth, TX: Harcourt Brace College Publishers.

Heckhausen, J., & Krueger, J. (1993). Developmental expectations for the self and most other people: Age-grading in three functions of social comparisons. *Developmental Psychology, 29,* 539–548.

Heider, F. (1958). *The psychology of interpersonal relations.* Hillsdale, NJ: Erlbaum.

Heine, S. J., & Lehman, D. R. (1995). Cultural variation in unrealistic optimism: Does the West feel more invulnerable than the East? *Journal of Personality and Social Psychology, 68,* 595–607.

Hoch, S. J. (1984). Availability and interference in predictive judgment. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 10,* 649–662.

Hoch, S. J. (1987). Perceived consensus and predictive accuracy. *Journal of Personality and Social Psychology, 53,* 221–234.

Hoch, S. J. (1988). Who do we know: Predicting the interests and opinions of the American consumer. *Journal of Consumer Research, 15,* 315–324.

Hofstätter, P. R. (1972). *Psychologie.* Frankfurt, Germany: Fischer.

Holmes, D. S. (1968). Dimensions of projection. *Psychological Bulletin, 69,* 248–268.

Holtz, R., & Miller, N. (1985). Assumed similarity and opinion certainty. *Journal of Personality and Social Psychology, 48,* 890–898.

Horney, K. (1937). *The neurotic personality of our time.* New York: W. W. Norton.

Horney, K. (1939). *New ways in psychoanalysis.* New York: W. W. Norton.

Hunter, J. E., & Schmidt, F. L. (1990). Dichotomization of continuous variables: The implications for meta-analysis. *Journal of Applied Psychology, 75,* 334–349.

Jacoby, L. L., & Kelley, C. M. (1987). Unconscious influences of memory for a prior event. *Personality and Social Psychology Bulletin, 13,* 314–336.

Jones, E. (1953). *The life and work of Sigmund Freud.* New York: Basic Books.

Jones, E. E., & McGillis, D. (1976). Correspondent inferences and the attribution cube: A comparative appraisal. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 1, pp. 389–420). Hillsdale, NJ: Erlbaum.

Jones, E. E., & Nisbett, R. E. (1971). The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones et al. (Eds.), *Attribution: Perceiving the Causes of Behavior* (pp. 79–94). Morristown, NJ: General Learning Press.

Kahneman, D., Slovic, P., & Tversky, A. (Eds.), (1982). *Judgment under uncertainty: Heuristics and biases.* Cambridge: Cambridge University Press.

Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist, 39,* 341–350.

Katz, D., & Allport, F. (1931). *Students' attitudes.* Syracuse: Craftsman Press.

Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation* (Vol. 15). Lincoln: University of Nebraska Press.

Keltner, D., & Robinson, R. J. (1996). Extremism, power, and the imagined basis of social conflict. *Current Directions in Psychological Science, 5,* 101–105.

Kenny, D. A., Bond, C. F., Mohr, C. D., & Horn, E. M. (1996). Do we know how much people like one another? *Journal of Personality and Social Psychology, 71,* 928–936.

Keysar, B. (1994). The illusory transparency of intention: Linguistic perspective taking in text. *Cognitive Psychology, 26,* 165–208.

Koehler, J. J. (1996). The base rate fallacy reconsidered: Descriptive, normative, and methodological challenges. *Behavioral and Brain Sciences, 19,* 1–53.

Koestner, R., Losier, G. F., Worren, N. M., Baker, L., & Vallerand, R. J. (1995). False consensus effects for the 1992 Canadian referendum. *Canadian Journal of Behavioural Science, 27,* 214–225.

Krueger, J. (1992). On the overestimation of between-group differences. *European Review of Social Psychology, 3,* 31–56.

Krueger, J. (1996a). Studying the use of base rates: Normal science or shifting paradigm. *Behavioral and Brain Sciences, 19,* 30.

Krueger, J. (1996b). Personal beliefs and cultural stereotypes about racial characteristics. *Journal of Personality and Social Psychology, 71,* 536–548.

Krueger, J. (1996c). Probabilistic national stereotypes. *European Journal of Social Psychology, 26,* 961–980.

Krueger, J. (in press). Enhancement bias in descriptions of self and others. *Personality and Social Psychology Bulletin.*

Krueger, J., & Clement, R. W. (1994). The truly false consensus effect: An ineradicable and egocentric bias in social perception. *Journal of Personality and Social Psychology, 67,* 596–610.

Krueger, J., & Clement, R. W. (1996). Inferring category characteristics from sample characteristics: Inductive reasoning and social projection. *Journal of Experimental Psychology: General, 128,* 52–68.

Krueger, J., & Clement, R. W. (1997). Consensus estimates by majorities and minorities: The case of social projection. *Personality and Social Psychology Review, 1,* 299–313.

Krueger, J., Ham, J. J., & Linford, K. M. (1996). Perceptions of behavioral consistency: Are people aware of the actor-observer effect? *Psychological Science, 7,* 259–264.

Krueger, J., & Heckhausen, J. (1993). Personality development across the adult life span: Subjective conceptions versus cross-sectional contrasts. *The Journals of Gerontology: Psychological Sciences, 48,* 100–108.

Krueger, J., & Zeiger, J. S. (1993). Social categorization and the truly false consensus effect. *Journal of Personality and Social Psychology, 65,* 670–680.

Levine, J. L. (1997). Reconstructing memory for emotions. *Journal of Experimental Psychology: General, 126,* 165–177.

Lorenz, K. (1962/1966). *On aggression.* New York: Harcourt, Brace, & World.

Mahoney, M. J. (1977). Publication prejudices: An experimental study of confirmatory bias in the peer review system. *Cognitive Therapy and Research, 1,* 161–175.

Marks, G., & Duval, S. (1991). Availability of alternative positions and estimates of consensus. *British Journal of Social Psychology, 30,* 179–183.

Marks, G., Graham, J. W., & Hansen, W. B. (1992). Social projection and social conformity in adolescent alcohol use: A longitudinal analysis. *Personality and Social Psychology Bulletin, 18,* 96–101.

Marks, G., & Miller, N. (1982). Target attractiveness as a mediator of assumed attitude similarity. *Personality and Social Psychology Bulletin, 8,* 728–735.

Marks, G., & Miller, N. (1985). The effect of certainty on consensus judgments. *Personality and Social Psychology Bulletin, 11,* 165–177.

Marks, G., & Miller, N. (1987). Ten years of research on the false-consensus effect: An empirical and theoretical review. *Psychological Bulletin, 102,* 72–90.

McArthur, L. A. (1972). The how and what of why: Some determinants and consequences of causal attribution. *Journal of Personality and Social Psychology, 22,* 171–193.

McCauley, C., Durham, M., Copley, J. B., & Johnson, J. P. (1985). Patients' perceptions of treatment for kidney failure: The impact of personal experience on population predictions. *Journal of Experimental Social Psychology, 21,* 138–148.

McGuire, W. J. (1964). Inducing resistance to persuasion: Some contemporary approaches. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 1, pp. 191–229). New York: Academic Press.

McKenzie, C. R. M. (1994). The accuracy on intuitive judgment strategies: covariation assessment and Bayesian inference. *Cognitive Psychology, 26,* 209–239.

McNemar, Q. (1962). *Psychological Statistics* (3rd ed.). New York: Wiley.

Meehl, P. E. (1990). Why summaries of research on psychological theories are often uninterpretable. *Psychological Reports, 66,* 195–244.

Messé, L. A., & Sivacek, J. M. (1979). Predictions of others' responses in a mixed-motive game: Self-justification of false consensus? *Journal of Personality and Social Psychology, 37,* 602–607.

Milgram, S. (1974). *Obedience to authority.* New York: Harper & Row.

Miller, C. T. (1993). Majority and minority perceptions of consensus and recommendations for resolving conflicts about land use regulation. *Personality and Social Psychology Bulletin, 19,* 389–398.

Miller, D. T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin, 82,* 213–225.

Mintz, E. (1956). An example of assimilative projection. *Journal of Abnormal and Social Psychology, 52,* 270–280.

Mullen, B. (1983). Egocentric bias in estimates of consensus. *Journal of Social Psychology, 121,* 31–38.

Mullen, B., Atkins, J. L., Champion, D. S., Edwards, C., Hardy, D., Story, J. E., & Vanderklok, M. (1985). The false consensus effect: A meta-analysis of 115 hypothesis tests. *Journal of Experimental Social Psychology, 21,* 262–283.

Mullen, B., Dovidio, J. F., Johnson, C., & Copper, C. (1992). In-group–out-group differences in social projection. *Journal of Experimental Social Psychology, 28,* 422–440.

Mullen, B., & Goethals, G. R. (1990). Social projection, actual consensus and valence. *British Journal of Social Psychology, 29,* 279–282.

Murray, S. L., Holmes, J. G., & Griffin, D. W. (1996). The benefits of positive illusions: Idealization and the construction of satisfaction in close relationships. *Journal of Personality and Social Psychology, 70,* 79–90.

Murstein, B. I., & Pryer, R. S. (1959). The concept of projection: A review. *Psychological Review, 56,* 353–374.

Myers, D. G. (1996). *Social psychology* (5th ed.). New York: McGraw-Hill.

Nasby, W., Hayden, B., & DePaulo, B. M. (1980). Attributional bias among aggressive boys to interpret unambiguous social stimuli as displays of hostility. *Journal of Abnormal Psychology, 89,* 459–468.

Newcomb, T. M. (1961). *The acquaintance process.* New York: Holt, Rinehart, & Winston.

Newman, L. S., Duff, K. J., & Baumeister, R. F. (1997). A new look at defensive projection: Thought suppression, accessibility, and biased person perception. *Journal of Personality and Social Psychology, 72,* 980–1001.

Newman, L. S., & Uleman, J. S. (1989). Spontaneous trait inference. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 155–188). New York: Guilford.

Nisbett, R. E. (1993). *Rules for reasoning.* Hillsdale, NJ: Erlbaum.

Nisbett, R. E., Borgida, E., Crandall, R., & Reed, H. (1976). Popular induction: Information is not necessarily informative. In J. S. Carroll & J. W. Payne (Eds.), *Cognition and social behavior* (pp. 113–133). Hillsdale, NJ: Erlbaum.

Nisbett, R. E., Krantz, D. H., Jepson, C., & Kunda, Z. (1983). The use of statistical heuristics in everyday inductive reasoning. *Psychological Review, 90,* 339–363.

Nisbett, R. E., & Ross, L. (1980). *Human inference.* Englewood Cliffs, NJ: Prentice-Hall.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84,* 231–259.

Nowak, A., Szamrej, J., & Latané, B. (1990). From private attitude to public opinion: A dynamic theory of social impact. *Psychological Review, 97,* 362–376.

Oakes, P. J., Haslam, S. A., & Turner, J. C. (1994). *Stereotyping and social reality.* Oxford, UK: Blackwell.

Platt, J. R. (1964). Strong inference. *Science, 146,* 347–353.

Pratto, F. (1992). Prejudice against discrimination. *Psychological Inquiry, 3,* 184–186.

Prentice, D. A. (1990). Familiarity and differences in self- and other-representations. *Journal of Personality and Social Psychology, 59,* 369–383.

Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving a social norm. *Journal of Personality and Social Psychology, 64,* 243–256.

Quadrel, M. J., Fischhoff, B., & Davis, W. (1993). Adolescent (in) vulnerability. *American Psychologist, 48,* 102–116.

Quattrone, G. A., & Tversky, A. (1984). Causal versus diagnostic contingencies: On self-deception and on the Voter's Illusion. *Journal of Personality and Social Psychology, 46,* 237–248.

Rabbie, J. M., & Horwitz, M. (1969). Arousal of ingroup–outgroup bias by a chance win or loss. *Journal of Personality and Social Psychology, 13,* 269–277.

Rhee, E., Uleman, J. S., Lee, H. K., & Roman, R. J. (1995). Spontaneous self-descriptions and ethnic identities in individualistic and collectivistic cultures. *Journal of Personality and Social Psychology, 69,* 142–152.

Robins, R. W., Spranca, M. D., & Mendelsohn, G. A. (1996). The actor-observer effect revisited: Effects of individual differences and repeated social interactions on actor and observer attributions. *Journal of Personality and Social Psychology, 71,* 375–389.

Rosch, E. H. (1978). Principles of categorization. In E. H. Rosch & B. B. Lloyd (Eds.), *Cognition and categorization.* Hillsdale, NJ: Erlbaum.

Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin, 86,* 638–641.

Rosenthal, R., & Rubin, D. R. (1982). A simple, general purpose display of magnitude of experimental effect. *Journal of Educational Psychology, 74,* 166–169.

Ross, L., Greene, D., & House, P. (1977). The "false consensus effect": An egocentric bias in social perception and attribution processes. *Journal of Experimental Social Psychology, 13,* 279–301.

Rothbart, M., Fulero, S., Jensen, C., Howard, J., & Birrell, P. (1978). From individual to group impressions: Availability heuristics in stereotype formation. *Journal of Experimental Social Psychology, 14,* 237–255.

Rothbart, M., Sriram, N., & Davis-Stitt, C. (1996). The retrieval of typical and atypical category members. *Journal of Experimental Social Psychology, 32,* 309–336.

Russell, G. W., & Arms, R. L. (1995). False consensus effect, physical aggression, anger, and a willingness to excalate a disturbance. *Aggressive Behavior, 21,* 381–386.

Schopenhauer, A. (1891). *The world as will and idea* (2nd ed., Vol. 2). London: Paul, Trench & Trubner.

Schuman, H., & Kalton, G. (1985). Survey methods. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (3rd ed., Vol 1, pp. 635–697). New York: Random House.

Sherman, S. J., Presson, C. C., & Chassin, L. (1984). Mechanisms underlying the false consensus effect: The special role of threats to the self. *Personality and Social Psychology Bulletin, 10,* 127–138.

Sherman, S. J., Presson, C. C., Chassin, L., Corty, E., & Olshavsky, R. (1983). The false consensus effect in estimates of smoking prevalence: Underlying mechanisms. *Personality and Social Psychological Bulletin, 9,* 197–207.

Sherman, S. J., Zehner, K. S., Johnson, J., & Hirt, E. R. (1983). Social explanation: The role of timing, set and recall on subjective likelihood estimates. *Journal of Personality and Social Psychology, 44,* 1127–1143.

Simon, B. (1993). On the asymmetry in the cognitive construal of ingroup and outgroup: A model of egocentric social categorization. *European Journal of Social Psychology, 23,* 131–147.

Snodgrass, J. G., & Corwin, J. (1988). Pragmatics of measuring recognition memory: Applications to dementia and amnesia. *Journal of Experimental Psychology: General, 117,* 34–50.

Spears, R., & Manstead, S. R. (1990). Consensus estimation in social context. *European Review of Social Psychology, 1,* 81–109.

Spellman, B. A. (1996). Acting as intuitive scientists: Contingency judgments are made while controlling for alternative potential causes. *Psychological Sciences, 7,* 337–342.

Stephan, W. G., & Stephan, C. W. (1985). Intergroup anxiety. *Journal of Social Issues, 41,* 157–175.

Suls, J., Wan, C. K., Barlow, D. H., & Heimberg, R. G. (1990). The fallacy of uniqueness: Social consensus perceptions of anxiety disorder patients and community residents. *Journal of Research in Personality, 24,* 415–432.

Sumner, W. G. (1906). *Folkways.* Boston: Ginn & Co.

Tajfel, H. (1970). Experiments in intergroup discrimination. *Scientific American, 223,* 596–602.

Taylor, M., Cartwright, B., & Bowden, T. (1991). Perspective taking and theory of mind: Do children predict interpretive diversity as a function of differences in observers' knowledge? *Child Development, 62,* 1334–1351.

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social-psychological perspective on mental health. *Psychological Bulletin, 103,* 193–210.

Tetlock, P. E., & Levy, A. (1982). Attribution bias: On the inconclusiveness of the cognition-motivation debate. *Journal of Experimental Social Psychology, 18,* 68–88.

Toch, H., & Klofas, J. (1984). Pluralistic ignorance, revisited. In G. M. Stephenson & J. H. Davis (Eds.), *Progress in applied social psychology* (Vol. 2, pp. 129–159). New York: Wiley.

Tversky, A., & Edwards, W. (1966). Information versus reward in binary choice. *Journal of Experimental Psychology, 71,* 680–683.

Tversky, A., & Kahneman, D. (1971). Belief in the law of small numbers. *Psychological Bulletin, 76,* 105–110.

Tversky, A. & Kahneman, D. (1973). Availability: A hueristic for judging frequency and probability. *Cognitive Psychology 5,* 207–232.

Twain, M. (1975). Neither winter nor summer nor morals. In F. Anderson, L. Salamo, & L. Stein (Eds.), *Mark Twain's notebooks and journals* (Vol. II). Berkeley, CA: University of California Press.

Uleman, J. S. (1989). A framework for thinking intentionally about unintended thought. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 425–449). New York: The Guilford Press.

van der Pligt, J. (1984). Attributions, false consensus, and valence: Two field studies. *Journal of Personality and Social Psychology, 46,* 57–68.

van der Pligt, J., Ester, P., & van der Linden, J. (1983). Attitude extremity, consensus and diagnosticity. *European Journal of Social Psychology, 13,* 437–439.

van der Pligt, J., van der Linden, J., & Ester, P. (1982). Attitudes to nuclear energy: Beliefs, values, and false consensus. *Journal of Environmental Psychology, 2,* 221–231.

von Hippel, W., Sekaquaptewa, D., & Vargas, P. (1995). On the role of encoding processes in stereotype maintenance. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 27, pp. 177–254). New York: Academic Press.

Wallen, R. (1943). Individuals' estimates of group opinion. *Journal of Social Psychology, 17,* 269–274.

Ward, C. D. (1967). Own height, sex, and liking in the judgment of the height of others. *Journal of Personality, 35,* 379–401.

Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review, 101,* 34–52.

Wellman, H. M. (1990). *The child's theory of mind.* Cambridge, MA: Bradford Books/M.I.T. Press.

West, P. M. (1996). Predicting preferences: An examination of agent learning. *Journal of Consumer Research, 23,* 68–80.

Wilder, D. A. (1984). Predictions of belief homogeneity and similarity following social categorization. *British Journal of Social Psychology, 23,* 323–333.

Woodruff, D. S., & Birren, J. E. (1972). Age changes and cohort differences in personality. *Developmental Psychology, 6,* 252–259.

Yinon, Y., Mayraz, A., & Fox, S. (1994). Age and the false-consensus effect. *Journal of Social Psychology, 134,* 717–725.

Zuckerman, M., Colwell, E. L., Darche, P. R., Fischer, S. A., Osmun, R. W., Spring, D. D., Winkler, B. A., & Wolfson, L. (1988). Attributions as inferences and explanations: Effects on discounting. *Journal of Personality and Social Psychology, 54,* 748–757.

Zuckerman, M., Mann, R. W., & Bernieri, F. J. (1982). Determinants of consensus estimates: Attribution, salience, and representativeness. *Journal of Personality and Social Psychology, 42,* 839–852.