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The Prejudiced Personality Revisited: Personal Need for Structure and Formation of Erroneous Group Stereotypes

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Two studies explored the relation between personal need for structure (PNS) and a reasoning process through which stereotypes may form. Participants viewed information about the performance of group members on intelligence-related tasks and then indicated their inference strategies and impressions of the groups. Results indicated that high-PNS participants were more likely than low-PNS participants to form erroneous group stereotypes. Individual differences in attributional complexity and need for cognition also predicted stereotype formation under some conditions. The effects of PNS and other cognitive personality variables were weakened under conditions in which participants believed that they would have to justify their impressions publicly. Discussion focuses on processes underlying the relation between PNS and stereotype formation and on relations among personality, social context, and social inference.

> We now come to what is perhaps the most momentous discovery of psychological research in the field of prejudice. To state it broadly: the cognitive processes of prejudiced people are in general different from the cognitive processes of tolerant people. In other words, a person's prejudice is unlikely to be merely a specific attitude toward a specific group; it is more likely to be a reflection of his whole habit of thinking about the world he lives in. G. W. Allport (1954, p. 170)

The 1950s represented the heyday for research relating personality characteristics to intergroup perceptions and behavior. Perhaps the classic example is the work associating the authoritarian personality with ethnocentrism and prejudice (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). Other research revealed that prejudice was related to the tendency to dichotomize cognitive operations (Allport, 1954) and to a general intolerance for ambiguity (Block & Block, 1951). Since that fertile decade, there have been isolated attempts to examine other enduring personality characteristics as they relate to intergroup perception (e.g., Crocker & Luhtanen, 1990; Gough & Bradley, 1993; Katz, Wackenhut, & Hass, 1986). However, from a contemporary viewpoint, there is much that is unknown about the relation between personality and intergroup perception. Most prior research has focused on ethnocentrism, ingroup favoritism, and prejudice against members of established minority groups. There is virtually no research relating personality to the many more subtle psychological processes through which group stereotypes develop and are maintained.

This is a substantial gap in the literature. The last two decades of research on intergroup perceptions have followed Allport's (1954) lead and have revealed a number of cognitive processes that operate in the formation and maintenance of group stereotypes (cf. Hamilton, 1981; Hamilton & Sherman, 1994; Stephan, 1985, 1989). It is now clear that erroneous stereotypes may result in part from unintentional processes related to attention, memory, attribution, and logical reasoning. Although the relation between stereotypes and prejudice is complex (Devine, 1989), it is clear that these stereotypes can importantly influence perception of and prejudice toward members of stereotyped groups (Dovidio, Brigham, Johnson, & Gaertner, in press). It is important to understand just what aspects of human personality influence the unintentional cognitive processes that contribute to stereotype formation, how they do so, and with what consequences. The present investigation represents one step toward a more complete understanding of what Allport referred to as "the dynamics of cognition in the prejudiced personality" (1954, p. 170). We focus specifically on individual differences that impact on a process of statistical reasoning in group perception.

Statistical Reasoning and Stereotype Formation

Erroneous stereotypes of certain groups may result in part from people's failure to use sufficiently complex inferential logic when integrating information about these groups (Schaller, 1994). For instance, gender stereotypes may have resulted in part from people's tendency to infer dispositions from behavior without considering that behavioral differences may be due to different social roles rather than to inherently different dispositions (Eagly & Steffen, 1984). Similarly, racial stereo-

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types may continue to be perpetuated in part by the failure of observers to recognize and control for the different social environments faced by people of different races (Fairchild, 1984). In a sense, then, accurate group perception requires that people engage in a reasoning process not unlike a statistical analysis of covariance, intuitively controlling for the differential situational constraints on group behavior. Empirical evidence suggests that the failure to engage in this reasoning process may play an important part in the formation of new stereotypes and in the perpetuation of existing ones (Schaller, 1994; Schaller & O'Brien, 1992).

Research also indicates that this reasoning process is responsive to various social and contextual variables (Schaller, 1992a, 1992b; Schaller & O'Brien, 1992). Under certain conditions, people tend to engage in very simplistic reasoning and form erroneous impressions and stereotypes. However, under other, predictable conditions, people are remarkably adept at engaging in an "intuitive" analysis of covariance and form very accurate impressions. It stands to reason that there also may be important and predictable personal variables influencing this statistical reasoning process and in the consequent tendency to form erroneous group stereotypes. One individual difference of particular promise is the desire to mentally structure one's environment in a simplified, manageable manner: the personal need for structure (PNS; Neuberg & Newsom, 1993; Thompson, Naccarato, & Parker, 1989, 1992).

Personal Need for Structure

As a species, we have apparently found it adaptive to impose order on our complex multidimensional environment. As a result, there is a ubiquitous tendency to organize our world according to simple cognitive structures (Fiske & Taylor, 1991; Markus & Zajonc, 1985). As individuals, however, some of us feel a much stronger need than others to simplify, structure, and order our environment. Although related but conceptually distinct personality constructs such as dogmatism, rigidity, and intolerance for ambiguity have been of interest to psychologists for years (e.g., Rokeach, 1960), only recently have researchers turned their attention specifically to the PNS. Drawing on Kruglanski's (1989) theory of lay epistemics, Thompson and colleagues (1989, 1992) developed a 12-item questionnaire that reliably measures PNS and predicts a number of interesting phenomena relevant to group-stereotyping processes.

In the only published study relating PNS to stereotyping processes, Neuberg and Newsom (1993; Study 4) found that high-PNS people were more likely to apply existing gender stereotypes when drawing inferences about individuals from ambiguous behavior. Note that Neuberg and Newsom's study focused on a process that arises only after group stereotypes have been established. The present concern is with how such stereotypes arise in the first place. No research has yet linked PNS to stereotype formation, but several studies have linked the need for structure to several mechanisms that are relevant to the statistical reasoning process just discussed.

One mechanism is that of attribution. Although causal attribution and intuitive analysis of covariance are different in important ways (Schaller & O'Brien, 1992), there are some similarities as well. One important similarity lies in the importance of considering situational constraints on behavior of performance. Moskowitz (1993) found that high-PNS individuals were more likely to form spontaneous trait inferences from a person's behavior. A corollary implication is that these individuals were less likely to consider other pertinent information (e.g., situational constraints) before forming an impression of the person.

Another study tested this implication more directly albeit with a different operationalization of the personality construct. Drawing on the same theoretical background, Webster and Kruglanski (1994) developed a scale to measure the conceptually similar construct of need for closure and found that this measure predicted "correspondence bias" in causal attribution (Webster, 1993). Specifically, individuals who are high in need for closure were more likely to ignore information about important situational constraints on behavior when drawing correspondent inferences about a person's attitudes.

A second mechanism is that of categorization. In previous studies on intuitive analysis of covariance (Schaller, 1992a; Schaller & O'Brien, 1992), measures of recall clustering have implied that people forming erroneous group stereotypes tend to categorize group information according to a simple, two-dimensional structure. On the other hand, people forming more accurate impressions (adjusting for situational constraints) appear to categorize group information according to a more complex, three-dimensional structure. The effect of PNS on categorization was tested by Neuberg and Newsom (1993; Study 3), who found that high-PNS individuals classified items according to more simplistic categorical structures.

These studies imply that high-PNS people may be more likely to mentally categorize group-relevant information according to simplistic cognitive structures and that they are more likely to ignore differential constraints that govern group behavior. For instance, high-PNS individuals may be more likely to ignore the important influence of social roles on the behavior of men and women. They may also be more likely to overlook the social, cultural, and economic obstacles that interfere with the achievement of historically oppressed minority groups. In general, individuals high in PNS may be most likely to form erroneous group stereotypes.

Of course, PNS may not be the only personality variable that influences statistical reasoning and consequent formation of erroneous group impressions. For instance, individual differences in attributional complexity (AC) have been shown to influence specifically the consideration of situational constraints on behavior (Fletcher, Danilovacs, Fernandez, Peterson, & Reeder, 1986) and attributional accuracy (Fletcher, Reeder, & Bull, 1990; Fletcher, Rosanowski, Rhodes, & Lange, 1992). It seems likely, therefore, that AC might also influence group stereotype formation.

A joint consideration of influences of PNS and AC may help to elucidate more clearly just what cognitive mechanisms underlie this stereotype-formation process. Our preceding discussion suggests that the statistical reasoning underlying stereotype formation may be a compound process influenced by both categorization and attributional mechanisms. No previous research has specifically attempted to distinguish between these

mechanisms, and the relative importance of each remains unclear. The extent to which PNS and AC predict stereotype formation may help address this question. The relative importance of the attributional mechanism may be revealed by the extent to which AC accounts for variance in stereotype formation. The relative importance of the categorization mechanism may be indicated by the extent to which PNS accounts for variance in stereotype formation above and beyond that accounted for by AC.

Study 1

Study 1 tested the effects of PNS and AC on the formation of erroneous group stereotypes. We used a group inference paradigm developed in earlier research by Schaller (1992a, 1994; Schaller & O'Brien, 1992). This paradigm allows us to examine the impressions participants form concerning the intellectual abilities of two groups (simply called Group A and Group B) and the nature of the logical reasoning process that participants use when integrating and drawing inferences from group-relevant information.

Method

Participants

The participants were 28 introductory psychology students who participated in two ostensibly unrelated experimental sessions in exchange for partial credit toward a course requirement.

Assessment of individual differences. During the first of the two experimental sessions, participants completed a set of questionnaires assessing different personality attributes. Included was a 12-item PNS scale (Neuberg & Newsom, 1993; Thompson et al., 1989) and a 28-item (AC) scale (Fletcher et al., 1986).

Group impression formation task. Participants attended in the second session approximately 1 week later and were met by an experimenter who was unaware of their PNS or AC scores. An introduction stated that the purpose of the experiment was to examine the manner in which people form impressions and judgments of others on the basis of discrete items of information. The participants were informed that their task would be to determine the relative intelligence of two groups—simply referred to as Group A and Group B—on the basis of group members' ability to unscramble anagrams. The participants were told that the group labels A and B referred to two different types of personality but were given no further information about the groups. The experimenter went on to explain that the members of each group were participants in a previous experiment who had been presented with anagrams one at a time and were given 30 s to solve each anagram.

Information about the two groups was presented in the form of a "slide show" on IBM-compatible microcomputers. Each slide presented four items of information: (a) the group membership of the person who attempted the anagram, indicated by an identifying letter–number code (e.g., A-07, B-16); (b) the outcome of the attempt (success or failure); (c) the actual anagram, which was either five letters long (e.g., DLABE) or seven letters long (e.g., YOCNEOM); and (d) the correct solution (e.g., BLADE, ECONOMY). Altogether, there were 50 slides presenting information about 50 different attempts by a group member to solve an anagram. These slides were arranged in one of three different orders, and the slides were presented at a rate of 8 s per slide.

Across the 50 slides, the proportion of five- to seven-letter anagrams was not equivalent for the two groups. Of the 25 anagrams attempted by Group A, 5 were five letters long and 20 were seven letters long; of the 25 anagrams attempted by Group B, 20 were five letters long and 5 were seven letters long. The success rates on the five- and seven-letter anagrams also differed. Group A members solved all 5 five-letter anagrams (100%) and 5 of 20 seven-letter anagrams (25%); Group B solved 15 of 20 five-letter anagrams (75%) and none of the 5 seven-letter anagrams (0%). (A summary of the stimulus information is presented in Table 1.) Thus, although Group A had a higher success rate on both five-letter and seven-letter anagrams, Group B solved more total anagrams, a seemingly paradoxical reversal resulting from the fact that Group B attempted mostly rather easy (five-letter) anagrams, whereas Group A attempted mostly much more difficult (seven-letter) anagrams. If one used a simplistic statistical reasoning strategy and ignored the differing constraints on each groups' performance, one would likely judge Group B to be more intelligent. If one used a more complex reasoning strategy and appropriately controlled for the differing constraints imposed by anagram difficulty, one would judge Group A to be more intelligent. The participants' final judgment is, therefore, indicative of the reasoning strategy on which it is based (Schaller & O'Brien, 1992).

After participants had been presented with these stimuli, they completed a questionnaire to assess their impressions of the groups' relative intelligence. On 9-point Likert-type scales, the participants rated which group they thought would do better if they were to attempt anagram tasks (we refer to this judgment as *anagram ability*) and which group was more intelligent ("intelligence I"). Responses were scored on a scale ranging from −4 to +4, with negative values indicating judgments in favor of Group B and positive values indicating judgments in favor of Group A. On another 9-point scale, participants indicated how confident they were in their judgments. (Confidence ratings were not related to impression accuracy and are not discussed further.) Participants then rated each group's intelligence separately on 9-point scales. By subtracting the rating of Group B from that of Group A, we created a second measure of relative group intelligence ("intelligence II").

In addition to these measures of stereotyping, participants completed two measures designed to offer direct and face-valid assessments of information-processing strategies. Participants ranked six types of information as to how important each type of information was "in the way you mentally organized the information." Rankings were later reverse scored (so that higher values indicated greater importance). Of particular interest was the importance accorded to the length of the anagram. Participants then were presented with a list of three possible information-organizing strategies. These varied in complexity; the third represented something akin to the logic of analysis of covariance. Participants indicated which of the three strategies most closely represented their own method of organizing the information when forming impressions. Depending on which strategy they chose, participants received a score of 1, 2, or 3; higher values indicated more complex information-organizing strategies (for details, see Schaller & O'Brien, 1992).

Participants also completed a procedure designed to offer a subtle and indirect indicator of the extent to which they attended to anagram length. Participants were given a blank sheet of paper and were asked to make a list of any anagram-solution words that they remembered from the presentation in the order recalled. Serial order served as the basis for computing a categorical clustering index ("Adjusted Ratio of Clustering"; Roenker, Thompson, & Brown, 1971), indicating the extent to which recalled words were clustered according to length. Nonrandom clustering on this particular dimension indicates that anagram length served as a retrieval cue, which, in turn, suggests that anagram length served as a categorization dimension during encoding (Schaller, 1992a; Schaller & O'Brien, 1992).

Results

Correlational analyses revealed that AC and PNS were not significantly related to each other ($r = -.10$). Table 2 presents

Table 1
Breakdown of Stimulus Information According to Group Membership, Anagram Length, and Performance Outcome

	Five-letter anagrams		Seven-letter anagrams		Aggregate	
Group	Success	Failure	Success	Failure	Success	Failure
A	5	0	5	15	10	15
B	15	5	0	5	15	10

the correlations between each of these personality constructs and the measures of group-stereotyping and reasoning measures. AC did not correlate significantly with any of these primary dependent measures. PNS did correlate with measures of group stereotyping and reasoning. All correlations were negative, as predicted. Significant correlations emerged between PNS and both measures of perceived relative intelligence and between PNS and the complexity of organizational strategy.

To illustrate this effect of PNS on the perception of erroneous group stereotypes, it is instructive to consider the perceptions of low- and high-PNS individuals. As Figure 1 reveals, participants falling below the median on PNS formed accurate impressions of relative group intelligence: They perceived Group A to be more intelligent than Group B. In contrast, participants with PNS scores above the median perceived Group A to be less intelligent than Group B. Thus, erroneous stereotypes impugning Group A were formed primarily by participants scoring high on this measure of PNS.

Was the effect of PNS on group impressions mediated by the manner in which participants organized group information? To address this question, we conducted a series of regression equations in the manner suggested by Baron and Kenny (1986). Of particular interest was the strength of the statistical relations between PNS and the two relative intelligence measures while controlling for self-reported organizing strategy. Interestingly, results indicated that, although these relations decreased slightly, they remained significant ($p < .06$) even after controlling for organizing strategy.

Table 2
Study 1: Correlations Between Personality Variables and Primary Dependent Variables

Dependent variable	PNS	AC	*n*
Group judgment and stereotyping			
Anagram ability	−.26	−.18	28
Intelligence I	−.51***	−.10	28
Intelligence II	−.45**	.11	28
Inferential reasoning during group judgment task			
Organizing strategy	−.43**	−.06	28
Importance of length	−.15	−.29	28
Recall clustering	−.12	−.03	28

Note. PNS = personal need for structure; AC = attributional complexity.
** $p < .05$. *** $p < .01$.

Discussion

These results support the hypothesis that PNS plays a role in the development of erroneous group stereotypes. Under conditions in which groups' performance outcomes differ as a result of differential external constraints, high-PNS individuals are more likely than low-PNS individuals to form erroneous negative stereotypes of the disadvantaged group. Thus, not only does PNS influence the activation and application of group stereotypes (Neuberg & Newsom, 1993), but it can also influence the initial formation of those stereotypes.

The effect of PNS on group stereotype formation does not appear to be a function entirely of attributional processes. Rather, it may be due in part to the different ways in which low- and high-PNS individuals mentally organized group-relevant information. This interpretation is supported by the fact that, among the process variables measured here, the strongest effect of PNS was on the measure assessing the complexity of participants' information-organizing strategies. It is also supported by the fact that PNS, but not AC, influenced group stereotype formation. This interpretation must still be considered tentative, however, given that the relation between PNS and group impressions remained significant even after controlling for participants' self-reported information-organizing strategies.[1]

The lack of effects for AC are a bit surprising. Given the conceptual parallels between intuitive analysis of covariance and causal attribution, it strikes us as premature to dismiss the possible effects of AC on this stereotype formation process.

Study 2

In Study 2, we tested again the effects of PNS and AC on erroneous stereotype formation. In addition, we examined the effects of another potentially relevant cognitive personality variable: need for cognition (NFC). The NFC scale (Cacioppo & Petty, 1982) measures the extent to which individuals feel the

[1] Several measurement issues might account in part for the failure to support the mediation hypothesis. First, the chronology of measurement (group impressions assessed before administration of processing measures) was inconsistent with the hypothesized causal chain. Second, the measure of organizing strategy was composed of a single item and was therefore of dubious reliability. This decreases the likelihood of obtaining results indicating mediation (Baron & Kenny, 1986). Third, this measure was based on participants' own self-reports, which were unlikely to represent entirely accurately their underlying cognitive processes (Nisbett & Wilson, 1977).

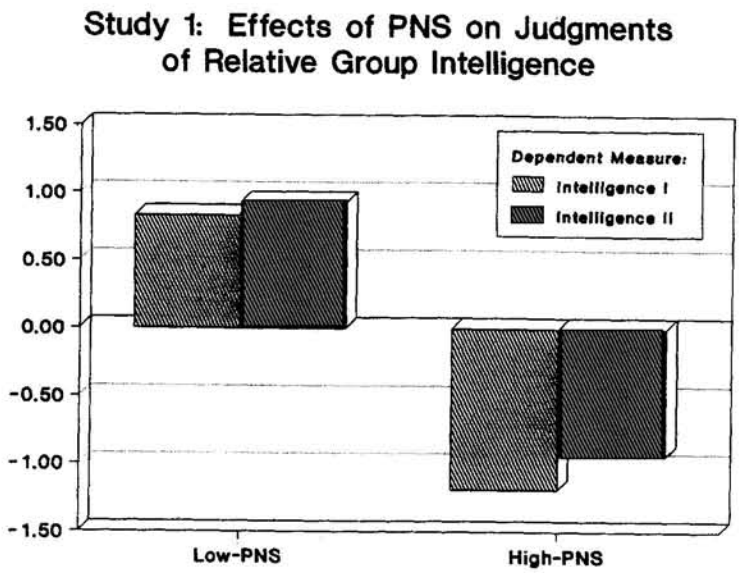

Figure 1. Study 1: Effects of personal need for structure (PNS) on judgments of relative group intelligence. (Positive values indicate accurate group impressions; negative values indicate erroneous group stereotypes.)

need to engage in effortful and complex cognitive rumination. Individual differences in NFC have been shown to have consequences for many different aspects of social cognition (e.g., Cacioppo, Petty, & Morris, 1983; Srull, Lichtenstein, & Rothbart, 1985), including processes of causal attribution (Lassiter, Briggs, & Bowman, 1991; Lassiter, Briggs, & Slaw, 1991). In addition, NFC has been found to correlate negatively with PNS (Neuberg & Newsom, 1993). Like PNS then, NFC may predict the formation of erroneous group stereotypes.

However, personality is not the only story here. People do not make social judgments in a social vacuum. Social context can arouse motives and goals that have important consequences on reasoning and stereotyping (Schaller, 1992a) and might importantly moderate the impact of individual differences (Kenrick & Funder, 1988; Snyder & Ickes, 1985). Study 2 examined the effects of accountability—the awareness that one must publicly communicate and defend one's impressions. Accountability has been found in previous research to have positive effects on thought complexity and social inference (Tetlock, 1983, 1985), although it does not always lead to more accurate inferences (Tetlock & Boettger, 1989). Given past work, it seemed reasonable to consider the possibility that accountability might have effects on this stereotype-formation process, and, more specific to our focus on the prejudiced personality, might moderate the impact of individual differences on this process.

There are two important issues to consider here. First, a "strong" social situation may overwhelm the effects of personality variables (Mischel, 1973; Snyder & Ickes, 1985). Thus, even if personality variables such as PNS are related to stereotype formation, these effects may obtain only under rather pallid circumstances but not when accountability concerns are aroused.

Second, if accountability does moderate the impact of personality variables on the stereotyping process, it is by no means clear just what "shape" this interaction might take. Accountability may motivate accuracy and might lead people in general—regardless of personality—to consider relevant information in a complete, comprehensive, and complex manner (Devine, Sedikides, & Fuhrman, 1989; Harkness, DeBono, & Borgida, 1985; Neuberg & Fiske, 1987; Tetlock, 1983, 1985). Conversely, the concerns aroused when people feel socially accountable might consume important cognitive resources and thus lead people in general to engage in overly simplistic and inferentially inaccurate reasoning (Gilbert, 1989). A third possibility is that the social concerns aroused under accountability conditions might lead people in general to embrace a strategy of moderation: As a means of playing it safe in the face of an uncertain future interaction, people may simply adopt a neutral, noncommittal viewpoint (Cialdini, Levy, Herman, & Evenbeck, 1973).

To examine the possibility that the effects of PNS (and possibly AC and NFC) might be moderated by situationally induced accountability concerns, we amended the procedures of Study 1 to include a manipulation of accountability. Most of the participants were led to believe that, after exposure to information about the groups, they would be asked to explain their impressions to another participant who had viewed the same information and to justify these impressions. These accountable participants were further differentiated according to whether they believed that the person to whom they would be communicating was (a) a member of Group A, (b) a member of Group B, or (c) not known to be a member in either group. We included these multiple accountability conditions to explore the possibility that the effects of accountability on statistical reasoning and stereotyping may be different depending on the person to whom one is accountable (Cialdini et al., 1973; Tetlock, Skitka, & Boettger, 1989). Participants in a control (no accountability) condition were not led to anticipate any communication with

other participants; they were told simply that they would be completing several questionnaires to measure their impressions.

Method

Participants

The participants were 71 introductory psychology students who participated in exchange for partial credit toward a course requirement. They were assigned randomly to experimental conditions.

Procedure

All participants attended the experimental session singly and were met by a same-sex experimenter in the hallway outside of a suite of laboratory rooms. Just before escorting the participant into the experimental room, the experimenter knocked on the door of an adjoining room, opened the door a few inches, and said "Okay, she or he's here. I'll go get started now." The participant was then seated in the experimental room and given a written introduction to the experiment. This introduction was similar to that of Study 1 but differed across experimental conditions.

Accountability manipulation. Participants in the control (no accountability) condition were told that, after looking through the anagram information, they would be given several questionnaires to complete to assess their impressions and judgments as to which group is more intelligent.

Participants in the three accountability conditions were told that there would be a "communication phase" to the experiment that would begin after they perused the anagram information. The experimenter explained that each participant had been randomly paired with another student ("Phil") who had signed up for a different part of this experiment but would be "looking through these same anagram cards that you will be." The experimenter went on to say that, during the second phase of the experiment, participants would be taken to the next room where they would be asked to "explain and justify to him [Phil] your impressions about which group is more intelligent." Participants were also told that their discussion with Phil would be audiotaped.

Participants presented with this accountability information were also told that, on the basis of some questionnaires distributed in psychology classes, the experimenters had attempted to determine whether they themselves were members of Group A or Group B. In all cases, the experimenter said to each participant, "We don't have a score for you—I think it was a computer scoring error." Depending on experimental condition, the experimenter went on to say either (a) "We do have a score for the other subject; it turns out that Phil is a member of Group A"; (b) "We do have a score for the other subject; it turns out that Phil is a member of Group B"; or (c) "We also don't have a score for the other subject."

Group impression formation task. Participants were then presented with the stimulus information describing anagram-solving attempts by Group A and Group B. The stimulus materials were identical to those presented in Study 1, except that the anagram information was presented on 50 index cards rather than on microcomputer. As in Study 1, however, participants were paced through the information at a regular rate of speed (in this case, 10 s per card).

After participants had looked through the entire set of 50 anagram cards, they were presented with a series of measures designed to assess their judgments and reasoning strategies. (For participants in the accountability conditions, the experimenter first left the room briefly, then returned, and indicated that there would be a short delay before the communication phase would begin and that participants should complete some questionnaires during this time.) These measures were similar to those used in Study 1 and described previously. There were a few differences, however.

As in Study 1, participants offered judgments of relative anagram ability and relative intelligence and their confidence in these ratings. However, participants in Study 2 did not rate separately the intelligence of Group A and Group B. Instead, these participants were presented with 10 evaluative trait adjectives tapping into nonintellectual dimensions (popular, industrious, unsociable, irresponsible, loyal, pessimistic, trustworthy, honest, happy, likable) and were asked to rate how likely it was that each trait was characteristic of members of Group A and of Group B. All ratings were assessed on 9-point scales and were scored in such a way that higher values reflected more positive ratings. Ratings of each group were averaged to form two indexes reflecting participants' general impressions of Group A and Group B. A difference score was then created, subtracting the general impression of Group B from that of Group A. More positive values on this difference score indicate a relatively more favorable general impression of Group A.

Participants also completed measures assessing cognitive processing of the information. These were identical to those used in Study 1.

Assessment of individual differences. After completing the experimental session, participants were debriefed in regard to the experimental procedures and the accountability manipulation. Afterward, all participants were given the opportunity to complete a packet of questionnaires for which they could receive additional experimental credit. These questionnaires were presented as an entirely separate study. The participants were instructed to complete these questionnaires on their own time and to return the completed packet to a designated room. The packet contained, in order, the following instruments: (a) a 34-item NFC questionnaire (Cacioppo & Petty, 1982), (b) a 28-item AC questionnaire (Fletcher et al., 1986), and a 12-item PNS questionnaire (Neuberg & Newsom, 1993; Thompson et al., 1989, 1992).

Results

Initial analyses examined the intercorrelations among the three individual-difference constructs. Results revealed that NFC and AC were strongly positively correlated ($r = .57$, $p < .01$), NFC and PNS were moderately negatively correlated ($r = -.30$, $p < .05$), and there was no correlation between AC and PNS ($r = .03$, *ns*).

Ignoring the accountability manipulation for the time being, we present the correlations among PNS, AC, and NFC and the primary dependent variables in Table 3 (differences in *ns* reflect missing data on some dependent variables). Replicating the results of Study 1, PNS was negatively and significantly correlated with group-stereotyping measures. PNS was also negatively correlated with the cognitive-processing measures, but these correlations were weaker and nonsignificant. The effects of AC and NFC on the dependent measures were generally weak and nonsignificant.

What effect did the accountability manipulation have on these results? There were no main effects of the accountability manipulation on any of the primary dependent variables. However, an examination of the correlations within accountability conditions suggested that accountability did moderate the impact of the personality variables on stereotype formation. Within the control condition, which most closely matched the procedures of Study 1, PNS, AC, and NFC all correlated strongly and significantly with measures of group stereotyping

Table 3
Study 2: Correlations Between Personality Variables and Primary Dependent Variables (Full Sample)

Dependent variable	PNS	AC	NFC	*n*
Group judgment and stereotyping				
Anagram ability	−.27**	.13	.16	71
Intelligence	−.38***	.20*	.12	71
General impression	−.36***	.02	.02	70
Inferential reasoning during group judgment task				
Organizing strategy	−.16	.14	.17	69
Importance of length	−.00	−.02	.06	70
Recall clustering	−.06	.14	.02	69

Note. PNS = personal need for structure; AC = attributional complexity; NFC = need for cognition.
* $p < .10$. ** $p < .05$. *** $p < .01$.

(see Table 4).[2] Within each of the three accountability conditions, the correlations were uniformly weaker. Given that the correlations were largely equivalent across the three conditions, these conditions were collapsed to create a single accountability condition. The correlations within this accountability condition are presented in Table 4.

Thus, under relatively pallid conditions, PNS was strongly predictive of the complexity of inferential reasoning and the accuracy of group impression formation.[3] To a somewhat lesser but still significant extent, AC and NFC influenced this process. On the other hand, under conditions in which social concerns (accountability) were aroused, the effects of these personality variables were less potent. Under accountability conditions, neither AC nor NFC was correlated with stereotype group perceptions or with cognitive processing. PNS still correlated significantly with group perceptions but not with measures of cognitive processing.

We used multiple regression techniques (Aiken & West, 1991) to test explicitly the hypothesis that accountability would moderate the effects of PNS and AC. To create a variable representing the interaction between accountability and PNS, we first converted PNS values to *z* scores and then multiplied these *z* scores by the dichotomized accountability manipulation (the control condition was coded as 1 and the accountability condition as −1). We then conducted a series of hierarchical regression analyses testing the main and interactive effects of accountability and PNS on each of the primary dependent variables. For each analysis, we entered the accountability condition and the PNS score on the first step, and then on the second step we entered the Accountability × PNS interaction term. A parallel procedure was used to test the interactive effects of accountability and AC.

The Accountability × PNS analyses revealed a consistent pattern of results across the primary dependent variables. On measures of group perception, the interaction effects approached but did not attain conventional levels of significance (βs between .20 and .23). Stronger interaction effects emerged on the cognitive-processing measures. There was a significant Accountability × PNS interaction on self-reported information organization strategy ($\beta = .32$) and on the importance accorded to anagram length ($\beta = .31$), both ps $< .05$. The effect on recall clustering was not significant ($\beta = .21$).

The results of the Accountability × AC analyses were similar. There was a significant interaction effect on judgments of anagram ability ($\beta = .34$, $p < .05$) and parallel but nonsignificant effects on the other group perception measures (βs = .21 and .22). No interaction effects emerged on processing measures (βs $< .17$).

These results indicate that, at least on some measures, situationally induced accountability concerns did moderate the impact of PNS and AC on the stereotype-formation process. To reveal more clearly the nature of these interactions, we performed a median split on PNS and examined means within the four cells of the 2 × 2 (Accountability × PNS) design.[4] Results revealed that, on virtually all measures, the accountability manipulation exerted a "homogenizing" effect on participants. For illustrative purposes, we have presented means corresponding to judgments of relative intelligence and self-reported organizing strategy in Figure 2. Compared with control conditions, accountability enhanced organizational complexity and judgmental accuracy among people who scored high on PNS, but it impaired the performance of low-PNS people.

Similar patterns emerged when considering the interactive effects of accountability and AC. We performed a median split on AC and examined means within the four cells of the 2 × 2 (Accountability × AC) design. These means suggest that accountability led to more accurate group impressions among people who scored low on AC but decreased judgmental accuracy among high-AC people.

Discussion

Once again, we found that PNS was significantly related to the formation of erroneous group stereotypes. Additional results (see Footnote 3) indicated that this effect of PNS on stereotype formation was mediated at least in part by the manner

[2] A series of regression analyses examined the independent effects of PNS, AC, and NFC on primary dependent measures. Results revealed that PNS and AC maintained independent effects on the dependent measures, implying that categorization processes and attributional processes contribute independently to this stereotype-formation phenomenon. NFC had no significant independent effect, indicating that any zero-order effects involving NFC resulted largely from shared variance accounted for by PNS and AC. Further analyses focused on the effects of PNS and AC.

[3] As in Study 1, we examined whether the relation between PNS and group judgment was mediated by measures of information organization. Selecting just participants in the control condition, we tested the relation between PNS and judged relative group intelligence while controlling for self-reported organizing strategy. Results indicated that the original relation ($\beta = -.67$; $p < .01$) was reduced but clearly did not disappear entirely ($\beta = -.43$; $p = .11$). Similar effects were obtained when controlling for the other process measures.

[4] The reader should note that analyses of variance based on these median splits revealed effects virtually identical to those of the regression analyses reported previously here. Similarly, differences between means are representative of the plotted regression slopes.

Table 4
Study 2: Effects of Accountability Manipulation on Correlations Between Personality Variables and Primary Dependent Variables

Dependent variable	PNS	AC	NFC	*n*
	Control condition			
Group judgment and stereotyping				
Anagram ability	−.56**	.61**	.44*	15
Intelligence	−.67**	.54**	.55**	15
General impression	−.47*	.26	.11	14
Inferential reasoning during group judgment task				
Organizing strategy	−.61**	.36	.41	15
Importance of length	−.42	.21	.48*	15
Recall clustering	−.37	.19	.19	15
	Accountability condition			
Group judgment and stereotyping				
Anagram ability	−.19	−.04	.05	56
Intelligence	−.29**	.09	−.03	56
General impression	−.33**	−.02	−.02	56
Inferential reasoning during group judgment task				
Organizing strategy	−.03	.07	.08	54
Importance of length	.13	−.12	−.13	55
Recall clustering	.03	.12	−.03	55

Note. PNS = personal need for structure; AC = attributional complexity; NFC = need for cognition.
* $p < .10$. ** $p < .05$.

in which participants mentally organized group-relevant information. AC and NFC were, under certain conditions, predictive of stereotype formation as well. The effects of PNS and other cognitive personality variables on stereotype formation were not consistent across situations. Under conditions in which public accountability concerns were aroused, the effects of AC and NFC all but disappeared, and the effects of PNS were considerably weakened. In contrast to past work revealing the effects of accountability on other forms of thought complexity and social inference (Tetlock, 1983, 1985; Tetlock & Kim, 1987), the accountability manipulation had no main effects on this group stereotype-formation phenomenon. The reasons for this lack of main effect are unclear, of course, although the null main effect is consistent with the emerging conclusion that the cognitive processes at work here are rather different from the attributional mechanisms underlying individual person perception (see General Discussion). The results that did emerge imply that the influence of the personality variables and the accountability manipulation are perhaps best understood within the context of an interaction between persons and situations (Endler & Magnusson, 1976; Snyder & Ickes, 1985).

The shape of this interaction yields some interesting insights into the effects of accountability on this particular stereotype-formation process. Accountability may have either a positive effect or a negative effect on statistical reasoning and group stereotyping depending on the personality characteristics of the perceiver. Among people who otherwise tended toward perceiving erroneous stereotypes (high PNS or low AC), accountability increased reasoning complexity and facilitated more accurate group impressions. Among people who otherwise engaged in complex reasoning and formed normatively accurate group impressions (low PNS or high AC), accountability decreased reasoning complexity and led to less accurate group impressions. Accountability had a homogenizing effect, eliminating the benefits of attributional complexity and reducing the judgmental errors associated with need for structure.

This effect may reflect an adaptive "moderation" strategy in the face of an uncertain interpersonal interaction (Cialdini et al., 1973). The prospect of explaining and defending one's views to another person who will almost certainly have formed his or her own (potentially different) impressions may have led participants to be wary of adopting a particularly strong judgment favoring either group. Rather than risking censure, people may prefer to adopt a more moderate position both in judgments and in the logical processes that accompany those judgments. Previous research has documented such a phenomenon in the expression of attitudes (Cialdini et al., 1973; Cialdini, Levy, Herman, Kozlowski, & Petty, 1976); a similar phenomenon may operate in the context of personality and inferential reasoning.

Of course, this is but one speculative interpretation of this interesting pattern of results. Other explanations might also be suggested. Nonetheless, the results from Study 2 do indicate the following conclusions: (a) PNS does significantly influence reasoning processes and judgments associated with the formation of erroneous group stereotypes, and (b) this impact is influenced by the arousal of situationally induced social concerns.

General Discussion

Across two studies we found that PNS significantly influenced the complexity of participants' inferential reasoning

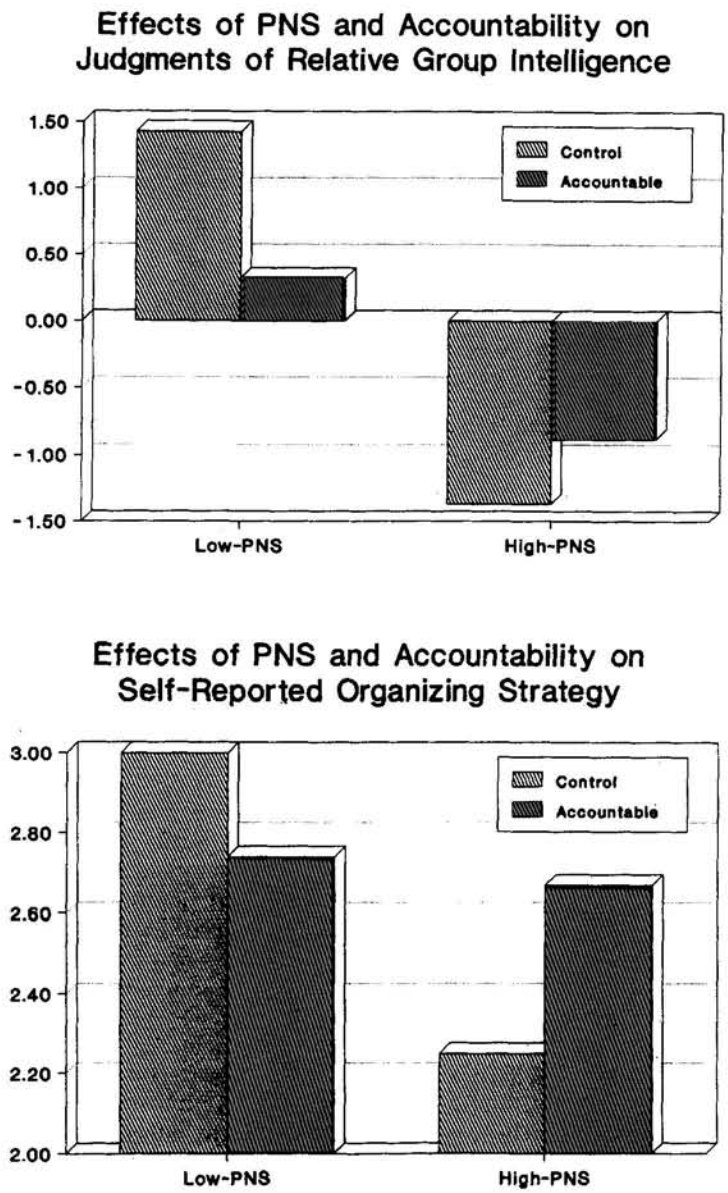

Figure 2. Study 2: Effects of personal need for structure (PNS) and accountability manipulation on judgment of relative group intelligence (positive values indicate more accurate group impressions) and on self-reported information organizing strategy (higher values indicate more complex organizing strategy).

strategies and significantly predicted the formation of erroneous group stereotypes. People high in PNS tended to engage in simplistic reasoning strategies and formed erroneous stereotypes impugning the intelligence of Group A. In contrast, people who were low in PNS engaged in more complex reasoning strategies and formed accurate perceptions concerning relative group intelligence. Thus, we have evidence that stable differences in the way that people cognitively process social information have important effects on the subtle cognitive mechanisms through which stereotypes and prejudice may first develop.

Additional results from the two studies offer insights into the mechanisms through which PNS influences stereotype formation. On the basis of research on PNS and related constructs (Moscowitz, 1993; Neuberg & Newsom, 1993; Webster, 1993), it seemed reasonable to consider at least two cognitive mechanisms through which PNS might influence the formation of erroneous stereotypes. One mechanism is through causal attribution. If high-PNS individuals are more likely to draw trait inferences spontaneously from behavior (Moscowitz, 1993), then they should be more likely to attribute the performance of group members to internal causes and less likely to attribute the performance to external constraints such as task difficulty. As a result, their relative group impressions are likely to be biased by the failure to consider differential situational constraints on the

different groups. A second mechanism is through the categorization of perceived information. If high-PNS individuals are more likely to use simplistic categorical structures (Neuberg & Newsom, 1993), then they are less likely to encode as many dimensions underlying group-relevant information. High-PNS individuals may be more likely to use simplistic two-dimensional cataloging system, identifying and encoding group membership and performance information. Low-PNS individuals may be more likely to use a three-dimensional cataloging system that identifies and encodes information relevant to task difficulty as well.

Through which of these processes does PNS exert its influence on erroneous stereotype formation? We suggest that the categorization process is of primary importance. Although tests of direct statistical mediation were not strongly indicative, several other results converge on this interpretation. First, PNS had a significant impact on a measure specifically designed to assess the manner in which participants categorized group-relevant information. Second, had PNS exerted its impact primarily through an attributional process, we would have expected that PNS would account for little, if any, variance beyond that accounted for by AC. This was not the case. In fact, the effects of AC were weaker than those of PNS and were not consistent across the two studies. Even under conditions in which AC did predict stereotype formation, PNS accounted for a significant proportion of unique variance in stereotype formation.

One other result is worth reporting here as well. In addition to participating in those procedures described previously, the participants who took part in Study 2 later responded to another inference task relevant to statistical reasoning. This later task presented participants with summary information concerning the performance of two individuals (Pat and Chris) who had attempted to solve 100 anagrams each (neither individual was identified as being a member of any group). The summary information (based on methods used by Schaller, 1992b) had a statistical structure similar to that of the group task performance described previously: Chris had a higher success rate than Pat on both five- and seven-letter anagrams, but because Chris attempted many more of the harder seven-letter anagrams, Pat solved more total anagrams. Participants responded to several questions concerning their impressions of the relative intelligence of Pat and Chris. A fundamental feature that sets this inference task apart from the stereotype-formation task described previously is that all relevant information about Pat and Chris was presented in summary form. The task did not demand that participants encode, categorize, and store judgment-relevant information. It is illuminating, therefore, that PNS had no effects whatsoever on inferences about Pat and Chris ($-.10 < rs < .16$). On the other hand, AC did correlate significantly with judgments of the relative anagram-solving ability of Pat and Chris ($r = .26$, $p < .05$). This set of results strengthens the argument that PNS influences group stereotype formation primarily through the process in which individuals encode, categorize, and store group-relevant information.

Because PNS influences certain cognitive mechanisms relevant to stereotype formation, its effects are almost certainly specific to certain stereotype-formation processes but not others. A number of cognitive processes contribute to the formation of erroneous group stereotypes (Mackie, Hamilton, Susskind, & Rosselli, in press). Consider stereotypes resulting from so-called distinctiveness-based illusory correlations (Hamilton & Gifford, 1976). Although the exact process underlying this phenomenon is a matter of current controversy (cf. Fiedler, Russer, & Gramm, 1993; Johnson & Mullen, 1994), none of the hypothesized processes are relevant to complexity of categorizational structure. Indeed, another study conducted in our laboratory offered absolutely no indication that PNS was related to stereotypes resulting from distinctiveness-based illusory correlations (rs on typical dependent measures ranged from $-.14$ to .15, all ns). The effects of PNS on stereotype formation appear specific to some, but not all, cognitive processes underlying stereotype formation.

The current results not only clarify the impact of PNS on stereotype formation, but they also shed light on just what cognitive processes underlie this stereotype-formation phenomenon in general. This phenomenon has been described as analogous to the failure to engage in an intuitive analysis of covariance. However, neither this analogy nor previous research results have revealed clearly the underlying cognitive processes. Although it has been argued that this stereotyping phenomenon is distinct from the attribution-based "correspondence bias" in individual impression formation (Schaller & O'Brien, 1992), it may be tempting nonetheless to consider the phenomenon simply as a product of biases in causal attribution. The present results suggest that, although attributional processes may play some role, the phenomenon should not be viewed merely as a consequence of biases in attributional logic. It appears to be more primarily a product of overly simplistic categorizational structures imposed on group-relevant information.

The complexity of this categorizational structure is influenced not only by personality concerns but also by situational concerns. Previous research (Schaller, 1992a, 1994; Schaller & O'Brien, 1992) identified several situational factors and social concerns that influence this stereotype-formation phenomenon directly. The present investigation demonstrates that a different social concern—public accountability—also influences the process. The effects here were rather subtle, however. Rather than exerting a main effect on the reasoning process, accountability moderated the influence of PNS and other personality variables. It seems unlikely that accountability is the only social–psychological variable that might have this effect. The implication echoes a well-known refrain in the psychology of personality: Personality variables such as PNS may exert important influences on group stereotype formation under conditions in which those stereotypes are forged in relatively "weak" social contexts. However, when group impressions are formed in a "strong" social context, those same personality variables may exert much less influence (Snyder & Ickes, 1985). In the real world, both weak and strong stereotype-formation contexts exist; the social context of human information processing is highly variable. This variable cannot be overlooked when considering the "dynamics of cognition in the prejudiced personality" (Allport, 1954).

Allport's (1954) perspective on prejudice was prescient, anticipating the "cognitive revolution" that would later sweep through research on personality and social psychology. Since

the 1950s, psychological research has uncovered a number of subtle cognitive processes that contribute to the formation of erroneous stereotypes about and prejudices toward social groups. However, our understanding of the prejudiced personality has not accumulated quite as quickly. There has been remarkably little research exploring the personality variables that influence and guide these subtle stereotype-formation processes. Nor has there been much research exploring the social-psychological factors that moderate the influence of those personality variables. The results of the present investigation suggest that it may be fruitful to redress these lacunae in our scientific understanding of stereotypes and prejudice. A complete portrait of the prejudiced personality must attend to differences in the way individuals cognitively process their social environment and to the way in which individuals' social environments affect these cognitive processes.

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