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Article *in* Psychological Science · October 2007

DOI: 10.1111/j.1467-9280.2007.01984.x · Source: PubMed

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Cognitive Costs of Exposure to Racial Prejudice

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ABSTRACT—*This study examined how encountering racial prejudice affects cognitive functioning. We assessed performance on the Stroop task after subjects reviewed job files that suggested an evaluator had made nonprejudiced, ambiguously prejudiced, or blatantly prejudiced hiring recommendations. The cognitive impact of exposure to ambiguous versus blatant cues to prejudice depended on subjects' racial group. Black subjects experienced the greatest impairment when they saw ambiguous evidence of prejudice, whereas White subjects experienced the greatest impairment when they saw blatant evidence of prejudice. Given the often ambiguous nature of contemporary expressions of prejudice, these results have important implications for the performance of ethnic minorities across many domains.*

Social and legal norms in the United States discourage the overt expression of many kinds of prejudice. Ethnic bias, in particular, is strongly sanctioned (Crandall, Eshleman, & O'Brien, 2002). Despite this, many ethnic minority groups continue to face discrimination, and even seemingly egalitarian behavior may mask prejudice (Monin & Miller, 2001). Contemporary forms of prejudice incorporate a mixture of negative and positive elements and are therefore more ambiguous and harder to categorize than the straightforward antipathy of "old-fashioned" forms of prejudice. They pose a challenge to the core human need to understand the workings of the social world (Fiske, 2004).

For optimal social functioning, people must accurately understand others' motivations. Previous research suggests that they will expend attention and effort to achieve this goal. Indeed, uncertainty about the cause of an event triggers diagnostic information seeking—a careful, laborious deployment of atten-

tion, designed to render an accurate causal assessment (e.g., Riley, 1998; Weary & Jacobson, 1997). Given that contemporary forms of prejudice are often subtle and ambiguous, targets of prejudice may experience cognitive impairment as they try to determine the cause underlying the negative events they encounter in their lives. In the research reported in this article, we addressed the extent to which exposure to prejudice affects individuals' cognitive functioning. The relative cognitive costs of exposure to ambiguous versus blatant prejudice should be related to individuals' prior experience with prejudice. As a result, we addressed this issue separately for ethnic minorities (Blacks) and Whites.

ETHNIC MINORITIES' EXPERIENCES WITH PREJUDICE

Some theoretical perspectives on coping with prejudice suggest that ethnic minorities should be relatively well equipped to deal with blatant forms of bias. C.T. Miller and Kaiser (2001), for example, argued that members of stigmatized groups develop adaptive strategies for coping with prejudice over time. These coping strategies may confer a psychological "immunity" that attenuates the negative consequences that would otherwise be associated with perceiving prejudice (see, e.g., Allison, 1998; Barrett & Swim, 1998). Similarly, the simple awareness that one's group is stigmatized results in a form of psychological preparedness. Members of some ethnic minority groups grow up thinking of themselves as potential targets of prejudice. This stigma consciousness (Pinel, 1999) facilitates the recognition of overt prejudice.

Psychological coping strategies cannot be activated, however, until targets can make an attribution to prejudice, and this may be quite challenging in an environment where prejudice is ambiguous. Hence, members of ethnic minorities are likely to experience uncertainty over the motivations behind negative treatment from others; indeed, such attributional ambiguity is one defining element of the experience of stigmatization (Crocker, Major, & Steele, 1998). Crocker and Major (1989)

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argued that ambiguity serves a self-protective function because attributing negative treatment to discrimination rather than to one's idiosyncratic personal qualities can buffer self-esteem. Attributional ambiguity may also influence affect and cognition, however, and it is unclear whether these consequences would be equally beneficial for members of stigmatized groups (see, e.g., [Aronson & Inzlicht, 2004](#)). Major, Quinton, and McCoy (2002) suggested that ambiguity "is not a benign psychological state," but rather "is often highly distressing" and "consumes cognitive resources" (p. 259). For example, exposure to modern sexism, which is subtle and ambiguous, elicits anxiety and inaction in women, whereas old-fashioned sexism, which is blatant, results in hostility and engagement ([Barreto & Ellemers, 2005](#)). In addition, the efficiency of dyadic problem solving is reduced when dyads consist of a Black and a White who is an aversive racist (i.e., someone who tends to express ambivalent messages toward Blacks). Specifically, Dovidio (2001) found that dyads consisting of a Black and an aversive-racist White took slightly longer to solve a problem than did dyads consisting of a Black and a blatantly prejudiced White. The mixed messages and subtle racial bias displayed by aversive racists presumably interfered with the effectiveness of accomplishing the goal in the interaction more than did the consistently negative behavior displayed by blatantly prejudiced Whites.

It is important for members of disadvantaged groups to be able to predict the likelihood of discrimination occurring in their immediate social environment, regardless of whether their own group would be the primary target. Uncertainty about others' prejudice leaves marginalized individuals unable to discern which coping strategies would be most appropriate to the situation. Thus, members of disadvantaged groups may be especially motivated to expend cognitive effort to arrive at a satisfying attribution for ambiguously prejudiced behavior, causing depletion in their ability to focus on other cognitive tasks. In other words, when the evidence of racial bias is ambiguous, members of disadvantaged groups may be vulnerable to decreased performance on pressing cognitive tasks. Therefore, we predicted that exposure to ambiguous prejudice would prove more problematic for the short-term cognitive functioning of Black individuals than would exposure to blatant forms of prejudice.

WHITE AMERICANS' EXPERIENCES WITH PREJUDICE

Past experiences with prejudice shape individuals' coping skills, which, in turn, determine cognitive disruption following an encounter characterized by prejudice. We suggest that there are group-level differences between members of disadvantaged versus advantaged groups in their experiences with prejudice. First, anti-White prejudice is so infrequent that Whites do not tend to think of themselves as potential targets of prejudice. Indeed, Pines (1999) found that Whites are less stigma conscious

than Blacks. Second, Whites are relatively unlikely to perceive prejudice (against either Whites or Blacks) under conditions of uncertainty. For example, Inman and Baron (1996) asked college students to rate the traits shown by actors in a series of vignettes that described ambiguously racist actions. Whites were less likely to label potentially racist acts as instances of prejudice than Blacks were, regardless of the target's race. In signal-detection terms, the threshold at which members of traditionally advantaged groups make attributions to prejudice may be relatively high (cf. [Barrett & Swim, 1998](#)), both because these individuals do not encounter bias very often and because the implications of prejudice are limited for them ([Schmitt & Branscombe, 2002](#)). These findings suggest that Whites are relatively insensitive to subtle cues of prejudice, regardless of the race that is targeted. Thus, we predicted that they would not experience cognitive disruption after exposure to ambiguous prejudice. Rather, we expected that Whites, in contrast to Blacks, would experience substantial disruption when exposed to blatant prejudice. Because overt racism is relatively rare ([McConahay, 1986](#)), Whites do not tend to develop the coping skills that would buffer them from cognitive disruption in such situations.

OVERVIEW OF THIS STUDY

The purpose of this study was to examine depletion in cognitive resources resulting from exposure to racial-prejudice cues. Subjects first reviewed (fictional) hiring recommendations that were blatantly or ambiguously motivated, or clearly not motivated, by racial prejudice. Then we assessed cognitive impairment with the Stroop (1935) color-naming task, which requires the selective deployment of attention. We predicted that this higher-level cognitive function would be depleted under different circumstances for White and Black individuals. That is, we expected Blacks' Stroop performance would be worse in the ambiguous-prejudice condition than in the blatant-prejudice condition because they would be forced to wrestle with attributional uncertainty in the former condition. In contrast, we expected that Whites would be unlikely to register the ambiguous cues as potential indicators of prejudice (cf. [Barrett & Swim, 1998](#)). Rather, we expected their Stroop performance to be impaired in the blatant-prejudice condition because they would be unaccustomed to encountering prejudice in a professional environment and would therefore lack strategies for coping with it.

METHOD

Subjects and Design

Two hundred fifty-five Princeton University undergraduates participated in the study and were compensated with either

payment or partial credit toward a course requirement.¹ Five subjects' data were excluded because of procedural error (e.g., misunderstanding directions or experimenter error), leaving a final sample of 250 (122 Blacks, 128 Whites) in a 2 (subject's race: Black, White) \times 2 (evaluator's race: Black, White) \times 3 (prejudice condition: none, ambiguous, blatant) between-subjects factorial design.

Procedure

Upon arrival, subjects received a written description of the cover story for the first of two supposedly unrelated studies. This description was in the form of a letter from the human-resources manager at an ostensibly real company. The letter asked for subjects' help in deciding whether to change the way the company made hiring decisions. Subjects learned that their task was to help the company decide whether it should adopt a new protocol in which human-resources officers would make collaborative rather than solo hiring decisions. We told subjects that they would be evaluating some actual recent hiring decisions made at the company, either by one human-resources officer working alone or by a group. Upon providing informed consent, all subjects were told that they had been randomly assigned to the solo-officer condition. They then received a job description, plus a résumé file and an evaluation sheet for each of four ostensible job candidates, and rated each candidate's level of qualification and hireability. Last, subjects received a file containing an information sheet about the human-resources officer and a set of his hiring recommendations. After they had looked over these materials, the experimenter apologized for not having the next questionnaire and suggested that they could do the second study while she obtained the forms. All subjects agreed to this arrangement and completed the ostensibly unrelated Stroop task on a computer while the experimenter was absent. Afterward, subjects completed the manipulation checks and were debriefed.

¹We conducted the study with four samples of subjects. Sample 1 ($n = 80$) and Sample 2 ($n = 77$) were composed of roughly equal numbers of Black and White subjects, all of whom received stimulus materials with an opposite-race evaluator. Subjects in Sample 1 were randomly assigned to either the ambiguous-prejudice or the blatant-prejudice condition. Subjects in Sample 2 were randomly assigned to either the no-prejudice or the ambiguous-prejudice condition. Subjects in Sample 3 ($n = 56$), who were mostly White students, received stimulus materials with a White evaluator. Subjects in Sample 4 ($n = 42$), who were all Black students, received stimulus materials with a Black evaluator. Subjects in Samples 3 and 4 were randomly assigned to one of the three prejudice conditions. The procedure was identical for all four samples. Data from the four samples were combined prior to analysis, resulting in a data set with all three prejudice conditions and all combinations of subject's race and evaluator's race represented. Because sample is almost fully confounded with the match between the subject's race and the evaluator's race (mismatched in Samples 1 and 2, generally matched in Samples 3 and 4), it is possible—though, we believe, unlikely—that the observed interaction between subject's race and evaluator's race on the Stroop task (see Results) was due to this variable.

Materials

Job Description

The job-description sheet detailed the company's search for an entry-level, full-time consultant whose job would be to address clients' needs in the area of employee compensation. The job description included a list of job responsibilities, the promise of a competitive salary and benefits package, and a list of minimal required skills and abilities. All of the materials, including the job description, were designed to convey the impression that the successful candidate would be working in a highly professional environment.

Job-Application Materials

We designed filler résumés for the first two candidates so that they would appear to be competent but unremarkable. The key résumés were from Candidate 3, who had a mediocre GPA from a mediocre school and was clearly unqualified, and Candidate 4, who had graduated from a prestigious preparatory school and Yale University with a respectable GPA. This last résumé detailed strong job experience and impressive school activities, making Candidate 4 the most qualified of the group.

We manipulated candidates' ostensible race via their résumés as well. In one set of résumés, we implied that the highly qualified Candidate 4 was Black (e.g., he had been a member of his college's Black Student Union) and that the less-qualified Candidate 3 was White (i.e., we omitted any race-based references in his résumé). In a second set of résumés, this pattern was reversed, so that the highly qualified candidate was presented as White and the less-qualified candidate was presented as Black.

Human-Resources-Officer Information Sheet

We manipulated the race of the human-resources officer using a one-page sheet detailing his name, number of years with the company, gender, and race. The officer was described as either a Caucasian male (when Candidate 3, the less-qualified candidate, was presented as White) or an African American male (when Candidate 3 was presented as Black).

Manipulation of Prejudice Cues

For each candidate, the human-resources officer provided a hiring recommendation accompanied by a short rationale. We manipulated prejudice level with the pattern of hiring recommendations and the content of the officer's notes. In the no-prejudice condition, the human-resources officer recommended hiring the best-qualified candidate, and his rationales were neutral with regard to race. The hiring pattern and notes gave subjects no reason to think that any candidates were discriminated against on the basis of race.

In the remaining conditions, the human resources officer recommended hiring an unqualified candidate who seemed to be of his own race (Candidate 3) over a clearly more qualified candidate who seemed to be of the other race (Candidate 4). In

the ambiguous-prejudice condition, the officer’s comments were neutral with regard to race (e.g., “good GPA but not business or econ”), so the reasons for his hiring recommendations were unclear. In the blatant-prejudice condition, his comments explicitly invoked race as a factor in the decision (e.g., the comments indicated that the Black candidate had been a member of “too many minority organizations,” and the White candidate was a “typical white prep-school kid”), making it clear that the decision was motivated by bias.

Measures

Manipulation Checks

We assessed subjects’ beliefs about the qualifications of the job candidates in order to ensure that they viewed the candidates as intended. For each of the four candidates, subjects rated their agreement with two statements: “This candidate is highly qualified for the job,” and “I would hire this candidate for the job.” Ratings were made on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). We also used one question to assess perceptions of prejudice in the hiring scenario: “In the last evaluation, to what extent were the comments made by the evaluator (the human-resources officer) prejudiced?” The response scale was bounded at 1 (*not at all*) and 7 (*very much*).

Cognitive Functioning

We assessed depletion in high-level cognitive functioning using the Stroop (1935) color-word task, which requires the rapid on-line inhibition of tempting responses (MacLeod, 1991; E.K. Miller & Cohen, 2001). Considerable processing capacity is required to respond with consistent speed and accuracy (Macrae, Bodenhausen, Schloerscheidt, & Milne, 1999). In this task, subjects saw a series of trials consisting of either the control string “XXXX” or a color word (“yellow,” “red,” “green,” or “blue”). Each stimulus was presented on a computer screen in one of four colors. Subjects’ task was to indicate the color of the text as quickly as possible. Subjects responded to each of 8 practice trials and 84 experimental trials by pressing the appropriate one of four color-coded keys on a standard keyboard.

RESULTS

Manipulation Checks

To test whether our manipulation of the candidates’ qualifications was successful, we conducted a paired *t* test that compared subjects’ evaluations of Candidate 3 with their evaluations of Candidate 4. As we expected, subjects judged Candidate 3 to be less qualified ($M = 3.91, SD = 1.11$) than Candidate 4 ($M = 5.60, SD = 1.14, t(247) = 20.43, p < .001, p_{rep} > .99, \eta^2 = .63$). Furthermore, subjects said that they would be less likely to hire Candidate 3 ($M = 3.91, SD = 1.25$) than Candidate 4 ($M = 5.66, SD = 1.23, t(247) = 19.15, p < .001, p_{rep} > .99, \eta^2 = .60$). Including race of the candidate as a between-subjects factor in a

repeated measures analysis of variance revealed that race did not moderate evaluations of the candidates’ qualifications, $F(1, 246) = 0.41$, or hireability, $F(1, 246) = 1.26$, both *n.s.*

Despite the overall success of this manipulation, 3 Black subjects and 1 White subject gave Candidate 4 low ratings (less than 3 out of 7) on both questions. Because their ratings indicated that they would agree with the human-resources officer’s recommendation not to hire Candidate 4, the prejudice manipulation did not have the intended meaning for them (i.e., that the human-resources officer had discriminated against Candidate 4). Therefore, we removed these 4 subjects from further analyses, leaving 246 subjects.

We also tested whether the prejudice manipulations were successful, by conducting a 2 (subject’s race) \times 2 (evaluator’s race) \times 3 (prejudice condition) analysis of variance on ratings of the comments made in the human-resources officer’s notes about the candidates. We observed the expected main effect of prejudice condition, $F(2, 234) = 97.03, p < .001, \eta^2 = .45$. Tukey’s post hoc tests indicated that the evaluator was viewed as significantly less prejudiced in the no-prejudice condition ($M = 1.89, SD = 1.16$) than in the ambiguous-prejudice condition ($M = 3.57, SD = 1.89$) and was viewed as significantly less prejudiced in the ambiguous-prejudice condition than in the blatant-prejudice condition ($M = 5.53, SD = 1.26$). The condition effect was qualified by an unexpected interaction with evaluator’s race, $F(2, 234) = 5.48, p < .01, \eta^2 = .04$. Inspection of the cell means (see Table 1) indicated that this interaction was driven by a larger effect of condition when the target of prejudice was Black and the human-resources officer was White ($\eta^2 = .40$ for Black subjects and $\eta^2 = .41$ for White subjects) than when the target was White and the officer was Black ($\eta^2 = .15$ for Black subjects and $\eta^2 = .27$ for White subjects). This result is consistent with Inman and Baron’s (1996) finding that people use prototypes to determine when prejudice occurs. Our combination of a Black target and a White evaluator fits the prototype of a scenario involving prejudice much more neatly than the reverse combination of a White target and a Black evaluator. It was

TABLE 1
Ratings of Prejudice in the Human-Resources Officer’s Comments (Manipulation Check)

Subjects’ race and condition	White evaluator	Black evaluator
Black subjects		
No prejudice	1.60 (0.75), <i>n</i> = 20	2.53 (1.73), <i>n</i> = 15
Ambiguous prejudice	3.95 (1.97), <i>n</i> = 38	2.62 (1.98), <i>n</i> = 13
Blatant prejudice	5.85 (0.88), <i>n</i> = 20	4.92 (1.26), <i>n</i> = 13
White subjects		
No prejudice	1.59 (0.87), <i>n</i> = 17	1.94 (1.06), <i>n</i> = 18
Ambiguous prejudice	3.44 (1.69), <i>n</i> = 18	3.57 (1.82), <i>n</i> = 37
Blatant prejudice	6.12 (1.22), <i>n</i> = 17	5.10 (1.38), <i>n</i> = 20

Note. Higher values indicate greater prejudice. Standard deviations are given in parentheses.

therefore easier for subjects of both races to make clean judgments about the level of prejudice involved in the former case.

Stroop Task Analyses

We removed Stroop trials with incorrect responses and trimmed the reaction time data as follows. For each subject, we calculated the mean and standard deviation for the control trials and for the incompatible trials (those in which the font color and the meaning of the text disagreed) separately, and then removed all responses 3 or more standard deviations from the mean for their respective kind of trial. We then calculated an average reaction time for each trial type using the remaining trials. Stroop interference scores were calculated by subtracting the mean reaction time for the control trials from the mean reaction time for the incompatible trials for each subject. We searched for statistical outliers within each prejudice condition separately, and removed a total of nine interference scores (three outliers in each condition). Thus, all analyses involving Stroop interference scores are based on an n of 237.

We entered the interference scores into a 2 (subject's race) \times 2 (evaluator's race) \times 3 (prejudice condition) analysis of variance and observed the expected interaction between subject's race and prejudice condition, $F(2, 225) = 5.13, p < .01, \eta^2 = .04$. As predicted, Black subjects and White subjects showed very different patterns of reactions to the three prejudice conditions (Fig. 1). Simple-effects analyses revealed that Black subjects experienced significantly more interference than did White subjects in the ambiguous-prejudice condition, $F(1, 233) = 5.74, p < .02, p_{\text{rep}} > .93, \eta^2 = .03$. In contrast, White subjects experienced significantly more interference than did Black subjects in the blatant-prejudice condition, $F(1, 233) = 5.89, p < .02, p_{\text{rep}} > .93, \eta^2 = .03$. Interference was comparable for Black and White subjects in the no-prejudice condition ($F < 1$). In addition, we conducted contrast analyses to examine how

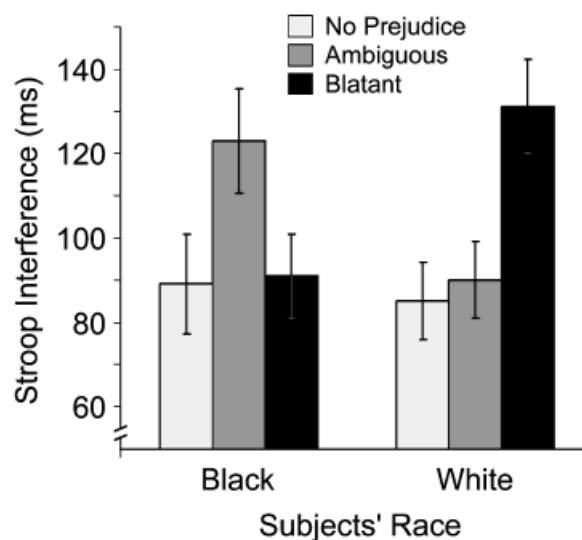


Fig. 1. Stroop interference as a function of prejudice condition and subjects' race. Error bars represent standard errors of the means.

Black subjects reacted to ambiguous prejudice and how White subjects reacted to blatant prejudice. The results supported our predictions. For Black subjects, we observed greater interference in the ambiguous-prejudice condition than in the other two prejudice conditions, $t(82) = 2.29, p < .03, p_{\text{rep}} > .94, \eta^2 = .05$. For White subjects, we observed greater interference in the blatant-prejudice condition than in the other two prejudice conditions, $t(58) = 3.35, p < .01, p_{\text{rep}} > .99, \eta^2 = .08$.

We also observed an interaction between subject's race and evaluator's race, $F(1, 225) = 7.36, p < .01, p_{\text{rep}} = .96, \eta^2 = .03$, indicating that the Stroop results were also determined by the match between subject's race and the race of the evaluator (and job candidate). Cognitive depletion was attenuated when the evaluative context featured a match between the subject's race and the human-resources officer's race (i.e., both Black or both White), and the job candidate was a racial out-group member (overall $M = 85, SD = 66$). Cognitive depletion was exacerbated when the evaluative context instead featured a match between the subject's race and the job candidate's race, such that the human-resources officer making the hiring recommendations was a member of the racial out-group (overall $M = 112, SD = 70$). No other significant effects emerged.

DISCUSSION

This study sheds light on the circumstances under which encounters with race-based prejudice disrupt cognitive functioning. The results revealed that cognitive consequences for White and Black individuals differed as a function of the clarity of the prejudice cues they encountered. In addition, cognitive impairment was more pronounced when an in-group member was being evaluated by an out-group member than when an out-group member was being evaluated by an in-group member.

The finding that blatant prejudice depleted the cognitive capacities of White individuals more than ambiguous prejudice does suggest that Whites are not well equipped to deal with blatant prejudice in a professional environment. In fact, our results suggest that Blacks are better prepared to cope with blatant prejudice than Whites are, at least in terms of the short-term effects on performance of cognitive tasks. However, we do not mean to suggest that attributions to prejudice are not detrimental for Black individuals. The adaptive strategies that individuals develop to cope with the experience of being a target of prejudice over time (C.T. Miller & Kaiser, 2001) are unlikely to confer complete psychological "immunity." Rather, Blacks may find that the negative consequences of blatant prejudice ultimately become manifest as problems with mental and physical health (e.g., Landrine & Klonoff, 1996).

Furthermore, it appears that Blacks are particularly vulnerable to cognitive impairment resulting from exposure to ambiguous prejudice—a level of prejudice that Whites may not even register. The finding that ambiguous prejudice impairs the cognitive performance of Black individuals more than blatant

prejudice accords well with findings of previous research on negative consequences of causal uncertainty (Weary & Edwards, 1994). Furthermore, because of the relatively ambiguous nature of contemporary expressions of prejudice, the implications of the finding that ambiguous prejudice depletes cognitive functioning for members of traditionally disadvantaged groups are potentially widespread. Cognitive resources are essential for success across a wide range of domains, from the academic and professional arenas to the domain of everyday social interactions. Imagine members of a faculty hiring committee who overhear a colleague's potentially biased evaluation of a candidate. Their need to digest and synthesize extensive amounts of information about the large candidate pool could be compromised, leading to a suboptimal hiring decision that affects not only the committee members themselves, but also the entire department. This is just one example of the myriad situations in which small decreases in task focus can snowball into large real-world consequences.

We set out to address how exposure to prejudice affects cognitive functioning. According to our results, encountering ambiguous prejudice and blatant prejudice are likely to disrupt cognitive functioning for Blacks and Whites, respectively, leading to suboptimal performance on tasks that require the on-line deployment of attention. Future research should focus on useful interventions that minimize this disruption, so that individuals of all ethnicities can be better equipped to anticipate and cope with prejudice without incurring individual costs.

Acknowledgments—We thank Deborah Prentice, Ed Kako, Genia Kozorovitskiy, and Crystal Hall for their helpful comments, and Emily Parker, Rose Kim, Megan Boyle, Bonnie Burlingham, Katharine Maglione, and Lisa Pugh for assistance with data collection.

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RECEIVED 8/28/06; REVISION ACCEPTED 12/13/06;
FINAL MATERIALS RECEIVED 2/12/07