Effect of Health-Related Stereotypes on Physiological Responses of Hypertensive Middle-Aged and Older Men

Corinne Auman,¹-³ Hayden B. Bosworth,²,³ and Thomas M. Hess⁴

¹Psychology Department, North Carolina State University, Raleigh.  
²Durham Veterans Affairs Medical Center, North Carolina.  
³Duke University Medical Center, Durham, North Carolina.

This study examined the influence of health stereotypes on stress response among middle-aged and older men. It was hypothesized that anxiety and cardiovascular reactivity would increase when health stereotypes were activated among veterans seeking care in an outpatient setting. Among a sample of 122 veteran patients with hypertension, the level of stereotype activation varied by means of reference to either their health status (health stereotypes) or, conversely, some personally valued leisure activities (no stereotype activation). Predicted stereotype-related increases in anxiety, galvanized skin conductance, and blood pressure were evident. Potential explanations for these results are explored, including those relating to the negative health stereotypes associated with being a patient.

NEGATIVE stereotypes about aging are pervasive in American culture. These stereotypes have multiple important consequences for older adults. For example, they can strongly influence reactions toward older individuals, leading to biases in perceptions of their ability (Erber, Szuchman, & Rothberg, 1990), judgments of the causal mechanisms underlying their cognitive performance (Erber & Rothberg, 1991), and behaviors toward them (e.g., use of elderspeak; Kemper, 1994). Importantly, these aging stereotypes have also been shown to negatively influence the behavior of older adults themselves. For example, research has shown that activation of negative stereotypes about aging can depress memory performance (Hess, Auman, Colcombe, & Rahhal, 2003; Hess, Hinson, & Statham, 2004; Levy, 1996; Rahhal, Hasher, & Colcombe, 2001), increase blood pressure and arousal (Levy, Hausdorff, Hencke, & Wei, 2000), and slow motor functions (Hausdorff, Levy, & Wei, 1999). There is even some suggestion that negative attitudes about aging can shorten one’s life (Levy, Slade, Kunkel, & Kasl, 2002).

There is also a body of research on health-related stereotypes. These studies suggest two conclusions. First, our society exhibits what Gekoski and Knox (1990) have termed healthism. That is, people tend to hold stereotypes that devalue the individual in poor health. These stereotypes include loss of functional ability, dependence on others, and close proximity to death. Such stereotypes can cause a negative evaluation of the person because they reflect characteristics that are outside the accepted norm of human functioning caused by illnesses that are often viewed as debilitating (see Bloom, Grazier, Hodge, & Hayes, 1991) and beyond the control of the individual (Stahly, 1988). Second, health-related characteristics appear to activate negative stereotypes. Increasing incidences of illness and expectations of health decline associated with older adulthood (Merluzzi & Nairn, 1999) mean that these negative health stereotypes may also increase in salience with age. In support of this assertion, prior studies found evidence that age alone did not explain biases in interpersonal perceptions and that health status was independently related to negative outcomes (e.g., poor prognosis by clinical psychologists; Braithwaite, 1986; Gekoski & Knox, 1990; James & Haley, 1995). Thus, it is important to consider how health stereotypes may also influence older adults.

Stereotypes and Medical Patients

As patients, individuals are aware of the potential to be stereotyped during encounters with medical personnel, and this may cause them to experience anxiety or stress. The health stereotype may result in increased helplessness, loss of control, or loss of independence (Leventhal, Nerenz, & Leventhal, 1982). For the older adult patient, avoiding being categorized as a patient may be particularly important. Older adult patients are likely dealing with aging stereotypes, and thus health stereotypes may represent an additive threat. Unlike younger patients, who may suffer from an illness and then recover fully, older adults take longer to recover and are less likely to recover fully. Being potentially viewed in this negative light when seeking medical treatment may cause these adults to delay or avoid treatment. Thus, it is important to understand the implications of health stereotypes on the behavior and health of patients.

The Present Study

In this study we examined health stereotypes in an outpatient setting at the Durham Veteran’s Affairs Medical Center (DVAMC). One reason we conducted this study was to expand the stereotyping research into a more applied, real-world setting. This setting helped avoid potential limitations in generalizability associated with prior studies and also provided a low socioeconomic status sample not usually found in university laboratories (see Ashton, Petersen, Wray, & Yu, 1998). On the basis of the research reviewed here, the fear of being categorized in a negative fashion as a result of health problems appears realistic and thus can threaten the individuals seeking medical treatment.
We conceptualized the present research within the context of the stereotype threat conceptual framework (Steele, Spencer, & Aronson, 2002), which argues that individuals experience negative responses in situations in which there is the potential for them to confirm a negative stereotype about a group to which they belong. We manipulated the degree of threat relating to negative health stereotypes through two types of interviews. We modeled the interview manipulation after the work of Shih, Pittinsky, and Ambady (1999) in which gender and racial stereotypes were subtly activated through questions rather than priming of the stereotype. We constructed the interview questions in the present study to activate health self-stereotypes implicitly, consistent with the construction of Shih and colleague’s (1999) gender and race questionnaires. This implicit activation was important, because we designed the interview to resemble what might happen in a medical interaction. In the medical interview condition, participants responded to health-related questions designed to highlight their status as medical patients. In contrast, in the leisure interview condition (control condition), they responded to questions that focused on a positive, non-health-related aspect of life. Relative to the leisure condition, participants in the medical interview condition were expected to experience stereotype threat as a result of the activation of negative health stereotypes associated with highlighting their identity as a sick person, which in turn was expected to be related to increases in blood pressure, heart rate, and skin conductance, as well as anxiety (Blascovich, Spencer, Quinn, & Steele, 2001; Levy et al., 2000).

We selected the physiological measures of blood pressure, heart rate, and skin conductance as outcome measures for this study because their elevation has been shown to be a proxy for anxiety and stress and to lead to poor health outcomes. These physiological responses allow individuals to react and cope with stressful situations in their environment that require physical action (e.g., fight or flight), but they are also activated in situations of mental stress in which bodily harm is not eminent (Jacobs et al., 1994). If these responses are activated often, as may be the case for stereotyped individuals, physical damage may be caused (McEwen, 1998), including heart disease (Barnett, Spence, Manuck, & Jennings, 1997).

Consistent with the stereotype threat framework (Steele et al., 2002), those individuals with high levels of investment in living independently—which would be expected to be negatively affected by poor health—were expected to exhibit greater cardiovascular reactivity (i.e., increase blood pressure and heart rate) and anxiety following activation of the health-related stereotype than were those with low levels of investment. Investment levels were not expected to influence the performance of participants in the non-health-related leisure condition because the negative stereotype was not being activated.

**METHODS**

**Participants**

We identified potential participants from a large pool of patients at the DVAMC who previously had been diagnosed with hypertension and no life-threatening disease. Hypertension is one of the most prevalent diseases among older adults and subsequently provided a homogenous sample of older adults experiencing a similar health problem.

The participants for this study were 122 male adults, aged 46–86 years, recruited at the DVAMC over a 10-month period. We powered the study (.78) to detect a medium effect ($d = .25$). The sample included 47 African American and 75 European American men. This ethnic distribution is representative of the population at the DVAMC (Department of Veterans Affairs, 1995). The mean education level for the sample was 13.26 years of schooling, with a range from 4 to 20 years. Participants were evenly distributed across three general age groupings (46–59, $n = 40$; 60–69, $n = 41$; and 70–86, $n = 41$).

**Materials**

**Stereotype activation.**—We accomplished negative stereotype activation through a series of five questions designed to highlight awareness of the participants’ medical condition. We designed these interview questions to activate the negative health stereotype of sickness, loss of control, and dependence. Participants discussed personally valued leisure activities through a series of five interview questions about favorite leisure activities, which were intended to represent nonstereotype activation. We designed these questions to highlight positive aspects of participants’ abilities and competence in a personally relevant area while downplaying their patient status (see the Appendix).

**Investment scale.**—Because the health stereotype includes dependence on others as a result of illness, interviewers asked participants to complete an investment scale about the importance of independent living. We adapted this measure from the Memory Achievement subscale of the Metamemory in Adulthood Questionnaire (MIA; Dixon and Hultsch, 1984), which assesses the importance of having a good memory to the individual participant. It consisted of 16 statements to which participants provided ratings ranging from strongly agree to strongly disagree, with possible scores ranging from 16 to 80. For this study, we reverse scored the scale so that high scores corresponded with high investment. Hess and colleagues (2003) found that responses to this scale moderated threat effects in the memory domain, suggesting its usefulness as a measure of investment. For our present purposes, however, we modified the content of the scale items to deal with how invested the participants were in being able to function independently in everyday life (e.g., “It is important to me to be able to live independently”). The reconfiguration of the scale for this study did not alter its reliability (Cronbach’s $\alpha = .80$).

**Physiological and Health Measures**

**Charlson comorbidity score.**—The Charlson comorbidity score is a weighted index that takes into account the number and seriousness of comorbid conditions for each participant. We used International Classification of Diseases (ICD-9) diagnosis codes to calculate this score (Charlson, Pompei, Ales, & MacKenzie, 1987; Deyo, Cherkin, & Ciol, 1992). We did not include any individuals with life-threatening illnesses in the study.

**Hypertension drugs.**—We used the number of hypertension drugs each participant was prescribed as a proxy for...
hypertension severity. Increased number of prescribed hypertensive medications is related to greater treatment-resistant hypertension or hypertension severity.

State anxiety.—We measured state anxiety by using the 10-item State-Trait Inventory (Spielberger, 1979). Cronbach’s alpha for the short-form used in this study was .84.

Blood pressure.—To simplify the analysis of these data, we calculated the mean arterial pressure (MAP) from blood pressure (BP) readings and used it as the dependent variable. It is commonly used in the medical field and is widely accepted as an index of blood pressure (e.g., Blascovich et al., 2001; Rogers et al., 2001; Zanke, Feagan, Mahon, & Feldman, 1997), and it is predictive of mortality and cardiovascular outcomes (Chobanian et al., 2003). It is calculated as follows: MAP = (2/3) diastolic BP + (1/3) systolic BP (in millimeters of mercury).

Heart rate.—We measured heart rate as the number of heartbeats per minute. Following the procedure of Levy and colleagues (2000), we gathered the heart rate and BP measures by using a portable, automatic machine. The machine was periodically validated against BP and heart rate measurements taken by a nurse in the clinic.

Skin conductance.—Skin conductance is a measure of electrodermal activity, which is related to the stimulation of the sweat glands in individuals’ hands when they face a challenging situation. Increased skin conductance is indicative of stress, and we measured it by using a NeuroDyne monitor (Cambridge, MA). We followed the procedure of Levy and associates (2000), in which skin conductance data points were the average of three consecutive values measured 1 s apart, providing a more robust estimate of arousal.

Procedure
The first author contacted patients prior to a regularly scheduled appointment with their primary care physician and asked them to participate in a research study dealing with how others’ perceptions of themselves can influence behavior.

The first author gathered baseline physiological readings at the beginning of the study. The physiological measures included heart rate, BP (systolic and diastolic), and skin conductance. Participants could not view the screens for either measurement device during the study.

After the baseline physiological readings, the first author screened participants for dementia and poor reading ability, which might interfere with participation. We used the Short Portable Mental Status Questionnaire (MSQ; Pfeiffer, 1975) for dementia screening. We used the Rapid Estimate of Adult Literacy in Medicine (REALM; Parker, Baker, Williams, & Nurss, 1995) to assess literacy level. We excluded participants who had less than a sixth-grade reading ability from the sample (n = 7).

The first author administered the investment questionnaire next, followed by a brief demographic questionnaire. We scored the investment questionnaire while participants completed the demographic questionnaire, and we made the interview condition assignment at this point in the study. We then stratified participants into either the medical (n = 62) or leisure interview (n = 60) condition. It was important that each condition have an approximately equal number of higher versus lower invested participants. Thus, we used the investment questionnaire in assigning an interview condition (medical investment: lower, n = 30, higher, n = 32; leisure investment: lower, n = 30, higher, n = 30). We also balanced each interview condition for minority (i.e., African American) participants: medical interview, n = 24; leisure interview, n = 23.

We gathered the first set of physiological readings (Time 1) next, before participants completed the medical or leisure interview. After finishing the interview, participants completed the state anxiety questionnaire, and we gathered a second set of physiological readings (Time 2). The first author then reminded participants about the interview (leisure or medical), and the participants completed the taking medications section of the Observed Tasks of Daily Living–Revised instrument (Diehl, Marsiske, & Horgas, 1998; Diehl, Willis, & Schaie, 1995). (We do not discuss the performance on this instrument because of low observed internal consistency in this sample.) Finally, we collected a third set of physiological readings (Time 3).

RESULTS
We removed one participant from all analyses because of an outlier value for the investment measure, leaving a total sample of 121 individuals. The alpha level for all statistical tests in this report was set at .05, unless otherwise noted.

Manipulation Check
To determine how even the distribution of higher and lower investment individuals was across ages and conditions, we conducted an Age × Condition analysis of variance (ANOVA) on investment scores. We treated age as a continuous variable and centered it at zero through standardization (Cohen, Cohen, West, & Aiken, 2001). We obtained no significant effects (ps < .48), indicating that the assignment procedure was successful in creating conditions containing participants with similar levels of investment in independent living across the age span tested. There were also no significant differences between conditions for age (Mmedical = 64.95, SD = 9.02; Mleisure = 65.33, SD = 8.92), years of education (Mmedical = 13.24, SD = 2.81; Mleisure = 13.28, SD = 2.94), or number of comorbid conditions (Mmedical = 2.40, SD = 2.16; Mleisure = 2.34, SD = 1.80).

We also examined responses to the medical and leisure interview questions. We expected that participants who were assigned to the medical interview would provide more health-related responses than participants assigned to the leisure interview. We coded all interview questions for responses that related to health. These responses fell into two categories: problems with functioning in daily life (e.g., cannot mow grass because of bad back) and mentions of disease (e.g., hypertension). The highest total number of health-related responses given by any participant was three. One experimenter coded the entire sample, with a second judge coding 25 randomly chosen interviews (20% of the sample). The interrater reliability was 1.0. There was a significant condition effect, F(1, 118) = 131.12, with participants in the medical interview reporting more health-related problems (M = 1.59, SD = .91) than participants in the leisure interview condition (M = .016, SD = .37).

In addition, we also obtained a significant Condition × Age interaction, F(1, 118) = 5.66. Follow-up analyses examining this
interaction involved comparing regression functions within interview conditions. Age was not significantly related to responses in the leisure interview condition. In contrast, we found age to have a significant impact on health-related responses in the medical interview condition, with the number of responses decreasing with increasing age. We can see the magnitude of this effect by comparing predicted scores at representative points 1 SD above and below the mean for the sample age distribution (Cohen et al., 2001). The age groups represented by these points were approximately 56 and 75, with corresponding predicted scores being .91 and .69, respectively. Thus, middle-aged men were more likely to produce health-related responses than were older men. Importantly, in spite of these age differences in responses, the number of health-related responses was greater in the medical than in the leisure interview condition at all points in the age distribution, indicating that the interviews were having the anticipated effects.

**Physiological Measures**

For each of the physiological measures, we conducted a general linear mixed model to examine the relationship among interview condition, age, and level of investment on the dependent variables (i.e., MAP, heart rate, and skin conductance) across measurement times. We treated age and investment level as continuous variables and centered them at zero through standardization (Aiken & West, 1991). The mixed model is able to explicitly adjust for missing values and repeated measurements, and it can handle both continuous and categorical variables. Thus, we were able to test hypotheses about population parameters (fixed effects) while also testing hypotheses about patient-specific parameters (random effects). The dependent variables for each of the physiological measures were the readings taken at Times 2 and 3 during the study. We did not include Time 1 readings in the analyses because they were taken before the randomization and did not reflect baseline levels. We did include the baseline measure in all analyses as a covariate to control for individual differences in initial readings. In addition, we included the number of hypertension drugs each patient was taking and the Charlson comorbidity score (Charlson et al., 1987; Deyo et al., 1992) as covariates to control for individual differences in treatment of hypertension and comorbid conditions. We considered REALM and MSQ scores as covariates, but inclusion of them in the primary analyses did not alter the results.

The analyses of the physiological measures included a within-subjects variable reflecting the repeated measurements during the study. We examined all within-subjects effects for violations of sphericity by using the Huynh–Feldt correction, but none were detected (Hertzog & Rovine, 1985).

**Skin Conductance and Blood Pressure**

We obtained a significant Age × Condition × Investment interaction for both the skin conductance, $F(1, 103) = 5.79, \beta = -0.32, SE = 0.13$ (see Figure 1) and MAP readings, $F(1, 108) = 4.19, \beta = -2.52, SE = 1.23$ (See Figure 2). To evaluate the
contribution of the interactions to the mixed model analyses, we evaluated the Akaike Information Criteria (AIC) model fit criteria (Akaike, 1973). The inclusion of the three-way interaction for skin conductance resulted in a change in AIC of 3.6, which is considered a moderate improvement in the fit of the model (Burnham & Anderson, 2002). For MAP the inclusion of the three-way interaction resulted in a change in AIC of 6.4, which is also considered a moderate improvement.

There were no effects involving time of measurement. Therefore, we used the mean of MAP and skin conductance measurements at Time 2 and Time 3 in follow-up analyses designed to identify the source of these interactions. In both cases, we contrasted regression functions predicting physiological responses from investment at representative age points within each interview condition. These revealed that the interaction between interview condition and investment varied in both form and strength as a function of age and dependent measure (i.e., MAP and skin conductance).

Figures 1 and 2 depict the three-way interactions for skin conductance and MAP, using predicted scores based on representative age and investment values 1 SD below and above the sample means (see Cohen et al., 2001). The ages represented by these points were 56 (middle-aged men), and 75 (older men) years of age and the investment levels represented were 61.62 (lower investment) and 74.97 (higher investment). Follow-up analyses to further examine the interactions involved comparing regression functions at these representative points.

Because of the directional nature of our hypotheses, we made the decision to use one-tailed tests of significance a priori. To control for experimentwise error, we utilized Bonferroni adjustments, resulting in a level of $\alpha = .01$. Not all reported follow-up analyses were significant at this level; however, effect sizes were of a reasonable strength, suggesting a power issue. All follow-up analyses have associated $p$ values and effect sizes reported.

We observed an interaction for skin conductance between investment and interview condition in the middle-aged participants, $t(108) = -1.89, p < .03, d = -.36$, indicating between a small and medium effect (Cohen, 1992). Lower invested middle-aged participants in the medical interview condition had significantly higher skin conductance readings than their leisure interview counterparts, $t(108) = -2.82, p < .006, d = -.54$, whereas the interview effect was not significant for the higher invested middle-aged men in the medical condition ($p = .45$). Further, the interaction between investment and interview condition was not significant for middle-aged men when we examined MAP. For older men, the interaction effects between investment and interview condition were somewhat different. For both skin conductance and MAP, those with higher investment in the medical interview condition had higher readings than those with higher investment in the leisure interview condition: skin conductance, $t(108) = -1.77, p < .04, d = -.34$; MAP, $t(115) = -1.76, p < .04, d = -.33$. We found no interview effects for the lower invested older men (skin conductance, $p = .35$; MAP, $p = .10$).

In addition, when we conducted post hoc tests within conditions, skin conductance responses demonstrated the hypothesized pattern for older men in the medical interview, with readings increasing with increased investment, $t(108) = -2.31, p < .01, d = -.44$. There were no significant investment effects for the middle-aged men in the medical interview condition ($p < .08$) or for either age point in the leisure interview condition ($p < .10$ for middle-age men, $p < .33$ for older men). There were no significant condition effects for the MAP readings.

### Heart Rate

We observed no significant effects for heart rate.

### Anxiety

The analyses of covariance (ANCOVAs) for state anxiety scores, with number of hypertension drugs and Charlson scores included as covariates, revealed the predicted main effect of condition, $F(1, 113) = 4.65$, with participants in the medical interview condition ($M = 17.55, SD = 5.94$) reporting significantly higher anxiety than their leisure interview ($M = 15.21, SD = 5.35$) counterparts. The expected Condition $\times$ Investment effect was not significant, $F(1, 113) = .62, p < .43$. Thus, these results were consistent with the expectation that interview condition would affect anxiety levels, but we obtained no support for the prediction that investment would moderate this effect.

### Discussion

Unlike previous research that has been conducted in laboratories, this study examined health stereotypes in an applied, real-world setting. This setting allowed for a unique, low socioeconomic sample. In line with previous research (Blascovich et al., 2001; Levy et al., 2000; Steele & Aronson, 1995), activated stereotypes increased physiological responses and anxiety levels.

### Physiological Arousal

Consistent with our hypotheses, we observed interview effects for both MAP and skin conductance among higher investment, older participants. Because skin conductance is indicative of stress experienced by the individual, these results suggest a higher level of stress for participants who are highly invested and were in the medical interview; this is a pattern of results consistent with the induction of stereotype threat. We also observed interview effects for skin conductance among middle-aged, lower investment participants. These results were in contrast to expectations; we assumed that individuals must be invested in a particular domain for them to be affected by a stereotype (Steele, 1997).

One potential reason for unexpected results for middle-aged men with lower investment may relate to the participants’ age. It is likely that susceptibility to threat is related to length of illness, which may also be correlated with age. Previous research has shown that disability and illness are viewed as more socially acceptable for older individuals (Menec & Perry, 1995) and that individuals who have been recently diagnosed with stigmatized diseases (e.g., cancer or AIDS) report more stigma than those who have been living with the illness longer (Lee, Kockman, & Sikkema, 2002). Thus, because middle-aged men have most likely encountered their health problems and been diagnosed with illness more recently than older men, it is likely that a health-related stereotype reaction was more likely regardless of investment level because of the heightened salience of their
condition. This salience may have been accentuated by their dealing with new health behaviors (i.e., taking medications, changing diets, etc.). Support for this increased level of salience is evident in the responses to the medical interview, in which middle-aged men reported more health-related issues than older men.

The findings with the investment measure have to be considered in light of the fact that the distribution of investment responses in the sample was skewed (i.e., $-1 \text{ SD} =$ moderate investment), with virtually no one indicating low investment. Thus, the comparisons may be more accurately described as between moderately and higher invested individuals, rather than between higher and lower invested individuals. This may have limited the power of the present analyses to identify strong investment effects, which may be primarily due to variations between those who are lower invested and those who are moderately or highly invested.

**Heart rate.**—Heart rate did not respond to the interview manipulation and investment level in the same manner as skin conductance and MAP. The null effects associated with heart rate may be partially explained by research demonstrating decreased responsiveness of heart rate with age (Steptoe, Moses, & Edwards, 1990; Steptoe & Tavazzi, 1996). These results are consistent, however, with other research on stereotype activation (e.g., Levy et al., 2000). It remains unclear why the middle-aged participants did not demonstrate changes in heart rate. The differences in responses across physiological measures may be due to the sensitivity levels of the different measurements. Such sensitivity issues indicate that BP and skin conductance may be the more useful indicators of physiological changes when we are examining stereotypes, particularly with older men.

**Implications for Medical Professionals**

If patients experience elevated levels of anxiety and stress when discussing their medical conditions, their ability to utilize information presented to them may be impaired. Stress has been found to impair working memory (e.g., Klein & Boals, 2001), and thus the changes associated with stereotypes (i.e., physiological and anxiety) may affect cognitive functioning. Indeed, Schmader and Johns (2003) found that stereotype threat negatively affects working memory functioning. Thus, finding nonthreatening ways to discuss medical information is important to consider, in an effort to help patients best utilize medical information being presented to them.

In addition, individuals who experience negative health stereotypes on a regular basis, and the stress associated with experiencing these stereotypes, may be more susceptible to diseases. Stress has been linked to the development of diseases such as hypertension and atherosclerosis (Barnett et al., 1997; Blascovich et al., 2001). The latter relationship is particularly important given that stress-related physiological reactions have been shown to be stable over time (Cohen et al., 2000). Furthermore, acute and chronic stressors have been demonstrated to increase individual susceptibility to illness (Suinn, 2001). For patients who must seek out health care often because of chronic conditions, negative health stereotypes may exacerbate the existing problems.

**Age and Health Stereotypes**

In general, age and health stereotypes are likely to be intertwined. Negative age stereotypes may incorporate negative health aspects, and vice versa. Thus, it may be possible that the observed effects were due to activation of aging stereotypes rather than those relating to health. Several things argue against this possibility. First, there was no mention of age during any part of the study and little potential for direct age stereotype activation. Second, the effects obtained are not specific to older adults, which is implied by previous research on the effects of both explicit and implicit activation of aging stereotypes (Hess et al., 2003; Levy et al., 2000). Stereotypes activated through subtle methods, such as in the present study, are assumed to have stronger effects for individuals who are targets of the stereotype, because of their self-relevance and subsequent lowered level of activation (Shih, Ambady, Richeson, Fujita, & Gray, 2002). Thus, the failure to observe stronger effects in the older men suggests that they were not due to the activation of stereotypes relating to old age. In addition, previous research (Hinson & Hess, 2004) has actually demonstrated that middle-aged adults exhibit reactance effects to the activation of aging stereotypes, demonstrating behavior that is inconsistent with the stereotype, thereby distancing themselves for inclusion in the older adult outgroup. Thus, the lack of age-specific effects suggests that the obtained results do not simply reflect the activation of aging stereotypes but rather are specific to health.

**The Stereotype Threat Framework**

This study offers support for the stereotype threat theory’s proposal that investment in a stereotyped domain is important in order for stereotypes to affect individuals. In addition, both anxiety and physiological arousal have been proposed as potential mediators in the stereotype threat literature (Blascovich et al., 2001; Steele & Aronson, 1995). This study supports previous findings of anxiety and physiological arousal associated with stereotype activation; however, it cannot offer support regarding the mediating effects of these factors on performance. Furthermore, this study also supports the findings of Rahhal and colleagues (2001) and Hess and colleagues (2003) that contextual factors can activate stereotypes and subsequently influence the behavior of individuals. The medical interview in this study was designed to activate stereotypes in a manner similar to what might occur in real life. Importantly, this study demonstrates these findings in less contrived circumstances than those used in most previous research with older adults and with a previously unexamined low socioeconomic status sample.

**Conclusions**

We found that health-related stereotypes could be activated in a real-life setting and influence individuals’ anxiety levels and physiological responses. These data suggest that such stereotypes, and individuals’ reactions to them, should be taken into consideration when one is encountering patients because of their potential to discourage prompt medical treatment and interfere with utilization of medical information. Of particular importance to the study of aging is the fact that, because many older adults have chronic health conditions, health-related stereotypes may act in concert with aging-related stereotypes, creating a type of “double-whammy” effect.
Acknowledgments

Dr. Auman received partial support from the National Institutes of Health under Grant AG00029. This research was also supported by a predoctoral fellowship from the VA Office of Academic Affairs to Dr. Auman. The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs. This research was drawn from a dissertation conducted by Corinne Auman (under the supervision of Thomas M. Hess) in partial fulfillment of doctoral requirements. Corinne Auman is now at the Presbyterian College Psychology Department.

Address correspondence to Corinne Auman, Psychology Department, Presbyterian College, PO Box 975, 503 South Broad St., Clinton, SC 29325. E-mail: cauman@presby.edu

References


Received November 13, 2003
Accepted August 13, 2004
Decision Editor: Margie E. Lachman, PhD

Appendix

<table>
<thead>
<tr>
<th>Stereotype Activation Questions</th>
<th>Medical</th>
<th>Leisure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Why are you here today?</td>
<td>1. What activity do you do that makes you feel good?</td>
<td></td>
</tr>
<tr>
<td>2. How long is your typical wait when you come for an appointment?</td>
<td>2. How long have you been doing this?</td>
<td></td>
</tr>
<tr>
<td>3. How often do you come for a medical appointment?</td>
<td>3. How often do you participate in this activity?</td>
<td></td>
</tr>
<tr>
<td>4. How long have you been a patient of the VA center?</td>
<td>4. What made you first become interested in this activity?</td>
<td></td>
</tr>
<tr>
<td>5. How does your illness limit your ability to (a) complete physical tasks, (b) take care of yourself without help, and (c) attend social activities?</td>
<td>5. What are the particular aspects of the hobby that you enjoy?</td>
<td></td>
</tr>
</tbody>
</table>