

New Directions in Aging Research

Mind Matters: Cognitive and Physical Effects of Aging Self-Stereotypes

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In the first part of this article, a wide range of research is drawn upon to describe the process by which aging stereotypes are internalized in younger individuals and then become self-stereotypes when individuals reach old age. The second part consists of a review of the author's cross-cultural, experimental, and longitudinal research that examines the cognitive and physical effects of aging self-stereotypes. The final section presents suggestions for future research relating to aging self-stereotypes.

I've never been more loved and appreciated than when I tried to "justify" and affirm someone's mistaken beliefs They received a feeling of security. But here was the rub: Too often, in order to justify *them*, I had to take myself by the throat and choke myself until my eyes bulged and my tongue hung out and wagged like the door of an empty house in a high wind. Oh, yes, it made them happy and it made me sick.
(Ellison, 1952, p. 432)

THIS passage is taken from Ralph Ellison's novel, *Invisible Man*, that charts the efforts of the African American narrator to navigate through a White society filled with stereotypes about African Americans. Although the narrator is speaking in metaphorical terms about the harmful effects for an African American adopting and acting out the race stereotypes of the 1930s, he describes a process that may occur today for older individuals who must navigate through a youth-centered society in which negative stereotypes of aging may literally harm the cognitive and physical functioning of older individuals.

In the first part of this article, I will present the central components of this process as illuminated by a number of sources. In the second part, I will describe the stages of my research that explore how cognitive and physical functioning is affected by aging self-stereotypes. In the third part, suggestions are offered for future research relating to aging self-stereotypes.

AGING SELF-STEREOTYPES: DEVELOPMENT AND OPERATION

A wide range of studies suggests that the development and operation of aging self-stereotypes have identifiable characteristics: (a) they originate in the form of aging stereotypes as early as childhood and are reinforced in adulthood; (b) aging self-stereotypes, as well as aging stereotypes, can operate below awareness; and (c) in old age, the aging stereotypes become aging self-stereotypes.

Internalization of Aging Stereotypes

The internalizing of aging stereotypes begins in childhood (e.g., DePallo et al., 1995; Isaacs & Bearison, 1986). The process has been described by Allport (1954), "A child who

adopts prejudice is taking over attitudes and stereotypes from his family or cultural environment" (p. 297). The outcome of this process was illustrated when children, ranging from preschool to sixth grade, were shown drawings that depicted a man at four stages of life; participants as young as three were able to identify the drawing of the oldest man, and 67% of all the children considered the oldest man to be "helpless, incapable of caring for himself, and generally passive" (Seefeldt, Jantz, Galper, & Serock, 1977, p. 509).

It appears that children's internalized aging stereotypes carry with them expectations about their own aging process. When asked how they would feel about becoming an elderly person, 60% of these children gave responses rated as negative, including "I would feel awful" (Seefeldt et al., 1977, p. 509). Another study found that among children aged four to seven, 66% mentioned that they prefer not to become old (Burke, 1981–1982).

As individuals age, these stereotypes tend to be reinforced by repeated exposure to the mainly negative aging stereotypes that exist in North America and Europe (Dijksterhuis & van Knippenberg, 1998; Levy, Hausdorff, Hencke, & Wei, 2000; Murphy, Monahan, & Zajonc, 1995; Palmore, 1999). There seems to be a high degree of susceptibility to these stereotypes, in part because there is no psychological need to defend against them when they only apply to others (Levy & Banaji, 2002).

The internalization of aging stereotypes is further facilitated by the likelihood of their being reinforced through a variety of cognitive processes. As an example, because individuals are "cognitive misers," they continue to draw on stereotypes that allow for fast and efficient processing of the vast array of information encountered daily (Bodenhausen, Kramer, & Susser, 1994; MacCrae, Milne, & Bodenhausen, 1994). In addition, information about elders may be selectively recalled so that it is stereotypically congruent (Levy, 1996).

Accordingly, it has been found that aging stereotypes have primacy over experience with older individuals. Nursing home caregivers use baby talk in addressing residents, regardless of

a particular resident's physical or cognitive health (Kemper, 1994). Similarly, even when younger workers have regular contact with older workers, they tend to cling to the inaccurate stereotype that older workers tend to be less productive than younger workers (Finkelstein, Burke, & Raju, 1995; McCann & Giles, 2002). As one way of eliminating dissonance, if a highly successful elder is encountered, this person may be categorized as an exception to the internalized category (Levy & Banaji, 2002).

Aging Self-Stereotypes Can Operate Below Awareness

Over the last two decades, there has been a proliferation of experimental studies concerned with the unconscious operation of stereotypes (e.g., Devine, 1989; Fazio, Jackson, Dunton, & Williams, 1995; Nosek, Banaji, & Greenwald, 2002a). Most of the studies have focused on implicit race and gender stereotypes, but a growing set of studies has been examining implicit age stereotyping (for a review, see Levy & Banaji, 2002). In the first of these studies relating to aging stereotypes, Perdue and Gurtman (1990) demonstrated that associating negative traits with the aged has an automatic or unconscious cognitive component. They found that when college students were subliminally primed with the word *old*, they made decisions about negative traits significantly faster than after being subliminally primed with the word *young*.

The authors summarize the process underlying their findings as follows: "Cognitively categorizing a person as 'old' may create a subset of predominantly negative constructs which are more accessible and more likely to be employed in evaluating that person, and thus will tend to perpetuate ageism from the beginning of the social perception process" (Perdue & Gurtman, 1990, p. 213). Because the elements of this process seem to be deeply engrained, it is likely that implicit ageism will continue to operate when, for instance, the students are at the 50th reunion of their college class.

A number of the implicit age-stereotyping studies has been conducted with the Implicit Association Test (IAT), which uses a response latency indicator based on pairing the attitude object, such as old or young, with an evaluation dimension, such as good or bad (see Banaji, 2001, for a more extensive description of the IAT). An Internet version of the IAT, with over 68,000 participants from the age of 8 to older than the age of 71, elicited more negative implicit attitudes toward the old than toward a wide range of stigmatized groups, including African Americans and homosexuals (Nosek, Banaji, & Greenwald, 2002b).

Research suggests that explicit beliefs tend to operate independently of implicit beliefs (e.g., Devine, 1989; Nosek et al., 2002b; Rudman & Glick, 2001). For example, an individual may express a positive attitude toward a targeted group on a self-report measure, but express a more negative attitude on an implicit measure (Devine, 1989). In a review of the correspondence between implicit and explicit beliefs about the same 15 target categories, including race and gender, age beliefs showed the smallest correlation between the two levels of beliefs (Nosek & Banaji, 2002). Although age attitudes tend to be negative on both the implicit and explicit level, they tend to be more negative on the implicit level (Nosek et al., 2002b).

Processing information on both the implicit and explicit levels may help to make elders particularly vulnerable to negative aging self-stereotypes. If the more negative aging stereotypes

operate implicitly, it may be more difficult to recognize the influence of these stereotypes.

Aging Stereotypes Become Aging Self-Stereotypes

When individuals reach old age, the aging stereotypes internalized in childhood, and then reinforced for decades, become self-stereotypes. The old is the only outgroup that inevitably becomes an ingroup for individuals who live long enough (Snyder & Miene, 1994). Because those who target members of the stereotype group eventually become the targets, it is not surprising that there is a correspondence between the aging stereotypes internalized previously and aging self-stereotypes. Although cultures tend to differ from each other in the content of their aging stereotypes (Luborsky & McMullen, 1999; Sokolovsky, 1994), younger and older individuals within cultures tend to report similar aging stereotypes (Brewer & Lui, 1984; Brewer, Dull, & Lui, 1981; Hummert, Garstka, Shaner, & Strahm, 1994; Imamoglu, Kueller, Imamoglu, & Kueller, 1993; Schmidt & Boland, 1986).

As an indication of the continuity between aging stereotypes and aging self-stereotypes, elders express attitudes toward their own group that are as negative as those expressed by the young toward the old (Nosek et al., 2002b). Consistent with this finding, older participants in a national sample were more likely than younger participants to oppose federal programs that benefit the old (Levy & Schlesinger, 2001). Further, the opposition of the older participants to these programs was predicted by aging stereotypes, including those that indicate a more favorable perception of the young than of the old. Thus, it appears that ingroup preference, one of the strongest findings in social psychology (Brewer, 2001; Tajfel, 1981), does not tend to apply among the old.

Self-stereotypes of aging may be acquired in two stages. When the individual reaches an age that is formally defined by institutions, or informally by other individuals, as old, she or he joins the aged membership group, which constitutes the first stage. It represents an artificial definition that is imposed, rather than one that is accepted by the target as valid (Sherif, 1953). In this initial stage, aging stereotypes become aging self-stereotypes because they are now directed at individuals who are no longer outsiders, but rather are categorized by others as part of one's membership group.

This is in contrast to the next stage that involves identification with others in the same category (i.e., a belief that one is old). At that point, the aged reference group has been joined (Hyman, 1942). The length of time needed to add participation in the reference group to participation in the membership group is likely to vary according to the negativity of an individual's aging stereotypes. That is, the more negative the aging stereotypes, the more resistance there would be to identifying with the old. Resistance tends to take the form of denial (Levy & Banaji, 2002). An expression of this denial can be found in the pursuit of supposed antidotes to signs of aging, such as Botox injections to temporarily smooth out wrinkles (Finn, 2002).

The unrelenting reminders of one's agedness that occur in everyday life (e.g., *The Image of Aging in Media and Marketing*, 2002; Friedan, 1993) are likely to erode the barrier erected by denial, thereby creating a sense of the relevance of aging to oneself. For example, in studies based on vignettes that feature either younger or older adults, participants were

more likely to perceive memory lapses in older adults as a result of factors that cannot be changed (e.g., a mental difficulty) and less likely to attribute these lapses to factors that can be changed (e.g., lack of effort), as compared with the same memory lapses in younger adults (Erber & Rothberg, 1991; Erber, Szuchman, & Rothberg, 1990). The carry-over of aging stereotypes to aging self-stereotypes was seen here as well, for the findings applied to both younger and older participants (Erber et al., 1990).

The likelihood of elders encountering ageist messages from the general population is suggested when the messages are conveyed by those who are ostensibly most sensitive to elderly individuals' needs—both emotional and physical. Geriatric and general psychiatrists who responded to hypothetical case studies of a middle-aged man with sexual dysfunction and an elderly man with the same complaint were less likely to take a sexual history of the elderly man and to refer him for appropriate treatment (Bouman & Arcelus, 2001).

The varied incursions, such as these, that gather after entering old age, impose a sense that aging is relevant to oneself. It is, therefore, to be expected that as the elder grows older, there will be an increased identity with one's cohort. This trend has been demonstrated on an implicit level by the finding that individuals in the 55–74 age group were more likely to identify with the young than were individuals older than 74 years (Hummert, Garstka, Greenwald, Mellot, & O'Brien, 2002).

When old age becomes self-defining, aging stereotypes may provide a new function: "Perhaps these negative expectations about aging will become self-fulfilling and impose unnecessary limitations on future generations of the elderly" (Korthase & Trenholme, 1983, p. 890).

Throughout the preceding review, the emphasis has been on negative aging stereotypes and their development into negative aging self-stereotypes. This follows from the emphasis on negative aging stereotypes in American society (Kite & Johnson, 1988; Palmore, 1999). Although the prevalence of these negative stereotypes, as well as their content, which often refer to debilitation, assure their greater salience, positive aging stereotypes are also internalized (Levy & Banaji, 2002). A number of researchers have found that within the category of elderly people, even though the majority of subcategories are negative, positive subcategories consistently emerge for both young and old participants (Brewer et al., 1981; Brewer & Lui, 1984; Hummert, 1990; Hummert et al., 1994; Schmidt & Boland, 1986). Moreover, there are individuals, who before reaching old age, harbor a preponderance of positive aging stereotypes, which may become a preponderance of positive aging self-stereotypes in old age (Levy & Langer, 1994).

Self-Stereotyping Versus Stereotype Threat

An alternative approach to the one presented in this review is provided by the theory of stereotype threat. It proposes that members of stereotyped groups who identify with a particular domain will have their performance in that domain adversely affected as a result of anxiety that they will confirm a negative stereotype about their group (Steele & Aronson, 1995). A basic premise of stereotype-threat theory is that stereotypes are not internalized (Steele & Aronson, 1995). This interpretation is appealing because it suggests that the problem can be remedied by concentrating on the setting rather than on the internalized

beliefs of the affected individual, which would present a greater challenge (Steele, 1997). However, the risk of dismissing internalization is that it reduces the impact of self-stereotypes (a term not used by stereotype-threat theorists) to an issue of coping with a context, thereby missing the depth and breadth of their influence.

Other limitations of the stereotype-threat theory include its assumptions that the operation of stereotypes occurs with the awareness of the targets and only in response to negative stereotypes (Steele & Aronson, 1995). As reviewed earlier, there is a body of research indicating that stereotypes can operate vis-à-vis their targets implicitly and in positive as well as negative guises.

Although the stereotype-threat framework is said to apply to all forms of stereotypes, including those relating to the old (Aronson et al., 1999), it has specific limitations when applied to the latter group. As an example, disengagement from the domain in which the stereotype threat occurs (e.g., academia in the case of African Americans who strongly identify with it) is presented as a way that the targets can cope with the stereotypes (Steele & Aronson, 1995), but disengagement from academia is probably a qualitatively different matter than disengagement from cognitive or physical health by older individuals. For health tends to be of such salience to elders (Hooker, 1999) that disengagement may not be feasible, even if individuals somehow had sufficient control over it to do so.

INFLUENCE OF AGING SELF-STEREOTYPES ON COGNITIVE AND PHYSICAL HEALTH

The lessons that can be drawn from the preceding literature review provide a context for the research that is presented in this section. For if aging stereotypes, which include expectations for future functioning, are internalized and become aging self-stereotypes, it seems plausible that the chronic activation of these stereotypes could contribute to older adults' functioning.

The physical and cognitive declines in old age are frequently explained in biological terms. As an example, aging has been defined as "a process of intrinsic, progressive, and generalized physical deterioration that occurs over time, beginning at about the age of reproductive maturity" (Austad, 2001, p. 3). My interest has been in examining an alternative approach: whether debilitation might be at least partly a result of a social psychological construct, in the form of aging self-stereotypes, rather than an inevitable biological process.

This exploration has been undertaken in a series of studies that has been pursued using a variety of research methodologies: cross-cultural, experimental, and longitudinal. Regardless of which approach was taken, the goal of understanding the consequences of aging self-stereotypes has remained, so that the studies have been designed to build upon each other.

Cross-Cultural Approach

Whether stereotypes of aging influence the cognitive and physical functioning of older individuals had not been previously explored. A colleague and I initially looked at how memory was affected by varying cultural stereotypes about memory in the old (Levy & Langer, 1994). Because mainland Chinese people and deaf Americans tend to hold more positive views of aging, we recruited young and old individuals from

these populations, as well as a hearing American comparison group. The Chinese group reported the most positive views of aging, the deaf American group reported the next most positive, and the hearing American group reported the most negative views of aging. Among the older participants, the pattern of memory performance mirrored the views of aging; that is, the Chinese performed the best and the mainstream Americans performed the worst. Further, among all the older participants, positivity of aging stereotypes and memory scores significantly correlated.

Experimental Approach

It was not clear from our cross-cultural study whether older individuals' self-stereotypes of aging influenced their memory, better memory influenced self-stereotypes of aging, or both (Levy & Langer, 1994). To help untangle potential influences, the investigation moved to the laboratory. Here I developed a subliminal priming technique to represent the process by which aging stereotypes might affect older individuals. Positive age-stereotype words (e.g., wisdom) or negative age-stereotype words (e.g., decrepit) were flashed on a computer screen at speeds designed to allow perception without awareness. The words in each condition were matched on a number of dimensions, including word length, frequency with which they appear in the English language, and how typical of aging they were—as rated by an intergenerational panel. (See Levy, 1996, for a fuller account of the procedure.)

In the initial study using this technique, older individuals exposed to negative-age-stereotype primes tended to perform worse than those exposed to positive-age-stereotype primes on four memory tasks (Levy, 1996). These results suggest not only that self-stereotypes of aging are capable of influencing a cognitive process in the aged but also that the process occurs without awareness. This unawareness has the advantage of allowing experiment participants to be blind to the measure while researchers study the self-stereotypes. But in the larger world, there is a disadvantage to unawareness. For it may allow elderly individuals to attribute a declining cognitive process to aging rather than to their environment and, in so doing, reinforce their negative self-stereotypes of aging.

In confirmation of this laboratory study (Levy, 1996), Hess, Auman, Colcombe, and Rahhal (2002) found that exposure to explicit negative-aging stereotypes resulted in lower memory performance among the older participants, in contrast to the older participants who were not exposed and to the younger participants who were exposed. Also, another group of researchers have found that subtly primed positive stereotypes are capable of increasing cognitive performance in targets of these stereotypes (Shih, Ambady, Richeson, Fujita, & Gray, 2002; Shih, Pittinsky, & Ambady, 1999).

In the next phase of research, the effect of self-stereotypes of aging on older individuals' behavior was considered. Specifically, I examined whether these stereotypes can influence handwriting (Levy, 2000), which is a motor system that is thought to operate unconsciously and to reflect personality (Allport & Vernon, 1933; Wolff, 1948). Handwriting samples were collected from older individuals before and after they were randomly assigned to either the positive or negative primed-age-stereotype condition. Then a person blind to the age and priming group of the writers selected neutral words from

each of the writing samples. A panel rated the handwriting of those who were subliminally exposed to the negative aging stereotypes as significantly older and more “deteriorated,” “senile,” and “shaky” than the handwriting of those exposed to the positive-aging stereotypes. This finding suggests that handwriting may serve as a diagnostic tool for measuring the impact of aging self-stereotypes. It also suggests that handwriting may serve to give others a misleading sense of an older individual's actual cognitive and physical condition.

In another study, colleagues and I examined whether aging self-stereotypes might influence walking (Hausdorff, Levy, & Wei, 1999). The speed of older individuals' walking has been found to predict their overall functional health and mortality (Alexander, 1996; Guralnik, Ferucci, Simonsick, Salive, & Wallace, 1995). Most studies have assumed that walking changes in old age are due to illness or a decline in activity (e.g., Vita, Terry, Hubert, & Fries, 1998). Before and after subliminal exposure to age-stereotype primes, older individuals in our study walked down a hallway with electronic measuring devices in their shoes that registered swing time (or the amount of time that a foot is lifted off the ground; greater swing time indicates better balance). Participants who were exposed to positive aging stereotypes showed a significant increase in swing time and gait speed (Hausdorff et al., 1999). Their average increase in speed was comparable to the gain observed when older individuals participate in rigorous exercise programs for several weeks (e.g., Alexander, 1996).

These studies have found support in research demonstrating the influence of race and gender self-stereotypes on behavior (Wheeler & Petty, 2001). In a survey of 25 articles covering self-stereotype studies that were published in the preceding 5 years (only two of which were aging studies; both are described in this article as examples of the research I did with colleagues), it was found that 80% demonstrated behavioral changes that are consistent with the content of the activated stereotypes (Wheeler & Petty, 2001).

To better understand the range of the influence of aging self-stereotypes, colleagues and I also examined whether aging self-stereotypes could influence will to live (Levy, Ashman, & Dror, 1999–2000). After subliminally exposing a group of young and old individuals to either the positive or negative age-stereotype-prime intervention, we presented them with a series of hypothetical medical situations, each of which involved a fatal condition and an intervention that could prolong their life. (The scenarios were modeled after those presented in some versions of the living will.) The hypothetical interventions entailed disadvantages by way of either the financial cost or the time that family members would need to spend administering and monitoring the intervention. We found that the older individuals exposed to the positive aging stereotypes tended to accept the life-prolonging medical interventions, regardless of financial or familial cost, whereas those exposed to the negative aging stereotypes tended to reject the life-prolonging interventions.

Having found evidence that aging self-stereotypes can influence older individuals' cognition, behavior, and will to live, the next study explored whether aging self-stereotypes might have a direct impact on physiological function, which had not been previously demonstrated (Levy et al., 2000). We used four indicators of cardiovascular reactivity (response to stress). The measurement was made (a) at baseline, (b) after

exposure to either the positive or negative subliminally primed aging stereotypes, and, finally, (c) after two potentially anxiety-producing challenges. We found that those participants who were subliminally exposed to the negative aging-stereotype primes demonstrated significantly greater cardiovascular stress after the challenges than those exposed to the positive aging-stereotype primes. Also, the negative aging stereotypes affected the cardiovascular measures even before the cardiovascular challenge. This suggests that negative aging stereotypes directly cause stress to older individuals, as well as exacerbate how older individuals respond to stressors in their environment.

Longitudinal Approach

Although it was assumed that responsiveness to the stereotype primes in the experimental studies would only be triggered if they had personal relevance to the participants, additional evidence was needed to show that this was the case. Further, the priming technique used in the experimental studies seemed to tap an accumulation of stereotypes that had been acquired over a lifetime, but there was no way of knowing what the effects would be at different stages of old age. For inevitably, a laboratory experiment is more in the nature of a snapshot than a movie. The next phase of the research was shaped by both of these considerations.

This recent research uses the term “self-perceptions of aging” so it would be clear we are referring to individuals’ view of themselves becoming older (Levy, Slade, & Kasl, 2002; Levy, Slade, Kunkel, & Kasl, 2002). (Direct links have been found between self-stereotypes of aging and self-perceptions of aging [Imamoglu et al., 1993; Ryan & Kwong See, 1993; Levy, 1999]). In these longitudinal studies, we examined whether more positive self-perceptions of aging predict better functional health over time (Levy, Slade, & Kasl, 2002) and better survival (Levy, Slade, Kunkel, & Kasl, 2002). Both studies draw on the Ohio Longitudinal Study of Aging and Retirement (OLSAR) that spans 20 years (Atchley, 1999). The participants were 50 or older and responded to a set of self-perception-of-aging items at baseline.

One study found, as predicted, that individuals with more positive self-perceptions of aging in 1975 reported better functional health from 1977 to 1995 (controlling for baseline measures of age, functional health, gender, loneliness, race, self-rated health, and socioeconomic status; Levy, Slade, & Kasl, 2002). The effect increased over six waves. These findings are given larger meaning by functioning problems (that occur in one out of five individuals over the age of 70) predicting a number of adverse outcomes, including hospital and nursing home admissions (Branch & Lu, 1989; Stump, Johnson, & Wolinsky, 1995).

As a potential mediator for this study, we considered perceived control. It seemed a good candidate because in previous studies, self-stereotypes of aging influenced memory self-efficacy (Levy, 1996) and mathematical self-efficacy (Levy et al., 2000), two situation-specific forms of perceived control. Here, a general measure of perceived control acted as a partial mediator, or partially explained how views of aging influence function (Levy, Slade, & Kasl, 2002).

The second study examined whether self-perceptions of aging influence survival (Levy, Slade, Kunkel, et al., 2002). To conduct this study, the OLSAR data were matched with the

survival data that we obtained from the National Death Index. We found that older individuals with more positive self-perceptions of aging, measured up to 23 years earlier, lived 7.5 years longer than those with less positive self-perceptions of aging. This advantage remained after controlling for age, functional health, gender, loneliness, race, self-rated health, and socioeconomic status. The survival advantage for those with more positive self-perceptions of aging seems noteworthy, especially because physiological measures (such as low cholesterol level) and behavioral measures (such as exercising) predicted a longer life span of 4 years or less in other studies (Fraser & Shavlik, 2001; Friedman et al., 1995).

In this study (Levy, Slade, Kunkel, et al., 2002), we considered whether will to live (measured in terms of a judgment that the perceived benefits of one’s life outweigh the perceived hardships) might partially mediate the relationship between self-perceptions of aging and survival. Will to live was primarily selected because laboratory research demonstrated that it can be influenced by self-stereotypes of aging (Levy et al., 1999–2000). The hypothesis that will to live acts as a partial mediator was confirmed (Levy, Slade, Kunkel, et al., 2002).

COMMON THEMES OF AGING SELF-STEREOTYPE STUDIES

The succession of cross-cultural, laboratory, and longitudinal studies provides clues about the means by which aging self-stereotypes are able to influence an array of cognitive and physical responses. The common themes of this research include the following.

1. Aging self-stereotypes trigger a response to images that are relevant to the self. In all of the studies by myself and various colleagues that included both young and old participants, a pattern emerged that suggests the importance of self-relevance to the operation of self-stereotypes. Although memory performance in the cross-cultural study was a reflection of age views among the older participants representing three distinct cultures, no memory differences emerged between the three groups of younger participants (Levy & Langer, 1994). This finding was expected because the stereotypes were not yet describing the younger participants’ self-identity.

Similarly, while the older participants exposed to the positive age-stereotype primes outperformed those exposed to the negative age-stereotype primes on the memory tasks, no age-stereotype effects on memory performance were found among the younger participants (Levy, 1996). The same priming procedure was applied to the two age groups in the will-to-live study in which the older participants tended to accept or reject life-prolonging interventions depending on whether they had received a positive or negative age-stereotype prime, respectively, whereas the younger participants tended to accept the intervention, without being influenced by the primes.

These findings contributed to the premise of a set of studies by Shih and her colleagues that found “targets of stereotypes, for whom the priming stimuli are self-relevant, are more sensitive to such stimuli and show a lower threshold of activation for such stimuli than do nontargets” (Shih et al., 2002, p. 640). The authors found that the

performance of nontargets can only be improved by the activation of primes that are blatant, and that the performance of targets can only be improved by the activation of primes that are subtle.

Further, the two longitudinal studies (Levy, Slade, & Kasl, 2002; Levy, Slade, Kunkel, et al., 2002) provide support for the assumption that the self is involved in the process by which stereotypes influence outcomes in older adults. These studies found that when self-perceptions of older adults are directly measured they predict both functional health and survival.

2. Aging self-stereotype can operate without awareness to influence cognitive and physical outcomes. Not only were the primes in all the experimental studies administered at speeds that allowed for processing below awareness, but the outcomes of these studies indicated unawareness. As an example, although handwriting is an expressive behavior that is thought to operate outside conscious control (Allport & Vernon, 1933), it was shaped by the age primes (Levy, 2000). Additionally, in the cardiovascular study my colleagues and I found that the older individuals who were randomly assigned to the negative age-stereotype condition seemed to be unaware of the increased stress that their body was experiencing: They rated the cardiovascular challenges as just as stressful as did those exposed to the positive aging stereotypes (Levy et al., 2000).
3. Both positive and negative aging self-stereotypes can be activated. The laboratory studies (e.g., Levy, 1996) demonstrated that the participants were responding to both types of primes; the effects were stereotype consistent. The variability of responses in the longitudinal studies is a real-world equivalent to the priming groups of our laboratory studies. Consistent with the existence of both stereotype forms in society, it appears that longitudinal-study participants varied in the degree to which they had internalized positive or negative stereotypes, rather than that they had internalized only one or the other. This variability may occur by subgroup for reasons of omission (e.g., less exposure to mass media) or of commission (e.g., greater esteem for the aged). Additionally, among individuals there will be differences in the ability to cope with stereotypes (e.g., Devine, 1989). On whatever level it is explained, the variability my colleagues and I found emphasizes the importance of recognizing the role of positive stereotypes for self-perception formation and activation, even, or perhaps especially, among members of stigmatized groups.

DIRECTIONS FOR FUTURE RESEARCH

Aging self-stereotype research, as outlined in this article, has helped to clarify various issues, but it has also raised new issues that could serve as a basis for future research.

Too little is known about the formation of implicit aging stereotypes in children and how these operate in relation to explicit aging stereotypes. Because children express ageism nonverbally (e.g., physically distancing themselves) before they express it verbally (Isaacs & Bearison, 1986), and nonverbal behavior is associated with unconscious processes (Allport & Vernon, 1933; McConnell & Leibold, 2001), it may be found that implicit aging stereotypes are acquired before explicit

aging stereotypes. Because of the development of methods for assessing stereotypes in children (e.g., Ambady, Shih, Kim, & Pittinsky, 2001), studying the development of implicit and explicit aging stereotypes now seems feasible.

Questions waiting to be answered about aging stereotypes extend to research methodology. For example, it is not yet known whether words (as used in the laboratory studies described earlier, e.g., Levy et al., 2000) are the most effective form of primes. Insofar as stereotypes tend to be processed as pictures (Allport, 1954), primes in the form of photographs might turn out to be more effective. Because the primed stereotype words of the experimental studies seem to have been activating images, if the trigger is a photograph it might provide a more direct linkage and, therefore, act as a stronger stimulus. The relative impact could be measured in a laboratory.

Another direction that research might take is examining whether a distinction between implicit and explicit levels of aging stereotypes would make it possible to resolve the "paradox of well-being," which refers to the high level of life satisfaction among the old that has been found "despite the fact that they are confronted on a daily basis with fear and devaluation from others within society" (Whitbourne & Sneed, 2002, p. 247). For perhaps the paradox of well-being results from studies of well-being using an explicit-level measurement (e.g., Haug, Belgrave, & Gratton, 1984; Mroczek & Kolarz, 1998), which may be at variance with the implicit pathway of self-stereotypes. Alternatively, implicit negative self-stereotypes of aging may lower older individuals' health expectations. When the actual level of health exceeds the expected level, it may facilitate a sense of well-being (Heckhausen & Brim, 1997).

To establish how far the net of self-stereotype outcomes extends, research into additional domains is needed. It would, for instance, entail determining whether cardiovascular health is the only type that is affected by age-stereotype primes. This outcome was expected because of the connection between activating internalized stereotypes, with their attendant stress, and cardiovascular reactivity (Levy et al., 2000). There would be a benefit to looking at potential outcomes that might be less expected but are also considered part of an inevitable aging process, such as decline in reaction time.

I noted earlier that elderly individuals may be exceptionally susceptible to negative self-stereotypes, in part because aging stereotypes are internalized long before they are relevant to their self-identity. Yet, this is only a presumption; it is not known whether elderly individuals are unusually vulnerable. Therefore, it would be useful if future researchers empirically determined the degree to which the old, in contrast to other targeted groups, respond to self-stereotypes. One way of accomplishing this would be to select elderly representatives of other stigmatized groups and measure responses to aging stereotypes against responses to stereotypes relating to their other stigmatized identity. Examples might include (a) women, belonging to a category that, unlike the aged, has been targeted from childhood and (b) individuals who become disabled late in life, belonging to a category that, like the aged, became targeted after a lifetime of targeting others. Comparing the extent to which relevant outcomes are influenced by stereotypes about, say, women and disability, in contrast to aging stereotypes, would clarify whether the latter carry a greater salience.

Other questions about multiple stigmatized identities could be explored in the process. For instance, whether belonging to more than one stigmatized group results in the elderly individual (a) coping more successfully if one of the targeted identities was acquired in childhood, so that there is a well-established set of defenses in place or (b) experiencing a cumulative effect produced by the stereotypes that results in greater vulnerability. These considerations could also shed further light on the Multiple Jeopardy Theory (Padgett, 1999). The studies testing it have tended to focus on being old and a member of more than one stigmatized group, without examining the impact of the specific stereotypes associated with these categories.

Further research is invited by the discrepant findings about whether younger people's cognition and behavior can be influenced by aging stereotypes. In the subliminal age stereotype studies (e.g., Levy, 1996) and the study by Hess and his colleagues (2002), the primed stereotypes influenced the old but not the young. Whereas, Bargh, Chen, and Burrows (1996) found that college students who were primed with a scrambled sentence task, intended to activate aging stereotypes, walked slower afterwards than their fellow students who were similarly exposed to neutral words. It is possible that all of these findings are a result of methodological shortcomings. For instance, there may have been a ceiling effect on the memory scores of the young in two studies (Levy, 1996; Levy & Langer, 1994). Or, in the study by Bargh and colleagues (1996), what were intended to be aging stereotype primes may have acted instead as walking primes; in which case a slower pace would result from such prime words as *careful*, *cautious*, *helpless*, and *withdraw*. An alternative explanation may turn out to be that the cognition and behavior of the young can be influenced by aging stereotype primes, but not to the same extent as with the old. The most direct way of clarifying matters would be through a walking study that included both the young (which was not the case in Hausdorff et al., 1999) and the old (which was not the case in Bargh et al., 1996), and assure that there is neither a ceiling effect nor ambiguous prime words.

An additional need exists to compare the influence of aging stereotypes presented at different levels of awareness. Studies have found that aging stereotypes can influence cognition and behavior when presented consciously (e.g., Hess et al., 2002), subliminally (e.g., Levy, 1996), or in an intermediate state (e.g., Bargh et al., 1996). In the everyday world, it is likely that aging stereotypes can be activated at any of these levels. Future studies could help determine (a) when each of these modes is most likely to operate, (b) what their relative strengths are, (c) whether they generate similar outcomes, and (d) whether they rely on the same mediators and moderators. As an example of what differences might be found: Negative aging stereotypes may operate similarly in the different presentation modes, but positive aging stereotypes may be strongest in the subliminal mode where they have the best chance of bypassing a life-long accumulation of negative aging stereotypes (Levy, 1996).

Previous research identified perceived control and will to live as only partial mediators in explaining how age perceptions influence outcomes (Levy, Slade, & Kasl, 2002; Levy, Slade, Kunkel, et al., 2002), hence there is room for exploring the operation of additional mediators. A promising place to start would be with biological measures, such as the immune system markers that have been found to operate in psychoneuro-

immunological processes (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). If new research determined that more than one type of mediator operates, it would be important to consider whether and, if so, how they are interdependent.

However, any proposals ought to remain secondary to what should be the long-term goal of stereotype research: Ameliorating the harmful effects of negative self-stereotypes of aging. This amelioration could occur from two directions. First, enhancing the influence of positive self-stereotypes of aging. Although this presents a formidable challenge, the laboratory research described earlier (e.g., Levy, 1996) suggests that positive self-stereotypes of aging can be activated to the point of overcoming negative self-stereotypes of aging, at least for a short period. Appropriate techniques for extending this period ought to be developed—both on an individual level where aging stereotypes operate and on a societal level where aging stereotypes originate.

The second approach to amelioration would involve mitigating the impact of negative self-stereotypes of aging. This might be achieved by seeking a technique to provide the aged with awareness of the aging-self-stereotype phenomenon. Determining the most suitable form for this technique would require considerable testing. However, a likely content might be based on findings from aging-self-stereotype research—such as reported in this article and proposed as manageable future research. Providing elders with a sense of aging self-stereotypes' causes and effects offers a prospect for self-awareness. This process is likely to require two phases. First, instilling a recognition that stereotypes may operate in everyday encounters. This is described by the narrator of *Invisible Man*: "It is as though I have been surrounded by mirrors of hard, distorting glass. When they approach me they see only my surroundings, themselves, or figments of their imagination—indeed, everything and anything except me" (Ellison, 1952, p. 1). Second, instilling a recognition that this distortion may be unknowingly engaged in by themselves.

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