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Subliminal Strengthening: Improving Elders' Physical Function over Time through an Implicit-Age-Stereotype Intervention

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Abstract

Negative age stereotypes that older individuals assimilate from their culture are associated with detrimental outcomes, including worse physical function. We examined for the first time whether positive age stereotypes, presented subliminally across multiple sessions in the community, would reverse this process. One hundred older individuals (aged 61-99, SD=10 years, *M*=81) were randomly assigned to an implicit-positive-age-stereotype intervention, explicit-positive-age-stereotype intervention, both, or neither. Interventions occurred at four one week intervals. As expected, the implicit intervention, in sequence, strengthened positive age stereotypes, strengthened positive self-perceptions of aging, and improved physical function. The improvement of physical function continued for three weeks following the last intervention session. Further, negative age stereotypes and negative self-perceptions of aging were weakened. For all outcomes, the implicit intervention's impact was greater than, and independent of, the explicit intervention's impact. The implicit physical-function effect surpassed a previous study's six-month-exercise intervention with similar-aged participants. These findings suggest the intervention served, in effect, as an implicit fitness center.

Older individuals tend to assimilate from their culture a variety of negative age stereotypes (i.e., deprecating beliefs about old people as a category) which are associated with detrimental outcomes, including worse physical function (e.g., Levy, Slade, Murphy, & Gill, 2012; Levy, Slade, & Kasl, 2002; Sargent-Cox, Anstey, & Luszcz, 2012). It had not been previously shown whether an implicit intervention with older individuals could mitigate negative age stereotypes and their effects over time. The current field study utilized a novel approach: presentation of implicit positive age stereotypes in multiple sessions. The goal was to generateimprovements at each stage of a predicted sequence comprising age stereotypes, self-perceptions of aging (i.e., beliefs about oneself as an old person), and physical function.

The rationale for the implicit intervention was based on single-session laboratory studies that showed: (1) subliminally presented positive age stereotypes improved older individuals' physical function (e.g., Levy & Leifheit-Limson, 2009); and (2) increased exposure to subliminal symbols correspondingly increased preference for them (Murphy, Monahan, & Zajonc, 1995). Building on these findings, we presented an implicit-positive-age-stereotype intervention four times, one week apart, and then examined whether these implicit-

stereotypes benefitted older individuals' outcomes three weeks following the last intervention session.

An additional goal of the current study was to explicate three facets of the process by which an implicit-positive-age-stereotype intervention could potentially improve age stereotypes, self-perceptions of aging, and physical function over time. The first facet examined was whether an implicit stereotype intervention would influence these outcomes more strongly than an explicit stereotype intervention. This was expected, because the implicit approach may bypass the internalized negative age stereotypes that tend to predominate over the positive ones (Levy, 2009); whereas, the explicit approach may be thwarted by cognitive strategies that preserve existing beliefs (e.g., Dasgupta & Greenwald, 2001). Support for these premises is provided by a single-session study in which an implicit-positive-age-stereotype intervention improved older participants' memory performance, but an explicit-positive-false-feedback intervention showed no effect (Levy, 1996). The explicit-intervention might have failed because it did not change participants' age stereotypes. In the current study, the explicit-positive-age-stereotype intervention was based on a conscious imagery technique that successfully reduced negative gender stereotypes (Blair, Ma, & Lenton, 2001).

The second facet examined was whether an implicit-positive-age-stereotype intervention would diminish negative age stereotypes and self-perceptions of aging. It is known that older individuals tend to hold contradictory positive and negative age stereotypes (e.g., *the old are wise* and *the old are senile)*, and that either type of stereotype can be activated by matching valence interventions (e.g., Levy & Leifheit-Limson, 2009; Meisner, 2012). Yet, it was not known whether an implicit positive intervention could counter negative age stereotypes, as well as negative self-perceptions of aging. We expected the implicit reinforcement of positive age stereotypes over time would challenge the premises (e.g., old-age debilitation) of negative age stereotypes and negative self-perceptions of aging, and, therefore, undermine their negativity.

The third facet examined was whether self-perceptions of aging would mediate the potential influence of an implicit-positive age stereotype intervention on improving outcomes. Two conflicting theories relate to this question. According to ideomotor theory, a successful implicit-positive-age-stereotype intervention would directly impact behaviors (James, 1896; Kawakami, Young, & Dovidio, 2002). Whereas, according to stereotype embodiment theory (SET), self-perceptions of aging are part of this process (Levy, 2009). Specifically, when individuals recognize through environmental cues that they have entered old-age, the age stereotypes that were applied to others acquire personal resonance, and thus become self-perceptions of aging, which can be activated by subsequent exposure to these cues; in turn, physical outcomes can then be impacted (Levy, 2009). Evidence supporting SET comes from single-session experiments that found age stereotypes influenced behavior only among, or were stronger among, older individuals for whom the stereotypes were self-relevant, in contrast to younger individuals for whom the stereotypes were self irrelevant (e.g., Levy, 2009; Marques, Lima, Abrams, & Swift, 2014; Meisner, 2012). In those studies, unlike the current one, self-perceptions of aging were not examined as part of the process.

In this study, we predicted that among older individuals an implicit-positive-age-stereotype intervention would: (1) strengthen positive age stereotypes and positive self-perceptions of aging, and improve physical function; these effects would be greater than an explicit-positive-age-stereotype intervention; (2) weaken negative age stereotypes and negative self-perceptions of aging; and (3) strengthen positive age stereotypes, which would strengthen positive self-perceptions of aging, which would improve physical function.

Method

Participants

The study cohort consisted of 100 individuals who met the following inclusion criteria: 60 years or older, able to read and write English, and able to commit to the weekly sessions held over two months. Participants ranged in age from 61 to 99 years (*M*=81, *SD*=10 years). In most cases, they were female (78%), high-school graduates (89%), and white (83%). Fifteen per cent identified themselves as African American, 4% identified themselves as Hispanic, and 2% identified themselves as both. These factors, along with baseline assessments of physical function, did not significantly differ by implicit and explicit-intervention groups, suggesting a successful randomization procedure.

Procedure

Participants were recruited by means of fliers distributed throughout housing complexes in greater New Haven, Connecticut. To increase ecological validity, the study took place in a quiet room in each participant's housing. Participants were interviewed at seven time points over eight weeks, and were exposed to the intervention once a week from Weeks 2 through 5. Follow-up measurements occurred at Weeks 5, 6, and 8; the seventh week was omitted, in order to extend the time preceding the last follow-up. The four-week timing of the intervention was based on single-session studies that found greater exposure to implicit stimuli increased their impact (Levy, Hausdorff, Hencke, & Wei, 2000: Murphy et al., 1995), and clinical trials targeting physical outcomes with older individuals (e. g., Hiyama, Yamada Kitagawa, Tei, & Okada, 2012).

Participants were unaware of the hypotheses and the nature of the group to which they had been assigned. Of the three experimenters, two (who tested 90% of the participants) were unaware of the hypotheses and the nature of condition assignment; the pattern of significant results did not differ between the three experimenters.

Measures

Predictors: Implicit and Explicit Interventions—The study followed a 2 (implicit-intervention group: positive age stereotype vs. neutral)*2 (explicit-intervention group: positive age stereotype vs. neutral) design. Thus, participants were randomly assigned to either an implicit-positive-age-stereotype intervention group, an explicit-positive-age-stereotype- intervention group, a combined implicit- and explicit-positive-age-stereotype intervention group, or a neutral-control group. All groups were matched in time and the nature of activities, with the implicit portion presented on a laptop computer and the explicit portion presented on a sheet of paper.

The implicit-positive-age-stereotype intervention and explicit-positive-age-stereotype intervention were dissimilar in form, but they were likely to have been similar insofar as they succeeded in producing aging images, or pictures, subliminally, as well as by essay prompts. Stereotypes have been described as creating "pictures" that "we carry about in our heads" (Lippman, 1922. p. 60).

(1)Implicit-Positive-Age-Stereotype-Intervention Group—Participants were subliminally exposed to age stereotypes by a technique that had been successfully used in single-session laboratory studies with older participants (e.g., Levy, 1996; Levy et al., 2000; Levy & Leifheit-Limson, 2009; Marques et al., 2014). The current study used Superlab 4.0 (Cedrus, Phoenix, Arizona) to determine subliminal speeds for each individual and to present the age-stereotype stimuli.

To generate the age-stereotype stimuli, we followed Banaji, Hardin, and Rothman's (1993) method of generating gender-stereotype stimuli. A list of positive age-stereotype words was first created by an intergenerational panel. The words used as stimuli were those rated by all members of a new intergenerational panel as 4 or below on a scale that ranged from 1 (*extremely positive*) to 7 (*extremely negative*), and were judged to be typical of old-age (e.g., *spry*).

Following the implicit stereotype presentation method developed by Devine (1989), age-stereotypes appeared in five blocks, each containing 20 words, with the first being a word to orient the participant to the group category (i.e., *old* or *senior)*, followed by 19 words presented in a random order that included the other category word, four neutral words matched in length to the stereotype words (e.g., *another*), and the 12 positive age-stereotype words, with two repeating. These words were flashed in black on a white background. To reduce the possibility of participants becoming familiar with the age-stereotype words, we created three versions of the implicit intervention conditions which varied their age-stereotype words. They were used in Weeks 2, 3, and 4; Week 5 repeated the words in Week 2.

Due to the high variability in visual processing speed between individuals at older ages (Wiegand et al., 2014), a descending-limits-paradigm method was used to determine the best stimulus-presentation speed that allowed perception without awareness for all participants. At the start of each of the four implicit-intervention sessions, stimuli with patterned masks flashed on participants' computer screens at gradually decreasing speeds that were delivered by the stimulus-presentation software. To prevent participants expecting to see words in actual trials, strings of random letters were used as stimuli. After each speed-specific block of stimuli presentations, the participant was asked: "Did you see any flashes on the screen?" If the participant reported seeing at least one flash, this speed was used for the intervention session. If not, the speed-trials program ran at progressively slower speeds until the participant observed a flash (70 ms-215 ms, M=170 ms). The longer average speed needed for perception without awareness in the current study, compared to other single-session implicit age-stereotype studies conducted with older individuals, likely reflects the current mean age being about a decade older (e.g., Levy, 1996; Marques et al., 2014); the speeds of

parafoveal vision processing and information processing tend to decline linearly with later age (Hahn et al., 2009; Papp et al., 2014).

Participants were then exposed to the implicit age-stereotype intervention. After each stimulus appeared on the computer screen, participants indicated whether a flash was seen above or below a bull's-eye by pressing computer keys that displayed either an up or a down arrow. They were told to: guess if they did not see anything, respond as quickly and accurately as possible, and keep their focus on the bull's-eye. A patterned mask (of nonsense symbols) covered over the afterimage of the stereotype words to reduce the likelihood of perception with awareness.

Participants did not significantly change response times over the four sessions, which suggests there was not an increase in awareness. Further, when participants were asked after the intervention sessions what they saw on the screen, they gave responses which indicated they were unaware of the implicit-intervention content (e.g., “saw a blur”).

The participants in this group were also exposed to an explicit-neutral condition, described in (4).

(2) Explicit-Positive-Age-Stereotype-Intervention Group—Participants were asked to “Imagine a senior citizen who is mentally and physically healthy.” The technique was derived from a successful single-session intervention in which young participants were presented with counter-stereotypical mental imagery by asking them to imagine a strong woman (Blair et al., 2001). Parallel to the implicit-positive-age-stereotype intervention, we created three versions of the explicit-intervention condition, in which participants were asked to imagine: “a senior citizen” in Weeks 2 and 5, “a female senior citizen” in Week 3, and “a male senior citizen” in Week 4. The validity of the explicit-intervention was supported by an intergenerational panel, without awareness of the participants’ groups, that rated all essays according to the positivity of the aging image they presented, on a scale from 1 *extremely positive* to 7 *extremely negative*, with 4 indicating *neutral*. The positive explicit age-stereotype essays were significantly more positive (M=2.00, SD=.52) than those essays generated by the neutral-explicit comparison group (M=3.88, SD=.25), t(96)=22.82, p<. 0001. Participants in Group 2 were also exposed to an implicit-neutral condition described in (4).

(3) Combined Implicit-and Explicit-Positive-Age-Stereotype-Intervention Group—Participants were exposed to the implicit-positive-age-stereotype intervention described in (1), and the explicit-positive-age-stereotype intervention described in (2).

(4) Neutral-Control Group—Participants were exposed to the implicit-neutral condition on a computer. The neutral stimuli consisted of a random series of letters, matched to the implicit-positive-age-stereotypes in word length, number of syllables, beginning letter, and ending letter. In all other respects, the procedure of presenting words was identical to the one used in the implicit-positive-age-stereotype intervention group. Participants in the control group were also exposed to an explicit neutral condition in which they were asked to

imagine neutral topics, such as “the kinds of uniforms or clothes that people wear in different types of transportation roles,” and then to write about this image.

Outcome Measures—These were collected at baseline preceding the intervention, and immediately following the intervention at Weeks 5, 6, and 8.

Age Stereotypes—This outcome was assessed with the Image of Aging Scale that asked participants to describe whether 18 items match “the kinds of images that come to mind when you think of old people in general (not including yourself)” (Levy, Kasl, & Gill, 2004). Half the items were positive (e.g., *capable*) and half the items were negative (e.g., *helpless*). Participants were given a choice from 0=*not at all matches my image of old people* to 6=*exactly matches my image of old people*. The overall measure for this scale was determined by reverse scoring the negative items, and then summing all the items. The scale had previously shown good one-week test-retest reliability, internal consistency, and convergent validity with older individuals (Levy et al., 2004). To examine the second hypothesis, a negative-age-stereotype subset was created by adding the nine negative items that were found to uniquely load on a single factor (Hatcher, 1994).

Self-perceptions of Aging—The same Image of Aging Scale items (Levy et al., 2004) that were used to assess age-stereotypes were used to assess self-perceptions of aging. Participants were instructed to assess how much the items matched their image of “Yourself as an old person.” They were given a choice from 0=not at all the way I think about myself as an old person to 6=exactly the way I think about myself as an old person. The overall measure for this scale was determined by reverse scoring the negative items, and then summing all the items. A negative-self-perception-of-aging subset was created, in order to examine the second hypothesis, by adding the same nine negative items that were used for the negative age-stereotype subset.

Physical Function—This was assessed with the Short Physical Performance Battery (SPPB), a well-established measure of physical function in older adults (Guralnik et al., 1994). It assesses strength, gait, and balance by examining, respectively: (1) time to rise from a chair and return to the seated position five times; (2) time to walk eight feet; and (3) ability to stand with feet together in the side-by-side, semi-tandem, and tandem positions for 10 seconds. Possible scores ranged from 0 to 12, with a higher score indicating better physical performance. Older individuals who receive lower scores on this measure have increased risk of disability, nursing-home placement, and mortality (Guralnik et al., 1994; Verghese, Holtzer, Lipton, & Wang, 2012).

Covariates—Age, sex, and health, as measured by number of medications, were included as covariates because they have been found to correlate with the SPPB (Buford et al., 2014; Guralnik et al., 1994; Verghese et al., 2012).

Analytic Plan

We examined the first and second hypotheses with a series of repeated measures analyses of covariance (ANCOVA) models, which included the implicit and explicit-interventions as the

predictors, adjusting for age, sex, health, and the baseline values of the outcomes. To address the third hypothesis, we constructed a structural equation model, according to the steps suggested by Hatcher (1994), that allowed us to simultaneously test the four variables of the conceptual model in a predicted time sequence with the implicit-intervention that took place at Weeks 2 through 5, positive age-stereotypes at Week 5, positive self-perceptions of aging at Week 6, and physical function at Week 8 - the final time point. Structural equation modeling was also employed to examine whether an alternative sequence of the variables could fit the data and whether our conceptual model fully mediated the relationship between the implicit-intervention and the physical-function outcome. The p-values are presented as one-tail tests, because we hypothesized a direction of the effects based on prior single-session studies which found positive age-stereotype interventions improved outcomes (Cumming, 2012; Levy, 2009; Marques et al., 2014; Meisner, 2012). All analyses were conducted with SAS version 9.3 (SAS Institute Inc., Cary, NC).

Results

In support of the first hypothesis, it was found that the implicit-positive-age-stereotype intervention significantly strengthened: (a) positive age-stereotypes, $F(1, 164) = 7.42$, $p = .004$, $\eta_p^2 = .065$, (95% CI=.009-.160); (b) positive self-perceptions of aging, $F(1, 164) = 6.01$, $p = .008$, $\eta_p^2 = .051$, (95% CI=.005-.142); and (c) physical function $F(1, 164) = 5.93$, $p = .008$, $\eta^2_p = .080$, (95% CI=.023-.118) (see Figure 1). These results are based on repeated measures ANCOVA models that adjusted for the baseline score of the outcome, sex, age, health, and the explicit-intervention.

The efficacy of the implicit-positive-age-stereotype intervention was also seen in the finding that it influenced neutral essays. For among the participants in the explicit-neutral condition, those exposed to the implicit-positive-age-stereotype intervention were significantly more likely to present a positive image of aging than those exposed to the implicit-neutral condition, $F(1, 42) = 4.69$, $p = .04$, after adjusting for covariates. This is illustrated by the following excerpt from the essay of a participant who was exposed to the implicit-positive-age-stereotypes preceding a neutral essay prompt to write about a room: “This room is designed principally to use the computers but we are doing many things to allow the world to see what can be done to enhance what elderly students do to help the world and themselves.”

Evidence for the stronger influence of the implicit-positive-age-stereotype is based on finding that the explicit-intervention did not significantly impact self-perceptions of aging, $F(1, 162) = 1.32$, $p = .25$, $\eta_p^2 = .019$, (95% CI=.001-.069) nor physical function $F(1, 162) = 1.81$, $p = .18$, $\eta_p^2 = .03$, (95% I=.002-.120) in the repeated measures ANCOVA models. Additionally, although the explicit-positive-age-stereotype intervention significantly strengthened positive age-stereotypes in the repeated measures model, $F(1, 162) = 6.09$, $p = .01$, $\eta_p^2 = .05$, (95% CI=.010-.165), the influence of the implicit-intervention was 30% greater, according to the effect sizes.

In support of the second hypothesis, the implicit-positive-age-stereotype intervention significantly weakened negative age-stereotypes in the repeated measures model, $F(1, 162)$

=3.30, p=.04, η_p^2 =.04, (95% CI=.008-.113). Similarly, the implicit-positive-age-stereotype intervention significantly weakened negative self-perceptions of aging in the repeated measures model, F(1, 162)=3.65, p=.03, η_p^2 =.03, (95% CI=.001-.111). These results are based on repeated measures ANCOVA models that adjusted for the baseline score of the outcome, sex, age, health, and the explicit-intervention.

The pattern of raw means and repeated-measure-models findings for the implicit-intervention, unadjusted for age, sex, and health, are similar to the adjusted-repeated-measure models in reflecting the implicit-intervention (see Table 1). The following are the findings for the implicit-intervention on the five outcomes in the unadjusted models: (a) positive age stereotypes, F(1, 168)=5.11, p=.01, η_p^2 =.04, (95% CI=.004-.123); (b) positive self-perceptions of aging, F(1, 168)=3.10, p=.04, η_p^2 =.03, (95% CI=.0001-.0966); (c) physical function, F(1, 168)=4.98, p=.01, η_p^2 =.05, (95% CI=.004-.137); (d) negative age-stereotypes, F(1, 166)=2.08, p=.08, η_p^2 =.02, (95% CI=.002-.086); and (e) negative self-perceptions of aging F(1, 166)=2.04, p=.08, η_p^2 =.017, (95% CI=.000-.079 . Although the last two outcomes did not meet the 95% level of significance (α=.05) in the unadjusted models, all five outcomes met the .05 level of significance in both the fully adjusted models and when age alone was added as a covariate; age may impact the processing of the implicit-intervention (Hahn et al., 2009; Papp et al., 2014).

In support of the third hypothesis, the three predicted paths were found to be significant in the expected direction and sequence (see Figure 2). That is, the implicit-positive-age-stereotype intervention predicted more positive age-stereotypes at Week 5 (β=.26, p=.008); positive age-stereotypes at Week 5 predicted more positive self-perceptions of aging at Week 6 (β=.34, p=.0009); and positive self-perceptions of aging at Week 6 predicted improved physical function at Week 8 (β=.21, p=.04). The structural equation model that tested our conceptual model was found to meet the goodness-of-fit criteria outlined by Hatcher (1994): Comparative Fit Index=.99, root-mean-square error of approximation (RMSEA)=.01, and χ^2=2.29, df=3, p=.51.

Two alternative structural equation models were also tested. In the first, the sequence of positive age-stereotypes and self-perceptions of aging was switched by using positive self-perceptions of aging at Week 5 and positive age-stereotypes at Week 6. The resulting model did not fit the data well: it resulted in a significant chi-square *test*, χ^2=8.97, df=3, p=.03, which indicates this model significantly differed from the data collected.

We also examined whether the conceptual model, with the two-part mediation of age-stereotypes and self-perceptions, fully mediated the relationship between the intervention and the physical-function outcome. Consistent with the full-mediation structural-equation-model criteria, suggested by Little and colleagues (Little, Card, Bovaird, Preacher, & Crandall, 2007), it was found that: (1) when the direct path between the implicit-intervention and the physical-function outcome was added to the conceptual model (see Figure 1), it was insignificant (β =.12, p=.21); (2) whereas, the paths of the original conceptual model remained significant; and (3) the fit indices did not significantly change when the direct path between the implicit-intervention and physical function was eliminated. In sum, the

predicted conceptual model provided a stronger, or a more parsimonious fit of the data, than the two alternative models.

Discussion

This study demonstrated for the first time that an implicit-intervention can significantly improve functioning over an extended period. The physical function improvement that resulted from the four-week implicit-positive-age-stereotype intervention was greater than the outcome of a six-month exercise intervention with a similar-aged cohort (McAuley et al., 2013).

The implicit-intervention appears to have exerted its influence through two processes. First, the positive age-stereotypes were immediately and significantly strengthened. Second, the structural equation modeling suggests that these enhanced stereotypes then acted, in effect, as an intervention that significantly strengthened positive self-perceptions of aging, which then acted as an intervention that significantly improved physical function.

It was also found for the first time that an implicit-positive-age-stereotype intervention could significantly decrease the negativity of age-stereotypes and self-perceptions of aging. This was shown in the model that adjusted for age, sex, and health. The effectiveness of the implicit-intervention on the range of outcomes contrasts with the parallel explicit-intervention which only significantly improved positive age-stereotypes.

The longitudinal improvement of the positive age-stereotypes is impressive because, prior to this intervention, the participants were likely to have been habituated to the negative age-stereotypes that prevail in society (e.g., Butler, 2008). The repetitive-implicit method's success might have been due to a countervailing habituation, in which the positive age-stereotypes gained familiarity and, thus, initiated a cascade of positive effects.

This study extends and integrates two lines of research with older individuals. Experimental research previously showed that implicit age-stereotype interventions influence outcomes in stereotype-congruent ways, but these studies were confined to single-sessions (e.g., Levy & Leifheit-Limson, 2009: Marques et al., 2014; also see two meta analyses: Horton et al., 2008; Meisner, 2012). Similarly, community-based longitudinal studies previously showed that more positive aging views predict better physical outcomes, but these studies did not include an implicit-intervention (e.g., Cheng, Yip, Jim, & Hui, 2012; Levy et al., 2002; Moser, Spagnoli, & Santos-Eggimann, 2011; Sargent-Cox, et al., 2012).

Assimilated negative stereotypes exist in other targeted groups, with injurious outcomes (e.g., Pachankis, Hatzenbuehler, & Starks, 2014). Whether the intervention of the current study would also succeed in those cases awaits investigation. For older individuals, however, this approach led to a process that appeared to create an implicit fitness center.

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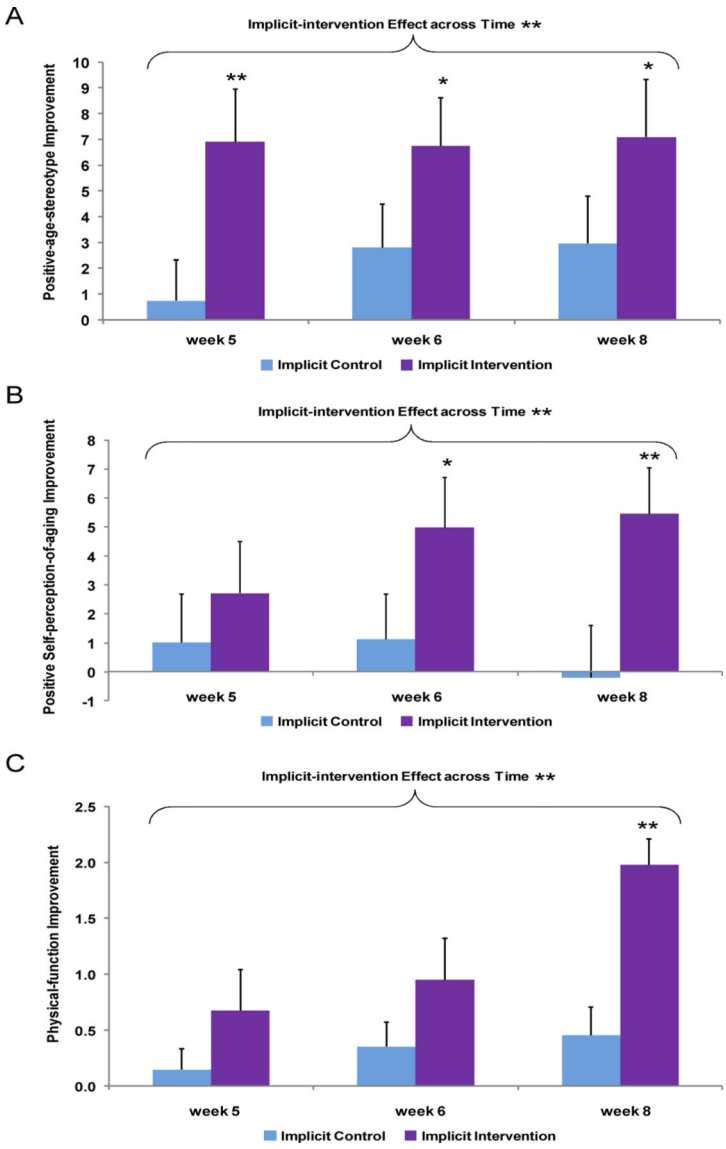

Figure 1.

Implicit-positive-age-stereotype Intervention's Improvement from Baseline of: (A) Positive Age Stereotypes; (B) Positive Self-perceptions of Aging; and (C) Physical Function. Bars represent standard errors of the means. ***p<.001, **p<.01, ***p<.05 in models of raw scores that adjust for baseline outcome values, age, sex, and health. Asterisks above bars indicate differences between implicit-intervention and implicit control. Asterisks in upper right corner of bar graphs indicate effect of implicit-intervention across the three time points.

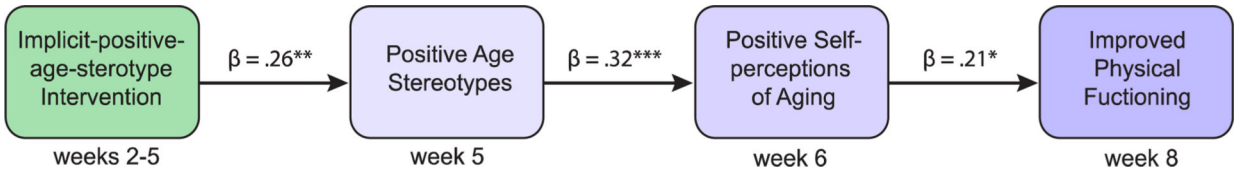

Figure 2.

Conceptual and Analytic Model of Positive-Age-Stereotype Effect on Physical Function. Asterisks show significance of paths in the structural equation model (*p<.05, **p<.01, ***p<.001).

Table 1

Raw Means for Outcomes by the Implicit-Positive-Age-Stereotype Intervention over Time

	Positive Age Stereotypes		Positive Self-perceptions of Aging		Physical Function		Negative Age Stereotypes		Negative Self-perceptions of Aging	
	Implicit		Implicit		Implicit		Implicit		Implicit	
	control	intervention	control	intervention	control	intervention	control	intervention	control	intervention
Week 1	54.54 (1.41)	55.62 (1.52)	74.88 (1.85)	76.32 (1.96)	7.00 (0.56)	6.94 (0.47)	31.68 (1.22)	29.88 (1.13)	18.54 (1.28)	16.65 (1.34)
Week 5	54.90 (1.49)	63.36 (1.86)	75.42 (2.14)	80.10 (2.20)	7.15 (0.55)	7.61 (0.54)	32.04 (1.04)	26.28 (1.55)	18.99 (1.52)	15.57 (1.38)
Week 6	55.44 (1.55)	61.20 (2.05)	73.44 (2.01)	79.74 (1.88)	7.12 (0.52)	7.81 (0.49)	30.51 (1.41)	28.44 (1.61)	19.17 (1.26)	15.93 (1.23)
Week 8	55.80 (1.66)	61.56 (2.05)	74.34 (2.23)	81.54 (1.91)	7.09 (0.55)	8.28 (0.46)	30.69 (1.22)	27.63 (1.51)	18.72 (1.41)	14.22 (1.25)

Note: Standard errors are given in parentheses.