



# Negative attitudes toward older adults: Subjective time to become older and “stereotype embodiment theory”-based intervention

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(Received 09 August 2022; Revised 09 September 2022; Accepted 12 September 2022)

## Abstract

Reducing negative attitudes toward older adults is an urgent issue. A previous study has conducted “stereotype embodiment theory”-based interventions (SET interventions) that present participants with the contents of SET and related empirical findings. I focus on the subjective time to become older (the perception of how long people feel it will be before they become old) as a mechanism for the effect of SET interventions. I make the SET intervention group and the control group in which the participants are presented with an irrelevant vignette. The data from 641 participants ( $M = 31.97$  years) were analyzed. Consequently, the SET intervention shortened the subjective time to become older and reduced negative attitudes toward older adults. When considering SET interventions, it would be useful to focus not only on the self-interested motives to avoid age discrimination but also on the subjective time to become older.

**Keywords:** negative attitudes; older adults; self-interested motives; subjective time

## Introduction

In various countries including Japan, negative attitudes held by young people toward older adults have been examined. For example, older adults are incompetent, outdated, and stubborn (Harada et al., 2004; Lytle et al., 2020) and such attitudes lead to lower mental health among older adults, such as less well-being and sexual expression (Syme & Cohn, 2021). Accordingly, reducing negative attitudes toward older adults is an urgent issue.

Meanwhile, the social group of older adults differs significantly from other discriminated groups such as racial/sexual minorities in that most people belong to it someday. Levy’s (2009) stereotype embodiment theory (SET) is useful for considering this point. SET assumes that old-age stereotypes are internalized throughout life and affect the self undesirably, such as lower cognitive/physical functions (Shimizu et al., 2021). Based on this, Shimizu et al. (2022b) conducted the “SET intervention,” in which the contents of SET and related empirical findings are presented to participants, and reduced anti-old attitudes. As a mechanism for the intervention’s effects, the authors focus on the motives to avoid age discrimination. Specifically, they show that not only the altruistic motives for the sake of older adults but also the self-interested motives to avoid undesirable effects on their own future were activated (Shimizu et al., 2022b).

## Objective

This study aims to investigate other possible mechanisms of SET interventions. Specifically, I focus on subjective time to become older (the perception of how long people feel it will be before they become old; Shimizu, 2021). The SET intervention may activate the perception that becoming an older person is not far in the future. This will lead the participants to perceive older adults as being closer to their ingroup rather than an outgroup (North & Fiske, 2012; Van Wicklin, 2020).

In this study, I make the SET intervention group and the control group in which participants are presented with an irrelevant vignette about the Internet. The hypothesis is that the SET intervention shortens subjective time to become older and reduces negative attitudes toward older adults.

## Methods

### Participants

Participants were recruited using CrowdWorks, a major crowdsourcing service in Japan. Participants were 720 Japanese, and those who answered incorrectly to the vignette reading check (see below;  $N = 74$ ) and who answered incorrectly to the item “Please choose the second from the right” ( $N = 6$ ) were excluded from the analysis (including duplicates). Consequently, the data used in the analysis consisted of  $N = 641$  (aged 18–39; 232 males and 409 females) with a mean age of 31.97 years ( $SD = 5.35$ ). Similar results to the main manuscript were obtained when analyzing data from all participants without screening (see Open Science Framework [OSF] repository, <https://osf.io/frhxq/>). This study was approved by the Ethics Committee of the University of Tokyo and was conducted in May 2022. Informed consent was obtained from all the participants.

### Procedure

Participants answered items on negative attitudes toward older adults (time 1). They were then randomly assigned to either the SET intervention group ( $N = 330$ ; 114 males and 216 females) or the control group ( $N = 311$ ; 118 males and 193 females). Participants carefully read the vignettes (see below) for each group. No time limit was set for reading the vignettes. After reading one of the vignettes, participants answered the following items: subjective time to become older, motives to avoid age discrimination (self-interested/altruistic), youth identity, and contact experience with older adults (quantitative/qualitative aspects). Then, participants responded to the items on negative attitudes toward older adults (time 2), the vignette reading check, and demographics.

### Vignette and reading check

For the SET intervention group, I used the vignette of Study 2 of Shimizu et al. (2022b). The vignette consisted of the contents of SET and related empirical findings (Levy et al., 2000; 2006; Westerhof et al., 2014). For the control group, I used the vignette of Shimizu et al. (2022b), which was based on Ikeda (2010). The full text of each vignette was posted on OSF.

For the vignette reading check, the SET intervention group answered the single item “We internalize discriminatory attitudes toward older adults throughout our lives and turn them against ourselves,” and the control group answered the single item “The media as a place where people can be active is called “participatory” media.” Each participant responded using “yes” or “no.” Only those participants who answered this item correctly (“yes” for both) were included in the analysis.

### Measurements

Negative attitudes toward older adults were measured by the Japanese version of the Fraboni Scale of Ageism (Harada et al., 2004), which consists of 14 items (5-point Likert scale), including “Many older

people are stingy and hoard their money and possessions.” The mean score was calculated ( $\alpha = .89$  for both times 1 and 2), with the higher score indicating the more negative attitudes.

Subjective time to become older was measured by two items (all of the following were 7-point Likert scale), including “Do you feel that you are far from being an older person?” The mean score was calculated ( $r = .88$ ,  $95\%CI = [.86, .90]$ ,  $p < .001$ ), with the higher score indicating the longer subjective time (Shimizu et al., 2022a).

Self-interested motives to avoid age discrimination were measured by the single item “Age discrimination should be avoided because it can negatively affect my future.” Altruistic motives to avoid age discrimination were measured by the single item “Age discrimination should be avoided because it can negatively affect older adults” (Shimizu et al., 2022b).

Youth identity was measured by the Japanese version of the Group Identification Scale (Uemura, 2001), which consists of seven items, including “Would you think it is accurate if you were described as a typical person of the youth?” The mean score was calculated ( $\alpha = .86$ ), with the higher score indicating the stronger youth identity.

Contact experience with older adults (quantitative aspect) was measured by the single item “Do you have much contact with older adults on a daily basis?” Contact experience (qualitative aspect) was measured by two items, including “When you have daily contact with older adults, do you feel that it is a friendly relationship?” The mean score was calculated ( $r = .81$ ,  $95\%CI = [.78, .83]$ ,  $p < .001$ ), with the higher score indicating the higher quality of contact experience (Shimizu et al., 2022c).

As demographic variables, participants were asked about their subjective wealth, age, and gender. Scale items, the data used in the analysis, the R scripts, and the histograms for each variable are posted on OSF.

## Results

Means, standard deviations, and correlation coefficients for each indicator are shown in Table 1. Participants’ age of the SET intervention group ( $M = 31.77$ ,  $SD = 5.48$ ) and control group ( $M = 32.17$ ,  $SD = 5.20$ ) did not differ significantly ( $t(639) = 0.96$ ,  $p = .34$ ,  $d = 0.08$ ). Meanwhile, a Welch’s  $t$ -test showed that the SET intervention group ( $M = 5.88$ ,  $SD = 1.27$ ) had higher self-interested motives than the control ( $M = 4.86$ ,  $SD = 1.39$ ;  $t(626) = 9.72$ ,  $p < .001$ ,  $d = 0.77$ ). This result was similar to the previous study (Shimizu et al., 2022b). Moreover, a Welch’s  $t$ -test showed that the SET intervention group ( $M = 3.48$ ,  $SD = 1.59$ ) had a shorter subjective time than the control ( $M = 4.00$ ,  $SD = 1.50$ ;  $t(639) = 4.27$ ,  $p < .001$ ,  $d = 0.34$ ). In sum, it suggested that SET interventions shortened participants’ subjective time to become older.

To examine the intervention’s effect, an analysis of the generalized linear mixed model (GLMM) was conducted; negative attitudes toward older adults were the dependent variables. The fixed factors of GLMM were the groups (SET intervention/control), the timings of the measurement (time 1/time 2), and interactions between these factors. The random effects were participants and participants’ subjective time to become older, youth identity, contact experience (quantitative/qualitative aspects), subjective wealth, age, and gender. Results showed a significant interaction between the groups and the timings ( $t(639) = 8.76$ ,  $p < .001$ ). Multiple comparisons revealed that negative attitudes were weaker in the SET intervention group at time 2 than at time 1 ( $t(639) = 13.97$ ,  $p < .001$ ). At time 2, negative attitudes were weaker in the SET intervention group than in the control ( $t(702) = 2.36$ ,  $p = .02$ ). Consequently, I believe that the SET intervention is effective in reducing anti-old attitudes.

A structural equation modeling was conducted with groups as the independent variable, negative attitudes toward older adults (time 2) as the dependent variable, and subjective time to become older as the mediating variable (Figure 1). I controlled for negative attitudes (time 1), youth identity, contact experience (quantitative/qualitative aspects), subjective wealth, age, and gender. The model showed a satisfactory fit of index (RMSEA  $< .001$ , AGFI  $> .999$ ), and the SET intervention group had a shorter subjective time to become older than the control ( $\beta = -.16$ ,  $p < .001$ ). The longer the subjective time, the

**Table 1.** Means, standard deviations, and correlation coefficients in each indicator

SET intervention group		<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1	Negative attitudes ( <i>t</i> 1)	2.76	0.68	—								
2	Negative attitudes ( <i>t</i> 2)	2.55	0.64	.88**	—							
3	Subjective time	3.48	1.59	.06	.08	—						
4	Self-interested motives	5.88	1.27	-.04	-.12*	-.17**	—					
5	Altruistic motives	4.59	1.87	-.20**	-.12*	.16**	.08	—				
6	Youth identity	3.68	1.04	-.02	-.05	.21**	.05	.07	—			
7	Contact (quantity)	3.69	1.71	-.22**	-.19**	-.11*	-.09	.06	.05	—		
8	Contact (quality)	4.70	1.10	-.60**	-.60**	-.05	.02	.07	.07	.28**	—	
9	Subjective wealth	3.52	1.28	-.07	-.08	.09	-.02	-.04	.12*	.04	.05	—
10	Age	31.77	5.48	-.05	-.02	-.31**	-.01	-.04	-.32**	.09	.05	-.04
Control group		<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1	Negative attitudes ( <i>t</i> 1)	2.71	0.65	—								
2	Negative attitudes ( <i>t</i> 2)	2.69	0.67	.95**	—							
3	Subjective time	4.00	1.50	.20**	.22**	—						
4	Self-interested motives	4.86	1.39	-.17**	-.19**	.03	—					
5	Altruistic motives	5.07	1.21	-.24**	-.26**	.11	.58**	—				
6	Youth identity	3.79	1.09	.02	.01	.30**	.08	.15**	—			
7	Contact (quantity)	3.48	1.73	-.11	-.12*	.00	.16**	.04	.07	—		
8	Contact (quality)	4.64	1.11	-.57**	-.57**	-.04	.22**	.24**	.07	.31**	—	
9	Subjective wealth	3.67	1.22	-.09	-.10	.11*	.03	.05	.21**	.06	.17**	—
10	Age	32.17	5.20	.01	.00	-.34**	-.01	-.07	-.35**	.06	.03	-.07

\**p* < .05;\*\**p* < .01.

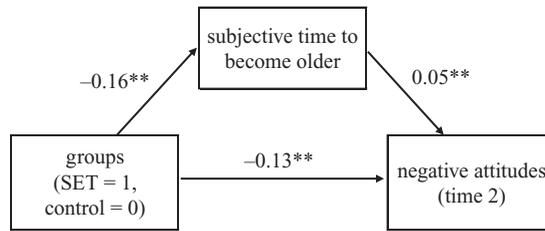


Figure 1. Results of a structural equation modeling (\*\* $p < .01$ ).

stronger the negative attitudes ( $\beta = .05, p = .007$ ). These findings suggested that the SET intervention shortened participants' subjective time to become older and reduced negative attitudes toward older adults: the hypothesis was supported.

## Discussion

In this study, I focused on subjective time to become older as a mechanism for the effect of SET interventions. The results showed that the subjective time to become older was shorter in the SET intervention group than the control. Moreover, the results of structural equation modeling suggested that the SET intervention shortened the subjective time to become older and reduced negative attitudes toward older adults. The perception that becoming older was in the not-too-distant future might lead to less anti-old attitudes (North & Fiske, 2012; Van Wicklin, 2020).

Despite the above findings, two major limitations exist. First, subjective time to become older was not measured prior to reading vignettes. Although this study showed that the subjective time was shorter in the SET intervention group than the control, I cannot determine whether this result was due to reading vignettes or sample bias. Second, I did not examine the effect of the subjective time on the duration of the intervention effect. Although the SET intervention is shown to be effective for about 1 week (Shimizu et al., 2022b), I cannot determine whether this is due to a shortened subjective time to become older. Therefore, future experiments should measure anti-old attitudes and the subjective time well after reading vignettes.

## Conclusions

In this study, I focus on subjective time to become older as a mechanism for the effects of SET interventions. SET interventions appeal to self-interested motives to avoid age discrimination (Shimizu et al., 2022b), but fail to sufficiently enhance the altruistic motives. Therefore, future research should improve the intervention to increase both self-interested/altruistic motives to avoid age discrimination. Meanwhile, participants' age in the previous study were diverse (Shimizu et al., 2022b), but the present study targeted younger adults aged 18–39. Since younger people have more anti-old attitudes than other generations (Foley et al., 2013), it is expected that the SET intervention will be used practically in educational settings.

**Data Availability Statement.** The data used in the analysis is posted on the Open Science Framework (OSF) repository (<https://osf.io/frhxq/>).

**Authorship Contributions.** Y.S. designed the study, conducted data gathering, performed statistical analyses, and wrote the article.

**Funding Statement.** This research was supported by JSPS KAKENHI (22J20303).

**Conflict of Interest.** The author declares none.

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**Cite this article:** Shimizu Y (2022). Negative attitudes toward older adults: Subjective time to become older and “stereotype embodiment theory”-based intervention. *Experimental Results*, *3*, e21, 1–9. <https://doi.org/10.1017/exp.2022.18>

# Peer Reviews

**Reviewing editor:** Dr. Massimo Grassi

Universita degli Studi di Padova Scuola di Psicologia, Department of General Psychology, via Venezia 8, Padova, Italy, 35131

Minor revisions requested.

doi:10.1017/exp.2022.18.pr1

## Review 1: Negative Attitudes Toward Older Adults: Subjective Time to Become Older and ‘Stereotype Embodiment Theory’-based Intervention

**Reviewer:** Alessia Rosi 

Date of review: 18 August 2022

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**Conflict of interest statement.** None

### Comment

Comments to the Author: In general, I find the idea motivating the study interesting. I have some comments on the paper that could improve the impact of the study.

In the abstract, information about subjects (n, age) should be added.

Overall, in both the introduction and methods, it is appreciated if the author adds more detail about some issues that in the present format of the manuscript are difficult to understand. For example, in the Introduction, the author should better specify the aim of the study. Moreover, I suggest better explaining the sentence on lines 35-36, as well as the SET (lines 41-42). Please, the author should also specify the context of the irrelevant vignettes (line 60).

In the method, I suggest putting more explanation about the intervention group and the control group (duration, trainer, etc).

Regarding the Results section, did the author check the equivalence of age and years of education between the intervention group and the control group?

In the discussion, more discussion about the results is needed, particularly regarding results of the structural equation modeling. Moreover, the findings of the study should be discussed in light of the existing literature.

### Score Card

#### Presentation



Is the article written in clear and proper English? (30%)

3/5

Is the data presented in the most useful manner? (40%)

2/5

Does the paper cite relevant and related articles appropriately? (30%)

3/5

## Context



Does the title suitably represent the article? (25%)

5/5

Does the abstract correctly embody the content of the article? (25%)

4/5

Does the introduction give appropriate context? (25%)

2/5

Is the objective of the experiment clearly defined? (25%)

2/5

## Analysis



Does the discussion adequately interpret the results presented? (40%)

2/5

Is the conclusion consistent with the results and discussion? (40%)

3/5

Are the limitations of the experiment as well as the contributions of the experiment clearly outlined? (20%)

4/5

## Review 2: Negative Attitudes Toward Older Adults: Subjective Time to Become Older and ‘Stereotype Embodiment Theory’-based Intervention

Reviewer: Dr. Giovanna Mioni 

University of Padua, Padova, Italy, 35122

Date of review: 07 September 2022

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**Conflict of interest statement.** no

### Comment

Comments to the Author: The authors addressed a very interesting topic concerning the negative attitudes held by young people toward older adults and the effect on older’ mental health.

The study is well designed and appropriate to address the research question.

Can the author report how many males and females are included in the SET and control groups?

### Score Card

#### Presentation



Is the article written in clear and proper English? (30%)

4/5

Is the data presented in the most useful manner? (40%)

3/5

Does the paper cite relevant and related articles appropriately? (30%)

4/5

#### Context



Does the title suitably represent the article? (25%)

4/5

Does the abstract correctly embody the content of the article? (25%)

4/5

Does the introduction give appropriate context? (25%)

4/5

Is the objective of the experiment clearly defined? (25%)

5/5

#### Analysis



Does the discussion adequately interpret the results presented? (40%)

5/5

Is the conclusion consistent with the results and discussion? (40%)

5/5

Are the limitations of the experiment as well as the contributions of the experiment clearly outlined? (20%)

5/5