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Age differences in preferences for emotionally-meaningful versus knowledge-related appeals

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Abstract: Socioemotional selectivity theory (SST), an influential life-span theory, suggests that older adults prefer persuasive messages that appeal to emotionally-meaningful goals over messages that appeal to knowledge-related goals, whereas younger adults do not show this preference. A mixed-factorial experiment was conducted to test whether older adults (≥ 65 years) differ from younger adults (25–45 years) in their preference for emotionally-meaningful appeals over knowledge-related appeals, when appeals are clearly developed in line with SST. For older adults we found the expected preference for emotionally-meaningful appeals for cancer centers but not for grocery stores and travel organizations. As expected, in most cases, younger adults did not show a preference. Implications for SST-based communication research and for practice are discussed.

Keywords: age differences, emotionally-meaningful appeals, knowledge-related appeals, older adults, socioemotional selectivity theory

1 Introduction

Socioemotional selectivity theory (SST) (e.g., Carstensen, Isaacowitz, and Charles, 1999), an influential life-span theory, outlines how the relative importance of goals changes as people age. SST distinguishes between emotionally-meaningful goals, which are directed at the regulation of emotion in the present moment, and knowledge-related goals, which are oriented toward gaining new knowledge and optimizing the future. As people age, they increasingly experience lifetime as limited, and consequently emotionally-meaningful goals are prioritized over knowledge-related goals in the goal hierarchy (e.g., Carstensen et al., 1999).

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Using SST, several scholars hypothesized that these age-related changes in goal hierarchy imply that older adults prefer persuasive messages that appeal to emotionally-meaningful goals over messages that appeal to knowledge-related goals, whereas younger adults do not show this preference (Drolet, Williams, and Lau-Gesk, 2007; Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot, van Reijmersdal, and Kleemans, 2015b; Williams and Drolet, 2005). However, these studies showed mixed findings regarding the age differences, potentially because the studies differed in how they defined and operationalized the appeals.

Therefore, the aim of the current study is to test whether the expected age differences are found when appeals are clearly developed in line with SST. The experiment tests whether older adults (≥ 65 years) indeed prefer emotionally-meaningful appeals over knowledge-related appeals in persuasive messages for three types of organizations, whereas younger adults (25–45 years) do not show such preference. In doing so, the study deepens our theoretical and empirical understanding of how changes in goal setting across the life span have consequences for responses to persuasive messages that appeal to these goals.

Applying SST in persuasive communication research is important because SST postulates age differences that may be vital for our ability to predict responses to persuasive messages. The changes in goal hierarchy – as described in SST – are considered an essential characteristic of aging that has found extensive empirical support in SST studies on, for instance, social network composition (e.g., Carstensen, 1995; Löckenhoff and Carstensen, 2004). In addition, communication research has shown that some changes in media preferences across the life span are consistent with SST (e.g., Bartsch, 2012; Mares, Bartsch, and Bonus, 2016; Mares and Sun, 2010). These findings raise the question whether the life-span development described by SST also translates into differential responses to persuasive messages. At first glance, SST may bear a resemblance to dual-process models widely used in persuasion research, such as the elaboration likelihood model (Petty and Cacioppo, 1986), that describe information processing by distinguishing between rational thinking and emotional processing. However, SST is fundamentally different since it is a theory of *motivation*, focusing on goal setting and goal pursuit (Giasson, Liao, and Carstensen, 2019). Thus SST not only provides predictions regarding age differences to communication research, but also invites communication scholars to investigate whether persuasive messages that appeal to goals that are prioritized in the goal hierarchy are preferred over messages that appeal to goals that are lower in the goal hierarchy.

The persuasive messages in the current study are developed in line with SST, by working with an operationalization of the appeals (van der Goot, Bol, and van Weert, 2019) that integrates formulations that are explicitly used in SST lit-

erature (Carstensen et al., 1999). An additional feature of this study is that, compared with previous persuasion research applying SST, it helps to understand the attractiveness of SST-based appeals in a wider variety of contexts. Previous studies that hypothesized age differences have particularly focused on consumer goods (Drolet et al., 2007; Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b; Williams and Drolet, 2005). Despite the mixed findings in these previous studies, the most recent SST-based persuasion study straightforwardly concluded that SST may have a limited applicability to advertising (Sudbury-Riley and Edgar, 2016). In response, we conducted an experiment that entails persuasive messages for a variety of organizations (grocery stores, cancer centers, and travel organizations), thus generating insight into whether SST-based predictions may apply to some persuasive contexts but not to others. Overall, the study does not only have implications for research in this field, but also has practical implications for communication with older adults, who are an important target group in our aging societies (United Nations, 2017) for persuasive messages in a wide variety of contexts, such as food (Moschis, 2017), health (World Health Organization, 2018), and leisure (Nimrod and Shrira, 2014).

Emotionally-meaningful versus knowledge-related appeals

The current study examines preferences for appeals that are clearly developed in line with SST. In a previous study (van der Goot et al., 2019), we developed a theoretically valid and reliable coding instrument, outlining three dimensions of emotionally-meaningful appeals (emotion regulation, optimizing the present, close social relationships) and three dimensions of knowledge-related appeals (knowledge acquisition, optimizing the future, novel social relationships).

The reason for this multidimensional approach in our operationalization of the appeals was that we observed that emotionally-meaningful versus knowledge-related goals, as described in SST-literature (e.g., Carstensen, Fung, and Charles, 2003; Carstensen et al., 1999; Löckenhoff and Carstensen, 2004), can be distinguished regarding three categories. First, the functional category: Emotionally-meaningful goals pertain to emotion regulation, that is, people aim to experience positive states, find meaning in life, gain emotional intimacy, establish feelings of social embeddedness, and avoid negative states (Carstensen et al., 1999). In contrast, knowledge-related goals refer to knowledge acquisition in the sense that people want to learn about the social and physical world (Carstensen et al., 1999) and want to pursue new information (Fung and Carstensen, 2003). Second, the time perspective: Whereas emotionally-meaningful goals are present-oriented (Löckenhoff and Carstensen, 2004) and related to satisfaction

in the moment (Carstensen et al., 1999), knowledge-related goals are focused on optimizing the future (Löckenhoff and Carstensen, 2004), preparedness (Carstensen et al., 1999), and expanding horizons (Carstensen et al., 2003). Third, the type of social relationships to which they pertain: Emotionally-meaningful goals are satisfied in emotionally gratifying close social relationships (Löckenhoff and Carstensen, 2004). In contrast, knowledge-related goals are aimed at establishing novel social relationships that could be helpful in the future (Löckenhoff and Carstensen, 2004). Translating these three categories as described in SST literature (i.e., functional category, time perspective, type of social relationship) to appeals in persuasive messages, we distinguished three dimensions of emotional-meaningful appeals (emotion regulation, optimizing the present, and close social relationships) and three dimensions of knowledge-related appeals (knowledge acquisition, optimizing the future, and novel social relationships). Each of these dimensions can be present --or absent -- in a persuasive message.

In our previous study (van der Goot et al., 2019), we used this dimensional structure to identify two complications in previous SST-based persuasion studies (Drolet et al., 2007; Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b; Williams and Drolet, 2005). First, the studies differed in the dimensions of emotionally-meaningful versus knowledge-related appeals they focused on. Second, the studies differed in how the persuasive messages appealed to SST goals. These differences in definitions and operationalizations of the appeals make it hard to compare the findings of the previous studies and most likely explain why these studies found mixed results. Essentially, the studies do not all pertain to the same type of appeals.

Consequently, we argued that for SST-based appeals it should be clear (1) which of the dimensions they focus on and (2) how the persuasive messages exactly appeal to the goals. In the current study, (1) the appeals focus on the functional category, that is, messages that appeal to emotion regulation are compared with messages that appeal to knowledge acquisition because the functional category describes the essence of the goals (i.e., what people strive for), and (2) the messages appeal to the goals very directly by communicating how the organization contributes to emotion regulation versus knowledge acquisition.

Differences between older and younger adults in preferences

Previous SST-based persuasion research has derived its expectations from two theoretical notions. First, the essential tenet in SST is that there are age-related changes in goal hierarchies: As people age, their perception of time left in life decreases, leading to an increased importance of emotionally-meaningful goals

(relative to knowledge-related goals) for older adults (e.g., Carstensen et al., 1999; Fung and Carstensen, 2003). An extensive body of empirical research has found age differences in social preferences and emotional experience that are in accordance with this theoretical notion (e.g., Carstensen, Fung, and Charles, 2003; Carstensen et al., 2011). Second, persuasion literature posits that people are generally more likely to appreciate messages that are relevant to their goals (e.g., Clary, Snyder, Ridge, Miene, and Haugen, 1994; Fung and Carstensen, 2003). These two notions led to the hypothesis that older adults would evaluate persuasive messages more favorably when they appeal to emotionally-meaningful (versus knowledge-related) goals (Drolet et al., 2007; Fung and Carstensen, 2003; Pour Mohammad and Drolet, 2019; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b; Williams and Drolet, 2005). This was contrasted with younger adults, who were expected to show heightened preference for messages pertaining to knowledge-related goals compared with emotionally-meaningful ones (Drolet et al., 2007; Williams and Drolet, 2005), or to not show a preference (Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b).

These studies have generated mixed findings. For older adults, some studies found the expected higher liking of emotionally-meaningful (versus knowledge-related) messages (Drolet et al., 2007; van der Goot et al., 2015b; Williams and Drolet, 2005); one study found the anticipated effect for one of the outcome measures (“forced choice”) but not for liking (Fung and Carstensen, 2003), whereas the most recent study actually showed the opposite, namely that older adults preferred knowledge-related over emotionally-meaningful appeals (Sudbury-Riley and Edgar, 2016). For younger adults, the findings were also inconclusive: They liked knowledge-related appeals more (Williams and Drolet, 2005), or in contrast they liked emotionally-meaningful (versus knowledge-related) messages more (van der Goot et al., 2015b; Sudbury-Riley and Edgar, 2016), or they did not show a preference (Fung and Carstensen, 2003), or their preference depended on product type (Drolet et al., 2007).

As said, we argue that these mixed findings are at least partially due to disparities between the studies in the definitions and operationalizations of the appeals. Consequently, we want to investigate whether age differences in preferences are apparent when the appeals are clearly in line with SST literature. In the present study, we focus on persuasive messages that appeal to emotion regulation versus knowledge acquisition. Moreover, in contrast to previous SST-based persuasion research that predominantly focused on consumer goods, this study examines whether the expected age-related differences occur for persuasive messages pertaining to a wider variety of contexts.

Using SST, we expect that older adults prefer messages with emotionally-meaningful appeals over messages with knowledge-related appeals. For

younger adults, some authors hypothesized no preference (Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b), and the empirical support for their preferences was very inconclusive. Therefore, we hypothesize that the younger group does not have a clear preference. We selected “forced choice” (in addition to “liking”) as a dependent variable to avoid a situation in which no clear preferences for emotionally-meaningful versus knowledge-related messages come to the fore (Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016). In sum, the following hypotheses are formulated:

H1: There is an interaction effect between age and type of appeal on liking, such that older adults like persuasive messages with emotionally-meaningful appeals more than persuasive messages with knowledge-related appeals, whereas younger adults like both types of messages equally.

H2: There is an interaction effect between age and type of appeal on forced choice, such that older adults are more likely to choose persuasive messages with emotionally-meaningful appeals than persuasive messages with knowledge-related appeals, whereas younger adults do not show a preference.

2 Method

Experimental design

The experiment had a $2 \times 2 \times 3$ mixed factorial design with age as between-subject factor (younger [25–45] versus older [≥ 65] adults) and appeal type (emotionally-meaningful versus knowledge-related) and context (organization type: grocery stores versus cancer centers versus travel organizations) as within-subject factors. Thus, all participants were exposed to the same six commercials. Ethical approval was given by the Institutional Review Board of our university.

Stimulus materials

The stimuli consisted of persuasive messages in the form of full-motion video commercials. For each organization type, we developed a commercial that appealed to emotion regulation, matched with one that appealed to knowledge acquisition. Our criteria for choosing organization types were that they should be equally relevant for younger as well as older adults, and that together they presented a wide thematic variation.

To find (USA-based) commercials that fulfilled these criteria, a research assistant coded commercials using a coding instrument that the authors had previously developed (van der Goot et al., 2019). Beforehand, the first author had trained the assistant in how to use the instrument. During the first round of coding, the assistant coded commercials available in the online database Ads of the World, in which commercials can be sought per so-called industry. To find emotionally-meaningful versus knowledge-related commercials, pertaining to a variety of contexts, we instructed the assistant to code ten commercials for each of five industries (i.e., education, electronics and technology, financial services, health and beauty, and public interest). This round did not lead to commercials suitable for this experiment. For the second round of coding, we instructed the assistant to search online, exploring a wider range of contexts, for commercials that appealed to emotion regulation versus knowledge acquisition, and that involved organization types equally relevant for older versus younger adults. Our evaluation of the 24 commercials that the assistant selected revealed that within the contexts of grocery stores, cancer centers, and travel organizations, we were likely to find suitable materials. For the third round of coding, we provided the assistant with specific search requests within these three contexts.

The six commercials that we subsequently selected were edited to ensure that they contained only the dimensions (emotion regulation versus knowledge acquisition) that we wanted to manipulate. Using the operationalization in the coding instrument (van der Goot et al., 2019), the messages appealed to emotion regulation when the following description was applicable: “The persuasive message communicates that the promoted product/organization/behavior contributes to emotion regulation. That is, the message communicates (explicitly or implicitly) that when you use this product/choose this organization/engage in this behavior, you will: experience positive states (you will feel good), and/or experience emotional meaning in life, and/or experience emotional intimacy, and/or experience feelings of social embeddedness, and/or avoid negative states.” The messages appealed to knowledge acquisition when the following operationalization was applicable: “The persuasive message communicates that the promoted product/organization/behavior contributes to knowledge acquisition. That is, the message communicates (explicitly or implicitly) that when you use this product/choose this organization/engage in this behavior, you will acquire new knowledge, and/or learn about new topics.” In addition, we ensured that the commercials were as comparable as possible in other aspects (e.g., duration, type of music, type of voice-over). Moreover, we removed brand names because participants’ preferences should not be based on specific brands. A description of the six commercials can be found in Appendix A. The commercials are available upon request from the authors.

Participants and procedure

Data for the experiment were collected through the USA-based online panel of the ISO-certified research company SSI. Participants received a reward from the research company. After giving informed consent, the participant's gender, age, and level of education were acquired for stratification purposes. A stratified sample was created in which gender and levels of education (lower versus higher) were equally represented. This procedure is in accordance with previous SST-based communication research (e.g., Fung and Carstensen, 2003), following the SST-assumption that the hypothesized age differences should hold across subgroups because perceived time in life is correlated with chronological age regardless of gender or education level or other sociodemographic variables (p. 165). This type of research indeed found that such other variables did not impact preference for persuasive messages with emotionally-meaningful versus knowledge-related appeals (Fung and Carstensen, 2003) or emotional experience (Carstensen et al., 2011). In our study, the younger age group consisted of participants aged between 25 and 45 years, and the older age group consisted of participants aged 65 years and older. To create two clearly distinguishable age groups, middle-aged participants (46–64 years) were not invited (for a similar stratification procedure and similar age groups, see Nguyen et al., 2017).

Participants were asked to watch six commercials, which were introduced per organization type. The introduction read: “Grocery stores make commercials to convince you to come to their stores [*Cancer centers* cure patients and do research. They make commercials to convince you to choose their center for treatment or donation. *Travel organizations* make commercials to convince you to book your trip with them]. You will see two commercials as examples of how grocery stores [*cancer centers/travel organizations*] communicate with you. We slightly edited the commercials to remove the names of the specific stores [*centers/organizations*]. After each commercial you will be asked to respond to a few statements. After the two commercials you will be asked which of the two commercials you liked better.”

After each commercial, manipulation check questions were presented, and liking was assessed. Forced choice was measured after each pair of commercials. The three pairs were presented in random order. Within each of the three pairs, the two commercials were presented in random order as well. After the six commercials, relevance of the organization types and belongingness to the target group of the organizations were measured. Furthermore, we posed an open-ended question, asking how the participants experienced the study including the videos. At the end of the experiment, participants were debriefed and thanked.

Measures

All measures were assessed on 7-point semantic differential scales, ranging from “strongly disagree” to “strongly agree”, unless indicated otherwise.

Liking. For each commercial, participants provided their answer to the statement “Please indicate how much you like the commercial you have just seen” on a 7-point scale ranging from “totally dislike” to “totally like” (van der Goot, van Reijmersdal, and Kleemans, 2015a).

Forced choice. For each pair of commercials, participants were asked to indicate which of the two they liked better (Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016). For cancer centers, the question read: “You just saw two commercials of cancer centers. Which of the two commercials do you like better? We are interested in your opinion about the type of commercial, not in your opinion about the specific center or treatments that are shown.”

Manipulation check. Based on the previously developed coding instrument (van der Goot et al., 2019), the extent to which the commercial was experienced as appealing to emotion regulation was measured using the following five items: “This commercial communicates that if I choose this [grocery store/cancer center/travel organization], I will: feel good; experience emotional meaning in life; experience emotional intimacy; experience feelings of social embeddedness; avoid negative states”. Based on the coding instrument, the extent to which the commercial was experienced as appealing to knowledge acquisition was measured using two items: “This commercial communicates that if I choose this [grocery store/cancer center/travel organization], I will: acquire new knowledge; learn about new topics”. Confirmatory factor analyses (CFAs) with residual covariances added resulted in an overall satisfactory model fit for the expected factor structure of the manipulation check (see Appendix B). The five emotion-regulation items were averaged into mean scales ($\alpha_{\text{grocery stores_emo commercial}} = .930$; $\alpha_{\text{grocery stores_knowl commercial}} = .936$; $\alpha_{\text{cancer centers_emo commercial}} = .908$; $\alpha_{\text{cancer centers_knowl commercial}} = .939$; $\alpha_{\text{travel_emo commercial}} = .918$; $\alpha_{\text{travel_knowl commercial}} = .921$), as well as the two knowledge-acquisition items ($\alpha_{\text{grocery stores_emo commercial}} = .931$; $\alpha_{\text{grocery stores_knowl commercial}} = .905$; $\alpha_{\text{cancer centers_emo commercial}} = .928$; $\alpha_{\text{cancer centers_knowl commercial}} = .929$; $\alpha_{\text{travel_emo commercial}} = .920$; $\alpha_{\text{travel_knowl commercial}} = .910$).

Additional measures

Relevance. For each organization type, relevance was assessed using three items. “For me, [grocery stores/cancer centers (for treatment or donation)/traveling and holidays] are relevant, important, interesting” (Zaichkowsky, 1994). The

three items were averaged into a mean scale for each organization type ($\alpha_{\text{grocery stores}} = .768$; $\alpha_{\text{cancer centers}} = .928$; $\alpha_{\text{travel organizations}} = .875$).

Target group. For each organization type, belongingness to the target group was assessed using one item: “Please indicate to what extent you see yourself as belonging to the target group of these organizations: I belong to the target group of cancer centers (for treatment and donation)”.

Analysis

To check for successful manipulation, we conducted two repeated-measures analyses of variance (ANOVAs) with appeal type and organization type as repeated measures, and as dependent variables 1) the extent to which the commercial was experienced as appealing to emotion regulation and 2) the extent to which the commercial was experienced as appealing to knowledge acquisition. To correct for significant deviations from sphericity, Huynh-Feldt estimates were reported for the repeated ANOVA.

To test the first hypothesis, we conducted a mixed ANOVA with age as between-subjects factor, appeal type and organization type as repeated measures (i.e., within-subjects factors), belonging to the target group of travel organizations as covariate (see section on sample characteristics below), and liking as continuous dependent variable. To correct for significant deviations from sphericity, Huynh-Feldt estimates were reported for the mixed ANOVA.

To test the second hypothesis, we performed a generalized estimating equations (GEE) analysis with age as between-subjects factor, organization type as within-subjects factor, belonging to the target group of travel organizations as covariate (see section on sample characteristics below), and forced choice as binary dependent variable. GEE extends multivariate regression analyses to a repeated-measures design, and is especially suitable for analyses including binary outcomes and time-independent covariates (Nagelhout et al., 2015; Williamson, Bangdiwala, Marshall, and Waller, 1996). All variables were standardized prior to adding them to the GEE model. In case of significant interaction effects, z-test statistics with Bonferroni correction were performed to compare column proportions. The datasets are available upon request from the authors.

3 Results

Sample characteristics

In total, 557 respondents filled out the questionnaire. Questionnaires that were stopped before all videos were watched ($n = 106$) and questionnaires that were completed in fewer seconds than the duration of the six commercials plus two minutes to fill out the survey ($358 \text{ seconds} + 120 \text{ seconds} = 476 \text{ seconds}$) ($n = 16$) were excluded. Thus, the final sample consisted of 435 participants.

This sample was composed of 209 younger adults ($M_{\text{age}} = 34.96$, $SD_{\text{age}} = 5.55$, range = 25–45, 50.7 % male) and 226 older adults ($M_{\text{age}} = 71.04$, $SD_{\text{age}} = 5.07$, range = 65–99, 49.1 % male). Younger and older adults in our sample had equal levels of education (50.7 % and 50.9 %, respectively, had completed higher levels of education). Related to the three organization types used for our stimulus material, younger and older adults did not differ in their perceived relevance of grocery stores: $F(1, 433) = 0.19$, $p = .660$, $\eta_p^2 = .00$; cancer centers: $F(1, 433) = 1.00$, $p = .317$, $\eta_p^2 = .00$; and travel organizations: $F(1, 433) = 0.04$, $p = .838$, $\eta_p^2 = .00$. Moreover, the age groups did not differ in their perception of belonging to the target groups of grocery stores: $F(1, 433) = 0.01$, $p = .936$, $\eta_p^2 = .00$; or cancer centers: $F(1, 433) = 0.66$, $p = .416$, $\eta_p^2 = .00$. However, they did differ in their perception of belonging to the target group of travel organizations, $F(1, 433) = 6.61$, $p = .010$, $\eta_p^2 = .02$, with younger adults feeling more strongly that they belong to this target group ($M = 4.61$, $SD = 1.96$) than older adults ($M = 4.13$, $SD = 1.93$). Therefore, belonging to the target group of travel organizations was considered a covariate when testing our hypotheses.

Manipulation check

Commercials that appealed to emotion regulation were, on average, perceived as more appealing to emotion regulation ($M = 5.05$, $SE = .06$) than commercials that appealed to knowledge acquisition ($M = 4.69$, $SE = .06$), $F(1, 434) = 100.28$, $p < .001$, $\eta_p^2 = .19$. This was also the case for each organization type separately ($M_{\text{grocery stores_emo commercial}} = 4.77$, $SE = .07$ versus $M_{\text{grocery stores_knowl commercial}} = 4.39$, $SE = .08$, $p < .001$; $M_{\text{cancer centers_emo commercial}} = 5.18$, $SE = .06$ versus $M_{\text{cancer centers_knowl commercial}} = 4.59$, $SE = .08$, $p < .001$; $M_{\text{travel organizations_emo commercial}} = 5.21$, $SE = .07$ versus $M_{\text{cancer centers_knowl commercial}} = 5.10$, $SE = .07$, $p = .020$).

In contrast, commercials that appealed to knowledge acquisition were, on average, perceived as more appealing to knowledge acquisition ($M = 5.32$, $SE =$

.06) than commercials that appealed to emotion regulation ($M = 4.94$, $SE = .07$), $F(1, 434) = 73.30$, $p < .001$, $\eta_p^2 = .14$. This was also the case for each organization type separately ($M_{\text{grocery stores_emo commercial}} = 4.80$, $SE = .08$ versus $M_{\text{grocery stores_knowl commercial}} = 5.28$; $SE = .07$, $p < .001$; $M_{\text{cancer centers_emo commercial}} = 5.17$, $SE = .07$ versus $M_{\text{cancer centers_knowl commercial}} = 5.33$, $SE = .07$, $p = .010$; $M_{\text{travel organizations_emo commercial}} = 4.86$, $SE = .08$ versus $M_{\text{cancer centers_knowl commercial}} = 5.33$, $SE = .07$, $p < .001$). The manipulation can thus be considered successful.

Effects on liking

Our hypothesized interaction effect between age and appeal type on liking (H1) was not significant, $F(1, 432) = 0.07$, $p = .792$, $\eta_p^2 = .00$. However, a significant three-way interaction between age, appeal type, and organization type was revealed, $F(1.85, 797.11) = 4.05$, $p = .021$, $\eta_p^2 = .01$, suggesting that the interaction between age and appeal type on liking differed for organization type. Simple effects analysis with Bonferroni correction revealed significant age \times appeal type interactions for the different organization types. This analysis showed that, for older adults, there was a significantly higher liking of the emotionally-meaningful appeal ($M = 5.57$, $SE = .09$) over the knowledge-related appeal ($M = 5.02$, $SE = .10$, *mean diff.* = 0.55 , $SE = .11$, $p < .001$) with regard to cancer centers. However, with regard to grocery stores, there was a significantly higher liking of the knowledge-related appeal ($M = 5.34$, $SE = 0.10$) over the emotionally-meaningful appeal ($M = 5.04$, $SE = .10$, *mean diff.* = -0.30 , $SE = .11$, $p = .005$), and for travel organizations, older adults did not display a difference in liking of the emotionally-meaningful ($M = 5.64$, $SE = .09$) over the knowledge-related appeal ($M = 5.66$, $SE = .09$, *mean diff.* = -0.02 , $SE = .08$, $p = .829$).

For younger adults, there was also a significantly higher liking of the emotionally-meaningful ($M = 5.59$, $SE = 0.10$) over the knowledge-related appeal ($M = 5.37$, $SE = .11$, *mean diff.* = 0.22 , $SE = .11$, $p = .045$) with regard to cancer centers. For grocery stores and travel organizations, younger adults showed no difference in liking of emotionally-meaningful appeals ($M_{\text{grocery stores}} = 5.53$, $SE = .11$; $M_{\text{travel organizations}} = 5.59$, $SE = .09$) versus knowledge-related appeals ($M_{\text{grocery stores}} = 5.60$, $SE = .10$, *mean diff.* = -0.07 , $SE = .11$, $p = .542$; $M_{\text{travel organizations}} = 5.58$, $SE = .09$, *mean diff.* = 0.01 , $SE = .09$, $p = .908$).

With regard to cancer centers, the difference in liking the emotionally-meaningful versus the knowledge-related appeal was significantly larger for older adults than for younger adults $F(1, 433) = 4.41$, $p = .036$, $\eta_p^2 = .01$. This age difference was not found with regard to grocery stores, $F(1, 433) = 2.12$, $p = .146$, $\eta_p^2 = .01$, and travel organizations, $F(1, 433) = 0.05$, $p = .822$, $\eta_p^2 = .00$.

Table 1: Mixed analysis of variance (ANOVA) and descriptive statistics for liking.

| | <i>F</i> | <i>df</i> _{M,R} | <i>p</i> | η_p^2 |
|--|----------|--------------------------|----------|------------|
| Appeal main effect | 0.53 | 1, 432 | .468 | .00 |
| Age main effect ^a | 2.60 | 1, 432 | .107 | .01 |
| Organization main effect | 4.60 | 1.95, 840.41 | .011 | .01 |
| Appeal × age interaction effect | 0.07 | 1, 432 | .792 | .00 |
| Appeal × organization interaction effect | 1.57 | 1.85, 797.11 | .210 | .00 |
| Age × organization interaction effect | 8.50 | 1.95, 840.41 | < .001 | .02 |
| Appeal × age × organization interaction effect | 4.05 | 1.85, 797.11 | .021 | .01 |

| Descriptive statistics | Appeal | | | |
|------------------------|-----------|-----------|-----------|-----------|
| | Emotional | | Knowledge | |
| | <i>M</i> | <i>SE</i> | <i>M</i> | <i>SE</i> |
| Grocery stores | 5.29 | .07 | 5.47 | .07 |
| Younger adults | 5.53 | .11 | 5.60 | .10 |
| Older adults | 5.04 | .10 | 5.34** | .10 |
| Cancer centers | 5.58 | .07 | 5.20 | .08 |
| Younger adults | 5.59 | .10 | 5.37* | .11 |
| Older adults | 5.57 | .09 | 5.02*** | .10 |
| Travel organizations | 5.62 | .06 | 5.62 | .06 |
| Younger adults | 5.59 | .09 | 5.58 | .09 |
| Older adults | 5.64 | .09 | 5.66 | .09 |

Note. ^aTest of between-subject effects. Asterisks indicate significant differences between emotionally-meaningful and knowledge-related appeals within a row.

* $p < .05$. ** $p < .01$. *** $p < .001$.

These findings partially support H1, as older adults showed a higher liking of the emotionally-meaningful appeal than the knowledge-related appeal regarding cancer centers. However, for grocery stores and travel organizations, they did not express the expected preference for emotionally-meaningful appeals. For two organization types (grocery stores and travel organizations), younger adults did not show a heightened liking for one of the two types of appeals, which is in line with H1. However, younger adults liked the emotionally-meaningful appeal more than the knowledge-related appeal regarding cancer centers. The findings are presented in Table 1 and visualized in Figure 1.

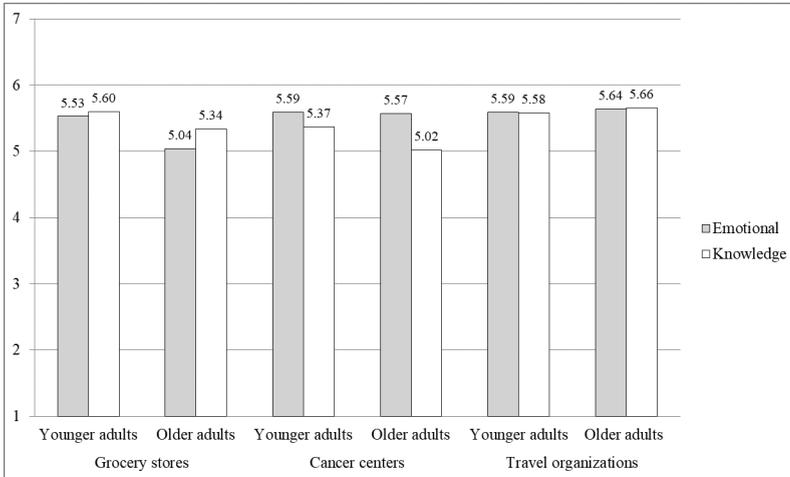


Figure 1: Visualization of the three-way interaction between age, appeal type, and organization type on liking (measured on a scale from 1 = “totally dislike” to 7 = “totally like”).

Effects on forced choice

Our hypothesized effect of age on forced choice (H2) was also not significant, Wald $\chi^2(1) = 0.67, p = .413$. However, we revealed a significant two-way interaction between age and organization type, Wald $\chi^2(2) = 11.99, p = .002$. For older adults, Z-score statistics with Bonferroni correction showed an overall significant relationship between organization type and forced choice, $\chi^2(2) = 29.83, p < .001$. For cancer centers, older adults chose an emotionally-meaningful appeal (62.8%) significantly more often compared to a knowledge-related appeal (37.2%). However, for grocery stores, older adults chose the knowledge-related appeal (62.4%) significantly more often than the emotionally-meaningful appeal (37.6%), whereas for travel organizations, older adults did not show a clear preference for either the emotionally-meaningful appeal (46.0%) or the knowledge-related appeal (54.0%).

For younger adults, we also found an overall significant relationship between organization type and forced choice, $\chi^2(2) = 6.14, p = .046$. For grocery stores, similarly to older adults, younger adults chose the knowledge-related appeal (55.0%) significantly more often than the emotionally-meaningful appeal (45.0%). For cancer centers and travel organizations, younger adults did not display a preference for either emotionally-meaningful (cancer: 52.6%; travel: 56.9%) or knowledge-related appeals (cancer: 47.4%; travel: 43.1%).

Table 2: Generalized estimating equations (GEE) and descriptive statistics for forced choice.

| | Wald χ^2 | df | p |
|--|---------------|-----------|-----------|
| Age main effect | 0.67 | 1 | .413 |
| Organization main effect | 23.46 | 2 | < .001 |
| Age \times organization interaction effect | 11.99 | 2 | .002 |
| Descriptive statistics | | Appeal | |
| | | Emotional | Knowledge |
| | % | % | |
| Grocery stores | 41.1 | 58.9 | |
| Younger adults | 45.0 | 55.0* | |
| Older adults | 37.6 | 62.4*** | |
| Cancer centers | 57.9 | 42.1*** | |
| Younger adults | 52.6 | 47.4 | |
| Older adults | 62.8 | 37.2*** | |
| Travel organizations | 51.3 | 48.7 | |
| Younger adults | 56.9 | 43.1 | |
| Older adults | 46.0 | 54.0 | |

Note. Asterisks indicate significant differences between emotionally-meaningful and knowledge-related appeals within a row.

* $p < .05$. *** $p < .001$.

The difference in choice for the emotionally-meaningful versus the knowledge-related appeal was significantly larger for older adults than for younger adults with regard to cancer centers, Wald $\chi^2(1) = 5.23$, $p = .022$. For travel organizations, the difference in choice for the knowledge-related versus the emotionally-meaningful appeal was significantly larger for younger adults than for older adults, Wald $\chi^2(1) = 4.90$, $p = .027$. This age difference was not found with regard to grocery stores, Wald $\chi^2(1) = 2.50$, $p = .114$.

Thus, similarly to H1, H2 was confirmed for one of the three organization types (cancer centers) for older adults, as they chose the emotionally-meaningful appeal as the one they liked most. For younger adults, H2 was confirmed for two out of three organization types (cancer centers and travel organizations), as they did not show a preference for either type of appeal there. The findings are displayed in Table 2 and visualized in Figure 2.

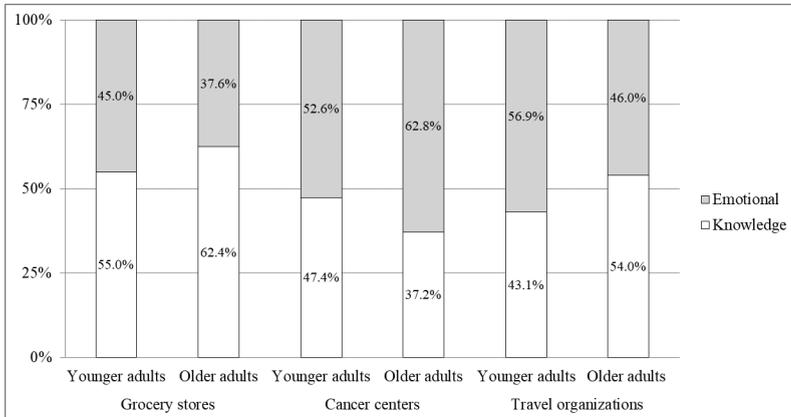


Figure 2: Visualization of the two-way interaction between age and organization type on forced choice (represented in percentages).

4 Discussion

SST (e.g., Carstensen et al., 1999), combined with the notion formulated in persuasion literature that media users prefer goal-relevant messages (e.g., Fung and Carstensen, 2003), leads to the expectation that older adults prefer messages with emotionally-meaningful appeals over messages with knowledge-related appeals, whereas younger adults do not show this preference. However, previous studies (Drolet et al., 2007; Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b; Williams and Drolet, 2005) have shown mixed findings regarding these age differences, potentially because the studies differed in how they defined these appeals. Therefore, the aim of the current study was to test whether the expected age differences are found when appeals are clearly developed in line with SST and are applied across different contexts.

The study revealed that for cancer centers, older adults showed the expected preference of emotionally-meaningful over knowledge-related appeals, whereas for younger adults this preference was smaller (on the liking measure) or absent (on the forced-choice measure). For the other two organization types, older adults did not show the expected preference for emotionally-meaningful appeals, whereas younger adults – in line with the prediction – showed no preference in most cases (except for a preference for knowledge-related appeals for grocery stores on the forced-choice measure). However, although the preference for emotionally-meaningful over knowledge-related appeals depended significantly on

age and organization type, the overall difference was small, so the effects should not be overinterpreted.

Implications for future research

The present study has several implications for research in this field. The fact that the current study (using appeals clearly based on SST) generated mixed findings, as did previous SST-based persuasion research, implies that age-related differences in goal hierarchy do not straightforwardly translate into age-related differences in preferences for appeals in persuasive messages in all types of contexts. Consequently, the current study indicates that future persuasion research that tests hypotheses derived from SST should take the following issues into account.

First, although we have to be cautious in drawing conclusions regarding organization types separately, the findings suggest that context matters: The results for cancer centers were in line with the prediction, while the ones for grocery stores and travel organizations were not. This corresponds with the fact that previous SST-based persuasion research, which predominantly focused on consumer goods, did not find clear age differences either. The emotional sensitivity of the cancer context may explain why we found the predicted preference of emotionally-meaningful over knowledge-related appeals for older adults here, and not in the less sensitive contexts of food and leisure. Previous studies into cancer-related communication have shown that emotional gratification and support are particularly important for older, compared to younger, adults. For instance, research has shown that older adults who were satisfied with the emotional support from a cancer website recalled more information than older adults who were not satisfied with the emotional support from the website, whereas younger adults did not show this bias (Bol et al., 2014). In contrast, in low-involvement contexts such as grocery stores, travel organizations, and consumer goods, the change in goal hierarchy may not be as relevant. In sum, based on our findings, we suggest that age-related differences in goal priorities may only translate to differential preferences for emotionally-meaningful versus knowledge-related appeals when persuasive messages pertain to an emotionally sensitive context such as cancer. Future research is needed to provide more empirical support for this argumentation. This research also needs to explore the additional possibility that – in the context of cancer centers – older adults may be more inclined than younger adults to place the knowledge component in the hands of medical specialists, which could contribute to even more prioritization of emotionally-meaningful goals in the goal hierarchy of ageing individuals.

Second, as the present study aimed to test the effects of appeals that were clearly developed in line with SST, it has implications for the design of persuasive messages in future SST-based communication research. We opted to focus on the functional category, that is, we compared messages that appealed to emotion regulation with messages that appealed to knowledge acquisition. Thus, the current operationalization of the appeals differed from operationalizations in previous SST-based persuasion research (Drolet et al., 2007; Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; van der Goot et al., 2015b; Williams and Drolet, 2005), in which some of the appeals were similar to (not SST-based) emotional and rational appeals as defined in the wider domain of communication research (e.g., Kneer, Hemme, and Bente, 2011; Nabi, 2015; Ryffel and Wirth, 2016). In the pursuit of answering the question how changes in goal setting across the life span (as described by SST) have consequences for responses to persuasive messages, we deem it important to continue examining the effects of appeals that are clearly SST-based. A suggestion on how to design future SST-based appeals is to not focus solely on one of the three categories as the current study did. Potentially, age-related differences in responses are more pronounced when messages appeal to more than one dimension of the goals. Particularly, SST postulates that knowledge acquisition that contributes to *optimizing the future* becomes less important as people age. Therefore, age effects may be larger when the second category, the time perspective, is also addressed in the persuasive messages. That is, emotionally-meaningful messages that appeal to (1) emotion regulation for (2) optimizing the present should be compared with knowledge-related messages that appeal to (1) knowledge acquisition for (2) optimizing the future. Such research will provide additional insight into whether messages that appeal to goals that are prioritized in the goal hierarchy are preferred over messages appealing to goals lower in the hierarchy. In such continuation of this line of research, it remains important that scholars explicitly state which of the categories they manipulate in their persuasive messages. In addition, SST-based communication research that investigates how life-span development in goal setting impacts media content selection and media experiences (e.g., Hofer, Burkhard, and Allemann, 2015; Mares, Bartsch, and Bonus, 2016; Mares and Sun, 2010) can benefit from our operationalization, specifically by attending to the dimensional structure.

Implications for practice

For communication professionals, this study seems to suggest that whether emotionally-meaningful (versus knowledge-related) appeals should be the preferred option in communication with older target groups depends on the context that

the communication pertains to. Whereas in an emotionally sensitive context such as cancer emotionally-meaningful appeals may be particularly attractive for aging individuals, this may be less applicable to low-involvement contexts such as food and leisure. However, regardless of context, opting for messages that appeal to either emotionally-meaningful or knowledge-related goals seems to be a safe choice, generating high appreciation among older as well as younger audience members. The persuasive messages in this study were designed to appeal directly to the SST-goals, and the liking scores were high for all six commercials. The appreciation was also apparent in the answers to the open-ended question that we posed in the debriefing. Participants stated, for instance: “I thought each of these commercials was excellent. They were thoughtful and meaningful, and this is how commercials should be”; “Loved these commercials; way better than the usual”; and “The commercials were good quality and very interesting, different than what you see all the time”. Although it may be expected that older adults differ from younger adults in preferences for certain types of content or audiovisual production features in commercials (e.g., van der Goot et al., 2015a), the current findings seem to suggest that appealing to fundamental goals in life is attractive for any age group.

Limitations

The present study also has limitations. First, working with an operationalization of the appeals (van der Goot et al., 2019) that was based on formulations that are explicitly used in SST literature (Carstensen et al., 1999), we defined ‘emotion regulation’ as experiencing positive states (feeling good), emotional meaning in life, emotional intimacy, feelings of social embeddedness, and/or avoiding negative states (Carstensen et al., 1999, p. 166). However, SST-related communication research investigating media preferences and experiences has made a distinction between hedonic well-being, that is, the presence of positive affect and absence of negative affect, and meaningfulness or eudaimonic well-being, that is, the fulfillment that one experiences when perceiving insights regarding life purpose, life meanings, and the feelings of flourishing that accompany living a life that embodies virtue (Hofer, Allemand, and Martin, 2014; Oliver and Raney, 2011; Wirth, Hofer, and Schramm, 2012). Future research is called for to examine age differences in the effects of persuasive messages that appeal to hedonic versus eudaimonic well-being.

Second, with the use of full-motion video commercials (instead of text-based materials as used in Drolet et al., 2007; Fung and Carstensen, 2003; Sudbury-Riley and Edgar, 2016; Williams and Drolet, 2005), we intended to increase the ecolog-

ical validity of the study. However, one may alternatively suggest that text-based material is the preferred option because it enables cleaner manipulations of the appeals. We do recommend future research in this field to (also) continue to use full-motion commercials in order to generate insights that have value for both research and practice.

5 Conclusion

To conclude, the present study aimed at investigating whether age differences in preferences are apparent when emotionally-meaningful versus knowledge-related appeals are clearly defined in line with SST literature. For older adults, we found the expected preference for emotionally-meaningful over knowledge-related appeals for cancer centers but not for grocery stores and travel organizations. As expected, in most cases, younger adults did not show a preference. The findings seem to imply that context matters: Age-related changes in goal hierarchy may only translate to older adults' preference for emotionally-meaningful over knowledge-related appeals when persuasive messages pertain to an emotionally sensitive context such as cancer. For practitioners, the high level of appreciation for the commercials in this study indicates that developing commercials that clearly appeal to life goals are an interesting opportunity, since they are attractive for older adults without putting off younger audiences.

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Appendix A: Description of the six commercials

| | Emotionally-meaningful appeals | Knowledge-related appeals |
|----------------------|---|--|
| Grocery stores | <p><i>Visuals:</i> Hands preparing food; washing dishes.</p> <p><i>Voice-over:</i> What if the choices in the grocery store could mean something more. Let's make our tiny choices add up to something bigger.</p> <p><i>Written text:</i> Protect a pollinator. Save a fish. Arrange some flowers.</p> <p>Duration: 1:20</p> | <p><i>Visuals:</i> Hands preparing food on grill.</p> <p><i>Voice-over:</i> How to grill with chef Lesli. Remove meat from fridge at least 20 minutes before grilling. Heat grill at least 10 minutes before.</p> <p><i>Written text:</i> How to grill with chef Lesli. Remove meat from fridge.</p> <p>Duration: 1:02</p> |
| Cancer centers | <p><i>Images:</i> Wife treated for cancer.</p> <p><i>Voice-over:</i> Being diagnosed with cancer is like being struck by lightning. We stay with you throughout the storm.</p> <p>Duration: 0:56</p> | <p><i>Visuals:</i> Cancer cells developing.</p> <p><i>Voice-over:</i> We revolutionized treatment of leukemia. We have learned how to target cancer cells without harming healthy cells.</p> <p>Duration: 0:42</p> |
| Travel organizations | <p><i>Visuals:</i> People in nature.</p> <p><i>Voice-over:</i> Somehow, we feel ourselves trapped in a world of comfort zones. But in the moment when we finally look up, we see that there is an easy way out. By travelling to a place where there is no fear of missing out.</p> <p>Duration: 1:01</p> | <p><i>Visuals:</i> People in nature.</p> <p><i>Voice-over:</i> We want to learn, we want to know. We are curious, we explore. By travelling, we gain so many answers. By travelling, we gain so many insights into what nature and history have to offer.</p> <p>Duration: 0:56</p> |

Note. Visuals, voice-over, written text: excerpts of visuals, voice-over and written text to clarify how the appeal was communicated in the commercial. Duration: minutes: seconds.

Appendix B: Confirmatory factor analyses for the manipulation check measurement

Goodness of overall model fit of confirmatory factor analyses to assess factor validity of the manipulation check.

| | CHISQ | df | RMSEA [90 % CI] |
|---|--------|----|-------------------|
| Commercial A: Grocery stores – emotional | | | |
| Hypothesized factor structure | 116.06 | 13 | .135 [.113, .158] |
| Additional residual covariance Item 1 – Item 3 | 55.83 | 12 | .092 [.068, .117] |
| Additional residual covariance Item 1 – Item 5 | 44.82 | 11 | .084 [.059, .111] |
| Additional residual covariance Item 4 – Item 5 | 34.00 | 10 | .074 [.048, .103] |
| Commercial B: Grocery stores – knowledge | | | |
| Hypothesized factor structure | 256.13 | 13 | .208 [.186, .230] |
| Additional residual covariance Item 1 – Item 3 | 221.25 | 12 | .200 [.178, .224] |
| Additional residual covariance Item 1 – Item 4 | 165.81 | 11 | .180 [.156, .205] |
| Additional residual covariance Item 3 – Item 5 | 156.65 | 10 | .184 [.159, .210] |
| Commercial C: Cancer centers – emotional | | | |
| Hypothesized factor structure | 90.68 | 13 | .117 [.095, .141] |
| Additional residual covariance Item 1 – Item 2 | 65.98 | 12 | .102 [.079, .126] |
| Additional residual covariance Item 1 – Item 5 | 33.54 | 11 | .069 [.043, .096] |
| Additional residual covariance Item 4 – Item 5 | 21.50 | 10 | .051 [.020, .082] |
| Commercial D: Cancer centers – knowledge | | | |
| Hypothesized factor structure | 78.94 | 13 | .108 [.086, .132] |
| Additional residual covariance Item 3 – Item 4 | 49.99 | 12 | .085 [.062, .111] |
| Additional residual covariance Item 2 – Item 5 | 24.39 | 11 | .053 [.024, .081] |
| Additional residual covariance Item 4 – Item 5 | 14.80 | 10 | .033 [.000, .067] |
| Commercial E: Travel organizations – emotional | | | |
| Hypothesized factor structure | 163.85 | 13 | .164 [.142, .186] |
| Additional residual covariance Item 1 – Item 2 | 68.76 | 12 | .104 [.081, .129] |
| Additional residual covariance Item 2 – Item 3 | 46.17 | 11 | .086 [.061, .112] |
| Additional residual covariance Item 1 – Item 4 | 36.91 | 10 | .079 [.053, .107] |
| Commercial F: Travel organizations – knowledge | | | |
| Hypothesized factor structure | 111.22 | 13 | .132 [.110, .155] |
| Additional residual covariance Item 1 – Item 2 | 51.28 | 12 | .087 [.063, .112] |
| Additional residual covariance Item 3 – Item 4 | 36.82 | 11 | .074 [.048, .100] |
| Additional residual covariance Item 4 – Item 5 | 21.27 | 10 | .051 [.020, .081] |

Note. CHISQ = Chi-square. df = degrees of freedom. RMSEA = root mean squared error of approximation. All items started with: “This commercial communicates that if I choose this [grocery store/cancer center/travel organization], I will ...”, Item 1 = ... feel good, Item 2 = ... experience emotional meaning in life, Item 3 = ... acquire new knowledge, Item 4 = ... experience emotional intimacy, Item 5 = ... learn about new topics, Item 6 = ... experience feelings of social embeddedness, Item 7 = ... avoid negative states.