Differences in Affect and Recall Capacity of Positive and Negative Pictures in Younger and Older Adults

Elidé S. Flores-Medel
University of La Verne

INTRODUCTION

It is widely known that memory alters or declines as we age, especially as we enter into older adulthood. Often, poor recall in older adults is attributed to less efficient cognitive processes. Such cognitive processes include recall, working memory, and speed (Cox, Davis, Wood, Bushmeyer, & Koling, 2005). Much of the cause for the difference in recall between older and younger adults has to do with their methods for processing information. However, differences are not limited to cognitive process and often have to do with how different stimuli arouse people, in particular, older adults versus young adults.

There is a change in the amygdala response to emotional stimuli between younger and older adults. MRI scans found differences in levels of arousal for negative pictures between young adults and older adults. Since there were no differences in levels of arousal for positive and neutral images, but only for negative images, it seems to be that the amygdala of older adults is less receptive to negative information (Mather et al., 2004). The difference between young and older adults was not due to a deterioration of brain function or process but likely to be because of the types of information it processes or responds to.

A study conducted by Mather and Knight (2005), found that when presented with valenced images, younger adults remembered the negative images more often than did older adults. On the other hand, older adults remembered positive images more often. In terms of their forgetting rates, older adults were more likely to forget the negative images than the positive images, while younger adults' forgetting rates for both positive and negative images was not significantly different. However, when the use of cognitive control was weakened in older adults, their positivity bias disappeared. Conversely, this did not seem to have any effect on younger adults.

According to socioemotional selectivity theory, the amount of time you perceive as having left in life guides the types of goals you seek. For example, if time is perceived as limited, goals tend to be emotionally meaningful. On the other hand, when time is perceived as vast, goals tend to lean towards attaining new knowledge. Since older adults tend to have less concern for the future, they can focus more of their attention on emotional seeking goals (Carstensen, Fung, & Charles, 2003).

Socioemotional selectivity theory seems to explain older adults' positivity bias. Since older adults are inclined to perceive their time left as becoming shorter, they tend to focus on more emotionally satisfying aspects of life, while younger adults do not, unless they, too, perceive their time left as short (Mather, 2006).

Older adults are often more selective about their social relationships. This is said to have an impact on their emotional responses (Carstensen, Isaacowitz, & Charles, 1999) For example, older adults have fewer social relationships as compared to younger adults. In addition, the social relationships that they hold are most often with people that they already know well, such as family members and long time friends. In general, social relationships with those that are well known and familiar to older adults allow them to deal with negativity in an easier manner and to bring forth more positive emotions. That, in turn, allows them to feel a sense of belonging and to obtain meaning in life. All together, situations in which people perceive their lives as ending, such as a terminal disease, elicits a person to question their meaning in life and that often leads them to place emotion at the center of their lives (Carstensen et al., 1999).

Based on the differences observed between age and the processing of positive, negative, and neutral information, the present study wishes to examine the differences in recall capacity between younger and older adults on the basis of positive and negative stimuli.

HYPOTHESES

The present study proposes three hypotheses:

1. Older adults will recall fewer negative pictures when compared to younger adults.

2. Older adults' negative affect scores will be lower than younger adults' scores for negative affect.

3. Older adults will find positive pictures more memorable than negative pictures when compared to younger adults.

METHOD

Participants

A nonrandom convenience sample of 78 participants was used for this study.
-40 undergraduate university students (29 women and 11 men) (*M* age = 21.3 years)
-38 senior citizens (34 women and 4 men) (*M* age = 79.5 years)
Ethnicities for entire sample varied with 61.5% Euro-American/White, 21.8% Latino/Hispanic, 9% African American and 7.7% Bi/Multiracial.

Measures

• Positive and Negative Affect Scale (PANAS; Watson & Clark, 1988)

•Recall

• 30 pictures (10 Positive, 10 Negative, 10 Neutral)

•Most memorable

Procedures

The experiment was conducted during regularly scheduled classes at a local university for the younger adult population. For the older adult population, several sessions were set up that were convenient to the participants. Sessions took place at two different local senior center facilities. Participants were informed that their participation was voluntary and confidential. To indicate agreement to participate, the attached consent form was signed and detached from the survey. Participants were then asked to watch a slide show of 30 pictures and immediately following the slide show were asked to answer the survey questionnaire portion. After completing the questionnaire, participants were asked to recall the pictures in any order they wished and to write down a brief description of the picture, for example, "boy smiling." Lastly, they were asked to describe in as much detail as possible the picture that stood out the most to them. Once completed, the surveys and answers were returned to the researcher and participants were provided a short debriefing explaining the research project.

RESULTS

Table 1
Means and standard deviations of recall of positive, negative and neutral pictures of younger and older adults

	Age					
	Younger Adults		Older Adults			
Dependent Variable	*M*	*SD*	*M*	*SD*	*t*	*p*
Positive	3.85	1.63	3.16	1.51	1.94	.05
Negative	3.10	1.69	2.05	1.73	2.70	.01
Neutral	2.32	1.65	2.63	1.65	0.71	NS

Table 2
Means, standard deviations, and one-way analyses of variance for positive and negative affect of younger and older adults

	Younger Adults		Older Adults		
Variable	*M*	*SD*	*M*	*SD*	*F*(1, 76)
Weekly PA	33.22	8.21	35.81	7.30	2.16
General PA	36.65	6.82	36.39	6.98	.03
Weekly NA	26.75	8.92	14.21	5.48	55.29***
General NA	20.05	5.56	13.10	5.13	32.71***

*p< .05, **p < .01, ***p<.001

Table 3
Most Memorable Picture Among Younger Adults and Older Adults

	Younger Adults	Older Adults	
Valence	(n=40)	(n=38)	X^2(3)
No answer	1	4	6.90
Positive	20	22	
Negative	13	4	
Neutral	6	8	

*p < .05; ** p < .01; ***p < .001

DISCUSSION

Since the socioemotional selectivity theory postulates that shifts in goals become more positively focused based on the time one perceives as having left (Carstensen, Fung, & Charles, 2003), it was hypothesized that older adults would be more receptive to positive emotional stimuli, and therefore remember less negative pictures than younger adults. The finding that older adults recall less negative pictures when compared to younger adults is consistent with previous findings that state that older adults remember less emotionally negative information and more positive information when compared with younger adults (Charles, Mather & Carstensen, 2003). These findings were also supported by other literature, including a study conducted by Mather and Knight (2005). However, contrary to their findings, younger adults also remembered more positive pictures when compared to older adults. These findings may be due to younger adults' general better memory.

Previous literature comparing negative affect between older adults and younger adults has been contradictory. It was hypothesized that older adults' negative affect scores would be lower than younger adults' scores for negative affect. This study found that younger adults experience significantly more negative affect, both on a weekly basis and in general, when compared to older adults. However, other literature comparing positive and negative affect between both groups has found that older adults report more positive affect than younger adults, but find no differences between negative affect between both groups (Mather & Knight, 2005). These contradictory finding suggest that further research is necessary to obtain more accurate or consistent results.

The hypothesis that older adults would find positive pictures more memorable than negative pictures when compare with younger adults was not supported by the findings in this study. Though there was a notable trend for older adults to find more positive pictures than negative pictures more memorable, it was not significant. Previous literature, however, has supported this hypothesis in finding a tendency for older adults to more often recall positive pictures (Mather & Knight, 2005). Lack of significant findings for this hypothesis may be due to small sample size or to participants not answering this question.

Limitations

Limitations for this study include working with an older sample and the explanation given to them regarding the study. For example, participants seemed skeptical to participate in research when the word "memory" was used. They often decided not to participate because they felt they would not be of use since they felt their memory was not as good as it used to be. Often, it would have to be explained to them that the study was more interested in what they remembered rather than how much they remembered. This would often help ease their reluctance to participate, but many still refused.

Future research

Future research in this area should include a middle aged group in addition to the younger adult and older adult groups. Also, the use of a bigger sample size may be beneficial in better generalizing results. Additionally, using a more diverse sample could help generalize across cultures since the bulk of the participants in this study were Caucasian. In addition, researchers can test for gender differences for both affect and recall of emotionally valenced pictures.

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