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## Aging, Attention and Situation Selection: Older Adults Create Mixed Emotional Environments

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### Abstract

Studies of age differences in affective experience tend to report positive age trends. Studies of attentional deployment also tend to find older individuals attending more to positive and less to negative stimuli. However, everyday entertainment choices seem to vary by age more in terms of meaningfulness and value than by valence. Relatively few age differences emerge in the valence of choices made in situation selection tasks, though older adults avoid arousal. Thus, both younger and older adults actively construct mixed emotional environments.

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Reading studies of age differences in affective experience, and potential underlying mechanisms for such age differences, may give the impression that older adults seek out and experience relatively greater positivity in their everyday lives compared to their younger counterparts [1]. Here, we consider evidence from studies in which adults of different ages are asked to actively select affective inputs. These studies suggest that, superimposed on age-related positivity, it also appears that even older adults actively construct mixed emotional environments.

### Age differences in affective experience

Many studies have reported that aging is associated with positive changes in affective experience (see review by Charles and Carstensen, [1]). Older adults display lower rates of depression than younger and middle aged adults [2] and life satisfaction appears to improve in older adults up until very old age [3]. Older adults also report fewer experiences with daily life stressors [4] and report lower levels of negative affect [5]. When discrete emotions are evaluated individually, experiences of anger, stress, and worry seem to be more prevalent in younger and middle adulthood, while experiences of sadness remain stable into old age [6,7].

There is also evidence that the long-term effects of encountering a negative event differ by age. When multiple stressors accumulate over time, older adults are less emotionally reactive to this pile up of stressors, and experience less resulting negative affect than their

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younger counterparts [8]. They also experience no significant changes in the frequency of positive affect with increasing daily stressors [9].

Some studies have also found that older adults experience overall positive affect more frequently than younger adults [4] while others have found that positive affect increases with age until very late in life, when there are some observable declines [10]. There is also evidence that older adults are more motivated than younger adults to maintain these positive moods. Older adults demonstrate more pro-hedonic motivations than younger adults, such as wanting to decrease negative affect or maintain positive affect, while younger adults are more likely to be motivated to increase negative affect or dampen positive affect [11,12].

How positive emotions of differing levels of arousal are perceived and experienced has also been shown to vary by age. Older adults have reported experiencing more low arousal positive emotions than younger adults [13], and older adults may find these low arousal positive experiences to be more pleasant than high arousal experiences. A lifespan evaluation of the International Affective Picture System (IAPS) revealed that with increasing age, high arousal images were associated with lower pleasantness ratings for both negative and positive images, while low arousal stimuli was associated with more pleasant ratings [14].

There has also been interest in how emotional complexity and experiences of mixed affect change with age. Mixed affect in aging has typically been measured by using experience sampling or daily dairies to evaluate the co-occurrences of positive and negative emotions during a specific emotional experience. In these studies, some researchers have found that older adults are more likely to experience mixed affect in their daily lives compared to younger adults [10,15] while others have found evidence for the opposite [12]. In particular, one of those studies found older adults who more rigidly categorize potential happy experiences as pleasant (and unhappy experiences as unpleasant) are less likely to experience mixed affect in their daily lives [12]. Further work on how mixed affect is experienced across the lifespan is needed to better understand what changes are taking place.

### **Age-related positivity effects in attention**

One possible explanation for age differences in affective experience is that older individuals process emotional inputs differently than younger adults. Carstensen and colleagues proposed that older adults display age-related positivity effects in their attention and memory, preferentially processing positive over negative stimuli [16]. Using stationary eye tracking (with a participant viewing a single emotional input on a computer monitor), we conducted a number of studies investigating age differences in attention to emotional stimuli [17]. In general, findings from these studies supported the idea that older adults display *positive attentional preferences*, such that they gaze relatively more at positive and less at negative stimuli. These age differences in preferences do not necessarily imply that positive attentional preferences are more effective at helping older rather than younger adults regulate their affective states; instead, we have found that these attentional patterns only predict better moods among older adults with good attentional control.

Though these findings were fairly consistent, we were curious about what might happen to age differences in attention to emotional stimuli if emotional inputs were not selected by the experimenter (as in our stationary eye tracking studies, as well as basically all lab-based emotion regulation research to date). As we considered how to design a way to study affective choices in the lab, we also considered work from communications researchers on the related topic of age differences in mass media choices.

## Age differences in media preferences

Communications researchers have been studying media usage across the lifespan for many years. Total time spent viewing television programs, motivations for viewing, and the content viewed have all been explored. More recently there has been an interest in how these choices are reflective of the emotional goals of the viewer and how they modify emotional states.

One consistent finding over many studies is that older adults tend to watch more television than younger adults [18,19]. Older adults report increases in television use as being caused by having more available time and flexibility in how they spend their days as they have aged, as well as limited physical mobility. Television viewing is an activity that can be easily accessed by someone who spends a large amount of time at home [20].

While some studies have found similarities in attitudes towards specific popular programs [21] others have found differences in the categories of programming that older and younger adults are most interested in viewing. For example, it has been shown that younger adults prefer viewing comedy programming and sports, while older adults prefer news/talk shows and game shows [22]. This is in line with other work demonstrating that older adults place a high value on television programming that they find to be informative [23].

More recently, studies have examined whether differences in viewing preferences between age groups are reflective of changes in what emotions the viewer is motivated to experience. When explicitly asked what emotional gratifications participants are seeking, older adults report being less interested in experiencing content that induces a negative emotional state, such as sadness or fear, and more interested in contemplative experiences compared to younger adults [24]. In terms of positive content, older adults report a greater interest in heartwarming content compared to younger adults who are more interested in experiencing fun [25]. When evaluating retrospective accounts of viewing preferences, older and middle aged adults also perceived desiring more negative content (specifically fear) in entertainment when they were younger, as well as being more motivated by boredom alleviation and fun in their preferences than they are currently [25].

Meaningfulness of the entertainment content has been shown to be a significant predictor in what older adults find enjoyable. Even when there is agreement between younger and older adults in terms of what they find to be meaningful, the meaningfulness plays a larger role in viewing interest for older adults. For example, in a study where older and younger adults judged the meaningfulness of a list of television program descriptions, there was agreement in how meaningful the sad programs were across ages. However, older adults expressed

more interest in watching those programs than did younger adults [26]. A similar pattern was observed with clips of gore that were either low or high in meaningfulness. The meaningfulness of the content was a stronger predictor of viewing interest for older adults compared to both younger and middle-aged adults, and higher reported levels of anticipated fear were a stronger negative predictor of viewing interest for older adults as well [26].

This evidence suggests that older adults may not be intentionally avoiding negative content in pursuit of positive content in all instances, simply that they have no desire to engage in a negative experience if they do not perceive any value or meaning in it. Seeking a meaningful experience through media has also been linked to eudaimonic gratifications. Having a eudaimonic media experience has been shown to lead to a contemplative or reflective response from the viewer, as well as inducing mixed affect [27]. When viewing the same video clips as younger adults, older adults report having more eudaimonic related responses, such as relatedness, personal growth, and life acceptance. Having these experiences was also correlated with experiencing a mixed affect of both joy and sadness in older adults, but not for younger adults [28].

Evidence from the communications literature suggests that although there are observed age differences in preference for positive and negative content in media selections, these differences are more complex and are influenced by the nature of the emotional content. Older adults' desire for a meaningful or contemplative experience in what they choose to watch influences the types of positive and negative experiences that they choose and enjoy having.

### **Age differences in situation selection and attention to selected stimuli**

Inspired by this mass media work, we set out to test whether attention to self-selected stimuli varied by age. First, though, we needed to design a paradigm for investigating how individuals of different ages make choices among an array of potential emotional inputs. This could be a behavioral proxy for the emotion regulation strategy of situation selection.

To do this, we created an "Affective Environment (AE)" – a room with different affective stimuli, in which participants could freely choose to interact with whatever stimuli they wanted. We investigated age differences in affective choices in the Affective Environment in a number of studies. When we varied the valence of the choices (some positive, some negative, some neutral), findings of age differences were mixed; some studies found no main effect of age [29] [30] whereas age differences generally in line with age-related "positivity" emerged in some [31]. One study using the AE also manipulated arousal, and found older adults avoided higher-arousal choices [32].

One criticism of the AE is that participants may not be familiar with this context, and this might influence their choice behavior. To address this possible criticism, we created a TV version of the AE, where participants could make choices just as if they were watching TV, using a familiar remote control. In two studies, more age differences emerged for arousal than valence; as older adults clearly preferred low arousal stimuli regardless of valence [33].

It was also important to us to consider situations that require more engagement from the individual than passively viewing emotional content. While there are many situations in our daily lives when this occurs, such as during TV viewing, there are also situations that require us to interact with our choices after making them. Our lab has examined situation selection in this context by using a paradigm with positive and negative video games. So far we have found some evidence for age differences in preferences for positivity, such that older adults were more likely to select a positive game to play first, and select more positive games overall when they had the opportunity to make multiple selections. However we have also found evidence for age similarities in total time spent playing the positive games, as well as in total number of positive choices when participants could only make one selection (KL Ossenfort *et al.*, unpublished).

We then used mobile eye tracking to try to consider attention to self-selected stimuli. This was a technical challenge because each participant had their own idiosyncratically-selected environment. Attention to self-selected stimuli could be more like situation selection (fewer age differences) or more like attentional deployment (more age differences). Results from two studies suggested that attention to self-selected stimuli more follows situation selection, with relatively fewer age differences and greater age similarity. Thus, the more individuals can construct their own affective environments, the fewer age differences emerge (DM Isaacowitz *et al.*, unpublished)

## Conclusion

When given choice over how to construct their environment, older adults behave similarly to younger adults, selecting context of varying emotional valence. There is some evidence that older adults avoid high-arousal context regardless of valence. When choices are constrained, older adults more reliably show a positive looking pattern in their attention. Thus, age-related positivity coexists with age-invariant interest in mixed emotional inputs, depending on the nature of the context.

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### Highlights

Older adults attend to more positive material in laboratory tasks when stimuli are selected by the experimenter.

Fewer age differences by valence emerge when participants freely select their own affective input, though older adults avoid arousing content.

Evidence from communications research indicates that older adults may choose to engage with negative material when they perceive it as meaningful.

Both younger and older adults actively engage with mixed emotional inputs when allowed to construct their own environments.