

## CHAPTER 15

# Positive Emotions across the Adult Life Span

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Quick, think of the typical older person. What comes to mind? If you were to answer “feeble, gray hair, slow, hard of hearing,” and maybe “wise,” then you would be conveying the predominantly negative stereotypes of later life that exist within U.S. culture (Hummert, 2011) and across the world (Löckenhoff et al., 2009). To some extent, such pessimistic views present an accurate portrayal of age-related declines in physical, sensory, and cognitive abilities (for reviews, see, e.g., Birren & Schaie, 2006; Craik & Salthouse, 2008). Given the pervasiveness of such losses, one might expect to find a similar downward trajectory in the emotional lives and social relationships of older individuals. However, counter to such expectations, it has become increasingly clear that healthy aging is associated with stable or improved socioemotional well-being (see Carstensen, Mikels, & Mather, 2006; Charles & Carstensen, 2010; Scheibe & Carstensen, 2010). To provide the reader with a better understanding of this apparent paradox, this chapter reviews theoretical explanations, considers underlying emotion regulatory mechanisms, and explores practical implications for the lives of older adults.

We begin with a review of age trajectories in various aspects of well-being and consider competing theoretical accounts of such effects. Next, we examine age differences in emotion regulatory strategies, with particular emphasis on the “positivity effect,” an age-related tendency to shift processing resources away from negatively valenced material, toward the positive (Carstensen & Mikels, 2005; Mather & Carstensen, 2005). After reviewing evidence for age differences in specific aspects of emotion regulation, we consider practical implications for interpersonal relationships, decision making, and—ultimately—longevity. We conclude by identifying open questions and contextualizing age differences in positive emotions within the broader framework of life-span development.

### Age Differences in Positive Emotions and Emotional Well-Being

Psychological well-being has been conceptualized in terms of life satisfaction, negative and positive affectivity, and the absence of psychopathology (Diener, Suh, Lucas, & Smith, 1999). A review of the extant litera-

ture reveals convergent age trajectories across these aspects of well-being. With regard to life satisfaction, early cross-sectional studies indicated that despite age-related declines in income and increased rates of widowhood, well-being remained stable and relatively high through middle age and into later life (for a review, see Diener et al., 1999). Subsequent longitudinal research found that life satisfaction increases until ages 65–70, at which point there is a decline (Mroczek & Spiro, 2005). However, this late life decline appears to be due to proximity to death, not chronological age per se (also see Gerstorf et al., 2010). Thus, as measured by life satisfaction, well-being appears generally to increase with healthy aging.

Similar patterns have been observed for trajectories of positive and negative affect. In both cross-sectional and longitudinal studies, older adults report lower levels of negative affect and relatively stable levels of positive affect relative to younger adults (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Carstensen et al., 2011; Charles, Reynolds, & Gatz, 2001; Mroczek & Kolarz, 1998). Importantly, these patterns are consistent across methodologies and have been observed in retrospective ratings of average emotional states (Charles et al., 2001), as well as everyday emotional experiences assessed via experience sampling (Carstensen et al., 2000, 2011). Such consistencies indicate that age-related changes in the tracking and recall of one's emotional experiences cannot account for the observed improvements in affect. Moreover, results are not limited to temporary mood states but also are found at the level of dispositional emotions: Large-scale longitudinal studies and comprehensive meta-analyses have documented age-related increases in emotional stability and decreases in the propensity to experience negative emotions (Roberts, Walton, & Viechtbauer, 2006; Terracciano, McCrae, Brant, & Costa, 2005).

Epidemiological evidence also suggests that psychopathology declines with age, with the exception of dementia and other neurological conditions specific to later life. In a nationally representative U.S. sample, the prevalence of anxiety, mood, and substance abuse disorders was found to be significantly lower among those age 60 and older compared to younger age groups (Kes-

ler et al., 2005). Similarly, in the National Health Interview Survey, the one-month prevalence of serious psychological distress was significantly higher in midlife than in old age (age 65 and over; Centers for Disease Control and Prevention [CDC], 2006).

In summary, despite the numerous losses that occur in later life, advanced age appears to be associated with stable or even improved levels of emotional well-being, positive emotions, and mental health. Although there is general consensus about the size and direction of this effect, there is less agreement about the underlying mechanisms.

### *Theoretical Perspectives*

Over the past few decades, competing theoretical explanations for age-related patterns in emotional well-being have been proposed (see Table 15.1). These theories vary in not only the specific mechanisms proposed to underlie age effects but also the degree to which they conceptualize age-related functional losses as a contributing factor.

At one end of the spectrum, it has been argued that sustained well-being in late life is a direct consequence of declines in cognitive and neural functioning. Cacioppo, Berntson, Bechara, Tranel, and Hawkey (2011) suggest that age-related limitations in the reactivity of affective brain circuits, especially in the amygdala, may account for decreased negative affect in advanced age. Similarly, Labouvie-Vief's (2003) dynamic integration theory (DIT; Labouvie-Vief, Grünh, & Studer, 2010) contends that emotional and cognitive functioning are inextricably linked. According to DIT, positive emotional development reflects a dynamic balance between "optimization" (i.e., a hedonic emphasis on positive emotions) and "differentiation" (i.e., the ability to tolerate mixed and negative emotions to maintain a realistic view of the world and the self). Age-related limitations in cognitive resources are thought to shift this balance toward optimization, which is less cognitively demanding than differentiation.

Life-span developmental frameworks, such as Baltes's model of selective optimization with compensation (SOC; Baltes, 1997; Baltes & Baltes, 1990), take a more optimistic stance. According to the SOC model, age-related losses in various areas of functioning

**TABLE 15.1. Theoretical Models of Adult Life-Span Emotional Development**

Theory	Abbreviation	Primary mechanism	Developmental outcome
Aging brain model (Cacioppo)	ABM	Selective age-related neural degradation in systems processing negative stimuli	Dampened emotional response to and memory for negative stimuli
Dynamic integration theory (Labouvie-Vief)	DIT	Age-related limitations in cognitive resources	Shift in dynamic balance from affect differentiation toward optimization
Selective optimization with compensation (Baltes)	SOC	With advancing age, developmental losses outweigh gains across multiple areas of functioning	Increased selectivity in goal pursuit and devotion of resources to goal pursuit; use of compensatory strategies to counteract losses
Selective optimization and compensation with emotion regulation (Urry & Gross)	SOC-ER	Age-related shifts in internal and external resources	Selection and optimization of emotion regulatory strategies that draw on resources which are enhanced or preserved with age
Motivational theory of lifespan development (Heckhausen)	MTL	Age-related losses in primary control (i.e., control over environment)	Increased reliance on internal secondary control mechanisms over primary control mechanisms
Socioemotional selectivity theory (Carstensen)	SST	Age-related shifts in goals as a result of limitations in future time perspective	Prioritization of emotionally meaningful present-oriented goals over information-related future-oriented goals
Strength and vulnerability integration (Charles)	SAVI	Age-related shifts in the balance of emotion regulatory strengths and vulnerabilities	Prioritization of antecedent- over response-focused strategies; impaired coping with extended and intense negative experiences

lead individuals to be more selective in their goal pursuit, optimizing personally relevant goals while employing compensatory strategies in other aspects of life. Thus, successful functioning and emotional well-being can be maintained despite compounding losses. In a recent extension of this model (selective optimization and compensation with emotion regulation, SOC-ER), Urry and Gross (2010) have argued that in advanced age, individuals selectively engage in regulatory strategies that draw on resources that are well preserved with age.

In a similar vein, the motivational theory of life-span development (MTL; Heckhausen, Wrosch, & Schulz, 2010) argues that “primary control,” the ability to exert active control over one’s physical and social environment, peaks in midlife and declines in old age. In contrast, secondary control mechanisms aimed at emotion regulation

and goal adjustment are thought to remain viable into advanced old age. Both the SOC and MTL frameworks emphasize the active role of older adults in responding to functional losses with emotion regulatory strategies and flexible goal adjustment. Nevertheless, these theories consider age-related declines in functional capacity as a driving force of age differences in emotions.

Socioemotional selectivity theory (SST), in contrast, emphasizes age-associated changes in future time horizons and their implications for motivational priorities and emotional experience (Carstensen, 2006; Carstensen, Isaacowitz, & Charles, 1999). Specifically, the theory proposes that when future time horizons are perceived as expansive, as is typical in youth, individuals prioritize future-oriented goals such as information acquisition and the development of extended social networks. As time horizons

narrow and one's future time is perceived as more limited, as is typical in older age, individuals focus on goals that are relevant to the present moment. This motivational shift is thought to lead to a prioritization of positively valenced and emotionally meaningful experiences.

Finally, in an effort to integrate existing theories into a broader theoretical framework, Charles's (2010) strength and vulnerability integration (SAVI) model argues that from an emotion regulatory point of view, aging is associated with both strengths (e.g., life experience, shifts in time horizons and goal priorities) and weaknesses (i.e., reduced physiological flexibility). This model further posits that older adults fare better in situations in which attentional strategies, reappraisal, or situation selection are feasible, but respond less favorably to situations involving sustained negative arousal.

Table 15.1 summarizes the proposed mechanisms and developmental outcomes in each of the theoretical explanations. To evaluate their relative merit, we proceed by reviewing the evidence for age differences in the strategic processing of emotional information, as well as other types of emotion regulatory strategies.

### Age Differences in Emotion Regulation and the Age-Related Positivity Effect

The broad term "emotion regulation" encompasses a variety of strategies aimed at altering emotional states to align better with personal goals and priorities. Importantly, emotion regulatory goals are not always "prohedonic" (i.e., aimed at maximizing positive emotions). In some situations, individuals may follow contrahedonic motivations and purposely elicit or maintain negative states, for instance, to motivate effortful performance (Tamir, Chiu, & Gross, 2007) or to gain self-knowledge (Labouvie-Vief et al., 2010). As noted earlier, SST proposes an age-related shift from future-oriented goals toward goals aimed at optimizing the present moment. Consistent with this notion, evidence from a large-scale experience sampling study suggests that the relative balance between pro- and contrahedonic goals shifts with age, such that contrahedonic motivations are most prevalent in adolescence,

whereas prohedonic motivations dominate in old age (Riediger, Schmiedek, Wagner, & Lindenberger, 2009).

Emotion regulatory strategies can be broadly classified according to the stage of the emotion generation process that is targeted (Gross, 1998; Urry & Gross, 2010). Early on, people may actively select or avoid specific emotion-generating situations (*situation selection*). Once a given situation is encountered, people may try to change the situation (*situation modification*), or direct their attention toward favorable aspects of the situation (*attentional deployment*). At later stages of the emotion generation cycle, individuals may modify their appraisal of the situation (*cognitive change*). Finally, once a given emotion has been elicited, people may attempt to change its subjective experience or external expression (*response modulation*; Opitz, Gross, & Urry, 2012; Urry & Gross, 2010).

To date, the literature on emotional aging has focused disproportionately on the early stages of the emotion regulatory process. The most striking evidence for age-related shifts comes from research examining "motivated cognition," that is, the strategic allocation of processing resources to support desired outcomes or emotional states (Mather & Carstensen, 2005). Although some aspects of cognitive functioning remain stable or improve with age (e.g., crystallized intelligence and implicit memory), effortful and deliberative processing abilities generally decline across the adult life span (Craik et al., 2008). However, several early studies indicated that older adults remember emotional material better than other types of material (Carstensen & Turk-Charles, 1994; Fung & Carstensen, 2003; Hashtroudi, Johnson, & Chrosniak, 1990). Older adults' focus on emotionally salient information may reflect, in part, a strategic shift toward affect-rich and experience-based processing modes that are relatively spared from cognitive decline (Peters, Diefenbach, Hess, & Vastfjäll, 2007).

Crucially, age groups differ not only in their emphasis on emotional material in general but also their relative emphasis on positive relative to negative material. While there is long-standing evidence for a cognitive processing bias toward negative material among younger adults (for reviews,

see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001), this pattern does not extend across the entire life span (Carstensen et al., 2006; Carstensen & Mikels, 2005; Mather & Carstensen, 2005). Instead, the allocation of processing resources appears to shift with age toward positive relative to negative information, a pattern termed the “age-related positivity effect” (Carstensen & Mikels, 2005).

Over the past decade, the positivity effect has been observed across a wide range of methods and stimulus types. In studies examining attentional deployment, both dot-probe tasks and eye-tracking technologies show an age-related focus toward positive and/or away from negative material (Allard & Isaacowitz, 2008; Bannerman & Regner, 2011; Isaacowitz & Choi, 2011; Isaacowitz, Wadlinger, Goren, & Wilson, 2006a, 2006b; Knight et al., 2007; Mather & Carstensen, 2003). The positivity effect has also been found in working memory (Mikels, Larkin, Reuter-Lorenz, & Carstensen, 2005) and memory for emotionally salient scenes, facial expressions, and words (Charles, Mather, & Carstensen, 2003; Chung, 2010; Grady, Hongwanishkul, Keightley, Lee, & Hasher, 2007; Grünh, Scheibe, & Baltes, 2007; Kensinger, 2008; Langeslag & van Strien, 2009; Leigland, Schulz, & Janowsky, 2004; Spaniol, Voss, & Grady, 2008; but see, e.g., Denburg, Buchanan, Tranel, & Adolphs, 2003; Grünh, Smith, & Baltes, 2005), as well as for autobiographical memory (Kennedy, Mather, & Carstensen, 2004; Ready, Weinberger, & Jones, 2007; Schlagman, Schulz, & Kvavilashvili, 2006), and false memory (Fernandes, Ross, Wiegand, & Schryer, 2008).

Corresponding patterns emerge at the neural level. Specifically, neural reactivity to negative stimuli appears to be lower among older adults, whereas reactivity to positive stimuli does not change with age. Convergent evidence for such effects comes from electroencephalographic (EEG) studies examining event-related potentials (Kisley, Wood, & Burrows, 2007), as well as functional magnetic resonance imaging (fMRI) studies examining the activation of subcortical emotional circuits including the amygdala (Mather et al., 2004). At first glance, the selective dampening of responses to

negative material is consistent with accounts based on selective deterioration in the neural circuits supporting negative affect (Cacioppo et al., 2011). However, neural degradation and decline may not be the primary mechanism. In fact, recent evidence suggests that the positivity effect depends on better, not worse, cognitive functioning. Mather and Knight (2005) found that the memory bias toward positive material was limited to older adults who scored higher on a measure of cognitive control. Moreover, in divided attention tasks, in which cognitive resources are occupied by a competing task, older adults do not show a positivity effect (Mather & Knight, 2005) or even focus on the negative (Knight et al., 2007).

Furthermore, consistent with the notion that the positivity effect serves an emotion regulatory function, older adults spend more time looking at positive stimuli after a negative mood induction, whereas younger adults look more at negative, mood-congruent stimuli in this situation (Isaacowitz, Toner, Goren, & Wilson, 2008). Looking toward positive and away from negative stimuli leads to more positive moods—but only for older adults with higher levels of attentional functioning (Isaacowitz, Toner, & Neupert, 2009). In fact, attentional deployment may be a particularly effective emotion regulatory strategy for older adults. When focusing attention away from a negative film clip and toward positive memories, older adults showed a larger drop in negative emotions than did their younger counterparts (Phillips, Henry, Hosie, & Milne, 2008). In summary, there is consistent support for the view that the positivity effect represents a form of motivated cognition driven by age-related shifts toward prohedonic emotion regulatory strategies.

Compared to the rich research record on age-related shifts in the deployment of processing resources, much less is known about *situation selection and modification*, although mounting evidence suggests that the age-related positivity effect extends to the earliest stages of the emotion regulation cycle. In groundbreaking work using narrative vignettes, Blanchard-Fields, Jahnke, and Camp (1995; for a review, see Blanchard-Fields, 2007), found that older adults avoided situations that might elicit negative emotions to a greater extent than did younger adults.



Rovenpor, Skogsberg, and Isaacowitz (2013) recently extended these findings to a laboratory setting. They allowed older and younger adults to choose among multiple affective streams consisting of video clips and reading material that varied in emotional valence. Age differences were limited to participants with high emotion regulatory efficacy, but within that group, older adults chose *less* negative material (relative to neutral and positive material), whereas younger adults chose *more* negative material. This finding is not only consistent with an age-related emphasis on prohedonic goals, but it also suggests that successful emotion regulation depends on perceived resources in the form of emotion regulatory efficacy.

Evidence for age differences in *situation modification* is similarly limited, but recent findings suggest that age groups differ in the construction of temporal sequences of emotional events. When asked to view a series of positive, negative, and neutral images, younger adults constructed improving sequences that saved the best images for last, whereas older adults constructed spreading sequences that avoided prolonged clusters of negative images (Löckenhoff, Reed, & Maresca, 2012). These findings are consistent with the SAVI model, which suggests that older adults avoid sustained emotional arousal because it prevents a threat to homeostasis (Charles, 2010), and also support SST insofar as a preference for spreading sequences was found to be associated with more limited future time horizons (Löckenhoff et al., 2012).

Taken together, the literature offers consistent evidence of age-related stability or improvement in antecedent-focused forms of emotion regulation. In comparison, research on age differences in the later stages of emotion regulation is much more limited. From a theoretical point of view, SOC-ER and SAVI proponents would agree that age-related decrements in effortful processing and physiological resilience may limit older adults' use of response-focused emotion regulatory strategies (Charles, 2010; Urry & Gross, 2010). Empirical evidence, however, reveals a more complex pattern.

With regard to *cognitive change strategies*, older adults report using cognitive reappraisal more frequently than do younger adults (John & Gross, 2004), but recent evi-

dence suggests that reappraisal is more effective in younger age groups (Urry & Gross, 2010). In part, age differences in the benefits of cognitive reappraisal may depend on the specific type of strategy that is employed. In particular, older adults are less adept than younger adults at using strategies that rely on emotional detachment from the current situation but superior at reappraising situations in a more positive manner (Shiota & Levenson, 2009).

Evidence for age differences in *response modulation* is similarly mixed. When stimuli are age-appropriate, older adults' self-reported and physiological emotional responses are at least as strong as those of younger adults (Kunzmann & Grühn, 2005; Kunzmann & Richter, 2009; Magai, Conesdine, Krivoshekova, Kudadjie-Gyamfi, & McPherson, 2006). Thus, observed age effects are not well explained by age decrements in emotional reactivity or emotion regulatory load. Also, age effects appear to differ depending on whether modulatory strategies target outward expression as opposed to interior states. Research with younger adults has found that the suppression of emotional behaviors and expressions can take a toll on subjective well-being and social relationships (Butler et al., 2003). Given older adults' prioritization of prohedonic goals, one would expect to see an age-related decrease in such strategies, and the literature generally supports this idea (John & Gross, 2004). However, when older adults are asked to actively suppress or amplify their emotional expressions, they do so just as effectively as their younger counterparts (Kunzmann, Kupperbusch, & Levenson, 2005; Phillips et al., 2008; Shiota & Levenson, 2009). Thus, age differences in the use of expressive modulation are likely to reflect proactive preferences rather than passive losses in the necessary skills. Older adults also perform as well as younger adults in modulating internal affective states (Scheibe & Blanchard-Fields, 2009), and this type of emotion modulation appears to be less cognitively depleting for older than for younger adults: When instructed to down-regulate their feelings after viewing a disgust-inducing video, younger adults showed reduced working memory performance, whereas older adults did not (Scheibe & Blanchard-Fields, 2009).

In summary, the literature suggests that most emotion regulatory skills are preserved across the life span. Older adults are not only well equipped to manage their emotions, but, consistent with SST, they are more likely to pursue prohedonic goals aimed at reducing negative or fostering positive states. In support of the SAVI and SOC-ER models, older adults appear to rely more heavily on attentional deployment than younger adults, and they may select and structure emotional experience in a way that avoids prolonged negative emotions. At the same time, there is little evidence that age differences in emotion regulation are driven by age-related cognitive losses. The positivity effect relies on active control mechanisms, and some aspects of emotion regulation actually appear to be *less* resource intensive for older relative to younger adults. In combination, age differences in emotion regulatory motivations and mechanisms provide a plausible account for the preservation of emotional well-being into the later years.

### Implications for Successful Functioning

Thus far, this review has focused on basic laboratory studies, but age-related shifts in emotion regulatory strategies may have practical implications for successful functioning in a variety of life domains. In the following sections we illustrate such effects with regard to social relationships, decision making, and—ultimately—longevity.

#### Relationships

Across the life span, perceived social support and a strong social network are important predictors of mental and physical well-being (Stephens, Alpass, Towers, & Stevenson, 2011). Consistent with an age-related emphasis on situation selection, SST suggests that older individuals restructure their social contacts to create tight-knit networks of familiar social partners that are conducive to emotionally meaningful and positively valenced interactions (Carstensen, 2006; Carstensen et al., 1999). Empirical evidence for such effects comes from a variety of sources. In studies of social partner preferences, older adults and those with limited time horizons were found to prefer close and famil-

iar social partners over novel social partners (Fredrickson & Carstensen, 1990; Fung & Carstensen, 2004; Fung, Carstensen, & Lutz, 1999). Also, older adults' actual social networks are smaller and contain a greater proportion of close social partners than do the networks of younger adults (Lang & Carstensen, 2002). Importantly, age differences in network characteristics appear to be due to a process of active pruning rather than passive loss. In a longitudinal study of older adults' social networks, perceived closeness to death was associated with a deliberate discontinuation of peripheral social relationships, whereas relationships with close relatives and life partners were selectively strengthened (Lang, 2000).

Older adults are not only selective about their social networks but also the types of interactions in which they engage. When asked to develop solutions for hypothetical problem scenarios, older adults are more likely than their younger counterparts to avoid interpersonal conflicts (Blanchard-Fields, 2007; Blanchard-Fields et al., 1995). In the same vein, daily diary and actual dyadic interaction studies examining exposure and reactivity to interpersonal tensions revealed that older adults used more avoidant and less confrontational strategies than their younger counterparts, resulting in more positive emotions (Birditt & Fingerman, 2005; Birditt, Fingerman, & Almeida, 2005; Lefkowitz & Fingerman, 2003). In concrete terms, whereas younger adults were more likely to actively exit confrontations or raise their voices, older adults were more likely simply to “do nothing” (Birditt & Fingerman, 2005).

When avoidant strategies are not possible, older adults may actively infuse the situation with positive affect. In a laboratory study in which couples were asked to discuss a topic of mutual conflict, older, compared to middle-aged, couples were more likely to express affection or temporarily switch to a more favorable topic (Carstensen, Gottman, & Levenson, 1995; Levenson, Carstensen, Gottman, 1994). Nevertheless, recent evidence suggests that age-related reductions in interpersonal tensions are limited to situations in which conflict can be avoided; actual confrontations are found to be equally upsetting for adults of all ages (Charles, Piazza, Luong, & Almeida, 2009).

Consistent with an age-related emphasis on prohedonic motivation, age differences in interpersonal strategies appear to benefit emotional well-being. Older adults with small and close-knit social networks report lower interpersonal strain (Lang & Carstensen, 2002), and older adults' use of avoidant strategies is associated with lower interpersonal tension and greater relationship satisfaction (Birditt & Fingerma, 2005; Birditt et al., 2005; Lefkowitz & Fingerma, 2003). In general, advanced age is associated with better marriages, greater perceived social support, and less interpersonal conflict than in younger age (Fingerma & Charles, 2010).

Despite the obvious emotional benefits, older adults' tendency to avoid conflict and reappraise interactions in positive terms also carries certain risks because it may prevent a realistic assessment of relationship concerns. For instance, when discussing a disagreement with their spouses, older adults were more likely than middle-aged adults to view their spouse's behavior as positive, even when independent observers did not (Story et al., 2007). A similar tension between potential benefits and detriments of age differences in emotion regulatory strategies is seen in the context of decision making.

### **Decision Making**

Older adults are often charged with the task of making crucial, complex decisions in domains such as retirement investment, health care, and prescription drug coverage. Recent findings indicate that such decisions require both emotional and cognitive capacities (see, e.g., Kahneman, 2003; Slovic, Peters, Finucane, & MacGregor, 2005). Thus, although much of the research on aging and decision making has focused on cognitive decline (Sanfey & Hastie, 2000), age-related changes in affective processing and emotion regulatory strategies are likely to play a role as well. For example, older adults' tendency to avoid decisions (Dror, Katona, & Mungur, 1998), to delegate decisions (Finucane et al., 2002; Meyer, Russo, & Talbot, 1995), and to rely on simplified decision rules (Johnson, 1990, 1993) is typically interpreted as a consequence of age-related limitation in cognitive resources. However, such patterns may also reflect a

form of situation selection because they limit exposure to emotionally aversive tradeoffs that are part and parcel of complex decision making (Luce, Payne, & Bettman, 2000).

Similarly, older adults have been observed to seek out and examine less information before making decisions than their younger counterparts (for a review, see Mata & Nunes, 2010). In part, this likely reflects age-related deficits in the ability to manipulate large amounts of information. Indeed, older adults show deficits in information comprehension and in the integration of information across situations (e.g., Finucane, Mertz, Slovic, & Schmidt, 2005; Finucane et al., 2002). However, age-related decrements in information seeking do not affect all types of information equally. Instead, the observed age pattern is consistent with motivated resource deployment and the age-related positivity effect. In particular, when older and younger adults are presented with tabular arrays of decision options, older adults review and recall more positive versus negative information than do younger adults (Löckenhoff & Carstensen, 2007, 2008; Mather, Knight, & McCaffrey, 2005). Consistent with SST, a greater focus on positive choice attributes is associated with limited future time horizons (Löckenhoff & Carstensen, 2007). Similarly, when presented with a choice among everyday items (e.g., a pen, a mug) and asked explicitly to evaluate the options, older adults list a greater number of positive versus negative attributes than do younger adults (Kim, Healey, Goldstein, Hasher, & Wiprzycka, 2008).

In further support for an age-related positivity effect in judgment and decision making, age groups differentially display one of the most robust biases in human decision making: the "framing effect" (i.e., the phenomenon whereby superficial differences in the description of a given choice substantially alter people's preferences). For instance, risk seeking is typically found to be greater when alternatives are described as losses versus gains, underscoring the impact of negative losses on younger adults (Kahneman & Tversky, 2000). Recent evidence indicates that, in contrast to younger adults, older adults do not show risk seeking in loss frames, which suggests that losses are less impactful for older adults (Mikels & Reed,



2009). Furthermore, whereas younger adults respond equally to gains and losses, older adults show reduced responses to losses, and intact neural and affective responses to gains (Samanez-Larkin et al., 2007). Also, consistent with this general pattern, older relative to younger adults were found to be more responsive to health messages when they were framed in positive versus negative terms (Shamaskin, Mikels, & Reed, 2010).

In decision making, as in social relationships, age differences in the processing and regulation of emotions may have beneficial *and* detrimental consequences. Consistent with an age-related prioritization of prohedonic goals, older adults' emphasis on positive choice characteristics is associated with more positive emotional experiences during the decision-making process (Löckenhoff & Carstensen, 2008), more favorable recall of past choices (Löckenhoff & Carstensen, 2007, 2008; Mather & Johnson, 2000), and greater choice satisfaction (Kim et al., 2008). Moreover, relying on emotion-focused decision-making styles may help older adults to make objectively better decisions because, relative to deliberative decision strategies, intuitive processing is comparatively well preserved with age (Queen & Hess, 2010). Consistent with this idea, older adults made better decisions in hypothetical health care scenarios when focusing on their emotional reactions versus the actual details, whereas younger adults showed the opposite pattern (Mikels et al., 2010). Thus, reliance on emotion and intuition may offer older adults a path toward sound and satisfactory choices. However, exclusive reliance on this type of processing may sometimes lead to flawed decisions (Gilovich, Griffin, & Kahneman, 2002). Moreover, the age-related positivity effect could put older adults at risk of overlooking critical disadvantages of decision options, and may make them more susceptible to fraud and false advertising (Löckenhoff & Carstensen, 2004).

### ***Positivity and Increased Longevity***

Ultimately, the age-related emphasis on positive emotions and emotional well-being may confer significant benefits in terms of longevity. A long research tradition examining personality predictors of longevity indicates that emotional stability and optimism

are associated with lower mortality in both healthy populations and patient samples (Maruta, Colligan, Malinchoc, & Offord, 2000; Novotny et al., 2010; Terracciano, Löckenhoff, Zonderman, Ferrucci, & Costa, 2008; see also Moskowitz & Saslow, Chapter 24, this volume). The benefits of positive affect are not limited to dispositions. In a sample of nuns, the proportion of positive emotional content in written biographies composed in the early 20s predicted survival up to six decades later (Danner, Snowden, & Friesen, 2001). Similar effects are found for everyday emotional experiences. Carstensen and colleagues (2011) followed adults of different ages across a 13-year span. Those individuals who experienced more positive versus negative emotions were more likely to survive. Importantly, the experience of positive emotions predicted longevity above and beyond age, sex, and ethnicity. Finally, there is mounting evidence that positive attitudes toward the aging process are associated with enhanced longevity. In a series of studies, Levy and colleagues (Levy & Myers, 2005; Levy, Slade, Kunkel, & Kasl, 2002; Levy, Slade, May, & Caracciolo, 2006) have found that individuals with more positive attitudes toward their own aging process experienced better health outcomes and lower mortality.

Taken together, these findings suggest that while positivity benefits health and longevity across the life span, it may take on particular relevance in advanced age as individuals face various health challenges and confront negative societal stereotypes about the aging process. Future research is needed to examine the specific mechanisms by which age differences in emotion regulatory strategies may translate into better physical health.

### **Directions for Future Research**

This review of the literature indicates that despite age-related losses across many domains of functioning, positive emotions and emotional well-being remain stable or even show improvement well into advanced old age. Although a variety of theoretical explanations of these effects has been proposed, well-preserved emotion-regulatory skills and the selective use of specific processing strategies appear to play key roles. In general, the pattern of results is consistent

with a proactive shift toward prohedonic goals driven by age-related limitations in future time horizons. In contrast, there is little evidence that the observed age trajectories are the result of neural or cognitive deficits, although—consistent with SAVI—adaptive responses to vulnerabilities in other aspects of functioning may be a contributing factor.

Apart from their theoretical relevance, age differences in emotion regulatory strategies have important practical implications. In this chapter, we have illustrated such effects in the contexts of interpersonal relationships, decision making, and longevity, but other domains of functioning may be affected as well. As discussed earlier, age-related shifts in emotional processing may have both beneficial and detrimental effects on successful functioning. Targeted interventions to address potential vulnerabilities of older populations are needed, but, to date, important gaps in the research record hamper their development.

First, it is critical to understand the extent to which older adults are aware of age-related shifts in emotion regulatory strategies, and the degree to which such strategies can be modulated by instructional manipulations. With regard to the positivity effect, initial evidence is quite promising. Two studies suggest that whereas younger adults are not aware of the positivity effect, older adults have some insight into its existence. For example, when asked to take the perspective of another person in retelling a story, older adults used a greater proportion of positive versus negative words when taking the perspective of an older compared to younger target person. In contrast, the emotional content of younger adults' responses was not affected by the age of the target person (Sullivan, Mikels, & Carstensen, 2010). Similarly, Löckenhoff and Carstensen (2008) found that older adults reviewed a greater proportion of positive information than did younger adults when making decisions for themselves or another older person, but equal proportions of positive and negative material when deciding for a younger person. Younger adults, in contrast, did not modulate their search patterns across target persons.

Importantly, older adults are not only aware of the positivity effect, but they are

also able to reduce their focus on the positive in response to situational demands. The positivity effect in autobiographical memory (Kennedy et al., 2004) and pre-decisional information search (Löckenhoff & Carstensen, 2007) is eliminated if instructional manipulations elicit information-seeking as opposed to emotion regulatory goals. Notably, in two studies that failed to find evidence for an age-related positivity effect, participants were informed in advance that their retention of the presented material would be assessed (Denburg et al., 2003; Grühn et al., 2005), likely activating information-seeking goals. In combination, these results suggest that age differences in emotion regulatory strategies can be modulated in response to situational demands, and that older adults may be at least partially aware of their emotional biases. To date, however, such findings remain limited to the attentional deployment stage of the emotion regulatory process, representing another important gap in the research record.

Few studies of age differences in emotion regulation have clearly differentiated among different stages of regulation. Whereas some studies use wording that could apply equally to all types of emotion regulation (Gross et al., 1997), others focus only on select types. In recent years, the information-processing stage of emotion regulation has received disproportionate attention, because research on the age-related positivity effect has dominated the field (Scheibe & Carstensen, 2010). Although this body of work is critical in many ways, it may be equally worthwhile to direct attention to both earlier and later stages of the emotion generation process. In doing so, the process model of emotion regulation (Gross, 1998; Urry & Gross, 2010) can serve as a guide to categorize specific regulatory strategies within a general framework. Particularly important gaps in the literature concern situation selection and modification. Also, affective forecasting skills, which are a key prerequisite for selecting emotionally satisfying situations, constitute an important avenue for future research (Löckenhoff, 2011; Nielsen, Knutson, & Carstensen, 2008; Scheibe, Mata, & Carstensen, 2010).

When examining age differences in various emotion regulatory strategies, it is also critical to differentiate between older adults'

preferences for a given strategy and their ability to implement that strategy successfully. As exemplified by age patterns in the modulation of emotional expressions (John & Gross, 2004), the finding that older adults do not typically rely on a certain strategy need not imply that they are unable to use that strategy when prompted to do so (Kunzmann et al., 2005). A better understanding of divergent age trajectories in emotion regulatory *skills* versus *preferences* would provide key insights into the underlying mechanisms.

Finally, future studies should examine the universality of age trajectories in emotional well-being and regulatory strategies. Following SST, one would expect that age-related limitations in time horizons and the associated emphasis on emotional meaning are found regardless of cultural context. However, in individualistic U.S. cultures, the pursuit of emotionally meaningful goals is likely to coincide with the optimization of personal well-being. Conceivably, differential patterns may emerge for interdependent cultures where the well-being of the group takes priority. Consistent with this idea, the positivity effect in attention and memory in older Chinese participants was found to be less pronounced among those whose self-concepts were more interdependent than among those who were more independent (Fung, Isaacowitz, Lu, & Li, 2010). At the same time, cross-cultural differences in emotion regulatory strategies and priorities need to be differentiated from culture-specific interpretations of emotional stimuli. For instance, a study examining memory for emotional images in younger versus older Koreans found a positivity effect, but only when cultural and age differences in valence ratings were taken into account (Kwon, Scheibe, Samanez-Larkin, Tsai, & Carstensen, 2009). Clearly, further research examining a wider range of cultures, using culturally appropriate stimuli, and covering a more comprehensive range of emotion regulatory strategies, is needed.

In conclusion, while studies of age differences in cognitive skills and physical prowess may paint a rather bleak picture of the later years, age trajectories of positive emotions and emotional well-being offer a more optimistic outlook, emphasizing stability or even age-related improvement. Once the

remaining gaps in the literature have been closed and a better understanding of the underlying mechanisms has been acquired, it may be possible to leverage the emotion regulatory strategies typically employed by older adults to offer younger populations an early glimpse at the serenity and balance of late life. Given the associations between positivity and lower mortality, this approach holds the promise of not only happier but also longer lives.

## References

- Allard, E. S., & Isaacowitz, D. M. (2008). Are preferences in emotional processing affected by distraction?: Examining the age-related positivity effect in visual fixation within a dual-task paradigm. *Aging, Neuropsychology, and Cognition, 15*, 725–743.
- Baltes, P. B. (1997). On the incomplete architecture of human ontogeny: Selection, optimization, and compensation as foundation of developmental theory. *American Psychologist, 52*, 366–380.
- Baltes, P. B., & Baltes, M. M. (1990). Selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Ed), *Successful aging: Perspectives from the behavioral sciences* (pp. 1–34). New York: Cambridge University Press.
- Bannerman, R. L., & Regner, P. (2011). Binocular rivalry: A window into emotional processing in aging. *Psychology and Aging, 26*(2), 372–380.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323–373.
- Birditt, K. S., & Fingerman, K. L. (2005). Do we get better at picking our battles?: Age group differences in descriptions of behavioral reactions to interpersonal tensions. *Journals of Gerontology B: Psychological Sciences, 60*(3), 121–128.
- Birditt, K. S., Fingerman, K. L., & Almeida, D. M. (2005). Age differences in exposure and reactions to interpersonal tensions: A daily diary study. *Psychology and Aging, 20*, 330–340.
- Birren, J., & Schaie, K. (2006). *Handbook of the psychology of aging* (6th ed.). Amsterdam: Elsevier.
- Blanchard-Fields, F. (2007). Everyday problem

- solving and emotion: An adult developmental perspective. *Current Directions in Psychological Science*, 16, 26–31.
- Blanchard-Fields, F., Jahnke, H. C., & Camp, C. (1995). Age differences in problem-solving style: The role of emotional salience. *Psychology and Aging*, 10(2), 173–180.
- Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erickson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion*, 3(1), 48–67.
- Cacioppo, J. T., Berntson, G. G., Bechara, A., Tranel, D., & Hawkley, L. C. (2011). Could an aging brain contribute to subjective well-being?: The value added by a social neuroscience perspective. In A. Todorov, S. T. Fiske, & D. A. Prentice (Eds.), *Social neuroscience: Toward understanding the underpinnings of the social mind* (pp. 249–262). New York: Oxford University Press.
- Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science*, 312, 1913–1915.
- Carstensen, L. L., Gottman, J. M., & Levenson, R. W. (1995). Emotional behavior in long-term marriage. *Psychology and Aging*, 10(1), 140–149.
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54, 165–181.
- Carstensen, L. L., & Mikels, J. A. (2005). At the intersection of emotion and cognition: Aging and the positivity effect. *Current Direction Psychological Science*, 14(3), 117–121.
- Carstensen, L. L., Mikels, J. A., & Mather, M. (2006). Aging and the intersection of cognition, motivation and emotion. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (pp. 343–362). San Diego, CA: Academic Press.
- Carstensen, L. L., Pasupathi, M., Mayr, U., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult life span. *Journal of Personality and Social Psychology*, 79, 644–655.
- Carstensen, L. L., Turan, B., Scheibe, S., Ram, N., Ersner-Hersfeld, H., Samanez-Larkin, G. R., et al. (2011). Emotional experience improves with age: Evidence based on over 10 years of experience sampling. *Psychology and Aging*, 26(1), 21–33.
- Carstensen, L. L., & Turk-Charles, S. (1994). The salience of emotion across the adult life span. *Psychology and Aging*, 9(2), 259–264.
- Centers for Disease Control and Prevention (CDC). (2006). Early release of selected estimates based on data from the January–June 2006 National Health Interview Survey. Retrieved from [www.cdc.gov/nchs/data/nhis/earlyrelease/200612\\_13.pdf](http://www.cdc.gov/nchs/data/nhis/earlyrelease/200612_13.pdf).
- Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional well-being across adulthood. *Psychological Bulletin*, 136(6), 1068–1091.
- Charles, S. T., & Carstensen, L. L. (2010). Social and emotional aging. *Annual Review of Psychology*, 61, 383–409.
- Charles, S. T., Mather, M., & Carstensen, L. L. (2003). Aging and emotional memory: The forgettable nature of negative images for older adults. *Journal of Experimental Psychology*, 132, 310–324.
- Charles, S. T., Piazza, J. R., Luong, G., & Almeida, D. A. (2009). Now you see it, now you don't: Age differences in affective reactivity to social tensions. *Psychology and Aging*, 24(3), 645–653.
- Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology*, 80, 136–151.
- Chung, C. (2010). Effects of view of life and selection bias on emotional memory in old age. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry*, 23(3), 161–168.
- Craik, F. I. M., & Salthouse, T. A. (2008). *The handbook of aging and cognition* (3rd ed.). New York: Psychology Press.
- Danner, D. D., Snowdon, D. A., & Friesen, W. V. (2001). Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality and Social Psychology*, 80(5), 804–813.
- Denburg, N. L., Buchanan, T. W., Tranel, D., & Adolphs, R. (2003). Evidence for preserved emotional memory in normal older persons. *Emotion*, 3, 239–253.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276–302.
- Dror, I. E., Katona, M., & Mungur, K. (1998). Age differences in decision making: To take a risk or not? *Gerontology*, 44(2), 67–71.
- Fernandes, M., Ross, M., Wiegand, M., & Schryer, E. (2008). Are the memories of older adults positively biased? *Psychology and Aging*, 23, 297–306.



- Fingerman, K. L., & Charles, S. T. (2010). It takes two to tango: Why older people have the best relationships. *Current Directions in Psychological Science*, 19(3), 172–176.
- Finucane, M. L., Mertz, C. K., Slovic, P., & Schmidt, E. S. (2005). Task complexity and older adults' decision-making competence. *Psychology and Aging*, 20(1), 71–84.
- Finucane, M. L., Slovic, P., Hibbard, J. H., Peters, E., Mertz, C. K., & MacGregor, D. G. (2002). Aging and decision-making competence: An analysis of comprehension and consistency skills in older versus younger adults considering health-plan options. *Journal of Behavioral Decision Making*, 15(2), 141–164.
- Fredrickson, B. L., & Carstensen, L. L. (1990). Choosing social partners: How old age and anticipated endings make people more selective. *Psychology and Aging*, 5(3), 335–347.
- Fung, H. H., & Carstensen, L. L. (2003). Sending memorable messages to the old: Age differences in preferences and memory for advertisements. *Journal of Personality and Social Psychology*, 85(1), 163–178.
- Fung, H. H., & Carstensen, L. L. (2004). Motivational changes in response to blocked goals and foreshortened time: Testing alternatives to socioemotional selectivity theory. *Psychology and Aging*, 19(1), 68–78.
- Fung, H. H., Carstensen, L. L., & Lutz, A. M. (1999). Influence of time on social preferences: Implications for life-span development. *Psychology and Aging*, 14(4), 595–604.
- Fung, H. H., Isaacowitz, D. M., Lu, A. Y., & Li, T. (2010). Interdependent self-construal moderates age-related negativity reduction effect in memory and visual attention. *Psychology and Aging*, 25, 321–329.
- Gerstorf, D., Ram, N., Mayraz, G., Hidajat, M., Lindenberger, U., Wagner, G. G., et al. (2010). Late-life decline in well-being across adulthood in Germany, the UK, and the US: Something is seriously wrong at the end of life. *Psychology and Aging*, 25(2), 477–485.
- Gilovich, T., Griffin, D., & Kahneman, D. (Eds.). (2002). *Heuristics and biases: The psychology of intuitive judgment*. New York: Cambridge University Press.
- Grady, C. L., Hongwanishkul, D., Keightley, M., Lee, W., & Hasher, L. (2007). The effect of age on memory for emotional faces. *Neuropsychology*, 21(3), 371–380.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74(1), 224–237.
- Gross, J. J., Carstensen, L. L., Pasupathi, M., Tsai, J., Skorpens, C. G., & Hsu, A. Y. C. (1997). Emotion and aging: Experience, expression, and control. *Psychology and Aging*, 12, 590–599.
- Grühn, D., Scheibe, S., & Baltes, P. B. (2007). Reduced negativity effect in older adults' memory for emotional pictures: The heterogeneity list paradigm. *Psychology and Aging*, 22, 644–649.
- Grühn, D., Smith, J., & Baltes, P. B. (2005). No aging bias favoring memory for positive material: Evidence from a heterogeneity-homogeneity list paradigm using emotionally toned words. *Psychology and Aging*, 20, 579–588.
- Hashtroudi, S., Johnson, M. K., & Chrosniak, L. D. (1990). Aging and qualitative characteristics of memories for perceived and imagined complex events. *Psychology and Aging*, 5, 119–126.
- Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review*, 117(1), 32–60.
- Hummert, M. L. (2011). Age stereotypes and aging. In K. W. Schaie & S. L. Willis (Eds.), *Handbook of the psychology of aging* (pp. 249–262). San Diego, CA: Academic Press.
- Isaacowitz, D. M., & Choi, Y. (2011). Looking, feeling, and doing: Are there age differences in attention, mood, and behavioral responses to skin cancer information? *Health Psychology*, 30(10), 1–11.
- Isaacowitz, D. M., Toner, K., Goren, D., & Wilson, H. (2008). Looking while unhappy: Mood congruent gaze in young adults, positive gaze in older adults. *Psychological Science*, 19, 848–853.
- Isaacowitz, D. M., Toner, K., & Neupert, S. D. (2009). Use of gaze for real-time mood regulation: Effects of age and attentional functioning. *Psychology and Aging*, 24, 989–994.
- Isaacowitz, D. M., Wadlinger, H. A., Goren, D., & Wilson, H. R. (2006a). Is there an age-related positivity effect in visual attention?: A comparison of two methodologies. *Emotion*, 6, 511–516.
- Isaacowitz, D. M., Wadlinger, H. A., Goren, D., & Wilson, H. R. (2006b). Selective preference in visual fixation away from negative images in old age?: An eye tracking study. *Psychology and Aging*, 21(1), 40–48.



- John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality, 72*(6), 1301–1333.
- Johnson, M. M. S. (1990). Age differences in decision making: A process methodology for examining strategic information processing. *Journal of Gerontology Psychological Sciences, 45*(2), 75–78.
- Johnson, M. M. S. (1993). Thinking about strategies during, before, and after making a decision. *Psychology and Aging, 8*, 231–241.
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist, 58*(9), 697–720.
- Kahneman, D., & Tversky, A. (2000). *Choices, values, and frames*. New York: Cambridge University Press.
- Kennedy, Q., Mather, M., & Carstensen, L. L. (2004). The role of motivation in the age-related positivity effect in autobiographical memory. *Psychological Science, 15*, 208–214.
- Kensinger, E. A. (2008). Age differences in memory for arousing and non-arousing emotional words. *Journals of Gerontology B: Psychological Sciences, 63*, 13–18.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(7), 768–768.
- Kim, S., Healey, M. K., Goldstein, D., Hasher, L., & Wiprzycka, U. J. (2008). Age differences in choice satisfaction: A positivity effect in decision making. *Psychology and Aging, 23*, 33–38.
- Kisley, M. A., Wood, S., & Burrows, C. L. (2007). Looking at the sunny side of life: Age-related change in an event-related potential measure of the negativity bias. *Psychological Science, 18*(9), 838–843.
- Knight, M., Seymour, T. L., Gaunt, J. T., Baker, C., Nesmith, K., & Mather, M. (2007). Aging and goal-directed emotional attention: Distraction reverses emotional biases. *Emotion, 7*, 705–714.
- Kunzmann, U., & Grühn, D. (2005). Age differences in emotional reactivity: The sample case of sadness. *Psychology and Aging, 20*, 47–59.
- Kunzmann, U., Kupperbusch, C. S., & Levenson, R. W. (2005). Behavioral inhibition and amplification during emotional arousal: A comparison of two age groups. *Psychology and Aging, 20*(1), 144–158.
- Kunzmann, U., & Richter, D. (2009). Emotional reactivity across the adult life span: The cognitive pragmatics make a difference. *Psychology and Aging, 24*(4), 879–889.
- Kwon, Y., Scheibe, S., Samanez-Larkin, G. R., Tsai, J. L., & Carstensen, L. L. (2009). Replicating the positivity effect in picture memory in Koreans: Evidence for cross-cultural generalizability. *Psychology and Aging, 24*, 748–754.
- Labouvie-Vief, G. (2003). Dynamic integration: Affect, cognition, and the self in adulthood. *Current Directions in Psychological Science, 12*(6), 201–206.
- Labouvie-Vief, G., Grühn, D., & Studer, J. (2010). Dynamic integration of emotion and cognition: Equilibrium regulation in development and aging. In M. E. Lamb, A. M. Freund, & R. M. Lerner (Eds.), *The handbook of life-span development: Vol 2. Social and emotional development* (pp. 79–115). Hoboken, NJ: Wiley.
- Lang, F. R. (2000). Endings and continuity of social relationships: Maximizing intrinsic benefits within personal networks when feeling near to death. *Journal of Social and Personal Relationships, 17*(2), 155–182.
- Lang, F. R., & Carstensen, L. L. (2002). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging, 17*(1), 125–139.
- Langeslag, S. J. E., & van Strien, J. W. (2009). Aging and emotional memory: The co-occurrence of neurophysiological and behavioral positivity effects. *Emotion, 9*, 369–377.
- Lefkowitz, E. S., & Fingerhman, K. L. (2003). Positive and negative emotional feelings and behaviors in mother–daughter ties in late life. *Journal of Family Psychology, 17*(4), 607–617.
- Leigland, L. A., Schulz, L. E., & Janowsky, J. S. (2004). Age related changes in emotional memory. *Neurobiology of Aging, 25*, 1117–1124.
- Levenson, R. W., Carstensen, L. L., & Gottman, J. M. (1994). Influence of age and gender on affect, physiology, and their interrelations: A study of long-term marriages. *Journal of Personality and Social Psychology, 67*(1), 56–68.
- Levy, B. R., & Myers, L. M. (2005). Relationship between respiratory mortality and self-perceptions of aging. *Psychology and Health, 20*(5), 553–564.
- Levy, B. R., Slade, M. D., Kunkel, S. R., & Kasl,

- S. V. (2002). Longevity increased by positive self-perceptions of aging. *Journal of Personality and Social Psychology*, 83, 261–270.
- Levy, B. R., Slade, M. D., May, J., & Caracciolo, E. A. (2006). Physical recovery after acute myocardial infarction: Positive age self-stereotypes as a resource. *International Journal of Aging and Human Development*, 62(4), 285–301.
- Löckenhoff, C. E. (2011). Age, time, and decision making: From processing speed to global time horizons. *Annals of the New York Academy of Sciences*, 1235, 44–56.
- Löckenhoff, C. E., & Carstensen, L. L. (2004). Socioemotional selectivity theory, aging, and health: The increasingly delicate balance between regulating emotions and making tough choices. *Journal of Personality*, 72(6), 1395–1424.
- Löckenhoff, C. E., & Carstensen, L. (2007). Aging, emotion, and health-related decision strategies: Motivational manipulation can reduce age differences. *Psychology and Aging*, 22(1), 134–146.
- Löckenhoff, C. E., & Carstensen, L. L., (2008). Decision strategies in health care choices for self and others: Older but not younger adults make adjustments for the age of the decision target. *Journals of Gerontology B: Psychological Sciences*, 63(2), 106–109.
- Löckenhoff, C. E., De Fruyt, F., Terracciano, A., McCrae, R. R., De Bolle, M., Costa, P. T., et al. (2009). Perceptions of aging across 26 cultures and their culture-level associates. *Psychology and Aging*, 24(4), 941–954.
- Löckenhoff, C. E., Reed, A. E., & Maresca, S. N. (2012). Who saves the best for last: Age differences in decisions about affective sequences. *Psychology and Aging*, 27(4), 840–848.
- Luce, M. F., Payne, J. W., & Bettman, J. R. (2000). Coping with unfavorable attribute values in choice. *Organizational Behavior and Human Decision Processes*, 81(2), 274–299.
- Magai, C., Consedine, N. S., Krivoshekova, Y. S., Kudadjie-Gyamfi, E., & McPherson, R. (2006). Emotion experience and expression across the adult life span: Insights from a multimodal assessment study. *Psychology and Aging*, 21(2), 303–317.
- Maruta, T., Colligan, R. C., Malinchoc, M., & Offord, K. P. (2000). Optimists vs pessimists: Survival rate among medical patients over a 30-year period. *Mayo Clinic Proceedings*, 75(2), 140–143.
- Mata, R., & Nunes, L. (2010). When less is enough: Cognitive aging, information search, and decision quality in consumer choice. *Psychology and Aging*, 25(2), 289–298.
- Mather, M., Canli, T., English, T., Whitfield, S., Wais, P., Ochsner, K., et al. (2004). Amygdala responses to emotionally valenced stimuli in older and younger adults. *Psychological Science*, 15(4), 259–263.
- Mather, M., & Carstensen, L. L. (2003). Aging and attentional biases for emotional faces. *Psychological Science*, 14, 409–415.
- Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: The positivity effect in attention and memory. *Trends in Cognitive Sciences*, 9, 496–502.
- Mather, M., & Johnson, M. K. (2000). Choice-supportive source monitoring: Do our decisions seem better to us as we age? *Psychology and Aging*, 15(4), 596–606.
- Mather, M., & Knight, M. (2005). Goal-directed memory: The role of cognitive control in older adults' emotional memory. *Psychology and Aging*, 20(4), 554–570.
- Mather, M., Knight, M. R., & McCaffrey, M. (2005). The allure of the alignable: younger and older adults' false memories of choice features. *Journal of Experimental Psychology: General*, 134(1), 38–51.
- Meyer, B. J. F., Russo, C., & Talbot, A. (1995). Discourse comprehension and problem solving: Decisions about the treatment of breast cancer by women across the life span. *Psychology and Aging*, 10(1), 84–103.
- Mikels, J. A., Larkin, G. R., Reuter-Lorenz, P. A., & Carstensen, L. L. (2005). Divergent trajectories in the aging mind: Changes in working memory for affective versus visual information with age. *Psychology and Aging*, 20, 542–553.
- Mikels, J. A., Löckenhoff, C. E., Maglio, S. J., Goldstein, M. K., Garber, A., & Carstensen, L. L. (2010). Following your heart or your head: Focusing on emotions versus information differentially influences the decisions of younger and older adults. *Journal of Experimental Psychology: Applied*, 16(1), 87–95.
- Mikels, J. A., & Reed, A. E. (2009). Monetary losses do not loom large for older adults: Evidence for a more balanced framing effect in older adults. *Journals of Gerontology B: Psychological Sciences*, 64, 457–460.
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A

- developmental perspective on happiness. *Journal of Personality Social Psychology*, 75(5), 1333–1349.
- Mroczek, D. K., & Spiro, A. (2005). Change in life satisfaction over 20 years during adulthood: findings from the VA Normative Aging Study. *Journal of Personality and Social Psychology*, 88(1), 189–202.
- Nielsen, L., Knutson, B., & Carstensen, L. L. (2008). Affect dynamics, affective forecasting, and aging. *Emotion*, 8(3), 318–330.
- Novotny, P., Colligan, R. C., Szydlo, D. W., Clark, M. M., Rausch, S., Wampfler, J., et al. (2010). A pessimistic explanatory style is prognostic for poor lung cancer survival. *Journal of Thoracic Oncology*, 5(3), 326–332.
- Opitz, P. C., Gross, J. J., & Urry, H. L. (2012). Selection, optimization, and compensation in the domain of emotion regulation: Applications to adolescence, older age, and major depressive disorder. *Social and Personality Psychology Compass*, 6(2), 142–155.
- Peters, E., Diefenbach, M. A., Hess, T. M., & Västfjäll, D. (2008). Age differences in dual information-processing modes: Implications for cancer decision making. *Cancer*, 113(12, Suppl.), 3556–3567.
- Phillips, L. H., Henry, J. D., Hosie, J. A., & Milne, A. B. (2008). Effective regulation of the experience and expression of negative affect in old age. *Journals of Gerontology: Psychological Sciences B: Psychological Sciences*, 63(3), P138–P145.
- Queen, T. L., & Hess, T. M. (2010). Age differences in the effects of conscious and unconscious thought in decision making. *Psychology and Aging*, 25(2), 251–261.
- Ready, R. E., Weinberger, M. I., & Jones, K. M., (2007). How happy have you felt lately?: Two diary studies of emotion recall in older and younger adults. *Cognition and Emotion*, 21(4), 728–757.
- Riediger, M., Schmiedek, F., Wagner, G., & Lindenberger, U. (2009). Seeking pleasure and seeking pain: Differences in prohedonic and contra-hedonic motivation from adolescence to old age. *Psychological Science*, 20, 1529–1535.
- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1–25.
- Rovenpor, D., Skogsberg, N., & Isaacowitz, D. M. (2013). The choices we make: An examination of situation selection in younger and older adults. *Psychology and Aging*, 28(2), 365–376.
- Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review*, 5(4), 296–320.
- Samanez-Larkin, G. R., Gibbs, S. B., Khanna, K., Nielsen, L., Carstensen, L. L., & Knutson, B. (2007). Anticipation of monetary gain but not loss in healthy older adults. *Nature Neuroscience*, 10(6), 787–791.
- Sanfey, A. G., & Hastie, R. (2000). Judgment and decision making across the adult life span: A tutorial review of psychological research. In D. C. Park & N. Schwarz (Eds.), *Cognitive aging: A primer* (pp. 253–273). New York: Psychology Press.
- Scheibe, S., & Blanchard-Fields, F. (2009). Effects of regulating emotions on cognitive performance: What is costly for young adults is not so costly for older adults. *Psychology and Aging*, 24(1), 217–223.
- Scheibe, S., & Carstensen, L. L. (2010). Emotional aging: Recent findings and future trends. *Journals of Gerontology B: Psychological Sciences*, 65, 135–144.
- Scheibe, S., Mata, R., & Carstensen, L. L. (2010). Age differences in affective forecasting and experienced emotion surrounding the 2008 US presidential election. *Cognition and Emotion*, 25(6), 1029–1044.
- Schlagman, S., Schulz, J., & Kvavilashvili, L. (2006). A content analysis of involuntary autobiographical memories: Examining the positivity effect in old age. *Memory*, 14, 161–175.
- Shamaskin, A. M., Mikels, J. A., & Reed, A. E. (2010). Getting the message across: Age differences in the positive and negative framing of health care messages. *Psychology and Aging*, 25(3), 746–751.
- Shiota, M. N., & Levenson, R. W. (2009). Effects of aging on experimentally instructed detached reappraisal, positive reappraisal, and emotional behavior suppression. *Psychology and Aging*, 24, 890–900.
- Slovic, P., Peters, E., Finucane, M. L., & MacGregor, D. G., (2005). Affect, risk, and decision making. *Health Psychology*, 24(4), 35–40.
- Spaniol, J., Voss, A., & Grady, C. L. (2008). Aging and emotional memory: Cognitive

- mechanisms underlying the positivity effect. *Psychology and Aging*, 23(4), 859–872.
- Stephens, C., Alpass, F., Towers, A., & Stevenson, B. (2011). The effects of types of social networks, perceived social support, and loneliness on the health of older people: Accounting for the social context. *Journal of Aging and Health*, 23(6), 887–911.
- Story, T. N., Berg, C. A., Smith, T. W., Beveridge, R., Henry, N. M., & Pearce, G. (2007). Age, marital satisfaction, and optimism as predictors of positive sentiment override in middle-aged and older married couples. *Psychology and Aging*, 22(4), 719–727.
- Sullivan, S. J., Mikels, J. A., & Carstensen, L. L. (2010). You never lose the ages you've been: Affective perspective taking in older adults. *Psychology and Aging*, 25(1), 229–234.
- Tamir, M., Chiu, C. Y., & Gross, J. J. (2007). Business or pleasure?: Utilitarian versus hedonic considerations in emotion regulation. *Emotion*, 7(3), 546–554.
- Terracciano, A., Löckenhoff, C. E., Zonderman, A. B., Ferrucci, L., & Costa, P. T. (2008). Personality predictors of longevity: Activity, emotional stability, and conscientiousness. *Psychosomatic Medicine*, 70(6), 621–627.
- Terracciano, A., McCrae, R. R., Brant, L. J., & Costa, P. T. (2005). Hierarchical linear modeling analyses of the NEO-PI-R scales in the Baltimore Longitudinal Study of Aging. *Psychology and Aging*, 20(3), 493–506.
- Urry, H. L., & Gross, J. J. (2010). Emotion regulation in older age. *Current Directions in Psychological Science*, 19(6), 352–357.