

Emotion Regulation in Older Age

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Abstract

Older age is normatively associated with losses in physical, cognitive, and social domains. Despite these losses, older adults often report higher levels of well-being than do younger adults. How can we explain this enhancement of well-being? In this article, we consider one possible explanation, namely, that older adults show enhanced emotion regulation. Specifically, we propose that older adults achieve well-being by selecting and optimizing particular emotion regulation processes to compensate for changes in internal and external resources. With this framework in mind, we suggest several directions for future research.

Keywords

emotion regulation, aging, selection, optimization, compensation, well-being

Imagine waking up to find that you no longer see, hear, or taste as well as you used to. Looking around your bedroom, you notice a number of medication bottles on your bedside table with your name on them. As you reach over to examine them, your joints creak in protest, and you feel an excruciating pain shoot through your back. Carefully, you get to your feet, but find yourself weaker and more unsteady than before. As you go about your day, people speak to you more slowly (and loudly) than usual, as if you're mentally incompetent. You find you aren't thinking as quickly as you normally do, and you lose several things you need, including your keys.

Now imagine that you will spend the rest of your life like this. How does it feel? Your answer probably falls somewhere between "awful" and "terrible." Given that the changes we've described are all normatively associated with growing old, it is hardly surprising that we tend to believe that people who are much older than us—at least those who actually experience the things we've just imagined on a daily basis—must be miserable. And yet, when you ask older people how they feel, their levels of well-being seem to be at least as high as those of younger adults.

Why don't older people feel worse? In this review, we consider several mutually compatible explanations. We then focus on the possibility that changes in emotion regulation, which refers to the processes we use to modulate which emotions we have, when we have them, and how we experience and express them (Gross, 1998), may be key to understanding well-being in older age.

acuity, have increasing difficulty managing activities of daily living, and are more likely to have multiple, sometimes debilitating, health conditions. Cognitively, we suffer from memory declines that, for some people, herald the onset of dementia. We also have trouble monitoring our own performance, inhibiting prepotent responses, and altering behavioral patterns in response to feedback. Socially, we are more likely to experience losses as the people we care about move away or die.

These observations paint a depressingly bleak picture of older age. Remarkably, however, many studies show that, compared to younger adults, older adults experience higher levels of hedonic well-being, at least until very late in life. For example, in a cross-sectional study, older adults reported *lower* levels of negative affect and *higher* levels of positive affect than younger adults did (Stawski, Almeida, Sliwinski, & Smyth, 2008). Such findings are not simply due to birth cohort effects; longitudinal studies also show that older age is related to increases in subjective well-being (Cacioppo et al., 2008) and decreases in negative affect (Charles, Reynolds, & Gatz, 2001).

Explaining High Levels of Well-Being in Older Age

Why do older adults experience higher levels of well-being than younger adults? One possibility is that we are mistaken

Well-Being in Older Age

Older age is associated with losses in a number of domains (Carstensen, Gross, & Fung, 1998). Physically, we lose sensory

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when we imagine that the losses experienced by older adults should lead to lower levels of well-being. After all, Gilbert, Pinel, Wilson, Blumberg, and Wheatley (1998) have documented that people are notoriously poor at affective forecasting, particularly when it comes to predicting the duration of their affective responses to events (e.g., a romantic break-up, failing to receive a promotion). Perhaps as age-related losses accumulate over the years, they have nothing like the impact we think they will have. This explanation suggests that older age should be associated with smaller (and more transient) increases in negative affect than younger people might expect. However, it does not explain the *decreases* in negative affect or *increases* in positive affect that older adults actually report.

A second explanation for high levels of well-being in older age has been advanced by Cacioppo, Berntson, Bechara, Tranel, and Hawkley (in press). This explanation hinges on the idea that there are age-related changes in emotion-generative brain structures such as the amygdala. In particular, they propose that reduced amygdala activation leads to reduced experience of negative emotion. This fits with the observation that older adults report a decrease in negative affect. However, the amygdala is also involved in generating positive emotional states (Murray, 2007), so if reduced amygdala activation leads to decreased negative affect, it should also lead to decreased positive affect. This prediction is inconsistent with older adults' reports of *increased* positive affect.

A third possibility is that as people age, they get better at regulating their emotions. One of the first theorists to feature emotion regulation was Carstensen (1993), whose socioemotional selectivity theory (SST) postulates that shrinking time horizons in older age prompt a greater emphasis on emotion regulation. This idea has subsequently been elaborated with the suggestion that age-related changes in motivation prompt greater allocation of resources to emotion regulation (Knight et al., 2007) and the use of more effective strategies (Carstensen et al., 1998). Enhanced emotion regulation would be consistent with the increased positive and decreased negative emotion reported by older adults. In what follows, we build on Carstensen's seminal work and outline a theoretically driven framework characterizing the specific emotion regulation processes that may facilitate well-being in older age. Although this framework has only been partially empirically tested, our hope is that it will help to stimulate and direct future empirical work.

A Process Conception of Emotion and Emotion Regulation

Before turning to the framework, it is useful to set the stage by considering how emotions arise and how they may be regulated. Emotions arise when situations are attended to and appraised (evaluated) as relevant to our current goals. They involve changes in how we feel (e.g., sad, happy, terrified), what we express (e.g., pout, smile, scream), and what our brain and body do (e.g., changes in neural activity, heart rate, sweating).

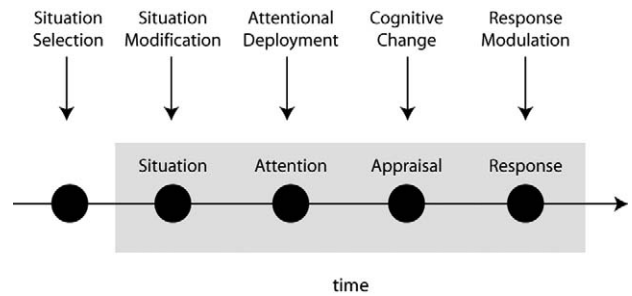


Fig. 1. A process model of emotion regulation. According to this model, emotion may be regulated at five points in the emotion-generative cycle, depicted in the shaded area: (a) selection of the situation, (b) modification of the situation, (c) deployment of attention, (d) change of cognitions, and (e) modulation of experiential, behavioral, or physiological responses.

According to the process model of emotion regulation (Gross, 1998), five families of emotion-regulatory processes may be distinguished. Each of these families targets a different stage of the emotion-generative cycle, a schematic of which (along with associated emotion regulation processes) is shown in the shaded portion of the X axis in Figure 1, and leads to a different profile of emotional responding.

Situation selection refers to choosing the situations one will encounter on the basis of the emotions that these situations are likely to produce. *Situation modification* refers to changing a situation one is in so as to influence one's emotional state. *Attentional deployment* refers to paying attention to certain aspects of the situation or thinking of something else entirely. *Cognitive change* refers to reappraising (reinterpreting) the situation so as to change its meaning in a way that alters the resultant emotional response. Finally, *response modulation* refers to directly changing feelings, behavior, and physiology after the multisystem response is already under way.

Age Differences in Emotion Regulation

How might emotion regulation vary by age? In general, older adults report being better at controlling their emotions relative to younger adults (Gross et al., 1997). In the past decade, evidence for age differences in some but not all emotion regulation processes has begun to accumulate.

Relative to younger adults, older adults construct smaller but closer social networks (Carstensen, Fung, & Charles, 2003) and experience lower negative affect when avoiding arguments with others (Charles, Piazza, Luong, & Almeida, 2009). These findings suggest that situation selection in the social domain may be more effective for older people than it is for younger people.

In addition, older adults deploy more attention to positive than to negative information, and this may have a mood-repairing effect (Isaacowitz, Toner, Goren, & Wilson, 2008). Older adults also show bigger decreases in negative emotion when asked to focus their attention away from an upsetting film

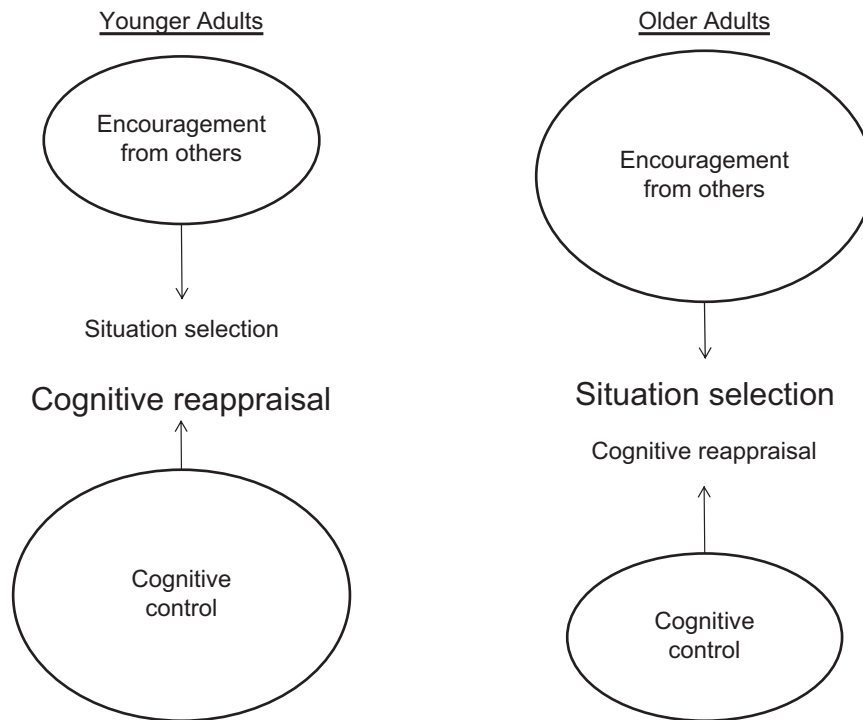


Fig. 2. Contrasting two resources (close relationships with other people who encourage involvement in positive situations and cognitive control) for two forms of emotion regulation (situation selection and cognitive reappraisal, a form of cognitive change). The sizes of the ovals indicate how much of the resource is available. The sizes of the text in which the emotion regulation processes (middle labels) are printed indicates degree of success/use.

clip to a positive autobiographical memory (Phillips, Henry, Hosie, & Milne, 2008). These findings suggest that attentional deployment may be more effective for older people than it is for younger people.

Unlike situation selection and attentional deployment, older adults are less successful using cognitive reappraisal to decrease unpleasant emotion compared to younger adults (Opitz, Rauch, Terry, & Urry, in press). Type of reappraisal may matter: Older adults are less successful at using detached reappraisal compared to younger adults but are more successful at using positive reappraisal (Shiota & Levenson, 2009). Thus, even though adults in their early 60s (thus “young old” people) use cognitive reappraisal more frequently than younger adults do (John & Gross, 2004), some forms of cognitive reappraisal may be less effective for older adults than they are for younger adults.

Finally, a few studies have now shown that older and younger adults are similarly successful at reducing outward expressions of emotion (Phillips et al., 2008; Shiota & Levenson, 2009), an example of the response modulation family. One study further suggests that older adults use expressive suppression less frequently than do younger adults (John & Gross, 2004).

What explains these age-related differences in emotion regulation ability and frequency? To answer this question, we find it useful to employ what we refer to as the selection, optimization, and compensation with emotion regulation (SOC-ER) framework.

SOC-ER

At the heart of the SOC-ER framework is the idea that people select and optimize particular emotion regulation strategies as a reflection of available resources (e.g., internal capabilities, environmental affordances). This is a direct application of Paul and Margret Baltes’ selection, optimization, and compensation (SOC) meta-theory (Baltes & Baltes, 1990) to the domain of emotion regulation. SOC meta-theory suggests that successful living can be achieved at any stage of the life span by people who set realistic goals that take into account their own capabilities (selection); commit time, practice, and effort to achieving selected goals (optimization); and increase efforts, develop work-arounds, or seek help to compensate for losses (compensation).

Although SOC meta-theory has broad applicability, we focus here on how it relates to emotion regulation (the SOC-ER framework) and, more particularly, to changes in older age. We suggest that older adults compensate for the loss of resources that support some forms of emotion regulation by selecting and optimizing alternative forms of emotion regulation, specifically those that are supported by a gain in (or maintenance of) other resources. Figure 2 uses a simple example to illustrate the type of change in emotion regulation use that is envisioned by the SOC-ER framework. In this example, we show how younger (left) and older (right) adults might regulate their emotions using just two possible resources (close relationships with people who encourage involvement in positive situations, an external resource, and cognitive control, an internal resource) and just

Table 1. The SOC-ER Framework: Resources That May Affect the Use of Five Families of Emotion Regulation Processes

Emotion Regulation Family	Domain	Proposed Resources
Situation selection	Internal	Ability to predict the emotions one is likely to experience in particular situations Knowledge of the trade-offs associated with approaching/avoiding certain situations
	External	Relationships with people who encourage involvement in positive situations Fewer roles that place one in negative emotion-eliciting situations
Situation modification	Internal	Knowledge about which aspects of a situation provide best route to modify emotions Ability to carry out one's plans for modifying the situation
	External	Access to people who help you shape your environment Ability to compel desired outcomes
Attentional deployment	Internal	Ability to recognize information as positive versus negative Undivided attention
	External	Access to people who draw attention to positive and away from negative information Access to situations with many positive and few negative stimuli
Cognitive change	Internal	Ability to take a different perspective Working memory to hold goal emotional state in mind Cognitive control
	External	Access to people who help you generate hedonically beneficial meanings
Response modulation [†]	Internal	Knowledge about the impact of one's own emotional expressions Ability to tolerate a mismatch between inner experience and outward expression Ability to exert voluntary control over facial and bodily behavior
	External	Access to or use of activities that influence somatic responding (e.g., medications, relaxation, exercise)
		Access to people who model context-appropriate emotional displays

[†] Resources for response modulation focus on regulation of expressive behavior

two emotion regulation processes (situation selection and cognitive reappraisal, a form of cognitive change).

As may be seen by the size of the ovals, older adults may receive more encouragement from others to get involved in positive situations than do younger adults because they have a smaller but closer social network (Carstensen et al., 2003). This represents a resource gain in older age. However, older adults may have lesser levels of cognitive control than younger adults because of age-related changes in the brain (Opitz et al., in press). This represents a resource loss in older age. As represented by the larger size of the text in which the emotion regulation processes are printed, this contrast of resources would lead us to expect younger adults to use cognitive reappraisal relatively more frequently and/or successfully, whereas we would expect older adults to use situation selection relatively more frequently and/or successfully.

Note that we referred just now to using emotion regulation "more frequently and/or successfully." We make this distinction between frequency and success because, although one might generally expect that optimizing a particular emotion regulation process with practice (i.e., greater frequency of use) should lead to greater success in actually changing one's emotions as desired, complex tradeoffs as resources ebb and flow over time could lead to divergent findings. Consider reappraisal, a form of cognitive change. Evidence reviewed earlier shows that older adults use cognitive reappraisal more frequently than younger adults do but that they are not necessarily more successful. It is possible that, in the earlier stages of late adulthood, one has acquired the necessary knowledge and life experiences to know that reappraisal can be effective and thus uses it with greater frequency than in the past. However,

cognitive resources may already be declining to some degree, in which case frequent use will not necessarily translate into actual success.

We must stress that the example in Figure 2 is only an illustration and a promissory note; there is as yet very little empirical research that identifies the resources required for emotion regulation. We can only offer a plausible list of logically derived (rather than empirically supported) suggestions (see Table 1) and speculate about how age differences in resources might explain known age differences in emotion regulation. But there are some compelling hints:

- Older adults are better at predicting feelings of emotional arousal than are younger adults (Nielsen, Knutson, & Carstensen, 2008). Better predicting how aroused one might feel in anticipated situations could be a resource that leads to improved situation selection in older age.
- Older adults pay more attention to positive than to negative information, but this effect goes away when attention is divided (Knight et al., 2007). Undivided attention could be a necessary resource for attentional deployment in older age.
- Compared to younger adults, older adults exhibit reduced reappraisal-related activation in prefrontal regions implicated in cognitive control (Opitz et al., in press). Reduced cognitive control could be a resource that reduces effectiveness of cognitive reappraisal to decrease negative emotions.

Directions for Future Research

We have argued that one explanation for higher well-being in older age is that older adults select and optimize emotion

regulation processes that take advantage of resource gains and compensate for resource losses. We believe our SOC-ER framework may be useful in guiding future research, and from this vantage point, four research directions seem particularly compelling.

First, although our predictions regarding age-related changes in resources provide a useful starting point, research to identify the resources that predict the types of emotion regulation processes people use, the frequency with which they use them, and the extent to which their use successfully modifies emotional responses is urgently needed. We must also determine how these resources change as we age. In that research, it will be important to broaden the focus to consider additional predictors. Beliefs about the malleability of emotions, perceived self-efficacy, and motivation to experience certain emotions as described by socioemotional selectivity theory will no doubt play a major role in the use and success of emotion regulation processes.

Second, there is good reason to believe that emotion regulation processes are linked to well-being. For example, individual-difference studies indicate that more frequent use of reappraisal (cognitive change) is associated with higher levels of positive and lower levels of negative emotion, lower levels of depressive symptoms, and higher life satisfaction. More frequent use of suppression (response modulation), by contrast, is associated with lower levels of positive and higher levels of negative emotion, higher levels of depressive symptoms, and lower life satisfaction (John & Gross, 2004). However, studies that test whether the frequency and/or success of emotion regulation processes mediate the association between age and levels of hedonic well-being are needed. Moreover, although we focused on *hedonic* well-being in this review, we speculate that SOC-ER principles might also promote *eudaimonic* well-being, which emphasizes achieving autonomy, mastery, growth, positive relations with others, self-acceptance, and sense of purpose.

Third, although many older people fare surprisingly well, not all do. Our analysis suggests that low well-being may accrue to older people who fail to make a compensatory shift in emotion regulation in light of changing resources. In these cases, treatments that teach older people how to use emotion regulation processes that rely on intact resources might be particularly useful. For example, older adults who struggle with anxiety might benefit more from cognitive bias modification, a treatment in which attention is trained, than from cognitive-behavioral therapy, a treatment in which new ways of interpreting situations are trained. This is putatively because cognitive bias modification requires intact resources for attentional deployment whereas cognitive-behavioral therapy requires intact resources for cognitive change. Treatments that boost beleaguered resources might also be useful. For example, if working memory capacity is critical for cognitive change but this resource declines in older age, interventions that improve working memory capacity may promote the success of therapies targeting cognitive change.

Finally, although we have presented the SOC-ER framework in the context of understanding well-being in older age,

we believe its principles extend to developmental changes from infancy through old age. Still more broadly, if we view chronological age as a proxy for differences in internal and external resources, it may be useful to apply the SOC-ER framework to other groups (e.g., those diagnosed with mental disorders), as well as to particular individuals within any particular group as they seek to adapt to different environmental contexts. From our perspective, individual and contextual variation that is of interest to developmental, cognitive, personality, clinical, and health psychologists may be illuminated by considering how variation in internal and external resources shape the use of different forms of emotion regulation.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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