
Feature Article

Socioemotional Selectivity Theory: The Role of Perceived Endings in Human Motivation

Laura L. Carstensen, PhD^{1,2,*} 

¹Department of Psychology, Stanford University, Stanford, California, USA. ²Center on Longevity, Stanford University, Stanford, California, USA.

*Address correspondence to: Laura L. Carstensen, PhD, Department of Psychology, Stanford University, 450 Jane Stanford Way, Bldg. 420, Stanford, CA 94305-2130, USA. E-mail: laura.carstensen@stanford.edu

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Abstract

Socioemotional selectivity theory (SST) is a theory of life-span development grounded in the uniquely human ability to monitor time. SST maintains that the approach of endings—whether due to aging or other endings such as geographic relocations and severe illness—elicits motivational changes in which emotionally meaningful goals are prioritized over exploration. Research guided by SST has informed preferences, social networks, and emotional experience and led to the discovery of the positivity effect in cognitive processing. This article, based on my 2015 Robert W. Kleemeier Award Lecture, describes the development of SST and its related program of empirical research.

Keywords: Emotion/affect, Positivity effect, Social networks, Socioemotional selectivity theory

A 90-year-old friend once told me that the downside of living so long was that most of her friends and loved ones had died. The upside, she added with a playful grin, was getting to see how it all turned out.

The same is true in science. Time is required to see the slow and steady progress that escapes us when a research program begins to unfold. Time provides the perspective that findings from single studies—with inevitable lingering questions—simply cannot provide. Most importantly, time allows us to see where we were wrong. With distance, we can see the blind spots that once obscured our search for truth. My father was a distinguished biophysicist, and in one of our many conversations about science, I recall him saying, “The tentative nature of knowledge does not speak against science. It *is* science.” I sometimes wonder whether we need to grow old ourselves before we can genuinely celebrate the discoveries that prove us wrong and come to appreciate that this is the surest way to come closer to the truth.

Reveling in finding out that we are wrong does not come naturally to humans. Not only do we look for evidence that we are right (Lord et al., 1979), we often fail to even *see* evidence that conflicts with our beliefs (Simons, 2012). The experimental method rests on the knowledge that we do not observe the world even-handedly. To challenge our presumptions and reveal the blind spots that we hold, we need a community of scholars with diverse backgrounds, perspectives, and beliefs. We need to question one another, debate findings, and demand replications of experiments—not because we doubt the sincerity of our colleagues or the rigor of their work, but because we appreciate that individuals inevitably bring their own assumptions to the laboratory, and these assumptions can obscure the truth.

I developed socioemotional selectivity theory (SST; Carstensen, 1993, 2006; Carstensen et al., 1999) to account for relatively high levels of social and emotional well-being observed in older adults despite very real losses associated with aging. Briefly, the theory maintains that constraints

on future time horizons motivate age differences in social preferences, selective deployment of cognitive resources, and engagement in prosocial behaviors, all of which subsequently benefit subjective experience. The following review describes my process of developing the theory, as well as the program of research that my students, colleagues, and I designed to test it.

Changing Views of Social and Emotional Aging

When my program of research got underway in the early 1980s, expectations about aging, including my own, were overwhelmingly negative. It was literally textbook knowledge that psychopathology increased with age, with at least mild forms of emotional disturbance presumed to manifest in the majority of old people (Pfeiffer, 1977). Carl Jung (1933) maintained that emotions become progressively generated from internal sources and increasingly detached from the external world as we age, writing that the “very old person ... has plunged again into the unconscious, and ... progressively vanishes within it” (p. 131). Disengagement theory (Cumming & Henry, 1961) postulated that toward the end of their lives, individuals and societies pull away from one another in preparation for death. Old age was sufficiently characterized by loss that assertions like “any theory of life-span development that were to posit general positive advances across broad domains of functioning in later adulthood can be judged to be false” (Baltes, 1997, p. 369) were accepted without challenge.

It was in this historical context that I embarked on a program of research focused on socioemotional aging. My aim was to characterize the emotional strife associated with the inevitable losses that come with age and ultimately find ways to ameliorate it. As such, it never crossed my mind that older people were *not* unhappy. Shrinking social networks had been well documented and a variety of interventions were being implemented to increase social interactions. Structured visitation programs and incentive-based interventions effectively increased social interactions during the experiments, but there was little evidence that these interventions generated authentic relationships that persisted after external incentives were withdrawn.

Around the same time, findings from the Epidemiological Catchment Area (ECA; Regier, 1984) contradicted the core assumption that older people were distressed. The ECA was a large-scale project funded by the National Institute of Mental Health (NIMH) in the mid-1980s to assess the prevalence of psychiatric disorders in community-residing Americans. It entailed face-to-face clinical interviews with participants who were recruited from multiple geographic regions and spanned the adult age range. At the conclusion of the study, findings were clear: Except for the dementias, older adults displayed *less* psychopathology of all forms than their middle-aged and younger counterparts (George et al., 1988; see also Blazer & Hybels, 2014). Because of the rigor and scope of the ECA study, these findings seriously challenged assumptions about psychiatric distress in old age. Long-held beliefs about inevitable declines in mental health began to be questioned.

In the years that followed, evidence for emotional *advantages* in emotional experience steadily accumulated (Scheibe & Carstensen, 2010). Study after study concluded that compared to their younger counterparts, older people reported better subjective control over their emotions (Gross et al., 1997) and more positive emotional experience (Mroczek & Kolarz, 1998). Older people displayed more empathy (Sze et al., 2012), expressed more gratitude (Chopik et al., 2019), and were more likely to forgive (Cheng, 2008) than younger people. Rather than grow stale, marital satisfaction improved with age—even in unhappily married couples (Levenson et al., 1993). Findings from Gallop polls reliably observed lower rates of worry, anger, sadness, and disgust in older people compared with younger people (Stone et al., 2010). Even during the coronavirus disease 2019 pandemic, which threatened older more than younger age groups, older people reported more positive and fewer negative emotions (Carstensen et al., 2020).

The juxtaposition of *improved* psychological well-being with the very real age-related losses and contractions of the social world came to be known as the “paradox of aging.” Not only did findings challenge assumptions about aging, they also challenged assumptions about happiness itself. Virtually all the presumed factors that make people happy—social status, physical health, broad and diverse friendship networks, and high levels of social engagement—decline with chronological age, and yet psychological well-being improves. The paradox of aging was a question worth addressing.

Socioemotional Selectivity Theory

Students often ask me how I developed SST. It is difficult to say precisely because the theory emerged from a long process marked by hunches, discussions with colleagues, data collections, refinements of hypotheses, falsifications of hypotheses, and occasional support for hypotheses. But it would be misleading to ignore the social influences on my thinking.

In 1992, just after I presented the first iteration of SST at the *Nebraska Symposium on Motivation* (Carstensen, 1993), I was invited to spend 6 months at the Max Planck Institute (MPI) for Human Development in Berlin. Margret and Paul Baltes were developing a broad model of development called selective optimization with compensation (Baltes & Baltes, 1993). The model offered a conceptual framework that outlined strategies people use to maintain functioning in select domains despite the losses that aging brings. We spent a great deal of time debating theories and evidence, joined by a steady flow of distinguished visitors to the MPI, such as John Nesselrode, Toni Antonucci, James Jackson, and Tim Salthouse, as well as (then) more junior trainees and staff scientists, including Ulman Lindenberger, Frieder Lang, Jacqui Smith, and Ursula Staudinger. It was a richly stimulating time in my career.

Of course, I benefitted tremendously from hallway conversations with my Stanford colleagues, who offered

critical commentary in the way that only good friends do. Robert Zajonc argued that my distinction of goals was inherently flawed because, by definition, all goals are emotionally meaningful. Health economist Alan Garber challenged me to think about the practical implications of SST. Hazel Markus urged me to think about the cultural contexts in which goals develop. And collaborators like John Gabrieli brought approaches and methodologies to the research that greatly enhanced the fidelity of findings.

Without funding from the National Institute on Aging (NIA), none of this research would have been possible, yet the role of NIA extended far beyond funding. Richard Suzman, Ronald Abeles, Lis Nielsen, and many others incentivized world-class researchers from a range of disciplines to focus on social and behavioral aging. Through these efforts, they established aging as a vibrant and evidence-based science. There is no doubt in my mind that without opportunities to draw on this rich intellectual resource, my research program would have followed a very different and far less interesting course.

I also came to know hundreds of older people from a part-time clinical practice at the Over 60 Health Center in Berkeley, California. My experiences there allowed me to gain an understanding of older people that was crucial to my program of research. Not only did my clients regularly shatter stereotypes, but they displayed vibrancy and resilience rarely described in the research literature. The passage of time was a frequent topic. People often spoke about the preciousness of lifelong friendships; others expressed the pride they took in having stood by spouses through long and unhappy times. Yet despite the enormous value they placed on their social relationships, most expressed disinterest in forging new relationships. As one man put it, “You can’t make new ‘old friends’ when you are 80 years old. The numbers simply do not work.”

Conversations like these reinforced the idea that time is an integral part of virtually all psychological phenomena. From the sequencing of rewards in operant and classical conditioning to the flow of oxygen in the measurement of brain activation, time is built into *most* behavioral and psychological processes. Most species monitor time. Yet, to the best of our knowledge, humans are unique in their ability to appreciate mortality and the limits mortality places on time. At both conscious and subconscious levels, we monitor our place in the life cycle with the tacit awareness that time eventually runs out. Time provides a changing context to which people adapt as they move through life.

Together, these experiences led me to the cardinal postulate of SST: The universal awareness of the passage of time is a powerful driver of human motivation and emotional experience. A reasonably stable set of goals—ranging from physical safety and sustenance to more psychological goals such as feeling supported and gaining information—motivates people throughout life, and the perception of time influences the priority placed on specific goals.

SST focuses on two main classes of psychological goals: one comprises preparatory goals, such as knowledge acquisition, initiating friendships, or exploring novel experiences. The other concerns feeling states, emotional satisfaction, and a sense of belonging, purpose, and worth. While Zajonc was right in his assertion that all goals engage the emotion system, he also agreed with the distinction that some goals are pursued *because* of accompanying feelings in the moment, while other rewards for other goals did not accrue for a long time. Spending time with a close friend represents the first type of goal. Taking a course in inorganic chemistry (for most people) represents the latter. SST claims that when time horizons are long and nebulous, as they typically are in youth, people prioritize goals that prepare them for seemingly endless and winding roads ahead. Under these conditions, great value is placed on knowledge building and exploration, even when such efforts are emotionally challenging. As time horizons grow shorter, as they typically do with age, emotional goals are prioritized over exploration. When time is limited, its value increases and people selectively invest in important activities with a focus on savoring experiences in the moments when they occur. Over the years, people shift from preparatory to consumptive goals, from goals about the future to goals realized in the present. At no point do older people stop caring about new learning, nor do younger people eschew emotional goals. Rather, the relative priority placed on exploration and meaning varies as a function of the temporal context in which goals are pursued.

Over time, my research program aimed at understanding mental strife in late life led to a theory about changing motivations in the face of shifting time horizons. I repeatedly discovered that my presumptions—and widespread assumptions in the field—were wrong. Aging is not characterized by emotional distress. On the contrary, older people have lower—not *higher*—rates of psychopathology. While loneliness is potentially devastating for some older people, it is less common in older than among younger people. Large social networks are not superior social networks in old age. In fact, emotional well-being is better among those who have relatively smaller social networks.

Below, I overview the research program as it unfolded over decades.

Time Horizons Influence Goal Priorities

The first empirical challenge we faced was devising a way to assess temporal influences on goals. In the early 1990s, Barbara Fredrickson, then a graduate student at Stanford and currently a professor of psychology at the University of North Carolina, and I developed an experimental approach drawing from behavioral economics, a field in which goals are inferred from expressed preferences. In our version of the task, we asked younger and older participants to imagine that they had 30 min of free time and could spend it with one of the three social partners who represented

distinct social goals (Fredrickson & Carstensen, 1990). An attractive stranger represented future possibilities, and an author represented knowledge seeking and learning potential. The third option, a close friend or family member, represented emotional meaning. We hypothesized that older people would choose emotionally meaningful partners and younger people would prefer partners that held future utility. Findings revealed that a substantial majority of older participants preferred emotionally significant partners, whereas younger people's choices were evenly distributed across the partner options.

In order to see if preferences were different under distinct temporal conditions, we tested another condition in which the same social partner options were presented under constrained future time. Before choosing a partner, we asked participants to imagine that they would soon be moving across the country by themselves without family or friends, thus priming an ending that was disentangled from mortality. In this condition, both younger and older people expressed strong preferences for emotionally meaningful partners. Future time, not age, influenced preferences.

Encouraged by these findings, we developed another experimental condition in which future time was expanded (Fung et al., 1999). Before choosing social partners, we asked participants to imagine that they had just learned about a new medical advance that ensured they would live about 20 years longer than they anticipated. In this condition, older people no longer favored emotionally meaningful partners. Rather, their preferences were indistinguishable from younger participants.

With leadership from Helene Fung, then a graduate student and now a professor at the Chinese University of Hong Kong, this paradigm has been employed numerous times, in samples spanning diverse cultures and countries. Age differences reliably appear when time horizons are unspecified, but these differences are eliminated when time horizons are held constant across age (Fung & Carstensen, 2004; Fung et al., 2001, 2020). Notably, when major events have primed mortality, such as the terrorist attacks in the United States on September 11 or the SARS epidemic in Hong Kong, age differences are also eliminated (Fung & Carstensen, 2006).

According to SST, observed age differences in goals are less about time since birth than time left in life. If so, younger people suffering from terminal illnesses may be more similar to older people in the ways they think about social partners and goals. In the late 1990s, when a positive diagnosis of human immunodeficiency virus (HIV) was essentially a death sentence, Fredrickson and I recruited a sample of gay men in their 30s who differed by HIV status (i.e., negative, positive but asymptomatic, and symptomatic) in order to study the ways that healthy and sick younger people mentally represented their social worlds (Carstensen & Fredrickson, 1998). We compared their mental representations of their social worlds with young, middle-aged, and older men recruited from the general

population. As we predicted, young men suffering from the deadly virus responded like older men, those who had the virus but were asymptomatic responded like middle-aged people, and those who were young and healthy responded similarly to other young people.

Small Social Networks Contribute to (Rather Than Detract From) Well-Being

Findings from these social preference studies suggested an alternative to assumptions that age differences in the size of social networks reflected deaths, disabilities, and a lack of social opportunities. If, instead, smaller networks reflect preferences for close social partners and less interest in more peripheral partners, we needed to examine not only the size but the composition of social networks. And if gradually shifting time horizons instigated selective pruning of social networks, changes would be apparent long before old age.

Longitudinal analysis was required and, fortunately, the Institute of Human Development at the UC Berkeley allowed me access to one of the oldest longitudinal studies in the world. The Child Guidance Study (Macfarlane, 1938) included in-depth interviews with individuals across a 34-year period from their late teens into middle age. Each of the transcribed interviews contained extensive discussions about participants' social relationships with their acquaintances, parents, siblings, friends, and spouses. The richness of the interviews allowed coders to rate satisfaction, frequency of contact, and emotional closeness across a range of relationships to see how they changed over time. Our analyses revealed selective reductions in social interaction that began early in adulthood and continued through middle age (Carstensen, 1992). As frequency and satisfaction with acquaintances declined, emotional closeness in close relationships increased. To my knowledge, this was the first study to demonstrate that the pruning of networks begins long before late life, challenging the presumption that age-related losses are the principal causes of shrinking networks. Rather, relatively early in adulthood, investments in close relationships increased while interest in more peripheral relationships waned.

I was able to extend this line of research during my stay at the MPI where Frieder Lang, now a professor at the Friedrich–Alexander University of Erlangen–Nürnberg, was then a graduate student. Lang was keenly interested in social networks in old age, and he was working with the first wave of data from the Berlin Aging Study (Baltes & Mayer, 2001), a major multidisciplinary study of older Germans conducted at the MPI. This representative sample spanned 70–104 years, and, as expected, the overall size of social networks was smallest in the oldest participants. However, the networks were assessed with Kahn and Antonucci's (1980) social convoy measure, which captures not only the size of social networks but the emotional closeness of each network member. We found that the oldest participants had just as many emotionally

close network members as the younger participants (Lang & Carstensen, 1994), suggesting that changes were not haphazard but focused. When Lang (2000) interviewed the same participants 4 years later, he learned that networks had grown even smaller, and most of the reduction in network size reflected preferences, not deaths. Moreover, emotional closeness to the most emotionally significant social partners had increased over the 4-year period. The process looked nothing like disengagement. Rather, it suggested that people were selectively pruning and shaping their social networks to be more *emotionally* meaningful over time.

Years later, Tammy English, a former postdoctoral fellow who is now on the faculty at Washington University in St. Louis, examined network changes longitudinally in a lifespan sample (English & Carstensen, 2014). In line with the findings from the two previous studies, large networks evident in early adulthood were culled over time to be smaller and more emotionally dense. Importantly, this reduction in network size correlated with emotional well-being. Our findings were not atypical: A meta-analysis by Wrzus et al. (2013) found evidence for similar patterns across many studies and countries.

Together, these findings about social networks aligned with our findings about social preferences and told a different story about social aging. Social worlds did not simply narrow due to loss, but were proactively shaped to support changing goals. Rather than pose risks to psychological well-being, well-honed social networks appeared to enhance well-being. We began to think that the paradox of aging was not a paradox at all.

Time Horizons Influence Emotional Experience

Though SST is not a theory about emotion per se, we reasoned that prioritizing emotional meaning should have positive effects on experience in day-to-day life. By the early 2000s, scores of survey studies had documented a positive relationship between age and emotional experience. Still, the evidence was based largely on cross-sectional studies and relied almost entirely on global reports of emotional experience. Skepticism remained—including my own—about the developmental course of emotional experience. Did cohort differences account for the findings? Or did individuals typically change over time? Would findings hold if we sampled emotions in daily life instead of asking people to broadly describe their emotional experience?

To put these questions to the test, my research group undertook the first longitudinal study of emotion in a lifespan sample based on experience sampling (Carstensen et al., 2000, 2011). We recruited a sample of Black and White Americans in which race, gender, and socioeconomic status were stratified across age. Participants, initially aged 18–94, carried electronic pagers for 1 week and were signaled at random times to report the degree to which

they were experiencing each of 19 distinct emotions. We repeated this week-long assessment 5 and 10 years later.

We learned a great deal from this project. Across race, gender, and socioeconomic status, negative emotions were reported less frequently as people grew older. Emotions reported by older people were more positive and less negative. Some of the most interesting findings were inspired by collaborators John Nesselrode and Nilam Ram, who have long argued that statistical averages are insufficient to understand developmental change. Repeated “bursts” of sampled experiences revealed that over time individuals became less emotionally labile, more stable, and on balance, more positive. We have come to think that age differences in emotional experience are driven primarily by a reduction in negative emotions: there is little evidence that older people are *happier* than younger people, but older people are *less unhappy* than younger people. Highly similar patterns have since been reported by independent teams of investigators based on more recent birth cohorts (Burr et al., 2021).

Moreover, emotional experience appeared to grow more complex with age. Furthermore, mixed emotions during the initial data collection were associated with subsequent benefits to physical health (Hershfield et al., 2013). Hal Hershfield, then a graduate student and now professor at UCLA, and I wondered if mixed emotions could be direct effects of limited time on emotional experience. We began to think about poignancy—times that are deeply joyful yet also bring a tear to the eye—and generated a list of prototypically poignant events. Nearly all of these events were marked by a sense of time *marching on*—children heading off to their first day of school, graduations, weddings, and births of grandchildren. These bittersweet reminders of time marching on may also remind us of our own mortality. To paraphrase Hemingway, all good stories end in death.

With these ideas in mind, Hershfield and I set out to capture poignancy experimentally. In one study, we used imagery inductions in which participants vividly imagined being in emotionally meaningful places and reported the emotions they were feeling (Hershfield et al., 2008). Next, we asked them to imagine being in that same place for the last time. Emotions reported during the “last time” were more mixed but, importantly, no less positive than those reported under open-ended conditions. The findings suggest that the approach of endings turns happiness into savoring, with a tinge of sadness that may increase gratitude. In another study of graduating seniors at commencement, students were primed with one of the two messages (that graduations mark endings or that graduations mark new beginnings) and were then asked about their emotions (Hershfield et al., 2008). Students in the condition priming endings reported a mix of emotions similar to those we observed in the imagery induction study. However, for those primed with new beginnings, commencement did not produce mixed emotions.

Goals Affect What We See, Hear, and Remember

In the early 2000s, Mara Mather and Susan Charles were both visiting my laboratory. Mather, now professor of gerontology and psychology at USC, had just finished her doctorate at Yale University. Charles, who is now a professor of psychological science and nursing science at UCI, had worked with me as an undergraduate at Stanford and returned to the laboratory for a stint as a research associate. We began a line of research that extended SST to cognitive processing and led to the discovery of a phenomenon called the “positivity effect.” The positivity effect refers to a developmental shift in which a well-documented attentional bias that favors negative information—once presumed to be universal (Baumeister et al., 2001)—becomes positive with age.

We reasoned that because goal priorities change with age and goals direct cognitive resources, these shifts may influence top-down cognitive processing. In an initial study, we used an incidental memory paradigm to assess age differences in the valence of remembered stimuli (Charles et al., 2003). Participants were asked to simply view a series of positive, negative, and neutral images. Afterward, we asked them to recall all the images they could remember. Emotional images were better recalled than neutral images, regardless of age. However, while younger people recalled comparable numbers of positive and negative images, middle-aged participants displayed a modest advantage for positive over negative images, and older participants recalled substantially more positive than negative images.

Over the next several years, my research group focused considerable attention on the positivity effect. Joseph Mikels, former postdoctoral fellow and now professor of psychology at DePaul University, revealed the effect in affective working memory (Mikels et al., 2005). Former graduate student Quinn Kennedy, now on the faculty at Naval Postgraduate School, found evidence for the positivity effect in autobiographical memory (Kennedy et al., 2004). Susanne Scheibe, former postdoctoral fellow and current professor at the University of Groningen, led a study about affective forecasting surrounding the 2008 presidential election and found that older peoples’ predictions about their responses were more accurate than those of younger people (Scheibe et al., 2011). Greg Samanez-Larkin, former graduate student and now a professor at Duke University, revealed age differences in neural responsiveness in anticipation of gains and losses. When younger and older participants played the monetary incentive delay task, increased insula and caudate activation was observed in anticipation of monetary gains; however, only younger people displayed similar patterns in anticipation of loss (Samanez-Larkin et al., 2007). In a meta-analysis of 100 experiments from multiple laboratories using a wide range of methods and foci, Reed et al. (2014) concluded that the positivity effect in cognitive processing was reliable and robust.

Along the way, we were intrigued by a handful of well-designed experiments that failed to observe the positivity

effect. With Andy Reed, a former postdoctoral fellow who is now Vice President of Behavioral Economics at Fidelity Investments, I conducted a careful review of the exceptions. We noticed a systematic pattern to these studies: Virtually all the experiments included explicit instructions that required the participants to process both negative and positive stimuli. When participants were explicitly provided goals, the positivity effect was systematically diminished or eliminated (Reed & Carstensen, 2012). In our view, these findings provided additional evidence that the positivity effect reflects motivational influences (rather than proposed alternatives such as cognitive decline or neural degradation). Former graduate student Corinna Löckenhoff, now professor of psychology at Cornell University, conducted an elegant series of studies demonstrating how experimental conditions that direct goals could produce or eliminate the positivity effect (Löckenhoff & Carstensen, 2007). Using a similar paradigm, Tammy English showed that the personal relevance of experimental stimuli affected positivity (English & Carstensen, 2015). This pattern further supported a top-down explanation for the positivity effect. Older people are capable of processing negative information; yet, all things being equal, they do not. As photographer Bill Cunningham put it, “Those who seek beauty will find it.”

Mather expanded on these ideas with a conceptual model of cognitive control, which greatly illuminated the role of executive functioning in the positivity effect (Mather, 2012; Mather & Carstensen, 2005). She showed that the effect is most evident in people with high levels of executive functioning and degraded under cognitive load (Mather & Knight, 2005). The effect is not evident in Alzheimer’s disease (Kalenzaga et al., 2016) or observed in patients with white matter degradation associated with cardiovascular diseases (Mather, 2020). Moreover, the positivity effect appears early in cognitive processing and operates subconsciously at the level of attention and memory. People do not report trying to focus on positive information; it is not a coping mechanism by which older people actively try to quell negative moods (Isaacowitz & Blanchard-Fields, 2012). Rather, even subconsciously, older people tend to look on the bright side of life.

Improving Health and Welfare

Several years ago, my research group began to explore potential practical applications of SST (Carstensen & Hershfield, 2021). We expected that behavioral interventions with older adults could be improved when messaging emphasizes positive consequences of behavior change instead of potential risks of the status quo. Based on evidence about the increasing priority on emotional meaning with age, we also reasoned that the promise of meaningful rewards would incentivize action in older people better than the promise of exploration or novelty.

Former graduate student Nanna Notthoff, now Assistant Professor for Exercise Psychology at Leipzig University, and I tested the hypothesis that positive messages would be more effective than negative messages in increasing healthy behaviors in older adults (Notthoff & Carstensen, 2014). Younger and older participants were provided with accelerometers to measure step counts over the course of the study. After a baseline period, they were assigned to one of the three experimental conditions: the experimental group received daily messages about the benefits of walking, while two comparison groups received messages about either the risks of sedentary behavior or neutral information. Younger participants increased walking in all conditions, but older adults only increased walking in the positive messaging condition. In another study focusing only on older adults, participants wore pedometers and received positive or negative messages throughout a month-long intervention. Step counts steadily increased in the positive condition; no changes were observed in the negative messaging condition.

The preponderance of the evidence that age is associated with increasing interest in emotionally meaningful activities and social partners led us to hypothesize that prosocial tendencies also increase with age. In one recent study, we gave young, middle-aged, and older participants the opportunity to earn money for themselves, loved ones, or charities by increasing their physical activity (as measured by pedometers using daily step counts). No age differences were observed in the “self” or “loved one” conditions. However, when earning for a charity, older people increased walking significantly while younger people did not (Raposo et al., 2021). Such findings highlight the potential to improve health and well-being in older people through engagement in activities that also benefit societies.

Summary and Future Directions

SST is a life-span theory of motivation that accounts for age-related changes in motivation as a function of perceived time horizons. The associated research program generated a profile of findings that has helped to characterize social and emotional development. As time horizons grow more limited—as they typically do with age—goals change in ways that lead to preferences to spend time with close social partners, construct smaller and more meaningful social networks, and the selective deployment of cognitive resources to process positive information. Even as life’s struggles continue with age, people savor time left, experience complex emotions, and appreciate life.

At this point, my research group actively tries to identify areas where we are wrong. For us, it is exciting to read and discuss well-designed studies that fail to support SST. Understanding which parts of the theory are supported (and which are not) is akin to finding lost puzzle pieces. For example, we suspect that the relatively objective yardstick of perceived time left in life is distinct from the more subjective

sense of time running out, with the former influencing deliberative choices and the latter influencing the savoring of experience. Additionally, whereas SST maintains that younger people prioritize exploratory goals over emotionally meaningful ones, we suspect that younger people value both exploration and meaningful experience. Indeed, it is possible that placing a high value on incompatible goals may account for some of the mental strife younger people report, as they must regularly choose between valued goals. Older people, on the other hand, may be advantaged by having clearer priorities and values.

Though the story remains incomplete, testing falsifiable hypotheses and integrating new knowledge will continue to advance the theory in new directions and hopefully provide insights into life-span development.

It will be interesting to see how it all turns out.

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Conflict of Interest

None declared.

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