Socioemotional Selectivity Theory, Aging, and Health: The Increasingly Delicate Balance Between Regulating Emotions and Making Tough Choices

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ABSTRACT After providing an introductory overview of socioemotional selectivity theory, we review empirical evidence for its basic postulates and consider the implications of the predicted cognitive and behavioral changes for physical health. The main assertion of socioemotional selectivity theory is that when boundaries on time are perceived, present-oriented goals related to emotional meaning are prioritized over future-oriented goals aimed at acquiring information and expanding horizons. Such motivational changes, which are strongly correlated with chronological age, systematically influence social preferences, social network composition, emotion regulation, and cognitive processing. On the one hand, there is considerable reason to believe that such changes are good for well-being and social adjustment. On the other hand, the very same motivational changes may limit health-related information-seeking and influence attention, memory, and decision-making such that positive material is favored over negative information. Grounding our arguments in socioemotional selectivity theory, we consider possible ways to tailor contexts such that disadvantages are avoided.

INTRODUCTION

Early in life, physical and mental health are strongly interconnected. However, as people approach old age, this association is weakened. Although increasing chronological age is associated with objective decline in physical health, subjective well-being is maintained or

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improves through adulthood (Diener & Suh, 1997). So surprising are these findings that the phrase "paradox of aging" has been coined to refer to the apparent disassociation of mind and body.

Socioemotional selectivity theory (SST; Carstensen, Isaacowitz, & Charles, 1999) explains the ostensible paradox in terms of motivation. With increasing age, perceived limitations on time lead to reorganizations of goal hierarchies such that goals related to deriving emotional meaning from life are prioritized over goals that maximize long-term payoffs in a nebulous future. According to SST, time perspective, not chronological age, drives these changes in adulthood. Because of the inextricable association between chronological age and perceived time left in life, age-related motivational patterns are apparent. However, theoretically, age does not play a causal role. Empirical evidence supports this contention. Under conditions that prime endings, similar goal changes are observed among younger adults as well. For example, young males with symptomatic HIV infections who are approaching the end of their lives mentally represent social partners in ways similar to people in old age (Carstensen & Fredrickson, 1998).

Motivational shifts in the face of constrained time have adaptive benefits. When time in life is limited, younger and older people alike pay more attention to the emotional aspects of situations, prioritize emotion-focused over problem-focused coping strategies, and prefer emotionally gratifying social contacts over contacts with novel social partners. As a result, greater emotional well-being is experienced. Also, satisfaction with social support networks is higher, which may ultimately hold benefits for physical well-being as well (Watkins, 1997).

However, the selection of any goal entails both gains and losses (Baltes, 1987). In some situations, selective choices aimed at enhancing immediate emotional states may ultimately jeopardize future well-being. In this paper, we consider whether or not a focus on emotional states may discourage practices that, while emotionally risky, may be critically important for optimizing health. In other words, even when the future is relatively limited, pursuing unpleasant information or taking necessary but anxiety-arousing precautions is, no doubt, important.

Because goals influence cognitive processing, our research team hypothesized that older people would favor emotionally relevant material in attention and memory. Empirical tests have supported

this hypothesis. Older people attend to and remember positive information better than negative information (Charles, Mather, & Carstensen, 2003; Mather & Carstensen, 2003). Autobiographical memory becomes more positive with age as well (Kennedy, Mather & Carstensen, in press). Reasoning from SST, we argue that this positivity effect is motivated by and contributes to the effective regulation of emotion. However, if the prioritization of positive information extends to the health care arena, problems may occur. Namely, negative aspects of choices may be overlooked, and learning from past negative experience may be reduced.

In this paper, we first introduce the framework of SST and provide evidence supporting its essential claim that perceived constraints on time lead to a prioritization of emotional balance and emotionally meaningful goals. Next, we provide evidence that the pursuit of emotional gratification in one's social networks and a focus on the positive in cognitive strategies help to maintain well-being. We then identify circumstances in which socioemotionally selective choices and an emphasis on emotional experience may be problematic. Specifically, we illustrate how socioemotionally selective goals could influence health-related information gathering, cognitive processing, and decision making in ways that are not beneficial to long-term well-being. Finally, we discuss implications for health policy and possible interventions that may help to retain the benefits and avoid the pitfalls of older adults' focus on emotional balance in the present.

Socioemotional Selectivity Theory

The influence of time perspective on goal priorities

According to SST (Carstensen, 1993, 1995, 1998), individuals are guided by the same essential set of socioemotional goals throughout life, such as seeking novelty, feeling needed, and expanding one's horizons. However, the relative priority of different sets of goals changes as a function of perceived time left in life. When the future is perceived as open-ended, individuals prioritize goals that optimize the future. This includes goals that pertain to the acquisition of information, goals that are aimed at personal development, and goals that are aimed at establishing new social contacts that could be helpful in the future. In the health context, future-oriented goals increase the acquisition of health-related information, motivate

exercise regimes and a healthy diet, and encourage preventive measures such as inoculations or screening tests. In contrast, when the future is limited, present-oriented goals that maximize emotional meaning become more relevant. This includes goals that are aimed at regulating one's emotions by avoiding negative states, intensifying positive states, and flexibly adjusting emotional experience in response to different situations. Although the pursuit of emotionally meaningful experience is typically positive, it often entails a complex mix of emotions, especially when represented in generative activities (e.g., passing on one's knowledge and taking responsibility for future generations; Erikson, 1985; Lang & Carstensen, 2002). In advanced age or in the late stages of a terminal illness, present-oriented goals may be aimed at alleviating aversive symptoms to free resources for emotionally meaningful activities such as interactions with loved ones.

While some motivational theories are primarily concerned with distinctions between the specific types of goals that instigate someone's actions (e.g., prevention vs. promotion, Higgins, 2001; approach vs. avoidance, Elliot, & Harackiewicz, 1996), SST is more concerned with how individual differences in time perspective affect a diverse range of goals. For example, having a future-oriented time perspective could motivate both attempts to prevent negative outcomes and efforts to promote favorable outcomes in the future. Importantly, SST makes predictions about the *relative priorities* of goals over the lifetime. Thus, there may be situations in which there are no conflicts between pursuing both future-oriented and short-term goals. Differences predicted by SST are most apparent when goals compete. For example, conflict may arise when the pursuit of future-oriented goals elicits negative affect or when the pursuit of emotionally meaningful goals in the present limits future opportunities.

SST further suggests that future-oriented and emotionally meaningful goals benefit from different types of social networks. Future-oriented goals such as information gathering and personal development are best pursued in expanded social networks with an ample supply of novel social partners who can help the individual acquire knowledge and form useful new social contacts. In contrast, emotionally meaningful goals benefit more from smaller social networks comprised of familiar social partners who are emotionally close and can facilitate emotion regulation in the present moment.

Future time perspective is inherently associated with chronological age—the older we are, the more limited we perceive our futures. However, age is not the only factor that influences people's time perspective. Other factors, such as serious illnesses, geographic relocations, even college graduations, may limit time perspective as well. Sometimes, time perspective is constrained for a specific situation, while global time perspective remains expansive, for example, before an impending relocation. Likewise, time perspective can be expanded by events such as unexpected medical breakthroughs. According to SST, factors that expand or limit future time perspective should have systematic effects on social goals and social network structure.

Our research team has demonstrated that time perspective drives age differences in social preferences (Fredrickson & Carstensen, 1990; Fung 1999; Fung & Carstensen, in press; Fung, Lai, & Ng, 2001). In a series of studies, respondents were asked to imagine that they had half an hour of free time with no pressing commitments and had decided that they would like to spend that time with another person. They were then given three potential social partners to choose from: (1) a member of their immediate family (i.e., a familiar and emotionally close social partner); (2) the author of a book they had just read (i.e., a novel social partner who can provide new information); (3) an acquaintance with whom they seemed to have much in common (i.e., a novel social partner who can provide the potential for future social contact). Among these choices, the familiar social partner choice represents an emotionally meaningful goal, whereas the novel social partner choices represent future-oriented goals related to information gathering and the development of new relationships, respectively. Using this paradigm Carstensen and her colleagues (Fredrickson et al., 1990; Fung et al., 1999, Study 1) found that older adults were more likely to prefer the familiar social partner, whereas younger adults showed no such preference. These findings are generalizable across different cultures: Fung and her colleagues (Fung et al., 1999, Study 2; Fung et al., 2001) reported similar age differences in social preference among samples collected in Hong Kong, mainland China, and Taiwan.

Importantly, age differences disappear when time perspective is limited or expanded by factors other than chronological age. Carstensen and Fredrickson (1990) limited future time perspective in a U.S. sample by asking older and younger people to imagine that they

were soon going to move across the country. Under this condition, respondents of all ages preferred familiar social partners. Fung and her colleagues (Fung et al., 1999, Study 2) replicated this effect in a Hong Kong sample by asking respondents to imagine that they were soon going to emigrate. Again, all age groups preferred familiar social partners when endings were salient. Analogous findings emerged when time perspective was expanded. Fung, and her colleagues (Fung et al., 1999, Study 1) asked participants in a U.S. sample to imagine that they had just heard about a medical discovery that would extend their life span by at least two decades. Now, even older participants showed equal preferences for novel and familiar social partners.

The influence of future time perspective is not limited to individual endings such as a personal relocation or emigration. Similar findings emerged when we studied a sociopolitical ending, namely the handover of Hong Kong from Great Britain to the People's Republic of China (Fung et al., 2001; Studies 3 & 4). A year before the handover, older, but not younger, people showed a strong preference for familiar social partners. However, two months before the handover, when the political ending was highly salient, all age groups preferred familiar partners. One year after the handover, when the time constraint had been lifted, previously observed age differences reemerged.

Considering these findings, one could still argue that a blockage of goals, not time perspective per se, accounts for goal changes. Under limited future time perspective, emotional goals may be pursued by default because they are the only goals still attainable. Alternatively, the increased salience of emotional goals may be driven by a search for emotional comfort when confronted by the threat of an ending and not by a desire for emotional meaning (as, for example, suggested by terror management theory; Taubman, Findler, & Mikulincer 2002). Fung and Carstensen (in press) conducted a series of studies to disentangle these explanations. Respondents of different ages were asked to imagine situations in which there were no constraints, only time constraints, only goal constraints, or both time and goal constraints. Findings suggest that both goal and time limitation are associated with an increased preference for familiar social partners. However, time constraints have an effect that is independent of goal constraints. Further, whereas goal constraints increase the desire for emotional comfort, time constraints lead to an increased emphasis on emotionally meaningful aspects of relationships.

In summary, studies on social partner preference suggest that social goals shift as a function of time perspective. When future time perspective is limited, emotionally meaningful goals become more salient and familiar social partners are preferred.

Socioemotional selectivity in social network patterns

Not surprisingly, changes in time perspective and associated changes in social preferences influence the composition of people's social networks. There is a marked decline in the number of social network partners as people age (e.g., Antonucci, 2001; Cumming, Dean, McCaffrey, 1960; Lawton, Moss, & Fulcomer, 1986–87; Lee & Markides, 1990; Maddox, 1963). However, the age-related decline in social contact does not equally affect all aspects of people's social networks. Most prominently, there is an age-related decline in the number of peripheral social partners such as distant friends and acquaintances. In contrast, the number of close social partners remains relatively stable across adulthood (Lang & Carstensen, 1994; Levitt, Weber, & Guacci, 1993). Notably, these reductions in network size are steepest from early to middle adulthood, suggesting that age-related losses in late life are not the driving factor (Carstensen, 1992). Further, the selective nature of decreases in social network size suggests that mortality is not the primary cause (Lang & Carstensen, 1994). Rather, people appear to adjust their social networks proactively to changing needs. Lang (2000) assessed changes in older people's social networks over a 4-year interval. He found that less-close relationships were more likely to be terminated than close relationships. Further, the majority of relationships that ended had been terminated deliberately, suggesting active optimization of the social network by weeding out less satisfying relationships. Further, subjective closeness to death was associated with decreased emotional closeness to peripheral, but not close, social partners.

These changes in the composition of social networks appear to benefit social satisfaction. Lansford, Sherman, and Antonucci (1998) found that although older adults had less frequent contact with members of their social network, they were more likely to be satisfied with the current size of their networks. A series of studies using samples from the Berlin Aging Study (BASE; Lang & Carstensen, 1994; Lang, Staudinger, & Carstensen, 1998) found that the typical characteristics of older people's social networks (i.e., smaller network

size, but greater emotional closeness to the network partners) were associated with greater social satisfaction, more frequent exchanges of tenderness, and less loneliness.

However, optimal network patterns change over the life span, and achieving high social satisfaction requires a match among one's social patterns, goals, and time perspective. Lang and Carstensen (2002) asked persons of different ages to rate their social partner preferences and goal priorities. Limited future time perspective was related to increased salience of emotionally meaningful goals (i.e., emotion regulation and generativity) whereas open-ended future time perspective was associated with greater salience of future-oriented goals (e.g., knowledge gathering or career development). Goal priorities were systematically related to social network characteristics. Preference for emotionally meaningful goals was associated with more relatives, fewer friends, and fewer non-kin social partners in the social network. Thus, people's social networks seemed to match their social goals. Moreover, people of all ages reported higher social satisfaction and lower social strain if their social goals matched their time perspective. Although our prior research has not addressed physical health, a voluminous literature suggests that socioemotional well-being is strongly predictive of physical well-being. An intact social network serves as a buffer against physical and psychological stressors (Cassel, 1990; Hall & Wellman, 1985; Lowenthal & Haven, 1968), reduces morbidity rates across a wide range of diseases (Cobb, 1976), and lowers mortality (Berkman, 1978; Berkman & Syme, 1994). In the elderly, such effects are especially pronounced (Blazer, 1981). In short, socioemotionally selective behavior in forming one's social networks is likely adaptive. People experience less social strain and more social satisfaction if their social goals are consistent with their social networks.

Socioemotional selectivity in cognitive processing

The influence of age-related goal shifts is not limited to conscious social partner choices and social network composition but may also affect basic cognitive processes. When acquiring new information, people often face a dilemma between the long-term benefits of negative information (e.g., preventing dangerous consequences in the future) and the short-term emotional costs associated with emotionally challenging material (Raghunathan & Trope, 2002). According

to SST, an individual's approach to this goal conflict changes with age and, increasingly, current well-being is prioritized over the acquisition of new information. In particular, SST predicts an age-related emphasis on emotionally relevant material and a reallocation of processing resources away from negative information or moods toward the positive aspects of situations. So far, evidence for such effects comes from research on categorization, memory, and attention.

When categorizing the world around them, people emphasize dimensions that are personally relevant (Zajonc, 2000). As predicted by SST, older adults place greater emphasis on the emotional implications of social relationships than younger adults. Fredrickson and Carstensen (1990; Carstensen & Frederickson, 1998) investigated people's mental representations of social partners. Participants were asked to sort descriptions of various social partners according to their perceived similarity. Multidimensional scaling was used to identify the underlying dimensions that people use to make such judgments. Three dimensions emerged: (1) potential emotional rewards, (2) potential for information gathering, and (3) possibilities for future contact. Across two studies, older adults put significantly more emphasis on the emotional aspects of the relationship than younger adults. In a third study (Carstensen & Frederickson, 1998), the same card sort task was completed by a group of men who were similar in age but differed in their HIV status: HIV negative, HIV positive-symptomatic, and HIV positive-asymptomatic. Again the respondents with the shortest time perspective (HIV positive-symptomatic) placed greater weight on the emotional dimension of relationships.

Additional evidence for an age-related focus on the emotional implications of relationships comes from a study by Hess and Pullen (1994). They investigated impression formation about a fictitious target person among older and younger adults. Compared to younger adults, older adults put more weight on negative behaviors of the target than on neutral or positive behaviors, that is, older participants focused more on those behaviors that could potentially lead to interpersonal conflicts. Notably, the effects were limited to negative behaviors in the ethical domain and did not extend to ability judgments, which are less relevant for the emotional quality of relationships (Hess, Bolstad, Woodburn, & Auman, 1999).

Advanced chronological age and time perspective may also influence how information is encoded, and recalled. Far from providing a

permanent "snapshot" of a situation, human memory is an elaborative process in which current motivations may influence how information is encoded in the first place and how the past is constructed upon retrieval (Johnson & Sherman, 1990). According to SST, when emotional goals are prioritized, emotionally relevant information should be remembered more easily.

Across a number of studies, older adults were found to remember a greater proportion of emotionally meaningful material than neutral material. For example, Carstensen and Turk Charles (1994) asked younger and older adults to read a two-page excerpt from a novel. The excerpt contained similar amounts of emotionally relevant and neutral information. In an incidental memory paradigm, participants were asked to recall as many details of the narrative as possible. Among older adults, a greater percentage of the recalled material was emotional than among younger adults. Similar findings were reported by Adams and her colleagues who examined age differences in the recall and interpretation of texts (Adams, Lavouvie-Vief, Hobart, & Dorosz, 1990). They found that older adults put more emphasis on subjective states and symbolic themes, whereas younger adults' recollections were more text-based and literal.

Age also affects memory for specific events. Hashtroudi, Johnson, and Chrosniak (1990) tested people's memory for everyday situations. Some of the situations were simulated in the laboratory, while others were merely imagined. In subsequent memory tests, younger adults recalled more perceptual and spatial information, whereas older adults recalled more thoughts and feelings. Comparable effects emerge in autobiographical memory (Gould & Dixon, 1993). When couples were asked to recall a past vacation, younger couples recalled more objective facts, while older couples recalled more subjective experiences, preferences, and feelings.

Older adults' increased focus on emotionally salient information is consistent with the predictions of SST. However, alternative explanations need to be considered. Age-related changes in cognitive performance have been associated with disinhibition, that is, the inability to suppress task-irrelevant material (Hasher, Zacks, & May, 1999). Conceivably, older adults' emphasis on emotional material could be due to their inability to prevent the interference of emotionally salient stimuli, not to the greater personal relevance of such material. However, inhibition deficits cannot explain why the age-associated focus on emotional information is accompanied by

systematic age differences in people's preference for positive over negative material.

Our studies have revealed differential memory for material with positive and negative emotional valence. While younger adults are subject to a negativity effect, that is, they usually recall a greater proportion of negative than positive material, increasing age is associated with a positivity effect, that is, a disproportionate amount of positive information is recalled. These effects have been demonstrated across a number of memory tasks. Testing memory for visual images, Charles and her colleagues (Charles et al., 2003) presented young, middle-aged, and older adults with a set of images from the International Affective Picture System (Lang, Bradley, & Cuthbert, 1995). In a subsequent recall task, older adults remembered a greater proportion of positive images. Also, the proportion of negative images remembered in both recall and recognition tasks decreased with age.

Age-related preferences for positive material have also been demonstrated in people's memory for past decisions. Mather and Johnson (2000) asked older and younger adults to make several choices between pairs of cars, apartments, etc. When asked to recall the specific features of their choices, older adults recalled more positive and fewer negative features of the chosen options than younger adults. Interestingly, when younger adults were asked to focus on their feelings immediately after making their choice, they became as choice-supportive as older adults.

Not surprisingly, age differences in the recall of positive and negative material extend to autobiographical memory as well. For example, as people get older they become more likely to underestimate the intensity of negative emotions experienced in the past (Levine & Bluck, 1997). Also, Field (1981) followed a cohort of participants longitudinally and asked them at different ages to recall their childhood. With increasing age, recollections became more and more positive. Kennedy and her colleagues (Kennedy et al., in press) asked a sample of nuns to recall personal information about health practices and physical and mental health that they had originally reported 14 years earlier. In a control condition, participants were simply asked to recall the information. In two experimental conditions, participants were instructed to focus either on their current emotions or on giving as accurate responses as possible. In the control condition, older nuns showed greater positivity effects in memory than younger nuns. Importantly, there were no age differences in baseline

mood, suggesting that older adults' focus on positive material was not due to mood congruency effects. After the memory task, however, the older group reported more intense positive emotions than the younger group, suggesting that the focus on positive material was an effective emotion-regulation strategy. When instructions specifically asked participants to focus on their current emotional state, even younger participants showed strong positivity effects in their memory and reported a better mood after the recall phase. In contrast, when instructions asked participants to be as accurate as possible, both younger and older age groups showed negativity effects in their memory. This suggests that older adults' more positive reflections of their past result from a greater emphasis on their emotional states, and this appears to support current well-being.

Recent work conducted in our laboratory suggests that differential processing of positive and negative material may start at a very early stage of processing and influence what types of information are encoded (Mather et al., 2003). In a dot-probe paradigm, older and younger participants were presented with pairs of faces. In each trial, one of the faces had a neutral expression and the other had an emotional expression (happy, sad, or angry). After 1000 ms. the faces vanished and a dot appeared on either side. Participants had to press a key to indicate the location of the dot and reaction times were used to infer the locus of attention. Relative to neutral faces, older adults responded faster if the dot was presented behind a happy face and slower if the dot was presented behind a negative face. Among younger adults, the valence of facial expression did not influence response time. A subsequent memory test also revealed that older adults remembered a disproportionate number of positive faces. These findings suggest that age-related differences in memory for positive and negative material stem from systematic age differences in the attention to emotional information.

In summary, age differences in motivation appear to be accompanied by systematic differences in the processing of emotionally charged material. As people get older, they are more likely to categorize their world along emotionally salient dimensions and they remember a disproportionately high amount of emotionally relevant material. With increasing age, people also focus on stimuli with positive emotional valence. These cognitive strategies may have considerable advantages as they may aid emotion regulation,

optimize coping efforts, and increase subjective satisfaction with one's present and one's past.

Socioemotional selectivity in emotion regulation and coping

A growing body of research demonstrates that psychological factors, such as coping and emotion-regulatory skills, may substantially influence general health status, risk for disease, and the prognosis of existing conditions (for a review see Watkins, 1997). Moreover, successful coping with stress may influence susceptibility to memory impairment. Elevated cortisol levels in response to life stress have been linked to accelerated hippocampal atrophy among both healthy individuals and people in the early stages of Alzheimer's disease (Hull, 2002; Lupien et al., 1998; McEwen & Seeman, 1999). Thus, successful emotion regulation may not only protect older people's physical well-being but their mental capacities as well.

The types of problems that people are facing change systematically across the life span. While younger adults are more concerned with instrumental types of problems in the domains of work and finances, older adults report more social and health-related problems (Folkman, Lazarus, Pimley, & Novacek, 1987). Compared to younger adults, older people's problem-solving goals are also characterized by more interpersonal issues and intimacy (Sansone & Berg, 1993). Thus, as people get older, they face fewer situations that respond to problem-focused coping strategies (i.e., instrumental behaviors that deal directly with the problem or its effects) and more situations that require emotion-focused coping strategies.

Life-span changes in the nature of everyday problems are accompanied by an increase in the use of emotion-focused, problem-solving strategies. Nevertheless, strategy use remains flexible and accommodates the requirements of different situations. Blanchard-Fields and her colleagues (Blanchard-Fields, Jahnke, & Camp, 1995) asked young, middle-aged, and older adults to write essays on how they would resolve each of 15 problem situations. When the situation was emotionally salient, older adults were more likely to use passive-dependent and avoidant-denial strategies than younger adults. However, if the situation was not emotional, no age differences were visible. Similarly, Blanchard-Fields and her colleagues (Blanchard-Fields, Chen, & Norris, 1997) investigated age differences in coping strategies for instrumental and social domains of problem

solving. Compared to younger adults, older adults were more flexible in their use of different strategies. They were more likely to use problem-focused strategies when dealing with instrumental problems and more likely to avoid emotional reactivity when dealing with interpersonal conflict. Similar effects emerge when time is limited for reasons other than chronological age. Compared to patients with nonterminal diseases, patients with terminal cancer are less likely to use problem-focused coping and more likely to use emotion-focused or religious coping (Kausar & Akram, 1998). In short, the emphasis on emotionally salient material under limited time perspective appears to provide older adults with the type of information needed to deal successfully with the specific kinds of problems they are facing and to regulate their emotions while doing so.

Given this evidence for older adults' adaptive problem-solving skills, it is not surprising that increasing age is, in fact, associated with better emotional balance. When describing their emotional experience, younger adults report higher psychophysiological responsiveness, while older adults report more mood stability and emotion regulatory control (Lawton, Kleban, Rajagopal, & Dean, 1992). Gross et al. (1997) investigated age differences in self-reported control over emotions and emotional experiences across five diverse groups: European Americans, African Americans, Chinese Americans, Catholic nuns, and Norwegians. Consistently, older adults reported significantly greater emotional control, less psychophysiological agitation, and fewer negative emotional experiences than younger age groups. These differences in self-report are backed up by an experience sampling study investigating everyday emotional experience (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). For one week, participants aged 18 to 94 were paged at random times during their days and evenings. At every page, participants rated the degree to which they were experiencing each of 19 positive and negative emotions. Results suggested that negative emotions decline in frequency until age 60; after that point, the decline ceases. Findings also suggested that as people get older, highly positive emotions become more stable and highly negative emotions become less stable. Importantly, emotion regulation among older adults is not characterized by hedonism, but rather by a complex mix of positive and negative emotions. A sense that each good-bye kiss may be the last creates more complex, poignant, and deeply gratifying emotional experiences. Indeed, the experience sampling

study mentioned above shows advanced age is associated with increasing emotional complexity, as indexed by the simultaneous experience of both positive and negative emotions (Carstensen et al., 2000).

In short, there is ample evidence for a greater emphasis on emotion-focused coping strategies as people age, and this is associated with better emotion-regulatory skills and more positive and less negative emotional experience among older adults. So far, this review suggests that older adults reap considerable benefits for psychosocial and physical health as they pursue present-oriented goals in their social networks, cognitive strategies, and coping efforts. However, focusing on emotional well-being in the present may not always be the optimal response to life's problems. In the remainder of this paper, we will discuss how prioritization of emotionally salient goals could affect health-related information gathering and decision making. After discussing potential challenges for older adults' health, we will suggest possible remedies and an agenda for future research.

Socioemotional Selectivity in Health-Related Decision-Making

Over the past decades, the healthcare system in the United States has changed dramatically. Traditional fee-for-service plans have been replaced by health maintenance organizations that offer a variety of choices. On the one hand, a certain amount of choice is desirable as it allows patients to select alternatives that best fit their needs. On the other hand, sound decisions require an active patient role and a complex set of skills. Decision makers first need to acquire a sufficient body of knowledge on which to base their decisions. Next, the information must be evaluated and different action alternatives identified. Once a set of possible options is established, decision makers need to employ sound strategies to discern the outcomes that will best serve them (Appelbaum & Grisso, 1988; Finucane et al., 2002; Yates & Patalano, 1999; Zwahr, Park, & Shifren, 1999). Previous research has demonstrated substantial age-related changes in every step of the decision-making process, and, so far, these changes have been attributed almost exclusively to age-related cognitive decline in working and long-term memory (e.g., Botwinick, 1969; Denney, Pearce, & Palmer, 1982; Johnson, 1990; Yates & Patalano, 1999).

Age-related cognitive decline may significantly influence decision making, but it is not the only plausible explanation for the observed changes. Far from a systematic and rational analysis, real life decision making is heavily influenced by personal preferences, individual goals, and emotional states (e.g., Finucane, Alhakami, Slovic, & Johnson, 2000; Hsee & Kunreuther, 2000; Kunda, 1990). Because health-related information frequently demands consideration of unpleasant possibilities, it can require trade-offs between the long-term benefits of acquiring useful information and short-term emotional well-being (Trope, Ferguson, & Ragunathan, 2000). On the one hand, when faced with this dilemma, positive emotional experiences can serve as a *resource* that allows people to thoroughly process negative information about their health in spite of the associated emotional costs (e.g., Aspinwall & Brunhart, 2000; Raghunathan & Trope, 2002). On the other hand, positive emotional experiences may serve as *goals* by themselves, i.e., participants' may adapt their information-seeking strategies in order to attain or maintain positive mood (Isen & Simmonds, 1978; Wegener, & Petty, 1994; Wegener, Petty, & Smith, 1995). Based on SST we expect that older adults will adopt the latter approach and prioritize current well-being over long-term benefits. Specifically, we predict that older adults will limit the acquisition of potentially negative information, prioritize personally relevant and positively valenced information, and avoid or delegate decisions that elicit negative emotions.

In the following sections, we review research on aging and decision making that supports these postulates. In addition, we present findings from recent studies conducted by our research team that illustrate the pivotal role of socioemotional goals in explaining age differences in medical decision making. Our motivational account also has important implications for interventions. Age differences in motivation could be addressed through instructional frames that highlight relevant material or through educational programs that teach optimal decision-making techniques. Throughout our discussion, we identify possible starting points for such interventions.

Information seeking

According to SST, limited time perspective leads to a decline in information gathering because people don't need to plan for an extended future. For example, when people of different ages were

asked to indicate the relative importance of different goals and plans, younger adults placed greater emphasis on knowledge gathering and career development, whereas older adults prioritized emotionally meaningful goals (Lang & Carstensen, 2002). When time perspective was controlled statistically, age differences in information-gathering goals were eliminated. Also, when presented with different versions of advertisements that employed either information-related or emotional slogans, older adults showed greater preference and better memory for emotional slogans than for information-related slogans, whereas younger adults' preferences and memory did not differ across the types of slogans (Fung & Carstensen, in press). When time perspective was experimentally expanded, age differences in advertisement preferences were no longer significant.

This age-related decline in knowledge-gathering goals appears to influence predecisional information seeking as well. Whether asked to choose among automobiles, make management decisions, or deal with interpersonal problems, older people consistently view and review a smaller proportion of the available information than their younger counterparts (Berg, Meegan, & Klaczynski, 1999; Johnson, 1990; Streufert, Pogash, Piasecki, & Post, 1990). Health-related information seeking is no exception. When asked to review hypothetical breast cancer and estrogen therapy scenarios in laboratory situations, older participants request less additional information and make their decisions faster than younger participants (Meyer, Russo, & Talbot, 1995; Zwahr et al., 1999). Analogous changes affect health-care decisions in real life. For example, compared to younger adults, older patients are less likely to request additional information from their doctors (Cassileth, Zupkis, Sutton-Smith, & March, 1980; Deber, Kraetschmer, & Irvine, 1996) and less likely to obtain a second opinion from another doctor (Petrisek, Laliberte, Allen, & Mor, 1997).

The resulting lack of information may result in negative consequences. Willis and her colleagues (Willis, Dolan, & Bertrand, 1999) presented older adults with everyday problems regarding medication adherence and nutrition. Incomplete information processing was the most frequent cause for older adults' errors. Also, when asked to study medication labels and use the information to decide about dosages, older adults took less time than younger adults to study the labels and made more mistakes as a result (Morrell, Park, & Poon, 1989).

Though later life changes in health-related information seeking are consistent with the predictions of SST, alternative explanations are possible. Most notably, reduced knowledge gathering has been associated with cognitive decline, resulting in limits on the amount of information that can be processed simultaneously (e.g., Johnson, 1990). According to this view, older adults seek less information because they cannot handle its complexity. However, such accounts cannot explain why age differences in information seeking seem to be affected by the affective valence of new material. In a very recent study, we asked younger and older participants whether they would request free, reliable, and anonymous information about their personal susceptibility toward different diseases and environmental threats.[1] Half of the participants were told that they could learn about their "risk" for each of the health threats (negative instructional framing); the other half were told that they could learn about their "protection" from the threats (positive instructional framing). Older adults rated themselves as more likely to request the information if it were presented in the protection frame as compared to the risk frame. Younger adults showed the reverse pattern.

In short, an age-related reduction in information seeking is consistent with goal shifts proposed by SST. Importantly, seeking less information may lead to negative outcomes for older adults' health (e.g., Willis et al., 1999), and interventions to promote information seeking in late life are needed. As suggested by our recent findings (see above), instructional frames can help to make information about health threats more palatable for older adults.[2]

Information evaluation and decision strategies

SST also predicts that limited time perspective is associated with a preference for emotionally meaningful and positively valenced material. Inevitably, information that is derived from personal experiences has greater emotional relevance than information that is encountered for the first time in the laboratory context. Also, with increasing age, memories of one's personal past become more positive (Field, 1981; Levine & Bluck, 1997; Kennedy et al., in press). Thus, older adults' judgments may rely more heavily on personal

1. This study was part of a dissertation conducted by the first author.
2. This study was part of a dissertation conducted by the first author.

experiences than those of their younger counterparts. For example, when dealing with moral dilemmas, older adults are more likely than younger adults to integrate new information into their existing cognitive frameworks (Pratt, Golding, Hunter, & Norris, 1988). Also, compared to younger people, older people's logical reasoning draws on prior world knowledge to a greater extent (Gilinsky & Judd, 1994). The same is true for health-related decisions. Berg and her colleagues (Berg, Meegan, & Klaczynski, 1999) asked participants of different ages to solve hypothetical everyday problems (e.g., a doctor's refusal to accept one's insurance). Younger adults adopted an "exhaustive style" of decision making that resulted in frequent requests for information and the generation of multiple strategies. In contrast, older adults' style was more "experiential," i.e., they were more likely to integrate the new information with prior experiences. Also, when asked to review medical information and give advice to a fictitious medication user, older participants were more likely to rely on their general background knowledge than younger adults (Gould, 1999).

While older adults' greater reliance on prior experience is consistent with the predictions of SST, alternative explanations have been suggested. For example, the age-related emphasis on prior experience could be a compensation for reduced analytical skills (Denney et al., 1982). However, age-related cognitive decline cannot explain why older people selectively favor information with positive emotional valence. Two recent studies conducted by our team suggest that when making health-related decisions, older adults process positive material more thoroughly. In one study, participants of different ages were presented with computer-based, decision scenarios that required them to choose among different health plans and primary care physicians.[3] Although there were no age differences in participants' actual choices, older participants reviewed positive information about the choice alternatives more frequently than negative information, while younger adults showed the reverse pattern. After the choices, older participants also recalled their chosen option more favorably than younger adults. This is consistent with findings by Mather and Carstensen (under review), who asked participants of different ages to make several choices between pairs of health plans, doctors, etc. Older adults recalled more positive and fewer negative

3. This study was part of a dissertation conducted by the first author.

features of the chosen options than younger adults. Independently of choice-supportive tendencies, older adults also recalled a greater proportion of positive features, suggesting deeper processing of positive information, while younger adults showed no preference for positive material.

On the one hand, a solid knowledge base and an emphasis on positive characteristics can serve as invaluable tools in complex medical decision making. On the other hand, extensive reliance on prior experience and positively valenced information may prevent the processing of disconfirming information and limit the acquisition of new strategies. For example, older patients are less likely to encode new medical information when it contradicts prior beliefs. Rice and Okun (1994; Okun & Rice, 2001) presented older adults with information about arthritis. In a subsequent memory task, information that contradicted existing beliefs was less likely to be remembered. This effect was even more pronounced for participants for whom the information was personally relevant because they suffered from arthritis themselves. Further, prior knowledge may be overgeneralized to situations where it is not valid. For example, when older adults were asked to solve problems of medication adherence and nutrition, inappropriate use of prior experience was a major cause of older people's errors (Willis et al., 1999). Also, focusing on the positive may not always be the best strategy. For example, Pierce (1993; 1996) suggested that cancer patients may discount viable treatment options too easily in an attempt to avoid negative side effects at all cost.

Apart from illuminating the underlying causes for these processing strategies, SST may also inform interventions to prevent problematic outcomes. For one, instructions could be rephrased to highlight the positive aspects of necessary treatments and preventive measures. Malloy and his colleagues (Malloy, Wigton, Meeske, & Tape, 1992), for example, presented older adults with medical advance directives that were framed in positive, negative, and neutral terms. Older adults who read the positive descriptions were more likely to request life-sustaining measures for themselves. Alternatively, instructions could highlight negative information that would otherwise be overlooked. For example, Hibbard and her colleagues (Hibbard, Harris-Kojetin, Mullin, Lubalin, & Garfinkel, 2000) asked participants to choose among different health plans and compared two sets of instructions that either cautioned participants to

avoid disadvantages or encouraged them to look for the plan with the most advantages. Participants who read the negatively framed instructions subsequently gathered more information than participants who had read the positively framed instructions. Importantly, such interventions need to be carefully tailored for different populations in order to balance adequate attention to negative features with the tendency to completely withdraw from the task if it becomes too aversive.

Decision avoidance

Beyond the influence on information seeking and evaluation, motivational shifts may also contribute to older adults' tendency to delegate their health-related decisions to others or—if possible—avoid decisions altogether. Often, decision making is not a pleasant experience. When decisions require trade-offs among personally relevant values (e.g., safety and price), the decision maker may experience negative emotions that are not related to the specific outcomes but to the decision process itself (Houston, Sherrill-Mittleman, & Weeks, 2001). Avoiding such conflictual choices is rewarded by a reduction in negative emotions. For example, when students were asked to review choices among different cars that required trade-offs among personally valued attributes, they became more likely to avoid the choice by sticking with the status quo or postponing the choice to a later time (Luce, 1998). Choosing an avoidant strategy led to a reduction in task-related, negative emotions and the mere availability of an avoidant option, even if it was not chosen, significantly improved emotional experience (Luce, 1998). Conceivably, older adults' greater emphasis on emotion regulation could make them even more susceptible to task-related, negative emotions than younger adults, and this could ultimately lead to a greater preference for avoidant strategies.

As expected, older adults are more likely than younger adults to refer health-related choices to their doctors or relatives instead of deciding for themselves. In laboratory studies, this is true for risky treatments options (Curley, Eraker, & Yates, 1984); breast cancer scenarios (Meyer et al., 1995); advance directives (Ainslie & Beisecker, 1994; Roberto, Weeks, & Matheis-Kraft, 2001), and health plan choices (Finucane et al., 2002). Studies on older patients' real life choices found similar effects. Compared to younger cancer

patients, older patients are three times more likely to defer decisions to their physician (Cassileth et al., 1980); among women with breast cancer, increasing age is associated with a preference for delegating treatment decisions (Petrisek et al., 1997); and in rehabilitation medicine patients, age is negatively associated with desired involvement in medical decisions and the desire to try different treatment approaches (Beisecker, 1988). Interestingly, when confronted with a progressive, life-threatening illness, younger adults also tend to delegate their decisions. While women with benign breast disease prefer to make treatment decisions in collaboration with their doctor, women with breast cancer are more likely to adopt a passive role and leave the decision-making responsibility to their physician (Beaver et al., 1996).

At first glance, people's tendency to delegate health-related decision making when their time perspective is limited does not seem to pose a problem. In fact, deferring one's decisions to a trained expert may not only save time and effort but also lead to better outcomes in the end. However, the quality of such surrogate decision making depends on the expertise and interpersonal skills of the health care professional who takes over. Thus, if older adults prefer not to make medical decisions by themselves, they at least need to choose a good representative to decide in their name. Unfortunately, older adults appear to dodge this decision as well. For example, Beisecker (1988) found that older patients were less likely than younger adults to see more than one doctor when dealing with a given problem.

While older people's reluctance to make health-related decisions is consistent with the claims of SST, alternative explanations have traced it to cohort differences in the patient role, with older cohorts subscribing to a more passive role that transfers all responsibility to the physician (e.g., Beisecker, 1988). However, the latter account cannot explain, why older people are also more likely to delegate decisions to their relatives (Roberto et al., 2001) or avoid decisions in contexts that are not health related (e.g., Streufert et al., 1990, Calhoun & Hutchison, 1981).

In summary, decision avoidance in response to emotionally challenging choices increases with age, and this could lead to problematic outcomes. Fortunately, avoidant tendencies seem to be susceptible to appropriate instructional frames. In a recent study, we presented adults of different ages with emotionally challenging choices among

several doctors, health plans, and hospitals.[4] One of the alternatives in each scenario was said to present the status quo (i.e., an avoidant choice). Participants were significantly less likely to show a bias towards the status quo if instructions highlighted the advantages as compared to the disadvantages of the different choices.

Conclusion

In this paper we have introduced SST as a comprehensive theoretical framework to conceptualize life-span changes in personal goals, social networks, and cognitive processing. We have argued that the proposed goal shifts may substantially promote or challenge psychological and physical well-being across the life span. Importantly, even if one's future is short, it may not be beneficial to focus exclusively on present-oriented goals and disregard future-oriented goals altogether. Indeed the old adage, "live like you're going to die tomorrow, plan like you're going to live forever" captures the wisdom of attending to both types of goals.

Although previous research is largely consistent with our motivational argument, significant gaps in the empirical evidence remain, and, so far, only a few studies have directly tested SST in the domain of health-related decision making. More research is needed to disentangle the effects of cognitive and motivational factors in health-related choices across the life span.

If found to be viable, our motivational account has important implications for the promotion of sound decision making. Future time perspective and goal preferences are not set in stone but are subject to contextual factors. As suggested by our recent studies, subtle changes in the emotional framing of instructions may encourage information gathering or reduce avoidant tendencies. The success of such interventions rests on achieving a good match with individual goal priorities. Thus, instead of presenting everybody with the same array of information, we suggest that decision options be adapted to the strengths and weaknesses of each individual decision maker. For example, computer supported decision-making tools (e.g., Goldstein et al., 1994), could incorporate an initial assessment of the patients' time perspective, socioemotional goals, and cognitive strategies. Subsequently, this data could be used to balance

4. This study was part of a dissertation conducted by the first author.

individual positivity or negativity effects in information acquisition and evaluation.

At the moment, such plans may still seem far-fetched. However, across the Western world, average life expectancies are increasing and health-care practices that were originally developed for a much younger patient population need to be adjusted to meet older adults' needs. Until recently, modifications in the health care system were primarily geared to accommodate age-related declines in physical and cognitive functioning. As a result, personal goals and individual preferences of an older patient population may have been neglected. We hope that the theoretical framework presented in this paper will prove to be a helpful tool in guiding future research to address this situation.

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