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**Strategies of Adaptation to Age-Related Losses
in Everyday Activities of Independent Seniors**

Sylvie Bourgeois

A Thesis

in

The Department

of

Psychology

**Presented in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy at
Concordia University
Montreal, Quebec, Canada**

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ABSTRACT

Strategies of Adaptation to Age-Related Losses in Everyday Activities of Independent Seniors

Sylvie Bourgeois, Ph.D.
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The purpose of this study was to examine the applicability of the theory of selective optimization with compensation (P. B. Baltes & Baltes, 1990) to the adaptive management of resources in everyday life in old age. The general hypothesis that loss-based selection, optimization, and compensation (SOC) use mediated the relationship between personal resource availability and successful aging outcomes was tested by interviewing 101 women and 41 men aged between 66 and 88 years, who were functioning independently in the community. A range of personal resources was assessed and reduced to physical health, cognitive, emotional, and social support composites. A semi-structured interview on changes since mid-adulthood in the performance of 12 everyday activities was conducted in order to measure the use of behavioral strategies to deal with age-related losses in everyday life. Categories of adaptive strategies were qualitatively induced from interview transcriptions and then converted into indices of loss-based selection, optimization, and compensation. Outcome measures of successful aging included everyday functioning, operationalized as the mean frequency of activities, and subjective well-being. Results from path analysis indicated that personal resources were associated with the use of specific SOC processes. Richer physical health resources predicted more optimization, whereas poorer physical health predicted greater loss-based selection and compensation. Poorer social support was related to more loss-based selection, whereas richer social support was associated with greater compensation use.

Overall, use of SOC processes played a mediating role in the relationship between resource availability and successful aging outcomes. More loss-based selection was predicted by poorer resource availability and led to lower levels of everyday functioning and subjective well-being. However, availability of resources, especially in the domains of physical health and social support, facilitated adaptive changes of everyday functioning related to optimization and compensation. Thus, invoking the SOC theory as a description of age adjustments of older adults was valuable in the search for a greater understanding of the relationship between resource availability and successful aging outcomes. Knowledge of how use of SOC processes in the context of everyday activities can promote successful aging has implications for individuals working with the elderly.

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Over the past few decades, a guiding theme in gerontological research has been “successful aging”. The theory of selective optimization with compensation (SOC; P. B. Baltes & Baltes, 1990) views successful aging as the attainment of desired outcomes and the minimization of undesired outcomes. The theory describes three general processes, selection, optimization, and compensation, which can be used to adapt to the shift toward a less positive balance of developmental gains to losses that occurs in old age. The status of the SOC theory in the literature, though, has remained largely conceptual.

The purpose of this study was to examine the applicability of the SOC theory to the adaptive management of resources in the context of everyday life in old age. In order to accomplish this, it was essential to be able to measure the strategies of selection, optimization, and compensation that were used by community-residing seniors in their everyday activities. At the time of data collection, no such instrument was available. Hence, one goal of this study was to develop a measure of selection, optimization, and compensation use in the form of an interview that would address changes since mid-adulthood in ways of performing everyday activities. Another goal of the study was to examine whether the strategic processes postulated by the SOC model actually mediate relations between personal resource measures and successful aging outcome measures. An investigation of how resource availability and resource limitations relate to the use of selection, optimization, and compensation strategies and how they relate to activity engagement and subjective well-being offers insight into the usefulness of the SOC theory for understanding adaptation to age-related losses in everyday activities. In addition to its scientific relevance, the study of the adaptive management of resources in

everyday life in old age has implications for intervention with this segment of our population.

Successful Aging

With increasing age, the balance between positive and aversive changes in physical and psychosocial functioning gradually tips toward the negative (P. B. Baltes, 1987, 1997; P. B. Baltes, Lindenberger, & Staudinger, 1998; Brandtstädter, 1993; Heckhausen, Dixon, & Baltes, 1989). Old age is associated with objective losses in physiological, cognitive, and behavioral functioning (P. B. Baltes & Baltes, 1990; Rowe & Kahn, 1987) even though there may be maintenance or even gains in specific domains of functioning such as pragmatic knowledge (P. B. Baltes, 1993; Schaie, 1993) and emotional regulation (Carstensen, Gross, & Fung, 1997). In this context of losses relative to gains, effective functioning in everyday life is threatened. Maintaining everyday competence represents a central developmental task of old age, producing autonomy and independent living. Furthermore, seniors rate the maintenance of everyday functioning as a goal that is integral to their quality of life (M. M. Baltes, 1996; Mack, Salmoni, Viverais-Dressler, Porter, & Grag, 1997). Although most age-related changes have the potential to challenge the well-being of seniors, the emerging perspective is that the aging individual is remarkably resourceful and flexible in adapting to age-related losses in order to maintain subjective well-being (Brandtstädter & Greve, 1994; Staudinger, Freund, Linden, & Maas, 1999; Staudinger, Marsiske, & Baltes, 1995).

A central theme in aging research has been successful aging; that is, the search for factors and conditions that help us to understand the potential of aging well (P. B. Baltes, 1997). No longer is old age viewed as necessarily a phase of only declining resources,

in which a minimum of detrimental losses is the best that one could hope for. Rather, it is now recognized that aging is heterogeneous and that older adults can exhibit a range of levels of functioning in everyday life (Garfein & Herzog, 1995). Over the past fifty years, a number of theories have been proposed to conceptualize successful aging.

Earlier theorists conceptualized the acceptance of decline as the adaptive task of old age. The disengagement theory maintained that to escape stresses associated with old age and to regain a sense of tranquility, older adults gradually needed to withdraw from active life and focus on inner fulfillment. The theory called attention to the gradual and mutual withdrawal between the older adult and society that represented a symbolic preparation for death. Thus, success was viewed as acceptance of and reconciliation with the loss of power endemic in old age (Cumming & Henry, 1961). In contrast, the activity theory argued that social withdrawal in old age was imposed by traditional societal practices such as retirement. According to the activity theory, successful aging demanded the maintenance of activity, replacement of lost roles with new ones, and involvement in society and interpersonal relationships (Maddox, 1963). The activity theory considered that the more active people were in later years, the greater would be their subjective well-being (Kelly & Ross, 1989). The activity theory evolved into the continuity theory (Atchley, 1989), a current theory of adaptation to aging, which will be discussed later.

Other theories of successful aging emerged from the emphasis in psychology on personality growth. Erikson's stage model suggested that the task of old age was acceptance and resolution of one's life. Specifically, Erikson's theory of lifelong personality development asserted that achieving generativity and wisdom was the criterion for success in old age (Erikson, Erikson, & Kivnick, 1986). Theoretical models

of positive mental health have also contributed to the discussion of successful aging criteria. For instance, the model of self-actualization (Maslow, 1968) viewed successful aging as the realization of one's full human potential. Such developmental models have been criticized because of their normative definition of an ideal state, which reflects the priorities and values of the middle and upper classes (P. B. Baltes & Baltes, 1990).

More recently, Ryff (1989a, b) proposed an integrative model of successful aging that is based on developmental, clinical, and mental health criteria. Ryff argued that multiple aspects of life must be taken into account when assessing successful aging. Her model includes six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Along the same lines, Rowe and Kahn (1987, 1997) maintained that successful aging is multidimensional, encompassing low probability of disease and disease-related disability, maintenance of high physical and cognitive function, and sustained involvement in interpersonal and productive activities.

Worth noting is that subjective criteria have preponderantly been used as indicators of successful aging. This emphasis appears to reflect the assumption that reality is in part personally constructed and that these perceptions, rather than objective states, subsequently determine behavior. The use of subjective criteria highlights the value judgement that the perceiving self ought to be the ultimate test for quality of life. However, P. B. Baltes and Baltes (1990) have argued that subjective indicators are over-weighted in definitions of successful aging because of humans' ability to adapt their subjective assessments to objectively diverse conditions. According to this view, subjective criteria of successful aging are necessary but not sufficient conditions for an adequate definition of successful aging. An encompassing definition of successful aging

requires consideration of both subjective aspects of quality of life and objective aspects of medical, psychological, and social functioning within a given cultural context.

In sum, “successful aging” has become a familiar term in gerontology and a considerable body of research has accumulated on its indicators. Success has been defined by multiple criteria of assessment (e.g., objective or subjective), by different authorities (e.g., individual, family, clinical/medical, societal), and by different norms (e.g., functional, statistical). In recent years, discussion of the psychological and behavioral processes people use to adjust to aging losses, which are more universal and less dependent on cultural vicissitudes, has gained momentum. There is now consensus that successful development should not only denote an end point that can be reached, but it should also take into account how people achieve desired states under increasing limitations in resources (M. M. Baltes & Carstensen, 1996; Schulz & Heckhausen, 1996).

Processes of Successful Aging

Theory of Selective Optimization with Compensation

What are the factors and processes that contribute to successful aging? In the 1990s, the theory of selective optimization with compensation (SOC) was developed by a group of prominent theorists and researchers (M. M. Baltes & Carstensen, 1996, 1999; P. B. Baltes, 1987, 1997; P. B. Baltes & Baltes, 1990; P. B. Baltes, Staudinger, & Lindenberger, 1999; Freund & Baltes, 2000; Marsiske, Lang, Baltes, & Baltes, 1995). The SOC theory attempts to represent the scientific knowledge of the nature of development and aging with a focus on successful adaptation. This life span perspective on psychological management describes how individuals can deal with human aging and the age-related shift toward a less positive balance of gains to losses (Brandtstädter &

Wentura, 1995). It considers development in old age as being multidirectional and modifiable, emphasizing the dynamic and continuous interplay between culture-based growth and biology-based decline in level of functioning. Successful aging is seen as the ongoing process of the person-environment interaction that maximizes gains and minimizes losses, in view of the person's needs and competence on the one hand and environmental demands and opportunities on the other (Staudinger et al., 1995).

The SOC theory is based on an action-theoretical perspective that conceptualizes adaptive strategies of individual life-management. The theory holds that developing and committing to a hierarchy of personal goals and engaging in goal-directed action are essential for achieving higher levels of functioning. However, when the cost for goal achievement outweighs the gains, there is increased pressure to find compensatory ways and to select critical life domains to preserve at the expense of others. Therefore, selection is important not only in choosing initial goals but in making the best of limited resources for optimizing gains and if necessary, compensating for losses. In short, the SOC theory views successful mastery of goals in the face of age-associated losses as the result of the interplay among elective selection, optimization, compensation, and loss-based selection.

Elective selection. The constraints of resources inherent to human existence, such as time and energy, necessitate selection throughout the life span (Freund & Baltes, 2000). On a general level, selection implies narrowing the range of domains of functioning or goals from the pool of available options that can be pursued given the internal and external resources at hand. Goal setting, which involves developing, choosing, and committing to goals, is a necessary precondition for achieving higher levels of functioning in life (Carstensen, Hanson, & Freund, 1995; Marsiske et al., 1995).

Nevertheless, in old age there are fewer opportunity structures and internal resources available, leading to a narrower range of possibilities from which to select and consequently reducing the demand for elective selection.

Optimization. Optimization refers to the enhancement and refinement of internal and external resources and means in order to achieve optimal levels of functioning or improved levels of performance in selected domains, especially under stable conditions. Optimization can involve the acquisition of new skills, the practice of skills, and the allocation of time, effort, and energy. To illustrate, there is growing evidence for optimization from intervention studies in cognition and social behavior in old age. This literature evinces plasticity and growth possibilities into old age. It appears that when environmental conditions encourage practice, training, and exercise and when attention and motivation are stimulated, declines —long considered to be intractable— can be reversed and even improved (M. M. Baltes & Carstensen, 1996).

Compensation. Compensation denotes the use of alternate means to maintain a given level of functioning in the face of age-related losses or decline in goal-relevant resources. Compensatory efforts are not necessarily dependent on existing means and might require the acquisition of new skills not yet in the person's repertoire. For example, in cognitive psychology the pragmatics of intelligence, which comprise generalized knowledge and task-relevant knowledge, have been found to have compensatory power to alleviate deficits in the mechanics of intelligence, which involve basic cognitive operations (P. B. Baltes, 1991). One instance is Salthouse's classic study (1984) on older expert typists. Salthouse found that older typists were slower in tapping rate and in reaction time, but they were not slower in the overall speed of typing because they compensated for their slower physical speed by reading further into the text before

typing. Studies on the use of memory aids in everyday life represent further cases in point. In investigating the use of memory aids in real life, Cavanaugh, Grady and Perlmuter (1983) reported a greater use of internal (e.g., organization, rehearsal) as well as external (e.g., lists, calendars) memory aids in older than in younger adults. Another illustrative example of compensation in old age is the use of help from others. Marsiske et al. (1999) noted that the age-related increase in need for assistance with everyday activities was mainly associated with functional impairment in the sensory (hearing and vision), sensorimotor (balance/gait), and motor (mobility and strength) domains.

Loss-based selection. When the costs for goal achievement or maintenance outweigh the gains, the SOC theory postulates that loss-based selection may be the most adaptive response. Loss-based selection is the process by which older persons readjust personal goals and/or modify their standards of performance in response to decline in goal relevant means. As internal and external resources become increasingly constrained, loss-based selection entails the avoidance of one domain altogether (stopping) or a restriction in tasks and goals within one or more domain ("partial selection"). For instance, in the context of everyday activities loss-based selection ensures that older persons are able to achieve acceptable levels of performance within a narrower range of activities, which are perceived to be the most important or for which abilities are the most preserved.

Continuity Theory and Selection, Optimization, and Compensation Use

The continuity theory (Atchley, 1989) can provide insight into individual variability in the use of selection, optimization, and compensation in everyday life. The continuity theory proposes that in making adaptive choices, older adults attempt to preserve and maintain existing psychological and social patterns by applying familiar

knowledge, skills, and strategies (Atchley, 1993). More precisely, continuity theory contends that older adults are motivated toward inner psychological continuity and outward continuity of behaviors and circumstances. Internal continuity refers to the preservation of perceived inner structures such as one's temperament, preferences, experiences, and skills. Internal continuity is essential for maintaining a sense of direction in active daily life, predictability, familiarity, and comfort in one's interpersonal life. In order to have a sense of internal continuity, individuals must have the capacity to see inner change as connected to their past and to see the past as sustaining their new self. External continuity is defined as the preservation of external structures such as physical and social environments and activity patterns in those environments. Perceptions of external continuity stem from doing familiar things in familiar places in the company of familiar people, which seems to promote a sense of mastery and satisfaction with life (Atchley, 1989). Thus, older adults may choose from among the various types of selection, optimization and compensation strategies those that allow them to maintain internal and external continuity.

Control and Coping Theories and the Theory of Selective Optimization With Compensation

Theories consistent with the theory of selective optimization with compensation are salient in the control and coping literature. The scope of coping- and control-related phenomena is vast and has given rise to a variety of theoretical formulations, including primary and secondary control (Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1996); problem-focussed and emotion-focussed coping (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Lazarus, 1993; Lazarus & Folkman, 1984); and

assimilative and accommodative modes of coping (Brandtstädter & Renner, 1990, 1992).

The following review will focus on two prevalent, recently articulated theories:

Heckhausen and Schulz's primary and secondary control model and Brandtstädter et al.'s model of assimilative and accommodative modes of coping.

Primary and Secondary Control

Heckhausen and Schulz articulated a life course theory of control that provides the basis for a life span model of developmental regulation (Heckhausen & Schulz, 1993, 1995; Schulz & Heckhausen, 1996). The life span theory of control (Heckhausen & Schulz, 1995) proposes that humans desire to produce behavior-event contingencies and thus exert primary control over the environment throughout their life span. Primary control involves attempts to change the external environment so that it fits the needs of the individual. Secondary control targets the self and serves to minimize losses in primary control and to maintain and expand existing levels of primary control. Secondary control helps the person to cope with failure and promotes primary control by channeling motivational resources toward selected goals (e.g., by enhancing the attractiveness of chosen goals, by disengaging from action alternatives that were not chosen). Heckhausen and Schulz (1995) posit that for each segment of the life course, modes of control are functionally adapted to the potentials and constraints that characterize the respective age period. Given the increasing age-related biological declines and socio-cultural challenges to primary control in old age, secondary control strategies become valuable as a means for maintaining the potential for primary control.

The model of developmental regulation (Schulz & Heckhausen, 1996) considers the role of adaptive combinations of primary and secondary control as instantiations of

selection, optimization, and compensation. Specifically, successful aging is equated with the development and maintenance of primary control throughout the life course, which is achieved through control-related processes that optimize functions of selectivity and compensation for failure. Selection processes regulate the choice of action goals so that competencies within the chosen domain are enhanced, but at the cost of developing non-chosen alternatives. Compensation processes serve to maintain, enhance, and remedy competencies and motivational resources after failure experiences.

Four control-related processes characterize selection and compensation (Heckhausen & Schulz, 1993). First, selective primary control refers to the focused investment of resources such as effort, time, and skills required for a chosen goal. Second, selective secondary control enhances the value of a chosen goal while devaluing non-chosen alternatives. Third, compensatory primary control is required whenever the physical or cognitive capacities of the person are insufficient to attain a chosen goal. Fourth, compensatory secondary control serves to buffer the negative effects of failure or losses on the person's motivation for primary control (e.g., disengagement from blocked goals, engagement in new alternative goals, strategic social comparisons).

To summarize, the theory postulates that successful life course is achieved when selection and compensation processes serve to maximize the primary control of the person over the life course. When primary control is threatened or lost, transition from selective primary control to compensatory secondary control would contribute to adaptation in that compensatory secondary control strategies buffer the negative emotional effects of failure or loss. Compensatory secondary control would preserve and rekindle the person's motivational resources for maintaining and enhancing primary control in the future without having to physically engage the environment. Thus,

Heckhausen and Schulz (1995) hypothesize that as people age, an increasing proportion of the stressors they face cannot be controlled or resolved, which results in diminished effectiveness of direct behavioral action and enhanced effectiveness of cognitive strategies that redefine the problem in such a way as to reduce emotional distress.

Indirect evidence demonstrating the adaptive value of diverse primary and secondary control strategies is reviewed by Heckhausen and Schulz (1995). Generally, results suggest that secondary control increases with age, but there remains controversy regarding whether primary control is stable across the life span. Currently, research is attempting to uncover as much as possible about the psychological processes that govern and accompany such perceptions of control in old age and the way in which outcomes are influenced by control beliefs.

Assimilative and Accommodative Modes of Coping

Related concepts of adaptation have been put forth by Brandtstädter and his colleagues (Brandtstädter, 1993; Brandtstädter & Greve, 1994; Brandtstädter & Renner, 1990; Brandtstädter, Rothermund, & Schmitz, 1998; Brandtstädter & Wentura, 1995; Brandtstädter, Wentura, & Greve, 1993; Brandtstädter, Wentura, & Rothermund, 1999). These theorists have developed a conceptual scheme of self-regulation in old age, distinguishing between two complementary modes of coping: assimilative and accommodative.

Assimilative mode of coping is also referred to as “tenacious goal pursuit”. It involves the use of intentional activities to maintain desired levels of functioning or to prevent anticipated losses in areas where the person must maintain some social norm. Examples of assimilative activities include self-corrective behaviors aimed at enhancing

performance such as modifying unhealthy daily routines, maintaining personal attractiveness, and acquiring new skills to enhance performance. As functional loss looms larger, the intentional focus of assimilative activities shifts toward more explicit compensatory objectives such as using external aids. Compensatory efforts reach a maximum when losses and impairments become sufficiently clear-cut but still remain within margins that seem amenable to corrective interventions. According to the model, assimilative activities are enhanced by percepts of control. Congruous with this assumption, Brandtstädter (1993) found that assimilative activities significantly increased with perceived deficits, but they were moderated by perceived control over development (i.e., the stronger the belief of external control, the weaker the relationship between perceived deficits and corrective tendencies).

Nonetheless, compensatory investments can yield diminishing returns in the face of irreversible losses, uncontrollable events, and chronic strains that accompany old age (Brandtstädter et al., 1999). When the costs of assimilative activities become too taxing, Brandtstädter et al. maintain that older adults may be better served by accommodating to age-related losses. Accommodative mode of coping denotes “flexible goal adjustment” to fit more closely with environmental constraints rather than changing the actual situation. Accommodative processes may involve deactivating barren goals by reducing their incentive value, rendering an initially aversive situation acceptable, using self-enhancing comparisons, adjusting aspiration levels to fit more closely with one’s available resources, and adopting less demanding performance standards. Of interest is that accommodative mode of coping is central to the concept of compensatory secondary control as outlined by Heckhausen and Schulz.

To reiterate, the dual-process model of assimilative and accommodative modes of

coping holds that when confronted with blocked goals, people first attempt to reach their goals through tenacious goal pursuit. If despite these efforts the goals remain blocked, flexible goal adjustment should occur. Brandtstädter and Renner (1990) found evidence indicating that assimilative and accommodative activities have opposite developmental gradients. The age-related decrease in tenacious goal pursuit and age-related increase in flexible goal adjustment were seen as consequences of increased losses in goal-related means with advancing age.

Other studies have provided substantiation for the theorized adaptiveness of accommodative coping in the face of irreversible losses that accompany the last phase of life. Brandtstädter et al. (1993) presented studies that focussed on accommodative mode of coping when confronted with health problems, age-related situational constraints, and the narrowing of future perspectives. In each instance, flexible goal adjustment dampened the negative influence of the life stressors on the subjective well-being of older adults. In a similar vein, Brandtstädter and Rothermund (1994) observed in a longitudinal study that accommodative strategies helped to maintain a sense of self-efficacy when participants were faced with losses. Specifically, perceived deficits of control in a particular goal domain were generally accompanied by rising depression, but the negative effect was mitigated by downgrading the importance of the respective goals.

As defined above, a core function of accommodation consists in neutralizing experiences of loss and mitigating the emotional load that is related to such experiences. Although aging connotes an increasing prevalence of negative over positive changes, accommodative processes should contribute to keeping the balance of gains to losses favorable by adjusting goal importance over time so as to neutralize losses and emphasize gains. Brandtstädter et al. (1998) found support for this theoretical assumption in a cross-

sequential study that assessed changes in perceived distance from goals and the personal importance of such goals. Indicators of gain and loss were formed by weighting longitudinal changes in goal distance (decrease or increase) by the rated importance of the respective goals and then aggregating across goals.

Taken together, the theoretical assumptions and empirical findings from the control and coping literature suggest that downscaling the importance of a blocked goal buffers the experience of loss. Given that restructuring one's goal hierarchy and adjusting one's standards as a response to loss are facets of loss-based selection, the proposition that loss-based selection contributes to successful management in the face of severe and permanent losses in old age is strengthened.

Theorists of developmental regulation across the life span have emphasized the importance of successful adaptation to aging and to the age-related shift toward a less positive balance of gains to losses. Various processes of adaptation have been conceptualized as essential in helping older adults to achieve desired states under increasing limitations in resources. The next sections will review the literature on outcome indicators of successful aging, focussing on everyday competence and subjective well-being.

Everyday Competence and Successful Aging

Everyday competence in the study of aging reflects the ability to mobilize and effectively use one's physical, cognitive, emotional, and social resources to produce day to day behaviors that are necessary to maintain independence, autonomy, and subjective well-being in the face of threats and challenges (M. M. Baltes, Maas, Wilms, Borchelt, & Little, 1999; M. M. Baltes, Mayr, Borchelt, Maas, & Wilms, 1993; Diehl, 1998; Park,

1997; Pushkar, Arbuckle, Conway, Chaikelson, & Maag, 1997). Two major lines of research in the area of everyday competence in old age have been differentiated: everyday functional competence and everyday cognitive competence.

Everyday Functional Competence

Everyday functional competence (also termed everyday functioning) refers to the person's ability to perform when necessary a broad array of self-care, instrumental, social, and recreational activities (M. M. Baltes et al., 1993, 1999; Diehl, 1998). Two broad domains of obligatory activities, whose successful completion is critical for the maintenance of autonomous functioning, have been identified in the literature. Activities of daily living (ADLs; Katz, Ford, Moskowitz, Jackson, & Jaffee, 1963) include activities such as bathing, grooming, and toileting. Instrumental activities of daily living (IADLs; Lawton & Brody, 1969) comprise the ability to manage one's finances, take one's medications, use the telephone, shop for necessities, prepare meals, carry out basic housekeeping chores, and transport oneself to locations outside the home. These activities must be performed consistently at an adequate level of frequency, at manageable levels of difficulty, and at a level of skill sufficient to avoid raising significant doubts about the competence of the individual in the minds of family, social service personnel, or in the individual's own mind. However, theorists have pointed out that although maintaining basic level of competence is a necessary condition for successful aging, it is not the sole goal for most seniors. Theorists of successful aging believe that continuity, quantity, and quality of a wide range of activities, including social and recreational activities to which time can be allocated deliberately, are associated with general well-being in old age (Atchley, 1989; Berkman et al., 1993; Horgas, Wilms, & Baltes, 1998; Rowe & Kahn, 1997; Schulz & Heckhausen, 1996).

Measurement of Everyday Functional Competence

Everyday functional competence has been operationalized on the behavioral level and has been assessed with various types of measures, which can be grouped into ordinal point scales, behavioral observations, activity checklists, and time budget methods. The first approach has its origins in the clinical sciences and focuses on the assessment of functional capacity or degree of independence in an individual. Typically, the older person or caregiver rates the level of competence in each ADL domain (Katz et al., 1963; Mahoney & Barthel, 1965) and IADL domain (Lawton & Brody, 1969) according to an ordinal point scale (e.g., can perform without help, requires help, or unable to perform even with assistance). Assessing the need for help with such activities provides an indication of the level of disability and the possible need for institutionalization or home care. One limitation of these ordinal point scales is that they assess the person's performance in different activities of daily living with a single item per domain (Kovar & Lawton, 1994). It has been argued that single-item measures do not adequately assess the complex constructs of competence in various domains (Willis & Schaie, 1994). Difficulty ratings can offer an additional perspective (Kovar & Lawton, 1994). In addition, the ratings are subjective and may be biased. To that effect, several studies have shown that geriatric clinical populations and even some healthy older adults tend to overestimate their functional ability, particularly for IADLs (e.g., Galanos, Fillenbaum, Cohen, & Burchett, 1994; Kiyak, Teri, & Borson, 1994; Weinberger et al., 1992). Proxy reports have been used to circumvent the response biases often inherent in self-reports. Proxy reports generally show a stronger association with older adults' actual performance than self-reports, but they too have limitations (Magaziner, Zimmerman, Gruber-Baldini, Hebel, & Fox, 1997).

Concerns regarding the error inherent in estimates by either the older person or proxy on global concepts such as amount of assistance and difficulty experienced have led to the development of behavioral observations of ADLs and IADLs. These performance measures involve the presentation of a standard task to the person in a controlled setting, with behavioral criteria for quality of performance. Examples are the Direct Assessment of Functional Status for older adults who are suspected of manifesting early signs of dementia (Loewenstein et al., 1989) and the Observational Tasks of Daily Living for healthy older adults (Diehl, Willis, & Schaie, 1995). These instruments have acceptable reliability; nevertheless, an important unresolved question concerns their validity for the purpose of evaluating competence for independent living. As noted by Willis (1996a), a critical problem in this area is the lack of an agreed-upon criterion for validating potential measures of everyday competence.

A third measurement approach emphasizes general activity patterns. In this tradition, the amount and nature of activity involvement have been of greater interest than how well the activity is actually performed. Checklists of activities sample a broad range of activities that are commonly engaged in by older adults and quantify the person's self-reported level of activity engagement according to ordinal point scales (e.g., Arbuckle, Pushkar, Chaikelson, & Lapidus, 1994; Clark & Bond, 1995; Everard, Lach, Fisher, & Baum, 2000). Activity checklists yield information that represents a reliable and valid indicator of the activity levels of older adults.

A fourth approach in assessing everyday functional competence aims to get a close description of daily activities in terms of time and space (Ujimoto, 1990). Time use can be collected in a number of fashions ranging from direct observation to retrospective

recall over specific periods. For example, the Yesterday Interview (YI; Moss & Lawton, 1982) attempts a temporal reconstruction of the sequence of activities during the day preceding the interview. Such a reconstruction allows the assessment of type, frequency, and duration of activities engaged by the participant during that day, as well as contextual dimensions of each activity. The interviewer asks the participant to recount all activities in the sequence of their occurrence during the preceding day. Then, the interviewer starts anew with the first activity reported and inquires about duration, frequency, geographical, and social context. Twenty-four-hour recall requires the respondent to recall the relevant events and aggregate the retrieved information into the adequate format. In addition, time use methodology runs the risk of cognitive and motivational factors compromising the validity of the answers (Engle & Lumpkin, 1992; Niemi, 1993). Inter-rater reliability assessments for the coding of the activities have yielded scores above .80 (e.g., M. M. Baltes et al., 1993).

Everyday Cognitive Competence

The second line of research on everyday competence comes from a new area in the study of cognitive aging, which addresses the cognitive performance of individuals in the context of their daily lives. Everyday cognitive competence has been defined as the ability to perform adequately those cognitively complex tasks considered essential for living on one's own in society (Diehl et al., 1995; Willis, 1991, 1996a). Limitations in everyday cognitive competence have been associated with a number of negative indices of physical and mental well-being (Willis, 1996b).

The relationship between basic cognitive abilities, as measured by traditional psychometric tests, and everyday cognitive abilities remains unclear. On the one hand,

performance on everyday cognitive tasks has been theorized to be less vulnerable to the negative effects of aging given the experiential, knowledge-based nature of everyday tasks (P. B. Baltes, 1997; Denney, 1989). According to this view, individuals develop as they age declarative and procedural domain-specific knowledge in areas in which they frequently participate. This specialized knowledge, in turn, decreases the reliance on other basic mental abilities for everyday task performance within those domains.

Psychometric tests are considered not to be true predictors of everyday competence. On the other hand, some researchers have maintained that age differences in everyday cognition resemble those found more generally for traditional measures. This perspective considers everyday cognition as being superordinate to and composed of a set of underlying basic abilities. The decline found for general intellectual functioning in the last decades of life would also characterize real-world problem solving (Marsiske & Willis, 1998; Willis, 1996b; Willis & Marsiske, 1991).

Empirical work on this matter has yielded contradictory results. Some studies have shown no cross-sectional age differences on certain measures of everyday cognitive performance, suggesting that everyday cognition is less vulnerable to the negative influences of aging (e.g., Cornelius & Caspi, 1987; Poon et al., 1992). On the contrary, many researchers have documented substantial cross-sectional decline in everyday cognitive abilities. For example, Willis and her colleagues have reported significant late-life cross-sectional age differences (Diehl et al., 1995; Marsiske & Willis, 1995) and longitudinal mean decline in everyday cognition (Willis, Jay, Diehl, & Marsiske, 1992; Willis & Marsiske, 1991). Allaire and Marsiske (1999) found that both traditional and everyday tests were negatively related to age. These authors believe that age-related

differences in basic mental abilities contribute to the observed age differences in everyday cognition. They conclude that the same complexity that characterizes the aging of basic cognitive abilities appears to also characterize the aging of everyday cognition.

Measurement of Everyday Cognitive Competence

A major challenge for persons involved in the assessment of older adults' cognitive performance with problems drawn from everyday life has been to identify the cognitive challenges confronted by seniors and to define the critical domains associated with living independently (Cornelius, 1990). Thus, the measurement of everyday cognition in old age is marked by substantial heterogeneity.

Operationally, investigators examining everyday cognition have varied tasks according to "ability-specificity" and "domain-specificity" (Allaire & Marsiske, 1999). To illustrate, measures assessing several cognitive abilities provide a general problem-solving score. Such measures usually require older adults to solve tasks of daily living that involve printed material associated with each of the IADL domains. Examples of measures include Everyday Problem Solving (Cornelius & Caspi, 1987; Marsiske & Willis, 1995) and Practical Problems (Denney & Pearce, 1989). Such measures have less face validity than in-home observational measures, but they allow the assessment of a larger number of occurrences of problem solving in a given time period. Measures assessing specific cognitive abilities comprise instruments in which researchers have identified specific abilities or specific domains of knowledge necessary for effective performance in everyday life. Instances are everyday memory (West, Crook, & Barron, 1992), tacit knowledge (Colonia-Willner, 1998), and wisdom-related knowledge (P. B. Baltes & Smith, 1990). In addition, some everyday cognitive competence measures

assess many domains of everyday functioning (e.g., Berg, Strough, Calderone, Sansone, & Weir, 1998; Blanchard-Fields, Chen, & Norris, 1997; Denney, 1989), whereas other measures assess more delimited categories of everyday tasks like medication use (Morrell, Park, & Poon, 1989).

Relationship Between Functional Competence and Everyday Cognitive Competence

The few studies that have investigated the relationship between self-ratings of performance in IADLs and performance-based measures of everyday cognitive competence have revealed modest associations. Older adults seem to be reporting higher levels of functioning in instrumental tasks of daily living than what objective measures of everyday cognition indicate (Marsiske, 1992; Willis, 1996b.). For example, Dolan and Willis (1999) found that 81% of the participants rated themselves as independent in IADLs while only 44% functioned above the 75th percentile of performance on a performance-based measure of cognitive ability to solve tasks associated with everyday activities. According to Dolan and Willis, self-reported independence in IADLs may be based on the absence of disability in daily activities whereas performance on objective measures of everyday cognitive functioning may represent earlier occurring functional limitations.

In addition, Allaire and Marsiske (1999) have suggested that everyday cognitive tasks might be interpreted as a measure of older adults' potential rather than of their actual daily performance. Although everyday cognitive problems are based in familiar functional domains, the specific tasks presented to older adults represent tasks that they should be able to do rather than tasks that they necessarily do in daily life. Hence, there may be a difference between the actual performance of individuals in everyday activities

and what they are capable of demonstrating under alternative assessment conditions. Furthermore, as cognitive aging theorists have argued, older adults can draw on accumulated knowledge to buffer against performance losses in familiar and over-learned domains of everyday life (P. B. Baltes, 1997; Salthouse, 1991a). However, older adults' ability to adapt cognitively to challenges in domains in which they do not have so much experience may be more susceptible to age-related losses (Allaire & Marsiske, 1999).

Activity Involvement in Old Age

Research examining age differences and age changes in activity patterns has generally shown that older adults participate in fewer activities and activities of a more sedentary nature than younger adults do. For example, Lawton, Moss, and Fulcomber (1986) found that older adults spent as much as five to six hours daily performing maintenance and instrumental activities. A cross-sectional analysis of a Canadian population health survey (Arbuckle & Maag, 1999) revealed that the percentage of people who reported at least one activity restriction increased markedly with age; that is, almost 30% in the 60 to 74-year-old group and 60% in the 75+ age group. M. M. Baltes, Wahl, and Schmid-Furstoss (1990) noted that older adults in one day engaged most frequently in obligatory activities such as shopping, resting, and transportation. Horgas et al. (1998) observed that obligatory activities occurred most frequently during the day, but television viewing temporally dominated. Resting also occupied a significant portion of the day (19% of the waking hours). M. M. Baltes et al. (1999) reported that obligatory activities that had to do with personal maintenance amounted to 35% of the time whereas recreational activities including reading and watching television took up 38% of the day, and social activities accounted for only 7% of the day. Verbrugge, Gruber-Baldini, and Fozard (1996) noted that time spent on personal care, sleep, shopping, and hobbies and

passive leisure was greater for older persons than young and middle-aged adults. The most essential aspects of living and the activities with the lowest physical and mental demands took up a larger fraction of older adults' days. Activities with the highest physical and mental requirements were given less time by older adults than by other age groups. Longitudinal data on activity changes are sparse (Cutler & Hendricks, 1990), but available longitudinal findings on age changes in activity involvement usually mirror patterns of age differences in activity participation (e.g., Stanley & Freysinger, 1995; Verbrugge et al., 1996).

Overall, older adults tend to prioritize, from among the activities that are within their capacity to perform, those that are required for personal maintenance or that are central to their life satisfaction. Therefore, optional activities, which are not associated with physical survival or independent living, are likely to be the first ones selected out. Nonetheless, there is great variation in the activities older people perform, and many older adults continue to participate in demanding activities that facilitate continued learning and development (Arbuckle et al., 1994; Berkman et al., 1993; Horgas et al., 1998; Klumb & Baltes, 1999).

Age alone cannot explain why older adults decrease their level of involvement in everyday activities. Differences in level of involvement in instrumental, social, and recreational activities in old age have been accounted for at least in part by individual differences in resource availability (M. M. Baltes et al., 1993, 1999; Klumb & Baltes, 1999; Lawton, 1986). Similarly, changes in functional ability (e.g., ADL functioning) in old age do not follow a consistent pattern of decline. The changes in functional competency have been associated with changes in physical, psychological, and social resources (Anderson, James, Miller, Worley, & Longino, 1998; Avlund, Davidsen, &

Schultz-Larsen, 1995; Béland & Zunzunegui, 1999; Idler & Kasl, 1995; Wolinsky, Stump, Callahan, & Johnson, 1996).

Resources of Everyday Functioning

Resources pertain to an individual's capacities and assets in the domains of physical, cognitive, emotional, and social functioning, which serve as indicators of the potential to adapt to everyday challenges that accompany aging and maintain everyday functioning and subjective well-being (M. M. Baltes et al., 1993, 1999; Diehl, 1998; Pushkar et al., 1997; Willis, 1996a). The following section will review the literature on predictors of activity involvement in old age, including sociodemographic variables and physical, cognitive, emotional, and social support resources.

Sociodemographic Variables

Background variables whose role in everyday functioning has been investigated include residential status, marital status, gender, and socioeconomic status. For example, Horgas et al. (1998) examined the effects of age, gender, residential and marital status, income, and education on late life activity engagement and found that age and residential status had the strongest association with activity frequency, duration, and variety. The old-old and those individuals residing in long-term care facilities had lower levels of activity engagement. According to Horgas et al., age as an internal resource reflected the underlying health and cognitive status of seniors, and residential status reflected external resources.

Smith and Baltes (1998) considered the extent to which gender predicted functioning in everyday activity dimensions in a large probability sample stratified by age and sex. They found gender differences in mainly two categories of everyday activities.

Women spent more time than men with complex instrumental activities; conversely, men reported spending more time in the activity of television watching. These gender differences in everyday activities were not accounted for by marital status, education, or health factors. The results indicated, however, that the everyday life profiles of men and women became more similar with age (especially above 85 years of age), which suggests that other factors such as health constraints may be leveling out gender differences.

Mayer, Maas, and Wagner (1999) examined how different socioeconomic resources influenced social participation in old age, using retrospective data on social activities before age 25, at age 60, and during the last year. They found that socioeconomic resources, especially father's social class, were an important predictor of social activity participation during young adulthood. Yet, socioeconomic resources measured later in people's lives did not have direct effects on their later social activities. Individuals from higher social classes reported more activities, but after controlling for activity level earlier in life and internal resources (especially intelligence), the direct effect of socioeconomic resources on activity involvement became insignificant. The socioeconomic situation appears to play an important role in determining social activities in young adulthood, but it loses its influence later in the life course (Mayer et al., 1999).

Physical Health Resources

A large body of geriatric research has focussed on the physical health status of older adults. For instance, Steinhagen-Thiessen and Borchelt (1999) found in a large representative sample stratified by age and gender that 96% of persons aged 70 and above had at least one and 30% had at least five medical, neurological, or orthopedic illnesses. Cardiovascular diseases were the most common, but diseases of the musculoskeletal

system such as osteoarthritis and osteoporosis caused more subjective complaints than cardiovascular disorders. Given the prevalence of physical illnesses in old age, investigators have been interested in the effect of health status on level of functioning in everyday activities.

Researchers have reported significant yet moderate associations between interview ratings or self-ratings of physical health in older adults and level of involvement in instrumental, social, and recreational activities (e.g., Everard et al., 2000; Glass, Seeman, Herzog, Kahn, & Berkman, 1995; Mayer et al., 1999). In general, declining physical health and increasing frailty seem to be of major importance for discontinuity of reported activity participation in old age. Increasing disability may lead to fewer choices in the activities that older adults can engage in because of decreased mobility, dexterity, and stamina. For such people, achieving desired goals may become increasingly less contingent on their own behaviors and increasingly contingent upon the behaviors of family and friends.

Several studies have centered on specific sensory impairments and their effect on older adults' everyday activity pattern. Visual decline in aging was found to reduce the likelihood of living independently in old age based on measures of ADL and IADL competence (Salive, Guralnik, Glynn, Christen, & Wallace, 1994). Even after controlling for age, gender, and comorbidity, vision status was an independent predictor of ADL limitation (Horowitz, 1994). Laforge, Spector, and Sternberg (1992) reported that people with vision impairments and people with vision and hearing impairments were significantly more likely to experience losses in ADL-IADL functioning over a one-year period. With regard to discretionary recreational activities, visual impairment was

associated with the giving up of enjoyed activities and reduced participation in tasks like reading and game playing (Heinemann, Colorez, Frank, & Taylor, 1988).

More recently, Marsiske, Klumb, and Baltes (1997) examined the extent to which age-related differences in visual and auditory acuity might account for age-related variance in everyday activity functioning, which comprised instrumental, social, and recreational activities. The results revealed that sensory acuity, particularly vision, was a significant predictor of both instrumental and discretionary activities and could explain most of the age-related variance in everyday activity functioning. However, in the context of a more fully specified model of activity predictors, the strong relationship of hearing and vision with instrumental and discretionary activities was not unique but was mediated through a set of psychological and behavioral constructs. According to Marsiske et al., the results suggested that sensory acuity influenced physical and psychological resources, which more directly affected activity participation.

Cognitive Resources

Studies on intellectual functioning across adulthood and late life have consistently obtained negative age gradients beginning in adulthood for cognitive mechanics, which include abilities such as reasoning, spatial orientation, and perceptual speed (Lindenberger & Baltes, 1997; Lindenberger & Reischies, 1999; Salthouse, 1991b; Schaie, 1994). Some authors have criticized that the design of much of the laboratory research has led to inflated estimates of the magnitude of age declines in basic processes of attention and memory (e. g., Williams & Klug, 1996). Even though true age differences in cognitive competence are likely to be smaller and begin later in life than laboratory research reveals, longitudinal data show that by age 75 most cognitive

functions have begun to decline (Schaie, 1996). Nonetheless, age gradients for pragmatic tasks (e.g., verbal performance, professional expertise) often evince maintenance into later phases of adulthood. It appears that experiential life history factors continue to regulate crystallized pragmatic functioning in old age (P. B. Baltes, 1993; Blanchard-Fields & Hess, 1995; Lindenberger & Baltes, 1997; Lindenberger & Reischies, 1999; Smith & Baltes, 1999).

Even if there is a general decline in intellectual functioning with old age, it is not large enough to produce pathological scores in most older adults (Béland et al., 1998). Further, considerable interindividual differences in performance across age coexist with the picture of robust decline across all intellectual abilities. Also, the literature on age changes in mental abilities indicates that at least part of the loss can be attributed to disuse. To illustrate, individuals who maintain an active, engaged lifestyle display better maintenance of memory and intelligence in old age (Arbuckle et al., 1994; Arbuckle, Maag, Pushkar, & Chaikelson, 1998; Christensen et al., 1996; Gold et al., 1995; Hultsch, Hammer, & Small, 1993; Pushkar et al., 1997; Schaie, 1996). Research on learning has shown that most older adults continue to have the potential to benefit from new learning experiences, though the extent of their learning capacity decreases with age (Lindenberger & Baltes, 1997). Individuals of all ages have a certain amount of untapped resources (Staudinger et al., 1995), including untapped cognitive resources (M. M. Baltes, Kuhl, & Sowarka, 1992). By capitalizing on this reserve capacity, older adults may raise performance levels, offsetting some part of the age-related decline.

Many studies have documented the importance of cognitive resources for everyday cognitive competence and for everyday functional competence. Research on everyday problem solving in old age has revealed that for healthy community-residing

older adults over half of the variance in performance on measures of everyday problem solving is accounted for by mental ability performance, with a somewhat greater proportion accounted for by fluid abilities (e.g., Denney, 1989; Diehl et al., 1995; Willis, 1996a; Willis & Marsiske, 1991). Functional assessment studies have indicated that older adults with cognitive impairments tend to have greater difficulties with IADLs and that lower mental functioning is particularly detrimental to the performance of more complex tasks of daily living (e.g., Béland et al., 1998; Fitzgerald, Smith, Martin, Freedman, & Wolinsky, 1993; Lemsky, Smith, Malec, & Ivnik, 1996; Richardson, Nadler, & Malloy, 1995). Poon et al. (1992) reported that participants across all three age cohorts (60s, 80s, and 100s) with high fluid intelligence maintained equal IADL scores, suggesting that fluid intelligence contributes to the amelioration of the effects of aging in the management of everyday needs. Carlson et al. (1999) noted that executive difficulties in planning and initiating a course of action were selectively associated with lower performance of higher-order IADLs relative to other domains of fluid cognition (i.e., verbal memory and spatial memory) in a high-functioning, community-based sample of older adults. Along the same lines, Grigsby, Kaye, Baxter, Shetterly, and Hamman (1998) found that executive functioning was an important determinant of functional status for both self-reported and observed ADLs and IADLs in a large bi-ethnic community sample. These results highlight the clinical usefulness of assessing executive functioning when determining the everyday functional competence of community-residing older adults.

Emotional Resources

In contrast to the case of cognitive resources, gerontological research has

evidenced few age losses in self and personality variables. For example, Smith and Baltes (1997, 1999) and Staudinger, Freund et al. (1999) obtained little age differences on a multitude of measures of self and personality. Where present, the relatively weak negative age differences in self and personality signified losses in characteristics considered to be desirable (e.g., life satisfaction) or increases in characteristics that clinical research regards as dysfunctional (e.g., loneliness). The relatively small age losses in measures of self and personality provide support for the psychological resilience of self and personality in old age, and they suggest that continued adaptive processes are in operation (Brandtstädter & Greve, 1994; Staudinger et al., 1995).

However, Smith and Baltes (1997) pointed out that there are also indications that the adaptive processes of self-regulation may be pushed to their limits in the face of increasing life constraints and accumulating losses. Their findings revealed that the oldest old displayed a profile pattern suggestive of a chronic stress reaction (e.g., fewer positive emotions, more external control beliefs). These authors raised the idea that perhaps adaptation to old age can be conceived as a threshold model where the age-associated trajectory of increasing challenges and decreasing compensatory opportunities ultimately leads to a collapse of the “life management system”.

Mastery is seen as a mechanism for successful adaptation to challenges over the life span. As a cognitive process, mastery beliefs can modify the meaning of challenging situations such that someone with higher mastery may be better able to make use of available personal and environmental resources in order to adapt to developmental losses (Femia, Zarit, & Johansson, 1997). Studies have consistently shown that mastery and related notions of control are related to sustained activity and perceived maintenance of

everyday competence in old age (e.g., M. M. Baltes et al., 1990; Eizenman, Nesselroade, Featherman, & Rowe, 1997). Furthermore, Femia et al. (1997) found evidence that mastery is a useful construct for understanding individual variability in functional performance among the oldest old. Although these studies contribute to our understanding of motivational forces that underlie older adults' everyday activity functioning, additional research is needed to obtain a more comprehensive picture. Some areas that require further investigation are the instrumental and emotional reinforcement value of specific behaviors related to independent, active living and the older persons' expectancies about the success or failure of their own behaviors (Diehl, 1998).

Social Support Resources

The convoy model of social relations (Kahn & Antonucci, 1980) provides a developmental framework for considering how individuals construct and maintain lifelong social relationships with significant others. It holds that the characteristics of both the individual and the situation influence the kinds of social relations, including social network, social support, and support satisfaction, that the person experiences. In late life, social contacts and social relationships tend to diminish (Antonucci, 1985; Antonucci & Akiyama, 1997), and emotionally close social partners occupy an increasingly larger percentage of the total network (e.g., Field & Minkler, 1988; Lang & Carstensen, 1994; Lang, Staudinger, & Carstensen, 1998; Wagner, Schütze, & Lang, 1999).

Such findings lend support to the socioemotional selectivity theory, which stresses proactive pruning that selectively emphasizes emotionally close social partners and disregards more peripheral ones as time in life grows increasingly limited.

Emotionally meaningful social experiences become more prominent and salient over other more knowledge-related interests in old age (Carstensen, 1991, 1993; Carstensen, Isaacowitz, & Charles, 1999). The socioemotional selectivity theory makes specific predictions about selection, optimization, and compensation in the domain of emotion and social relations. More precisely, when social endings are approached in old age, emotional goals are selected over other goals. When the regulation of emotion is given greatest priority among social motives, social partners are selected to optimize emotional experience. By narrowing the range of social partners, older adults compensate for reductions in physical and cognitive resources, freeing time and energy to direct toward selected social relationships (Carstensen et al., 1999).

The idea that older people dismiss social contacts that are associated with less meaningful or less rewarding experiences in everyday life does not mean that social contacts are not needed in old age. Social support has been found to be associated with increased functioning and well-being in old age, particularly when individuals experienced increased needs or difficulties in activities of everyday life (Everard, Lach, Baum, Fisher, & Brownson, 1998; Wilcox, Kasl, & Berkman, 1994). Social support from spouses, children, or other adults can include both emotional and instrumental support and may be nondirective (allowing the person to remain in control by helping with the task without taking over) or directive (taking greater responsibility for the person's task). Social partners can also pose a threat to one's autonomy when the presence of others in everyday life leads to overprotection (M. M. Baltes, 1995, 1996). It appears that spending time with people in everyday life may be adaptive at times when support is needed to perform everyday tasks, but it may be detrimental to everyday functioning when social

contacts are not in accordance with the person's needs. Thus, managing difficulties in daily activities and managing social resources may be understood as the dynamic interplay between maintaining autonomy and relying on social support from other people (M. M. Baltes & Carstensen, 1996; M. M. Baltes & Silverberg, 1994; Lang & Baltes, 1997).

Multiple Resource Domains and Everyday Functioning

Some studies have investigated the effect of personal resources on everyday functioning from a broader resource perspective than the ones reviewed previously. For example, correlates of high functioning in a cross-sectional study by Berkman et al. (1993) were various indicators of health status, educational attainment and income, lack of psychiatric symptoms, and personality characteristics of self-efficacy and mastery. In a longitudinal study by Roos and Havens (1991), self-reported health, absence of certain chronic conditions, and not having lost a spouse to death or institutionalization contributed to the maintenance of independent functioning in old age. Garfein and Herzog (1995) reported that the most robustly aging older adults had greater social contact, better health and vision, and fewer significant life events in the past three years than their less robustly aging counterparts. This study utilized a multidimensional conceptualization of robust aging that comprised levels of productive involvement and affective, cognitive, and functional status. Lefrançois, Leclerc, and Poulin (1998) surveyed a stratified probability sample of 601 older participant using an in-depth structured interview. Resources assessed included age, gender, marital status, education, level of social interaction, and health status. Results confirmed previous research findings indicating that health status and education are important impediments to recreational

participation among older adults. Pushkar et al. (1997) found that psychosocial resources helped to explain age-related differences in everyday functioning, operationalized as the level of everyday activity engagement, even after controlling for gender, health, and education.

M. M. Baltes et al. (1993, 1999) shed some light on the structural aspects of everyday competence, by proposing a classification with two components of skills necessary for daily living in old age. The first component reflected a basic level of competence (BaCo), which comprised activities that were highly routinized and necessary for survival, and the second component reflected an expanded level of competence (ExCo), which consisted of discretionary activities and advanced instrumental activities of daily living. With the use of structural equation modeling, the authors found that BaCo was more strongly linked to health-related resources, which were indicated by physical health, balance/gait, and depressivity, accounting for 86% of the variance in BaCo. Expanded level of competence was more strongly associated with psychosocial resources, which were indicated by fluid intelligence, personality, and socioeconomic status, accounting for 91% of the variance in ExCo. Age had an indirect effect, which was mediated by more proximal psychosocial factors, on both BaCo and ExCo.

In conclusion, a wealth of studies have documented the significant associations between sociodemographic characteristics, physical health variables, cognitive variables, emotional variables, and social support on the one hand and the levels of everyday functioning of older adults on the other hand. Taken together, this body of research has consistently shown the importance of the availability of personal resources for the

maintenance of everyday functional competence in old age. One question that remains unanswered is whether consideration of resource availability only is sufficient to understand level of everyday functioning in old age. It could be that resource use; that is, what one does with one's resources to adapt to age-related losses, adds explanatory power to our understanding of how level of everyday functioning is associated with resource availability of older adults.

Selection, Optimization, and Compensation Strategies and Everyday Functioning

One recent study provided preliminary support to the idea that how well older adults adapt to everyday challenges depends on the availability and the appropriate use of resources in the physical, cognitive, emotional, and social domains of functioning. Specifically, M. M. Baltes and Lang (1997) investigated differential aging in everyday activities between resource-rich seniors (i.e., who were above the median in both sensorimotor-cognitive factor and social-personality factor) and resource-poor older adults (i.e., who were below the median on both resource factors). When considering age differences, there were more and larger negative age effects in frequency and variety of everyday activities in the resource-poor group than in the resource-rich group. Older people with few resources seemed to be less active and engaged in fewer different activities, concentrating on self-care tasks. The authors hypothesized that still available resources are key to successful aging because they are used for selective optimization and compensation in daily tasks, thereby delaying functional decline.

In a subsequent follow-up study, M. M. Baltes, Lang, and Rieckmann (1999) explored whether the protective function of resources in everyday functioning (M. M. Baltes & Lang, 1997) was associated with a facilitated use of SOC strategies in everyday

life. The researchers examined whether the resource-rich older adults had made more use of the processes of selection, optimization, and compensation than resource-poor seniors during a four-year period. The resource groups were compared with respect to changes in parameters of everyday functioning denoting selection, optimization, and compensation, which had been assessed twice within the four-year time period. Selection was operationalized as the percentage of social time spent with family members or as a decrease in the diversity of different activities within the most salient leisure domain relative to the diversity across all activities. Compensation was indicated by regenerative activities such as sleeping during daytime. Optimization was reflected in the variability in time investments represented by the intraindividual standard deviation of durations of all activities reported. Findings revealed that resource-rich older people had reduced the diversity of activities within the most salient leisure domain, slept more often and longer during daytime, and increased the variability of time investments across activities. Provided that one accepts their operational definition of selection, optimization, and compensation, this study more clearly shows that resource-rich older adults, as compared to resource-poor older adults, make greater use of selection, compensation, and optimization strategies in everyday functioning.

Well-Being and Successful Aging

Maintaining high levels of subjective well-being is considered to be one aspect of successful aging (P. B. Baltes & Baltes, 1990). Although there is consensus that well-being is a multidimensional phenomenon, there is less agreement about the mechanisms underlying a sense of well-being and the ways to measure the concept. For instance, there is disagreement as to whether the focus should be on objective criteria of well-being; that

is, the objective set of criteria that specify the physical, personal, and material life conditions that could potentially contribute to a “good life” in old age, or on self-reports of well-being; that is, the individual’s subjective experience of life. The approach that conceptualizes well-being in terms of material resources and life conditions is generally represented in the fields of sociology and economics whereas the approach that emphasizes subjective well-being is taken primarily by psychologists (Smith, Fleesom, Geiselman, Settersten, & Kunzmann, 1999).

Subjective well-being refers to what people think and how they feel about their lives—to the cognitive evaluations of their objective life conditions and their emotional experience associated with their life circumstances. Components of subjective well-being include favourable global judgements of one’s life, satisfaction with important domains, high levels of positive affect, and low levels of negative affect (Diener, 2000). Defining well-being in terms of the person’s subjective experience of life avoids the difficult task of establishing consensus about criteria of quality that satisfy both individuals and social institutions (Smith, et al., 1999). Current measures of well-being contain multiple self-report items of each construct and have some degree of validity (Diener, 1994). However, subjective well-being measures can be contaminated by biases. For example, global measures of life satisfaction can be affected by mood at the moment of responding to the scale and by other situational factors. Yet, situational factors usually pale in comparison with long-term influences on well-being measures (Eid & Diener, 1999).

The increased risk for losses in old age in various resource domains such as socioeconomic status, health, fluid cognitive abilities, social network, and everyday functional competence could lead one to conclude that older adults should have lower

levels of subjective well-being than younger people. Nevertheless, studies typically reveal that the majority of older respondents experience positive life satisfaction despite differences in objective life conditions (e.g., Brandtstädter & Greve, 1994; Smith, 1995; Smith et al., 1999). Smith et al. (1999) put forth an integrative model derived from Campbell, Converse and Rodgers (1976), which posits that overall subjective well-being is a function of the direct and indirect effects of social and demographic variables, such as age, gender, and marital status; objective life conditions, such as number of illnesses, number of relatives, and activity level; and subjective experiences of these life conditions, such as subjective health, satisfaction with activities, and satisfaction with social network. Subjective domain evaluations are generally seen as stronger predictors of subjective well-being than are the objective measures of domain status (Smith et al., 1999). Hence, even when objective conditions do deteriorate in old age, the effects on subjective well-being appear to be cushioned by other variables such as social comparison processes, shifts in aspirations, and individual differences in subjective importance of life circumstances (Brandtstädter & Greve, 1994; Staudinger, Freund et al., 1999).

The following review will present the current status of knowledge of the various predictors of subjective well-being in old age, including objective life conditions and subjective domain evaluations. Specifically, the associations of sociodemographic variables and resources in the physical, emotional, and social domains with subjective well-being will be examined. In addition, studies that have centred on the relationship between level of everyday functioning and well-being and between SOC strategies and subjective well-being will be reviewed.

Personal Resources and Subjective Well-Being

Sociodemographic Variables

In spite of the stereotypical beliefs that older adults are unhappy, being older represents only a small risk for lower subjective well-being. Smith et al. (1999) indicated that the majority of participants aged 70 and over reported satisfaction with their present life conditions. Nonetheless, older women, persons aged 85 and over, and individuals living in institutions reported less frequent experiences of positive emotions, an important component of subjective well-being. Taken together, Smith et al.'s results showed that age, gender, marital status, and institutionalization accounted for 6% of the variance in subjective well-being, which is similar to findings with younger samples. Pinquart and Sörensen (2000) conducted a meta-analysis of 286 empirical studies on the association of socioeconomic status (SES), social network, and everyday functional competence with subjective well-being in the elderly. The meta-analysis revealed that SES explained 2.2% to 3.2% of the variance in subjective well-being, with the association being stronger for men than for women. Income was correlated more strongly with well-being than was education, which could be due to a higher influence of income on actual quality of life. Socioeconomic status was also more strongly associated with well-being in men than in women. In light of these findings, it can be concluded that sociodemographic variables provide only limited explanatory power for subjective well-being in old age.

Physical Health, Emotional Resources, and Social Support Resources

Objective life conditions and subjective domain-specific evaluations have been found to be stronger predictors of individual differences in subjective well-being than sociodemographic variables. In the physical health domain, a number of researchers have

found that subjective health status was a stronger predictor of subjective well-being than were objective measures of health (e.g., Smith et al., 1999).

In the emotional domain, personality predispositions appear to be the strongest factors influencing long-term levels of subjective well-being (Staudinger, Fleesom, & Baltes, 1999). In particular, the central personality traits of extraversion and neuroticism are known to be stable across adulthood and have been strongly linked to positive and negative affect, respectively (Costa & McCrae, 1994). Even for centenarians, extraversion constituted a significant predictor of subjective well-being (Adkins, Martin, & Poon, 1996). Yet, persons high on neuroticism not only experience more negative affect, but they are also less able to deal with stressful situations and have less self-control and more unrealistic ideas. Such characteristics can impede the capacity to deal with age-related difficulties and thus decrease aging satisfaction. In addition, self-regulatory mechanisms such as control beliefs have been associated with subjective well-being in adults. Results from studies that experimentally manipulated the level of personal control suggested that increased personal control is causally related to higher levels of psychological well-being (Rodin, 1987). High level of perceived control also contributed to happiness and a positive outlook on the future (Flammer, 1995).

In the social domain, studies have established that the presence of a network of family and friends who provide emotional and material support helps to buffer the adverse psychological reactions to functional limitations and contributes to subjective well-being (e.g., McMullin & Marshall, 1996; Newsom & Schulz, 1996; Oxman, Berkman, Kasi, Freeman, & Barrett, 1992). Results from a large meta-analytic study (Pinquart & Sörensen, 2000) showed that quantity of social contacts in old age was not as highly correlated with subjective well-being as was the quality of contacts. More

precisely, there were higher associations between quality of contact with adult children and life satisfaction, when compared with quality of contact with friends. The quality of social interactions was related more strongly to well-being for older elderly respondents than for younger elderly respondents. These findings are in accordance with Carstensen's theory of socioemotional selectivity, which states that in old age emotionally meaningful social experiences become more prominent over other more knowledge-related interests (Carstensen et al., 1999). Moreover, the meta-analysis revealed that the quantity of social contacts with friends was more closely related to subjective well-being than the quantity of contact with adult children. High frequency of contact with friends suggests emotionally positive exchanges and enjoyment, which are important sources of well-being in daily life.

Activity Level and Subjective Well-Being

Reviews of the activity theory of aging have concluded that there is substantial support for the hypothesis that the more active people are in their later years, the greater will be their subjective well-being. Reduced everyday competence may restrict preferred activities that have been a source of pleasure and life satisfaction and thus influence well-being (Atchley, 1989, 1993; Kelly & Ross, 1989; Lawton, 1987; Moen, 1995). In his discussion of high-investment activities and life satisfaction among retired older adults, Mannell (1993) provided evidence that substantiates the supposition that older adults who are more satisfied with their lives invest greater effort and resources in more of the activities of everyday life and are also committed to their freely chosen activities. The author speculated that having a repertoire of discretionary activities, which have the potential to challenge one's skills, and feeling committed to them may contribute to the

successful transition from a lifestyle dominated by obligated work activities in adulthood to a lifestyle characterized by freedom of choice during retirement.

A number of studies have shown that there is a positive, weak to modest relationship between everyday activity involvement in old age and subjective well-being, as indicated by measures of life satisfaction and of happiness (e.g., Auslander & Litwin, 1991; Collins & Paul, 1994; Lai & McDonald, 1996; Madigan, Mise, & Maynard, 1996; Zimmer & Hui-Sheng, 1996). To illustrate, McIntosh and Danigelis (1995) examined the relationship between productive activities (i.e., paid work, formal religious activity, formal nonreligious activity, and informal volunteering) and two indicators of subjective well-being (i.e., positive and negative affect) in older adults. The results did not represent strong indication of the importance of productive activity as a consistent predictor of affect. The most salient productive activity as predictor was informal volunteering, and the least relevant was paid work. However, the mixed findings pointed to patterns by race/gender subgroup and type of affect. The results of a meta-analytic study (Pinquart & Sörensen, 2000) revealed that basic and expanded levels of everyday functional competence had almost equal relationships with subjective well-being (explaining 4.2 to 7.3% of the variance in well-being). No age difference was found in the association between everyday competence and well-being in the elderly samples. Stones and Kozma (1986, 1989) reported that the strength of association between measures of happiness and activity level was low (10% of variance or less) relative to the variances explained by their stabilities (50% or more). Furthermore, some part of the relationship between the two variables has been shown to be spurious, depending on the common relationship of both propensities to other variables (e.g., socioeconomic status). According to Stones

and Kozma, the low level of association is consistent with the formulation that happiness and activities are reflections of different underlying propensities. These results suggest that level of competency in basic, instrumental, social, and recreational activities in old age is related to subjective well-being; nevertheless, the strength of association does not seem to be very strong.

Taken together, these studies on the relationship between resources and subjective well-being in old age validate Campbell et al.'s (1976) integrative model of well-being, which postulates that overall subjective well-being is a function of the direct and indirect effects of sociodemographic variables, objective life conditions, and subjective experiences of these life conditions. Undoubtedly, subjective well-being in older adults is complex and multi-determined. One question that arises from this body of literature is whether the SOC theory, as a description of age adjustments of older adults, would further our understanding of the predictive system of subjective well-being in old age.

Selection, Optimization, and Compensation Strategies and Subjective Well-Being

The central thesis of the SOC model is that the "orchestration" of selection, optimization, and compensation contributes to successful development. In old age, these processes might be conducive to the preservation of a sense of well-being. This hypothesis was investigated with a subsample of the Berlin Aging Study ($N = 200$, mean age of 83.5) (Freund & Baltes, 1998, 1999). Three domains marked by six variables served as outcome measures of subjective quality of life: subjective well-being, positive emotions, and absence of social and emotional loneliness. As predicted, the selection, optimization, and compensation composite was positively related to most of the subjective indicators of successful aging. Because "subjectively aging well" is a complex construct that is likely determined by many factors, the magnitude of the correlations was

of moderate size. The associations between the SOC composite and the subjective outcome indicators were robust when various rival predictive measures of successful aging (age, control beliefs, personal life investment, physical and mental health, neuroticism, extroversion, openness, and intelligence) were controlled for. Worth noting is that when the relative importance of selection, optimization, and compensation was compared, optimization and compensation were more powerful predictors, with each being related to most of the outcome measures. Based on this study, the use of SOC processes to deal with life challenges appears to make a unique contribution to subjective quality of life.

Measurement of Selection, Optimization, and Compensation Processes

Selection, optimization, and compensation use has been measured with a domain-general questionnaire and domain-specific instruments. P. B. Baltes, Baltes, Freund, and Lang (1995) have developed a 12-item, domain-general, self-report measure of selection, optimization, and compensation use as represented by a list of behaviors considered prototypical instances. Sample items from this questionnaire include: for elective selection, "I always focus on the one most important goal at a given time"; for loss-based selection, "When things don't go as well as before, I choose one or two important goals"; for optimization, "I keep trying as many different possibilities as are necessary to succeed at my goal"; and for compensation, "When things don't go as well as they used to, I keep trying other ways until I can achieve the same result I used to". Each item of the questionnaire consists of two statements, one reflecting the target process and the other reflecting an alternative, non-SOC-related strategy. When responding to questionnaire items, individuals are asked to decide which of the two statements describes them better.

The number of affirmative responses to the SOC strategies represents the overall SOC value. The questionnaire has shown satisfactory test-retest reliability and content and construct validity (Freund & Baltes, 1998). It offers the advantage of ease of administration and scoring, and it allows the investigation of SOC as one combined process of selective optimization with compensation (i.e., SOC composite based on the significant positive intercorrelations of the components) and as individual processes of loss-based selection, optimization, and compensation. However, the questionnaire is limited when research questions pertain to the use of SOC strategies in a specific context.

The few researchers that have investigated the applicability of the SOC theory to specific domains of functioning were required to develop their own measure of SOC processes. Abraham and Hansson (1995) created their own measure to assess the extent to which persons used selection, optimization, and compensation strategies in the workplace. The researchers elaborated 24 items that sampled broadly the concepts proposed in the theoretical literature. The items, though, were not qualitatively inferred from interview data. The study participants were instructed to indicate, using a 6-point scale, the extent to which they used each proposed strategy to make up for developmental losses they had experienced that could influence their job performance. Along the same lines, Wiese, Freund, and Baltes (2000) explored the applicability of the SOC theory to the pursuit of career-related and partnership-related goals in young adulthood, measuring SOC use with two domain-specific scales (work and partnership) and the domain-general questionnaire (P. B. Baltes et al., 1995). Gignac, Cott, and Badley (2000) took a different approach in assessing SOC use in the specific domain of everyday activities. Their study investigated how community-dwelling older adults with osteoarthritis and/or osteoporosis adapted to disability arising from their condition. Using open-ended questions on changes

or modifications in the way respondents were doing the activities, the researchers obtained qualitative data on the kinds of behavioral efforts that participants made. All responses were content analyzed to identify broad categories of efforts. Examples of these types of behavioral adaptations were “performing activities less often” and “using gadgets for assistance”. An examination of participants’ adaptations suggested that they could be organized to reflect the processes of selection, optimization, and compensation. Behavioral efforts that were indicative of selection included performing activities less often, giving up or avoiding activities altogether, and restricting or limiting activities. Optimization efforts included behaviors that were aimed at augmenting or enriching individuals’ reserves to enable them to continue functioning. Compensation efforts consisted of a wide range of modifications to the performance of an activity.

Goals and Hypotheses of the Current Study

The status in the literature of the theory of selective optimization with compensation has been largely conceptual (Marsiske et al., 1995). P. B. Baltes and Baltes (1990) have argued that the use of selection, optimization, and compensation can help to offset losses in specific functions and reserve capacities, resulting in a more narrowly defined yet effective life in old age. Discussions of the SOC theory have mainly emphasized its utility in representing the development of intellectual functioning. To illustrate, the SOC theory has been useful in conceptualizing interventions to increase the cognitive functioning of older adults through guided learning (P. B. Baltes, 1987, 1997; P. B. Baltes & Baltes, 1990). Dual-task methodology has been used to study the interactive dynamics of selection, optimization, and compensation in an on-line fashion and has offered a potentially rich avenue for the continued investigation of SOC dynamics in cognitive functioning (Freund, Li, & Baltes, 1999). However, little empirical

work has been done to test the SOC theory and its implications for the maintenance of everyday functioning and subjective well-being in old age. No empirical studies have been undertaken to determine what types of resources facilitate the use of selection, optimization, and compensation in order to adapt to aging losses in everyday activities. The three components may be activated more easily and readily when there is a rich array of resources available from which to draw. Furthermore, there has been virtually no research on how each SOC process influences levels of everyday functioning and subjective well-being and on the manner in which the SOC components work together in the context of everyday competence. Instead, research has mostly documented the negative influence of losses in physical health, cognitive, emotional, and social support resources on level of functioning in everyday activities and on level of subjective well-being.

Thus, the purpose of the present study was to examine the applicability of the theory of selective optimization with compensation to the adaptive management of resources in everyday life in old age. Specifically, the main goal was to explore how the SOC components might operate within the domain of everyday activities, with an interest in the dynamic interplay among selection, optimization, and compensation. The focus was on physical health, cognitive, emotional, and social support resources of community-dwelling seniors as well as on the behavioral ways in which they adjusted to age-related losses to maintain everyday functioning and subjective well-being. In order to accomplish the purpose of the study, it was essential to be able to measure the strategies of selection, compensation, and optimization that independent seniors used to adapt to aging losses in everyday activities. Nevertheless, at the time of data collection no such instrument was available. Therefore, another goal was to develop a measure of selection, optimization,

and compensation use in the form of a semi-structured interview. Adaptation to aging losses in everyday functioning would be detected when looking at reports of changes since mid-adulthood in ways of performing everyday activities.

Building on assumptions derived from the SOC theory, it was hypothesized that the relationships between the availability of physical health, cognitive, emotional, and social support resources and outcomes of successful aging were mediated by selection, optimization, and compensation use (see Figure 1 for an illustration of the relationships in the form of a conceptual model). Based on this general hypothesis, the following hypotheses were formulated:

- 1) Age and socioeconomic status would constitute distal resources whose effect on SOC use and successful aging outcomes would be mediated by more proximal resources such as physical health, cognitive abilities, emotional functioning, and social support.
- 2) Both selection and compensation use would be predicted by decreased levels of resources in the physical health, cognitive, emotional, and social support domains, whereas optimization use would be facilitated by greater resource availability in the same domains.
- 3) Selecting out activities or parts of activities would be associated with lower levels of everyday functioning and with lower levels of subjective well-being. Optimization and compensation use in everyday activities would be related to greater levels of everyday functioning and to higher levels of subjective well-being.
- 4) People would rely on a different pattern of adaptation for instrumental and for discretionary activities. Specifically, older adults would devote considerable adaptive efforts to compensate for difficulties experienced with instrumental tasks rather than use loss-based selection (i.e., rather than forgo or restrict instrumental activities) because they

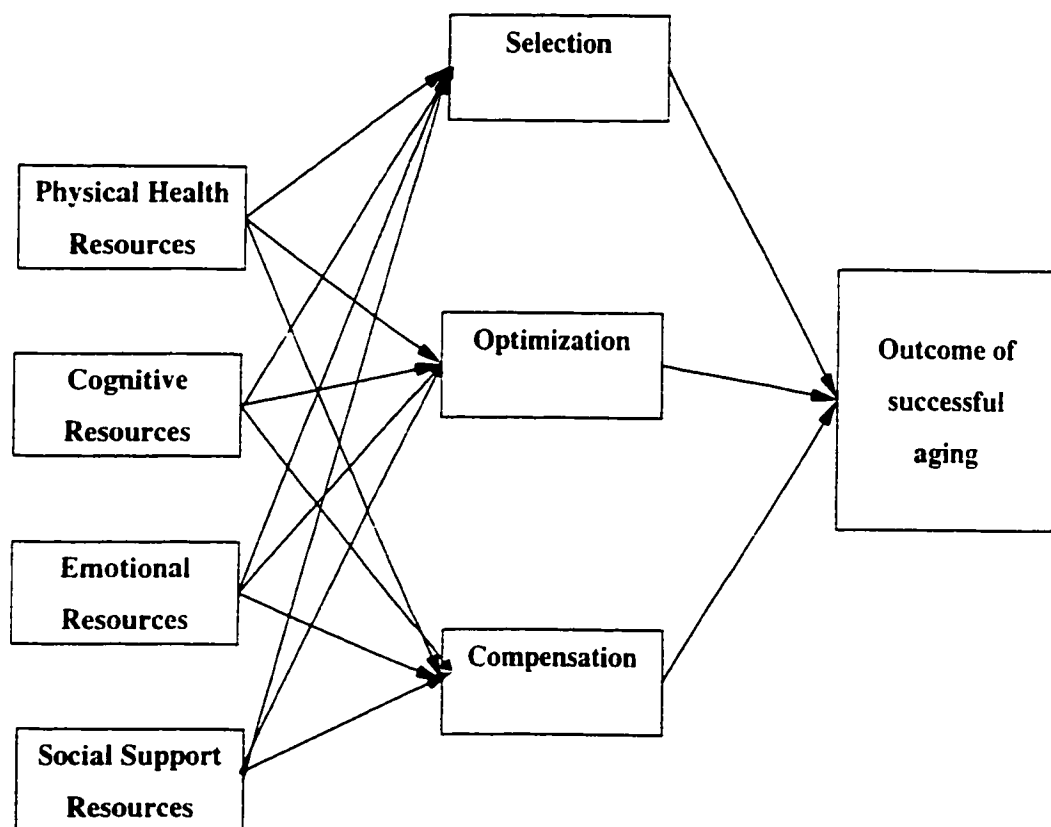


Figure 1. Conceptual model illustrating the hypothesized relationships among the variables.

are generally thought of as necessary for independent living. For optional recreational activities, older adults experiencing performance difficulties would give up or limit their participation (i.e., use loss-based selection). Older adults could try to optimize their performance in selected instrumental and discretionary activities, but optimization efforts would be more frequent in discretionary activities that facilitate continued learning and development.

Method

Participants

The individuals who participated in this study were part of a three-phase project. A description of how these participants were ultimately selected follows. In Phase 1, 455 community-dwelling older adults from the Greater Montreal area were interviewed according to their preference either at the Adult Development and Aging Laboratory at Concordia University or in their homes. These volunteers were recruited from the pool of individuals who had participated in previous studies in the laboratory, from various community groups and seniors' organizations, and through announcement in local community papers and word of mouth. The 300 women and 155 men ranged in age from 63 to 95 years ($M = 73.9$; $SD = 6.0$) and in years of education from 3.5 to 22 ($M = 13.3$; $SD = 3.4$). Participants were screened for level of off-target verbosity using a structured life history interview (Arbuckle & Gold, 1993). Off-target verbosity (OTV) has been defined as extended speech that is lacking in focus or coherence, which characterizes a minority of elderly individuals (Gold, Andres, Arbuckle, & Schwartzman, 1988; Gold, Andres, Arbuckle, & Zieren, 1993; Pushkar Gold & Arbuckle, 1995).

Phase 2 took place a mean of 6.3 months after Phase 1 (range = 0.84 to 20

months). Eligible to participate in this phase were all English-speaking participants from Phase 1 whose verbosity score was in the upper 15%, the middle 50%, or the lower 15% of the OTV distribution. Of the 336 Phase 1 participants who were eligible, 198 participated in Phase 2 that involved dyadic interaction contexts. Participants were paired randomly with the restrictions that the two members of each dyad should be of the same sex, similar in age, and not previously acquainted with each other. Participants had a mean age of 74.0 years ($SD = 5.6$), ranging from 64 to 91 years, and they had a mean education level of 13.4 years ($SD = 3.1$), ranging from 3.5 to 22 years.

Phase 3 occurred a mean of 12 months following Phase 2 (range = 2 to 21 months). The goal was to invite back approximately 150 individuals who had participated in both Phases 1 and 2, according to a desire to maintain a range in age, gender, and off-target verbosity levels. Other selection criteria were that the person was functioning independently in the community and that he or she could come to the laboratory for the interview. Of those individuals who were contacted, only a few declined to participate, had become incapacitated, or had passed away. Every effort was made to accommodate to the availability of the individuals. The final sample for this study consisted of 101 women and 41 men. The 142 participants were between 66 and 88 years of age ($M = 74.8$; $SD = 5.5$) at the time of testing, which was similar to the mean age of Phase 1 and Phase 2 samples. Originally, 144 persons were interviewed, but two cases were dropped from the analyses because of serious health problems that invalidated some measures.

Materials and Measures

Table 1 lists the battery of measures that were used in this study and indicates the phase of the larger project in which the tests were administered. A description of these measures is presented below.

Table 1

Measures Administered in the Three Phases of the Larger Project and Used in This Study

Phase	Measure
Phase 1	Life history interview
	Off-target verbosity score based on responses to the life history interview
	Seriousness of Illness Rating Scale
	Social Support Questionnaire
Phase 2	Trail Making Test
	Eysenck Personality Inventory
	Interpersonal Relationship Inventory
Phase 3	Interview on life changes since Time 1 interview
	Financial situation rating
	Self-perceived adequacy of health
	Digit-digit and digit-symbol tasks
	Modified Wisconsin Card Sorting Task
	Mastery Scale
	Interview on strategies of adaptation in everyday activities
	Memorial University of Newfoundland Scale of Happiness
	Marlow-Crowne Social Desirability Scale

Demographic Information

Demographic information on participants' age, education, marital status, living arrangements, and income was obtained in an initial interview in Phase 1 (see Appendix A, Table A1) and was updated in the present study in the context of a brief interview assessing life changes since Phase 1 (see Appendix A, Table A2). Indicators of individuals' socioeconomic status derived from the two interviews included highest level of education achieved in years, financial situation when interviewed in Phase 1, and current financial situation. The interview question asking participants to describe their financial situation used a 7-point scale ranging from 1 (very difficult, I can't manage at all) to 7 (very comfortable, I can afford everything I need or want).

Physical health resource measures were selected based on their face validity and because they correlated moderately with each other. Cognitive, emotional, and social support resource measures were selected on the same basis.

Physical Health Resources

Physical resources were indexed by the Seriousness of Illness Rating Scale and an item assessing self-perceived adequacy of health.

Seriousness of Illness Rating Scale. Physical health was ascertained by individuals' scores on an abridged version of the Seriousness of Illness Rating Scale adapted for older samples (SIRS; Wyler, Masuda, & Holmes, 1968, 1970). In this study, respondents checked off the symptoms and diseases that they had experienced in the past five years from a list of 60 illnesses. Each illness in the SIRS is weighted by its seriousness according to test norms made by health professionals, and the sum of the weighted scores provides a total illness score. Higher scores on this scale indicate a

greater number of illnesses. A test-retest reliability coefficient of .71 has been reported for SIRS scores (abridged version) for older men over a three-year period (Gold et al., 1995).

Self-perceived adequacy of health. The self-reported quality of overall current health was evaluated using a 5-point scale ranging from 1 (very good) to 5 (very poor). Self-reports of health status are known to relate to actual health conditions, but they are also recognized as reflecting subjective factors that may not have any relevance to actual physical health (Watson & Pennebaker, 1989). The personal appraisal of health appears to be strongly and negatively influenced by a trait termed negative affectivity, which is indexed by high scores on personality measures of neuroticism and anxiety. Some caution is thus warranted in interpreting data representing self-rated health status.

Cognitive Resources

Cognitive resources, and more specifically fluid abilities, were indexed by the Trail Making Test, digit-digit/digit-symbol tasks, and the Modified Wisconsin Card Sorting Task.

Trail Making Test. The Trail Making Test (Reitan & Wolfson, 1985) is composed of two parts, A and B. Trails A consists of 25 circles printed on a white sheet of paper. Each circle contains a number from 1 to 25. Participants' task is to connect the randomly presented circles with a pencil line as quickly as possible, beginning with the number 1 and proceeding in a numerical sequence. Trails B also consists of 25 circles, but they are numbered from 1 to 13 and lettered from A to L. Participants are asked to connect the randomly presented circles in sequence, alternating between numbers and letters. Performance is measured by the time in seconds needed to complete each trails. The

variable used in this study was the difference in time required to complete Trails B correctly minus the time to complete Trails A correctly, which is considered to measure the cognitive flexibility needed to alternate between two highly overlearned sequences. A larger difference score reflects poorer cognitive flexibility. In general, reported reliability coefficients have ranged from .60 to .90 with more in the .80's (Lezak, 1995).

Digit-digit/digit-symbol tasks. Processing speed was assessed from performance on a computerized version of the digit-digit and digit-symbol tasks developed by Salthouse, Kausler, and Saults (1988). The set of symbols and the format of the code table were based on the digit-symbol subtest of the Revised Wechsler Adult Intelligence Scale (Wechsler, 1981). Test-retest reliability tends to run high, with correlation coefficients in the .82 to .88 ranges for adults and older adults (Wechsler, 1981). In the digit-digit task, participants are required to decide whether the two digits shown in the center of the screen are the same or different. In the digit-symbol task, participants have to decide whether the digit-symbol pair shown matches the symbol shown with that digit in the accompanying code table. In each case, participants indicate their response by pressing either the “/ ” key, labeled “yes” for same, or the “z ” key, labeled “no” for different. Eighteen test pairs are presented in a different random order to each participant on each of the three trials, with each digit and each symbol appearing twice over the 18 items, once in the context of a “yes” judgement and once in the context of a “no” judgement. The measure of processing speed is the mean latency of correct responses on the digit-symbol task over the three trials minus the mean latency of correct responses on the baseline digit-digit trials. Digit-digit time is subtracted in order to remove that part of the digit-symbol latency that reflects perceptual-motor response. The residual latency is

assumed to measure primarily the central processing time required to check the target stimulus against the code table and to determine whether or not there was a match. A larger difference score thus indicates slower central processing speed.

Modified Wisconsin Card Sorting Task. A modified version of the Wisconsin Card Sorting Task (Milner, 1964) was used as a measure of frontal lobe executive functioning. This modified version (M-WCST; Nelson, 1976) requires participants to discover the “correct” basis for classifying stimuli that differ on three dimensions: shape, color, and number. Individuals are presented with four target cards, each different in number, color, and form. Also, participants are supplied with a deck of 48 response cards with similar stimuli to be sorted by placing each card in front of one of the four target cards based on one of the three categories. Participants are told whether their choice is correct or incorrect and using this feedback, try to get as many correct as possible. Each time that participants correctly classify six successive stimuli, the experimenter informs them that the correct basis of classification has shifted to a different “rule”. Individuals must then inhibit classifying the cards on the basis of the previous dimension. The procedure is continued until six categories are achieved or the pack of 48 cards is used up. The M-WCST provides subscores that indicate the number of categories completed and the number of perseverative and nonperseverative errors. Among these three variables, the number of perseverative errors is generally used as an indicator of inhibitory functioning; however, in this study this variable was skewed. Given that the number of completed categories correlated significantly with the number of perseverative errors ($r = -.76$), it was used to reflect executive functioning.

Off-target verbosity. Off-target verbosity (OTV) scores that had been obtained in Phase 1 of the larger project were used as data reflecting communication competency

(see Appendix A, Table A1). A reliable measure of OTV was developed by Arbuckle and Gold (1993), in which responses to interview questions are scored for irrelevant information (“outs”) and extent of irrelevant information contained in the responses (“extents”). Interrater reliability for the 75 interviews that were scored twice was .89 for Item OTV and .96 for Extent OTV. The OTV scores used in this study represented a factorial combination of outs and extents across all questions asked, with higher scores denoting a higher level of off-target verbosity.

Emotional Resources

Emotional resources were indexed by the Eysenck Personality Inventory and the Mastery Scale.

Eysenck Personality Inventory. The Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1968) assesses personality in terms of two independent dimensions, introversion-extraversion and neuroticism-stability. It also includes a Lie scale, which was conceived both as a check on the social desirability and as a personality attribute approximating conformity. The questionnaire consists of 57 items to which examinees answer “yes” or “no”. The neuroticism subscale was used in this study as a measure of the personality dimension of emotional adjustment. Neuroticism scores reveal the extent of emotional lability, anxiety and somatic concerns, with low scores on the neuroticism scale suggesting the ability to maintain effective emotional adjustment and control. Test-retest reliability coefficients for the EPI range from .84 to .94, and the validity of the orthogonal, two-dimensional scheme has been empirically demonstrated (Eysenck & Eysenck, 1969; Howarth, 1976; Loo, 1979). The neuroticism subscale has a split-half reliability of .89 and correlations of .59 to .77 with other measures of trait anxiety.

Mastery Scale. Sense of control was also considered to be an important adaptive resource and was assessed by the Mastery Scale (Pearlin & Schooler, 1978). The scale has been developed for use with community-residing adult samples, and it measures the extent to which individuals regard their life experiences as being under their own control in contrast to being fatalistically determined. Control is conceptualized in terms of subjective experiences within individuals' minds and not in terms of actual abilities and true environmental contingencies. People's self-beliefs about their own abilities combine with task beliefs about the nature of the task to produce their self-efficacy expectations; that is, their sense of whether they could successfully perform the behaviors needed to achieve the particular desired outcomes. The concept of mastery as measured by the Mastery Scale has been shown to be a predictor of psychological symptoms associated with coping with daily stresses (Folkman et al., 1986). Individuals respond on a four-point Likert scale about the extent to which they agree or disagree with eight statements. The internal reliability of this measure exceeds .75 as measured by Chronbach's alpha (Folkman, Lazarus, & Gruen, 1986). Higher scores indicate a greater sense of mastery.

Social Support Resources

Social resources were indexed by the Social Support Questionnaire and the Interpersonal Relationship Inventory.

Social Support Questionnaire. The Social Support Questionnaire (SSQ; Saranson, Levine, Basham, & Saranson, 1983) was used to measure the size of participants' social support networks and their degree of satisfaction with the social support received. The respondents list all persons who provide them with instrumental and emotional support in different situations and rate their satisfaction with the support received. Higher scores on the SSQ denote a larger size of social support network and greater satisfaction with the

support received. The two dimensions have good reliability and correlate with measures of depression. Pushkar Gold et al. (1995) reported test-retest reliability coefficients over six months to be adequate; that is, .69 for network size and .72 for social support satisfaction.

Interpersonal Relationship Inventory. A second measure was used to assess participants' social support: the social support subscale of the Interpersonal Relationship Inventory (IRI; Tilden, Nelson, & May, 1990). The IRI was developed to measure social support as well as conflict and reciprocity within interpersonal relationship networks. The social support subscale evaluates the perceived availability or enactment of helping behaviors by persons whom one is engaged with informally. The social support subscale contains 13 items that are anchored with a 5-point, agree-disagree continuum and a 5-point, often-never continuum. Content validity index of the IRI items is reported to be .97 (Tilden et al., 1990). The social support subscale of the IRI has also demonstrated adequate test-retest reliability, i.e., two-week test-retest reliability of .91 (Tilden et al., 1990). Tilden, Hirsch, and Nelson (1994) reported ongoing evidence from 19 studies of the psychometric quality of the IRI. Internal consistency ranged from .70 to .90 in the studies. Investigators also provided evidence for construct validity of the scales; that is, support, conflict, and reciprocity were compared to a variety of theoretically relevant constructs and were found to be significant in the majority of instances.

Interview on Strategies of Adaptation in Everyday Activities

The semi-structured interview used in this study (see Appendix A, Table A3) was developed from and based on the Pushkar et al. (1997) Everyday Activity Questionnaire. The interview addressed five instrumental activities (meal preparation,

housekeeping/home maintenance, grocery shopping, financial management, and medication intake) and seven social and recreational activities (visiting friends and relatives, entertaining friends and relatives, physical activities, hobbies and creative activities, organization involvement, volunteer work, and travelling). “Helping others” was also part of the interview, but this activity was not included in the analyses because of the difficulty in coding the information provided by interviewees. Because no listing of activity domains is totally comprehensive, the selected activities represented those most frequently engaged in by community-residing older adults (Clark & Bond, 1995; Pushkar et al., 1997). Inquiring about basic self-care activities in our community-dwelling sample would not have been very informative because of a probable ceiling effect that would have precluded the detection of subtle differences in functional capacity. Self-care activities are highly routinized and seem to be the last affected by aging losses (M. M. Baltes et al., 1993, 1999).

The interview on everyday activities consisted of a set of closed- and open-ended questions to gather information on activity parameters and adaptive strategies (Holstein & Gubrium, 1995; Quinn Patton, 1990). It took each respondent through the same sequence of questions while some flexibility in probing and using follow-up questions was allowed (Flick, 1998). For example, interviewers could use nondirective probes such as “tell me about that” or “can you explain what you mean” to clarify the meaning whenever responses appeared ambiguous. The semi-structured interview was pilot tested on eight elderly individuals. As a result, minor changes were made to the wording of some of the questions, and a guide on probing was developed for interviewers (Maxwell, 1996). Once the piloting phase was completed, the interview procedure was not modified

because of the need to standardize the procedure to enhance comparability of data across sources. However, true grounded theory approach calls for a recursive process (Strauss & Corbin, 1990).

For each of the 12 activities, interviewees were first asked whether or not they had performed the activity from about age 50 onwards and whether or not they were performing the activity now. Mid-adulthood was used as a reference point in the past because this period was not likely to include parenthood but was likely to involve work-related activities. If interviewees were presently engaged in the activity, they were required to rate the frequency using a 4-point scale (described below). Then, they were asked whether or not they were experiencing any difficulty in performing the activity, and if so, to tell the interviewer the types of difficulties they were experiencing (without using any pre-determined categories). Subsequently, respondents were requested to rate the level of difficulty using a 3-point scale (described below). In addition, interviewees were asked to describe any differences in functioning in the activity from mid-adulthood to the present. Questions that were used included “Have you changed or modified the way in which you do this activity now compared to your mid-adulthood?” or “Do you do this in a different way now than how you used to?”. Respondents answering “yes” were probed for details regarding the nature of the modifications. The open-ended nature of this last part allowed interviewees to express themselves in their own words within the structure of the interview and thus facilitated the exploration of adaptive strategy use.

Frequency of Everyday Activities

For the purpose of this study, level of everyday functioning was operationalized as the mean frequency across instrumental, social, and recreational activities in which the

person was involved. The mean frequency across instrumental activities and the mean frequency across discretionary activities were also computed. Although previous research has identified everyday competence as a latent construct, consisting of both basic level of competence and expanded level of competence (M. M. Baltes et al., 1993, 1999), this study treated everyday functioning as an observed variable. Frequency scores ranged from 0 (never) to 4 (every day). The wording of the frequency scale was modified for meal preparation and for travelling in order to accommodate to the nature of these activities. To illustrate, frequency ratings for cooking included “never”, “not every day”, “once per day”, “twice per day”, and “three times per day”. No frequency rating was attributed to the activity of medication intake.

Difficulty Experienced in Everyday Activities

A score of difficulty experienced in each activity was attributed to every participant based on the information obtained in the interview on everyday activities. A score of 1 indicated that the person had stopped the activity because of personal constraints; a score of 2 indicated that the person was performing the activity with difficulty (including physical, cognitive, and/or motivational difficulties); and a score of 3 indicated that the person was performing the activity with no self-reported difficulty. Difficulty scores represented the mean difficulty experienced across a maximum of 12 activities.

Subjective Well-Being

The Memorial University of Newfoundland Scale of Happiness (MUNSH; Kozma & Stones, 1983) has been widely used as a measure of subjective well-being or happiness for nonclinical older people. The MUNSH assesses the balance between

positive and negative affective experiences. The 24-item scale includes 10 questions that measure affect in the past year and 14 questions that inquire how the person feels more generally. All questions are answered true or false, and happiness scores are calculated by subtracting negative experiences from positive experiences. Higher scores are meant to reveal a more positive balance; nevertheless, for ease of interpretation of the data collected in this study, the significance of the scale was reversed (i.e., higher scores reflect less happiness). The positive and negative dimensions of well-being have been found to correlate with the extraversion and neuroticism dimensions of personality respectively. This measure has demonstrated a high internal consistency score ($\alpha = .86$) and a superior correlation with a criterion measure ($r = .86$). Test-retest reliability after an interval of six months to one year was .70 (Kozma & Stones, 1983).

Social Desirability

Given the extent of self-report measures employed in this study, the Marlow-Crowne Social Desirability Scale (SDS; Crowne & Marlow, 1960) was used to assess the extent to which participants choose socially desirable responses. Use of the SDS as a measure of situational demand is well supported. The SDS is primarily a measure of response style with little content overlap with measures of subjective well-being. The scale contains 33 items that describe either desirable but uncommon behaviors (e.g., admitting mistakes) or undesirable but common behaviors (e.g., gossiping). Respondents are asked to respond “True” or “False” to 18 items keyed in the true direction and 15 in the false direction. One point is scored for each response in the socially desirable direction, with scores varying between 0 (no social desirability) to 33 (highest social desirability). The authors have reported an internal consistency coefficient ranging from

.73 to .88 and a test-retest correlation of .88 over a one-month interval.

Procedure

Administration of Interview and Questionnaires

Participants were interviewed by either the author (S. B.) or three other female research assistants. The research assistants had been trained by the project coordinator in test administration and by the author (S. B.) in techniques of interviewing such as building rapport, maintaining a collaborative relationship, pacing, listening, and probing (Kaufman, 1994; Kvale, 1996; Rubin & Rubin, 1995). Each interviewer completed two to three pilot sessions in order to practice administration. They were observed through a one-way mirror by two professors involved with the Adult Development and Aging Laboratory, who gave them constructive feedback regarding interview style and test administration. Interviewers were also made aware of subtle aging biases and how they could inadvertently be communicated to participants. In addition, the interviewers periodically viewed each other's sessions and gave each other feedback on deviations from standard administration so as to maintain as much similarity to each other as possible.

Participants were recruited and interviewed in the Adult Development and Aging Laboratory on an ongoing basis over a period of four months. Each person was given a consent form, which described the purpose of the study, the voluntary and confidential nature of participation, and procedures. Participants were tested individually, which involved partaking in an audiotaped interview, doing paper-and-pencil and computer tasks, and completing questionnaires. The trained interviewers administered the psychosocial, cognitive, and everyday functioning measures in a predetermined order.

The testing session in Phase 3 lasted between two and three hours, depending on the pace at which participants did the tasks and the amount of conversation pertaining to unrelated topics. Pauses with refreshments were offered to participants every 45 minutes to minimize fatigue and maintain motivation. Everyone was able to complete testing in one session without difficulty. Each participant was given an honorarium of \$25.00. After the participant had left, interviewers made notes in the person's file on interview behaviors (e.g., cooperativeness, motivation, sensory problems) for possible future consultation.

Content Analysis of the Qualitative Data

All of the audiotaped interviews ($N = 142$) were transcribed from an oral form to a written mode in preparation for qualitative content analysis. Each interview had taken between 40 to 75 minutes to administer during the testing session, and the time needed to transcribe one interview ranged from two-and-a-half to three hours, depending on the quality of the recording and the degree of talkativeness of the interviewee. The emotional aspects of the conversation such as "long pause", "tense voice", and "giggling" were not included in the transcriptions. Given that this step was demanding, the author (S. B.) transcribed 30 interviews, and the remainder was completed by either one research assistant or a professional secretary, who were given clear instructions on procedures for typing. Transcription was ongoing and necessitated approximately ten months to complete. In 11 cases, technical problems with the tape recording had occurred; as a result, the author (S. B.) telephoned these individuals and obtained the missing information directly.

The next step was to develop a valid coding scheme that would include all meaningful elements of the interview responses and would not distort the original

meaning intended by the participants. Inductive analysis entails the immersion in details and specifics of the data in order to allow the categories to emerge from patterns found in the cases under study, without being constrained by predetermined categories of analysis (Flick, 1998; Miles & Huberman, 1994; Quinn Patton, 1990; Weber, 1990). This analytic process involved the systematic organization and synthesis of the data by classifying responses into categories and subcategories. The coding scheme was achieved through a recursive movement between raw data and inferred categories until no new categories were necessary to classify the information (i.e., saturation). Repetitions and anecdotal digressions were not subjected to content analysis. Qualitative analysis of 50 transcripts was required to achieve saturation and arrive at a preliminary coding scheme. The transcripts had been selected for representativeness of interviewer and of participants' gender, age, and off-target verbosity level.

At this point, the author (S. B.) and thesis supervisor (T. A.) met to discuss the content of the coding scheme, with an emphasis on the behavioral adaptation strategy categories for each of the 12 activities. The coding scheme needed to take into account the criteria of validity for inferred categories: 1) internal consistency of categories, 2) independence of categories, 3) precision and clarity of labels, 4) exhaustiveness, and 5) parsimony (Miles & Huberman, 1994). Consequently, a couple of categories in the coding scheme were merged together while a few behavioral strategies were divided into more than one category. For categories that were ambiguous, the wording was revised and examples were listed in a coding manual (see Appendix B). The final categorization scheme included the following categories for each of the 12 activities examined: continuity of activity (four types), change in activity participation (presence or absence), global change in strategy (four types), use of external help (three types), strategies used

(number of behavioral strategies inferred varied from activity to activity), reported difficulty (four types), and nature of difficulties experienced (four types). The complete coding scheme is enclosed in Appendix C.

Then, inter-coder reliability was established. Specifically, the author (S. B.) and thesis supervisor (T. A.) independently coded using the categorization scheme a couple of interviews that had been randomly selected. The raters met and discussed discrepant ratings until a consensus was reached, which led to the addition of a few details to the coding manual. After that, the two raters independently coded 30 randomly selected transcripts, which represented 21% of the sample. For each of the 30 interviews, the number of agreements and disagreements were summed across the 12 activities. The mean intercoder reliability for the four dimensions coded in the 30 transcripts was 90.8% agreement. The dimension “continuity/discontinuity of activity” had 94.2% agreement; the dimension “change in performance of activity” had 89.4% agreement; the dimension “global strategy type used in activity” had 90% agreement; and the dimension “type of difficulty reported” had 89.7% agreement.

Subsequently, the author (S. B.) applied the coding scheme to the remainder of the sample ($N = 112$), which added up to 142 coded interviews. To ensure consistent application of the coding scheme, the first interview of every set of 15 transcripts was recoded and compared to the initial coding. The coding manual also helped to maintain reliability of the application of the coding scheme. This part of the methodology proved to be laborious (approximately five months of full-time work); nevertheless, it gave the author (S. B.) the opportunity to appreciate the richness of the qualitative data that were obtained from the participants.

Operational Definitions of Selection, Optimization, and Compensation in the Context of Everyday Competence

As a means of classifying the behavioral adaptations for quantitative analysis, the framework of selective optimization with compensation was applied (P. B. Baltes & Baltes, 1990). When moving into more specific contexts such as everyday competence in old age, it is the theories and research paradigms available for the categories that need to be invoked to define the logical status of selection, optimization, and compensation (Freund et al., 1999). The strategy categories reflecting behavioral changes were converted into indices of selection, optimization, and compensation according to the following working definitions.

Selection referred to a de-emphasis of activities, which included either partial selection or total selection. Partial selection involved redefining the activity with only part; that is, keeping part of the activity and stopping part to maintain acceptable performance standards. Total selection meant stopping fully the activity. Optimization pertained to the emphasis of activities; that is, changing the content of the activity to enhance performance, expanding by taking on more, or using available resources in an optimal way. Compensation comprised adaptation processes for activity maintenance; that is, using alternate means to maintain performance and reach the same goals or modifying performance standards by doing the activity less perfectly.

Table 2 displays for each of the everyday activities the typology of behavioral strategies that were coded as partial selection. Note that for four of the instrumental activities no partial selection strategies were inferred. Participants who had dropped part of the activity also reported getting help to maintain the activity, and this strategy was ultimately coded as an instance of compensation. Table 3 presents the typology of

strategies that were coded as optimization, and Table 4 displays the typology of strategies that represented compensation.

Results

Preliminary Statistical Procedures

Accuracy of Data Entry

The data gathered from the quantitative measures and the content analysis of interviews were entered independently by the author (S. B.) and a research assistant. The resulting files were compared to identify the specific locations of discrepancies. This step was valuable, for it allowed the elimination of any human error in data entry.

Data Screening

Missing data. The randomly scattered missing data in the sample (less than 1%) were replaced by the mean value of the variable in question. This approach to the problem of missing data is viewed as an appropriate and conservative procedure for preserving the number of cases in the sample (Tabachnick & Fidell, 1996).

Multicollinearity. The correlations among variables and composites were inspected for the presence of bivariate multicollinearity. Multicollinearity on the multivariate level was checked by calculating squared multiple correlations between each variable and all the rest. This examination revealed no instances of bivariate and multivariate multicollinearity.

Univariate and multivariate outliers. Univariate outlier analyses were performed on all the variables. Outliers can unduly affect the size of correlations and the multivariate procedures involving correlations; therefore, z transformations were carried out on cases with extremely low or high z scores. Because there was no apparent pattern

Table 2

Behavioral Adaptive Strategies Reflecting Partial Selection

Activities	Behavioral Strategies
Cooking	Prepares self simpler meals; mentions that skips meal
Housekeeping	None were generated by participants
Grocery Shopping	None were generated by participants
Financial Management	None were generated by participants
Medication Management	None were generated by participants
Visiting	Restricts visiting periods
Entertaining	Restricts entertaining periods
Physical Activities	Same intensity level of activities, but decrease in number of activities Decrease in intensity level of activities, and decrease in number of activities
Hobbies	Dropped some activities, but maintains some Dropped some/all previous activities, but now does new activities (i.e., overall decrease in level of involvement)
Organizations	Dropped some organizations, but remains involved in some Dropped some/all past organizations, but is now involved in new organizations (i.e., overall decrease in level of involvement)
Volunteering	Dropped some volunteer activities, but maintains some Dropped some/all past volunteer activities, but is now involved in different volunteer activities (i.e., overall decrease in level of involvement)
Travelling	Stays “more locally” due to constraints or choice (i.e., decrease) Trips now limited to family visitations (i.e., decrease in amount of travelling)

Table 3

Behavioral Adaptive Strategies Reflecting Optimization

Activities	Behavioral Strategies
Cooking	<p>Cooks large quantities, freezes, and heats up later; buys in bulk and freezes portions</p> <p>Changed one's eating habits</p> <p>Improvement (person is trying out new recipes; is a better cook)</p>
Housekeeping	None were generated by participants
Grocery Shopping	Buys in bulk so doesn't need to go to store as often
Financial Management	Improvement in ability to manage finances
Medication Management	None were generated by participants
Visiting	Visits more; is going out with friends (doing more activities outside the home)
Entertaining	Entertains more now than in the past
Physical Activities	<p>Same intensity level of activities, but increase in number of activities</p> <p>Increase in intensity level of activities, but decrease in number of activities</p> <p>Increase in intensity level of activities, and increase in number of activities</p> <p>Increase in intensity level, but same number of activities</p> <p>Past no physical activities, but is now physically active</p>
Hobbies	<p>Is doing same activities now, but increase in frequency</p> <p>Dropped some/all past activities, but now does new activities (i.e., overall increase in level of involvement)</p> <p>Has kept all past activities at same level of involvement, and now does some new activities</p> <p>Past no hobbies/creative activities, but now does activity</p>

Table 3 (continued)

Organizations	is involved in same organizations, but increase in frequency/level of involvement
	Dropped some/all past organizations, but is now involved in new organizations (i.e., overall increase in level of involvement)
	Has kept all past organizations, and is now also involved in different organizations
	Past not involved in organizations, but now is involved
Volunteering	Is involved in same volunteer activities, but increase in frequency now
	Dropped some/all volunteer activities, but now is involved in different volunteer activities (i.e., overall increase in level of involvement)
	Has kept all past volunteer activities at same level of involvement, and is now also involved in new ones
	Past not involved in volunteering, but now volunteers
Travelling	Increase in traveling

Table 4

Behavioral Adaptive Strategies Reflecting Compensation

Activities	Behavioral Strategies
Cooking	<p>Heats up “prepared”/frozen foods; uses convenience foods</p> <p>Goes to restaurant several times per week or buys take-out</p> <p>Allows self more time to do tasks required by the activity</p> <p>Explicit mention of help from another person</p>
Housekeeping	<p>Puts off tasks if feeling tired; does tasks when “feels like it”</p> <p>Allows self more time to do tasks; breaks up tasks and takes pauses in-between</p> <p>Does not let tasks accumulate</p> <p>Only does when necessary; only does what is necessary; decrease in frequency and/or thoroughness</p> <p>Explicit mention of help from another person (formal or informal) for housekeeping and or home maintenance</p>
Grocery Shopping	<p>Buys small quantities more often</p> <p>Now has groceries delivered</p> <p>Uses mechanical aids</p> <p>Explicit mention of help from another person (informal or formal)</p>
Financial Management	<p>Uses compensatory strategy to facilitate banking/ bill payment</p> <p>Explicit mention that now uses help from family/friend/formal services</p>
Medication Management	<p>Uses cognitive strategies to remember to take medication</p> <p>Prepares in advance pill intake (for the day or week) using pill box</p> <p>Explicit mention of help from another person</p>

Table 4 (continued)

Visiting	Explicit mention of help from another person
Entertaining	Has changed way of entertaining: "keeps it simple"
	Is going out with friends instead of formally entertaining at home
	Takes family to restaurant instead of formally entertaining at home
	Explicit mention of help from another person
Physical Activities	Decrease in intensity level of activities, but increase in number of activities
	Decrease in intensity level of activities, but same number of activities
	Doing same activities, but less intensely
Hobbies	Doing same activities now, but decrease in frequency
Organizations	Is involved in same organizations, but decrease in frequency/ level of involvement
Volunteering	Is involved in same volunteer activities, but decrease in frequency
Travelling	Travels with tour groups now
	Has modified travelling conditions (i.e., changes in mode of transportation)
	Has modified travelling habits
	Has modified type of trips/destinations (e.g., needs comfort, less moving around)

to these scores and the distributions were relatively normal otherwise, all standardized scores larger than 3.00 or smaller than -3.00 were changed to equal the next most extreme score. This option preserved the deviancy of a case without allowing it to be so deviant that it distorted correlations (Tabachnick & Fidell, 1996). There were no multivariate outliers identified within the sample using the Mahalanobis distance at $p < .001$.

Univariate and multivariate normality. The variables were also inspected for univariate normality using frequency distributions and normal probability plots that showed the relation of actual z scores to the ones expected in a normal distribution. This examination revealed that the stopping variable was non-normally distributed. A decision was made not to transform this variable, but rather to use it in analyses in combination with the partial selection variable. The combination variable “partial selection and stopping” was normally distributed. Multivariate normality is a common assumption of the data in structural equation modeling, and it implies that all univariate distributions are normal; the joint distributions of any combination of the variables are also normal; and all bivariate scatterplots are linear and homoscedastic (Tabachnik & Fidell, 1996). The assumption of multivariate normality is not readily tested, for it would require the testing of an infinite number of linear combinations of variables for normality (Kline, 1998; Tabachnik & Fidell, 1996). Following Tabachnick and Fidell’s recommendations, the assumption of multivariate normality was partially checked through normality, linearity, and homoscedasticity of variables. No instances of non-normality were apparent through the inspection of univariate distributions.

Demographic Results

The descriptive statistics on demographic characteristics are presented in Table 5.

Table 5

Sample Demographic Characteristics (N = 142)

Characteristic	<u>n</u>	%
Age Group		
Younger (66 to 74 years)	74	52.1
Older (75 to 88 years)	68	47.9
Gender		
Female	101	71.1
Male	41	28.9
Marital Status		
Single	17	12.0
Married	52	34.5
Separated/Divorced	26	18.3
Widowed	47	35.2
Education		
≤10 years	22	15.5
11-12 years	41	28.9
13-16 years	64	45.1
>16 years	15	10.5
Self-Rated Financial Situation		
Fairly Difficult	7	4.9
Not Bad	14	9.9

Table 5 (continued)

Fairly Comfortable	32	22.5
Comfortable	61	43.0
Very Comfortable	28	19.7
Off-Target Verbosity Rating		
Low	25	17.6
Moderate	88	62.0
High	26	18.3
Missing	3	2.1

With respect to age, the sample split approximately equally into a younger group (under 75 years of age) and an older group (aged 75 years and older). The majority of participants were female. An almost equal number of participants were either married or widowed while fewer individuals were single or separated/ divorced. Most participants possessed high levels of educational attainment reflected in secondary and post-secondary education. A total of 62.7% of participants reported being financially comfortable or very comfortable. The majority of participants manifested a moderate level of off-target verbosity, which is indicative of a socially appropriate level of talkativeness.

One question of interest was whether mean differences between various demographic groups (age, gender, marital status, education, and financial situation) on each of the SOC processes and on outcomes of successful aging (frequency of activities, difficulty experienced, and subjective well-being) were larger than expected by chance. Because there were several dependent variables (DVs), multivariate analysis of variance was used as a way of avoiding alpha inflation that would occur from doing a series of univariate analysis of variance. The age variable was split into a younger group (below 75 years of age) and an older group (75 years of age and older). The marital status variable was divided into an unmarried group (including single, separated, divorced, and widowed) and a married group. The education variable was split into one group with 12 years of education or less and one group with 13 years of education or more. The financial status variable was split into a less comfortable group (comprising the categories “fairly difficult”, “not bad”, and “fairly comfortable”) and a more comfortable group (comprising the categories “comfortable” and “very comfortable”). Results of the evaluation of assumptions of normality, homogeneity of variance-covariance matrices,

linearity, and multicollinearity were satisfactory.

With the use of Hotelling's trace criterion, the combined DVs were significantly affected by both gender, $F(6, 135) = 6.36, p < .001$ and marital status, $F(6, 135) = 8.68, p < .001$. As shown in Table 6, women engaged significantly more frequently in daily activities than men, univariate $F(1, 140) = 4.15, p < .05$; they reported experiencing significantly more difficulties in everyday activities than men, univariate $F(1, 140) = 7.78, p < .01$; and they reported using compensation strategies in significantly more activities than men, univariate $F(1, 140) = 14.98, p < .001$. Table 7 shows that the unmarried group reported experiencing significantly more difficulties in activities than the married group, univariate $F(1, 140) = 4.76, p < .05$; the unmarried group also reported using compensation strategies in significantly more activities than married individuals, univariate $F(1, 140) = 33.34, p < .001$. The married group reported being significantly happier, univariate $F(1, 140) = 4.76, p < .05$. The interaction effect of gender by marital status was nonsignificant, $F(6, 133) = 0.35, p > .05$. In addition, the combined DVs were not significantly affected by age, $F(6, 135) = 1.25, p > .05$, education, $F(6, 135) = 0.60, p > .05$, and financial status, $F(6, 135) = 2.12, p > .05$. Note that a significant univariate effect was found for difficulty of activities in relation to age, univariate $F(1, 140) = 5.20, p < .05$ and for well-being in relation to financial status, univariate $F(1, 140) = 5.95, p < .05$.

Descriptive Data on the Classification of Interview Responses

The presentation of the most salient descriptive results from the classification of responses follows the sequence of the categorization scheme (see Appendix C).

Table 6

Multivariate and Univariate Analyses of Measures of Selection, Optimization and Compensation, Frequency and Difficulty of Activities, and Well-Being in Relation to Gender

Dependent Variables	Women (<u>n</u> = 101)		Men (<u>n</u> = 41)		F (1, 140)
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Selection	.33	.18	.31	.17	0.59
Optimization	.22	.13	.23	.14	0.02
Compensation	.38	.13	.28	.13	14.98***
Frequency of activities	2.09	.46	1.92	.44	4.15*
Difficulty experienced ^a	2.58	.30	2.72	.22	7.78**
Subjective well-being ^b	1.82	1.03	1.80	1.03	0.02
<u>F</u> (6, 135) = 6.36, $p < .001$					
* $p < .05$ ** $p < .01$ *** $p < .001$					

^aHigher scores reflect less difficulty experienced. ^b Higher scores reflect lower levels of happiness.

Table 7

Multivariate and Univariate Analyses of Measures of Selection, Optimization and Compensation, Frequency and Difficulty of Activities, and Well-Being in Relation to Marital Status

Dependent Variables	Unmarried (<u>n</u> = 90)		Married (<u>n</u> = 52)		F (1, 140)
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Selection	.34	.18	.31	.17	0.82
Optimization	.23	.14	.22	.12	0.18
Compensation	.39	.13	.27	.13	33.34***
Frequency of activities	2.10	.44	1.94	.49	3.89
Difficulty experienced ^a	2.58	.30	2.69	.24	4.76*
Subjective well-being ^b	1.96	1.04	1.57	0.97	4.76*
<u>F</u> (6, 135) = 8.68, $p < .001$					

* $p < .05$ ** $p < .01$ *** $p < .001$

^aHigher scores reflect less difficulty experienced. ^bHigher scores reflect lower levels of happiness.

Continuity and discontinuity of activity. Figure 2 presents the frequency distributions of activities stopped, begun, and maintained in old age. A total of 60.5% of the sample reported having stopped a mean of two activities. A total of 49.3% of the participants reported that they had taken on a mean of two activities relative to their past. In addition, participants reported that they were still performing a mean of eight activities.

Global change in performance. Table 8 reveals that decrease in level of involvement in everyday activities is not the only type of global change that occurs in the performance of activities in old age. All participants reported a decrease in activity involvement. However, 55% of the sample had adopted some type of mixed or substitution approach in order to maintain performance in activities, and 79% of the interviewees reported having experienced a positive change, including an increase in level of involvement in some activities.

Use of external help. Table 9 shows that the use of external help in everyday activities was reported by most participants, but only for a few activities. Participants indicated using formal and informal help from others in only 12% of the activities. Likewise, the use of mechanical aids was reported for only 4% of the activities examined.

Nature of difficulties experienced. Table 10 demonstrates that most participants reported experiencing difficulties in activity performance in very few activities. Most of the reported difficulties in instrumental and discretionary activities were physical in nature. Participants reported experiencing physical difficulties in a mean of two activities, which included a mean of one instrumental activity and a mean of one discretionary activity. Participants acknowledged encountering cognitive difficulties on average in less

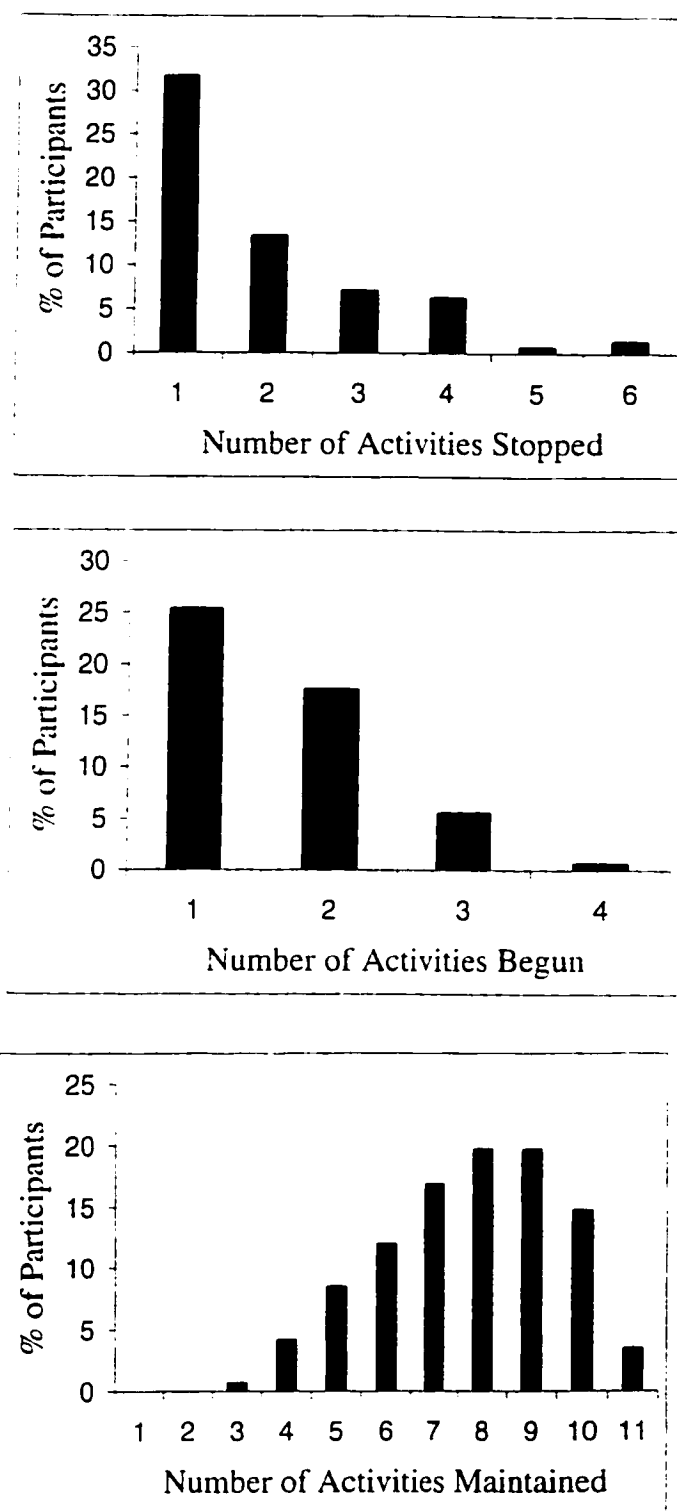


Figure 2. Frequency Distributions of Activities Stopped, Activities Begun, and Activities Maintained in Old Age.

Table 8

Direction and Frequency of Change in Activities Performed in Old Age (N=142)

Direction	<u>n^a</u>	<u>% of Activities Changed</u>	
		Mean	Range
Decrease	142	43	9 - 82
Mixed	78	13	9 - 44
Increase	112	18	9 - 45

^an = Number of participants reporting at least one activity changed in the stated direction.

Table 9

Use of Aids in Everyday Activities Performed in Old Age (N=142)

Type of Aid	<u>n^a</u>	<u>% of Activities where Aids Used</u>	
		Mean	Range
Human	102	12	1 - 45
Mechanical	45	4	1 - 22

^an = Number of participants reporting the use of this type of aid.

Table 10

Nature of Difficulties Experienced in Activities Performed in Old Age (N=142)

Type of Difficulty	<u>n</u> ^a	<u>% of Activities where Difficulties Reported</u>	
		Mean	Range
Physical	105	1.96	1 - 8
Cognitive	50	0.44	1 - 2
Emotional	61	0.65	1 - 3

^an = Number of participants reporting this type of difficulty.

than one activity, which comprised a mean of .34 instrumental activity and a mean of .11 discretionary activity. Furthermore, respondents indicated that they were having emotional/motivational difficulties in a mean of less than one activity, which included a mean of .33 instrumental activity and a mean of .34 discretionary activity.

Domain Specificity of Adaptation

A total of 1456 behavioral efforts were categorized into adaptive strategies. In total, stopping comprised 11% of all of the behavioral efforts reported by participants. Partial selection represented 21% of all of the strategies reported. Approximately 21% of all the ways of adaptation reported by participants reflected optimization efforts. Over 47% of all the efforts reported were compensation strategies.

Figure 3 displays the proportions of reported instances of stopping, partial selection, optimization, and compensation by activity type. Respondents reported stopping more often in the domain of discretionary activities than in the domain of instrumental activities (89% of all of the stopping instances were reported for discretionary activities). Similarly, participants indicated that they had limited their participation (i.e., partial selection) more in discretionary than in instrumental activities (83% of all of the partial selection strategies were reported for discretionary activities). Over 75% of all of the optimization strategies reported were found in discretionary activities whereas the greater proportion of compensation (65% of all compensation efforts) was reported for instrumental activities.

Structural Equation Modeling

Structural equation modeling (SEM) was chosen as method of analysis for simultaneously testing all the relationships among the variables (Tabachnick & Fidell,

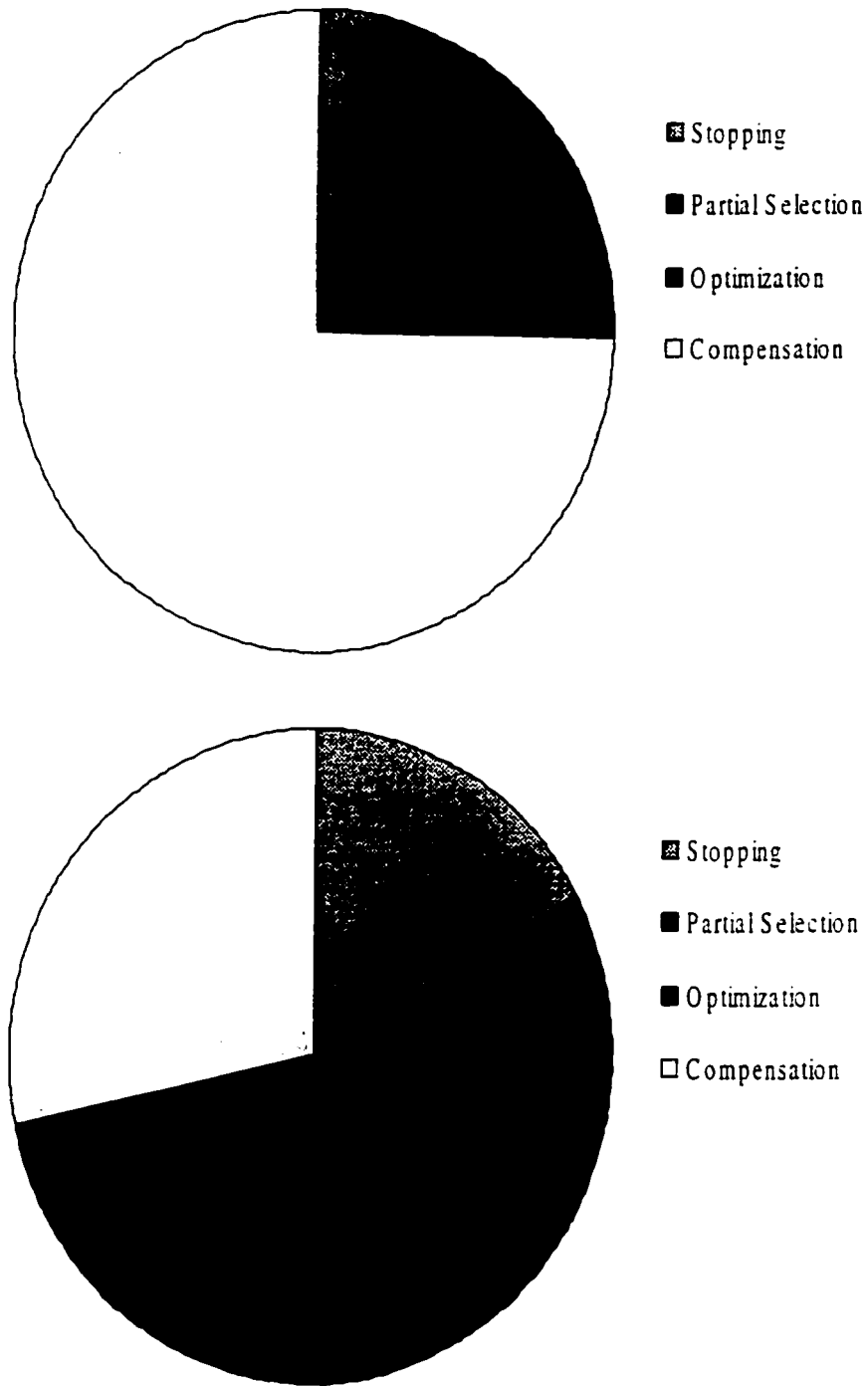


Figure 3. Proportions of Reported Instances of Stopping, Partial Selection, Optimization, and Compensation in Instrumental Activities (Upper Graph) and in Discretionary Activities (Lower Graph).

1996). The following section describes the derivation of the resource variables and the selection, optimization, and compensation variables that were subsequently used in structural equation modeling.

Resource Variables

A range of personal resources was assessed to gain a better understanding of their role in SOC use and in the maintenance of everyday competence and subjective well-being. In a preliminary step, variables within each category of resource measures were examined separately to ascertain whether they could be reduced to a single factor through principal components, given that the measures had face validity on indices of the construct in question and correlated moderately with each other. Consistent with expectations, only one factor could be extracted for each category of resource measures. The five resource areas are displayed in Table 11. For the socioeconomic status factor, a higher factor score indicated richer resources; for the physical health factor, a higher score reflected poorer resources; for the cognitive factor, a higher score indicated poorer resources; for the emotional factor, a higher score reflected richer resources; and for the social support factor, a higher score suggested richer resources.

Selection, Optimization, and Compensation Variables

For the purpose of structural equation modeling, each of the selection, optimization, and compensation variables was operationalized as the total number of activities in which participants reported using at least one strategy of that type. In order that persons who had never done an activity were not penalized, the number of activities for each SOC variable was expressed as a proportion of the total number of activities that the individual had actually done.

Table 11

Factor Loadings, Eigenvalues, and Variance Explained in Resource Factors (N= 142)

	Factors				
	SES	Physical	Cognitive	Emotional	Social
Level of education	.49				
Financial situation at time 1	.86				
Financial situation at time 3	.89				
Self-reported illnesses		.82			
Self-reported health status		.82			
Cognitive flexibility			.81		
Speed of processing			.79		
Executive functioning			-.63		
Neuroticism				-.83	
Sense of mastery				.83	
Size of support network					.75
Satisfaction with support					.80
Perceived social support					.80
Eigenvalue	1.77	1.34	1.67	1.39	1.85
Variance explained (%)	59.00	67.00	55.60	69.60	61.70

Loss-based selection. The loss-based selection variable (i.e., partial selection and stopping) represented the number of activities in which at least one partial selection strategy or stopping strategy was reported by participants. The maximum possible score for this variable was 11 activities. No stopping or partial selection strategy was inferred from participants' responses for the activity of medication intake. Each participant's score was the sum of his or her partial selection score and the number of activities stopped. The partial selection score was a proportion of the number of activities for which the participant reported a partial selection strategy divided by the number of valid activities. An activity was valid if it was engaged in at midlife.

Optimization. The optimization variable comprised the number of activities in which at least one optimization strategy was reported by participants. The maximum possible score for this variable was 10 activities. No optimization strategy was inferred from participants' responses for the activities of housekeeping/home maintenance and medication intake. Each participant's score was expressed as a proportion of the number of activities for which the individual reported an optimization strategy divided by the number of valid activities.

Compensation. The compensation variable was operationalized as the number of activities in which at least one compensation strategy was mentioned by participants. The maximum possible score for this variable was 12 activities. Again, each participant's score was expressed as a proportion of the number of activities for which the person reported a compensation strategy divided by the number of valid activities.

In addition to this set of SOC variables, a second set was created based on the number of strategies. Each of the SOC processes was operationalized as the number of partial selection, stopping, optimization, and compensation strategies reported by

participants (i.e., four totals), taking into account the number of valid activities for each participant. These two sets of SOC variables correlated highly with each other; that is, for partial selection, $r = .96$, $p < .001$; for optimization, $r = .97$, $p < .001$; and for compensation, $r = .90$, $p < .001$. The number of stopping strategies (second set) was the same as the number of activities in which stopping was reported (first set). Some preliminary models were run with the SOC variables representing number of strategies and yielded results similar to the models with the SOC variables representing number of activities in which the strategy type was reported. However, the SOC variables that represented the number of activities in which each strategy type was reported were clearer conceptually and therefore, were chosen for structural equation modeling. Furthermore, computing the number of activities instead of the number of strategies attenuated the possible confounding effect that high off-target verbosity could have had in the generation of strategies.

Descriptive Statistics of the Variables Used in Structural Equation Modeling

Table 12 shows the means, standard deviations, and ranges of personal resources, SOC processes, and outcomes of successful aging that were used in SEM. Since means and standard deviations of factor scores are not very informative, descriptive statistics are given for the variables that constitute the resource factors¹. Note that the off-target verbosity variable is standardized and has a mean of 0 and a standard deviation of 1. The values associated with loss-based selection, optimization, and compensation represent the

¹ One score became an outlier on the physical health factor, but it was only discovered after structural equation modeling had been completed. In order to determine the influence of this outlier on the pattern of results, one model was run with the outlier score of 3.76 having been replaced with the value 3.00. The result of the fit of this model was almost identical to the fit of the model with the physical health factor incorporating the outlier score, and there were no changes in the path values.

Table 12

Means, Standard Deviations and Ranges of Personal Resources, Selection, Optimization and Compensation Processes, and Outcomes of Successful Aging (N = 142)

Variable	<u>M</u>	<u>SD</u>	Minimum	Maximum
Age	74.84	5.53	66.00	88.00
Level of education	13.34	3.11	4.00	21.00
Financial situation 1	5.42	1.03	2.00	7.00
Financial situation 3	5.62	1.08	2.00	7.00
Self-reported illnesses	5.10	2.96	0.00	14.00
Self-reported health status	1.78	0.79	1.00	4.00
Cognitive flexibility	70.89	48.09	13.00	255.00
Speed of processing	2160.90	669.08	1140.00	4897.00
Executive functioning	4.40	1.95	0.00	6.00
Neuroticism	8.81	4.96	0.00	22.00
Sense of mastery	23.12	2.81	16.00	32.00
Size of support network	3.57	2.01	0.30	9.00
Satisfaction with support	5.28	2.01	2.20	6.00
Perceived social support	53.02	6.34	34.00	64.00
Off-target verbosity	-0.01	1.01	-1.42	3.00
Partial selection + stopping	0.33	0.17	0.00	0.80
Optimization	0.23	0.13	0.00	0.60
Compensation	0.35	0.14	0.00	0.64
Well-being	27.70	3.78	18.00	32.00
Frequency of all activities	2.04	0.46	0.82	3.46
Frequency of instrumental activities	2.36	0.57	0.50	3.25
Frequency of discretionary activities	1.86	0.55	0.14	3.57

proportion of activities in which the strategy types were reported. Partial selection and stopping strategies were reported in a mean of 33% of the activities; optimization efforts were reported in a mean of 23% of the activities; and compensation strategies were reported in a mean of 35% of the activities. The range of values for the SOC variables suggests considerable variability within the sample. Regarding outcomes of successful aging, the mean for the well-being variable (unreversed scores) indicates a sample that reported being generally happy. In line with previous research, the frequency of instrumental, obligatory activities was somewhat higher than the frequency of discretionary, social and recreational activities. The range of values for frequency of activities indicates some variability within the sample.

Table 13 presents the zero-order correlations among age, gender, marital status, socioeconomic resource factor, physical health resource factor, cognitive resource factor, emotional resource factor, social support resource factor, off-target verbosity, SOC adaptive processes, subjective well-being, and frequency of both instrumental and discretionary activities. Examination of the intercorrelations revealed interesting associations that were generally in the predicted directions. Older age was associated with being unmarried, poorer cognitive and emotional resources, higher off-target verbosity, and more compensation use. Women were more likely to be unmarried, have poorer emotional resources, use more compensation, and have a higher frequency of activities, especially in the instrumental domain. Being married was associated with greater physical health, richer emotional resources, less compensation use, greater subjective well-being, and lower frequency of instrumental activities. Higher socioeconomic status was related to richer physical health, cognitive and emotional

Table 13

Correlation Matrix of Sociodemographic Variables, Personal Resources, SOC Processes,
and Successful Aging Outcomes (N =142)

Variable	1	2	3	4	5	6	7
1.Age							
2.Gender	-.08						
3.Marital status	-.18*	.35***					
4.Socioeconomic status	.02	.05	.08				
5.Physical resources	.16	-.02	-.21*	-.24**			
6.Cognitive resources	.24**	.00	-.06	-.22**	.06		
7.Emotional resources	-.20 *	.27**	.27**	.30***	-.40***	-.10	
8.Social resources	.01	-.08	.14	.12	-.21*	.02	-.25**
9.Off-target verbosity	.25**	-.17*	-.12	-.07	.04	.19*	-.12
10.Partial selection and stopping	.15	-.06	-.08	-.09	.41***	.12	-.21*
11.Optimization	-.07	.01	-.04	.01	-.24**	-.16	.11
12.Compensation	.18*	-.31***	-.44***	.02	.26**	.05	-.26**
13.Well-being	.12	-.01	-.18*	-.22**	.45***	.05	-.52***
14.Frequency (all activities)	-.10	-.17*	-.16	-.01	-.29***	-.13	.07
15.Frequency (instrumental activities)	-.06	-.23**	-.41***	-.15	-.10	-.04	-.18*
16.Frequency (discretionary activities)	-.09	-.09	.03	.08	-.33***	-.15	.19*

Table 13 (continued)

Variable	8	9	10	11	12	13	14	15
1.Age								
2.Gender								
3.Marital status								
4.Socioeconomic status								
5.Physical resources								
6.Cognitive resources								
7.Emotional resources								
8.Social resources								
9.Off-target verbosity	-.03							
10.Partial selection and stopping	-.25**	.21*						
11.Optimization	.03	.02	-.45***					
12.Compensation	.05	.14	.04	-.01				
13.Well-being	-.41***	-.04	.42***	-.21*	.04			
14.Frequency (all activities)	.30***	-.22**	-.57***	.34***	.11	-.35***		
15.Frequency (instrumental activities)	.01	-.13	-.21*	.13	.33***	-.07	.69***	
16.Frequency (discretionary activities)	.39***	-.21*	-.62***	.36***	-.06	-.42***	.90***	.32***

* $p < .05$, ** $p < .01$, *** $p < .001$

resources as well as higher subjective well-being. Personal resources were generally related to SOC use. In particular, poorer physical health resources were related to more partial selection and stopping, more compensation, and less optimization. Poorer emotional resources were related to more partial selection and stopping and more compensation. Poorer social resources were associated with more partial selection and stopping. Use of SOC strategies was also associated with certain outcomes of successful aging. Worth noting is that greater partial selection and stopping were associated with lower subjective well-being and lower level of everyday functioning. Greater compensation use was related to greater level of functioning in instrumental activities, whereas greater optimization use was related to higher well-being and greater level of functioning. Results also revealed nonsignificant correlations between social desirability scores of participants and the other variables used in the analyses (ranging from $r = .00$ to $r = \pm .11$), which suggests that the measures were not contaminated by concerns about social desirability.

Structural Equation Modeling Results

The goal of path analysis in the context of this study was model generation, which involved testing whether a model produced an estimated population covariance matrix that was consistent with the sample observed covariance matrix. When the initial model did not fit the data, it was modified to improve its parsimony and/or its fit and tested again with the same data (James & Brett, 1984). The model generation strategy allowed the discovery of models that made theoretical sense and whose statistical correspondence to the data was reasonable. The model-fitting program that was used was EQS PowerMac 5.6 (Bentler, 1995).

Model Specification

The first step in path analysis was the specification of a priori models that represented the “causal” hypotheses. The method of model specification in EQS is the Bentler-Weeks method. In this method, every variable is either a dependent variable (i.e., endogenous variable) or an independent variable (i.e., exogenous variable or measurement error representing all omitted causes of an endogenous variable). The parameters to be estimated are the variances and covariances of the independent variables and the path coefficients. Path coefficients correspond to correlations after all other variables prior to the dependent variable have been controlled. For example, the path coefficient for the direct effect of one variable on another variable controls for their presumed common causes. Correlations among multiple presumed causes of one endogenous variable are also controlled so that path coefficients for the direct effects are over and above any spurious effects (Klem, 1995). Path analysis does not incorporate measurement error and may lead to biased estimates of the relationships between variables if the measures used do not have good psychometric characteristics (Kline, 1998). In this study more than one measure of physical, cognitive, emotional, and social support resources were used to minimize the problem of measurement error. In addition, only the measures that had sound psychometric properties were selected.

The exogenous variables that were allowed to covary in the a priori models were based on the literature and on the author’s hypotheses. Correlations representing unanalyzed associations were specified between age and cognitive resources; age and emotional resources; socioeconomic status (SES) and physical health resources; SES and cognitive resources; SES and emotional resources; physical health and emotional resources; physical health and social support resources; emotional and social support

resources. Loss-based selection, optimization, and compensation were hypothesized to mediate the relationship between personal resources and outcomes of successful aging. Each of the a priori models was first fitted without direct paths between resources and outcomes of successful aging. The structural relationships between the personal resources and each of the SOC processes were specified according to the research hypotheses. Selection was specified as being directly predicted by age, SES, physical health, cognitive, emotional, and social support resources. Optimization was postulated as being influenced by age, SES, physical health, cognitive, emotional, and social support resources. Compensation was assumed to be predicted by age, SES, physical health, cognitive, emotional, and social support resources. Furthermore, selection, optimization, and compensation were specified as having a direct effect on frequency level of everyday activities and on subjective well-being. In a four-level model, frequency level was specified as leading to subjective well-being.

Model Estimation

Identification concerns whether it is theoretically possible to derive unique estimates of each parameter in the model. If a model fails to meet requirements for its identification, attempts to estimate it may not be successful (Tabachnick & Fidell, 1996). If there are more observations (i.e., number of variances and covariances among the observed variables) than model parameters, then the model is said to be overidentified, which is a necessary condition for proceeding with the analysis (Kline, 1998). The models in this study had a number of observations that was greater than the number of parameters and thus, met the first condition for identification.

Another condition for model identification is that the structural part of the model be identified. If the structural part of the model is recursive, it is identified (Tabachnick & Fidell, 1996). The models tested were recursive; that is, all effects were unidirectional and the measurement errors of the endogenous variables were independent where there were direct effects between the endogenous variables. Thus, the models in this study also met the second condition for identification.

The maximum likelihood estimation (ML) was used to analyze the variance-covariance matrix and to estimate the parameters and goodness of fit of each model. Maximum likelihood estimation assumes multivariate normality of the endogenous variables and the exogenous variables that are continuous; nonetheless, the values of parameter estimates generated by ML are relatively robust against non-normality (Kline, 1998). Maximum likelihood estimation is iterative, and iterative estimation converges to a solution quicker if the procedure is given starting values. The initial start values for the models tested were generated automatically by EQS (Bentler, 1995).

Model Fit Evaluation

The fit of each of the a priori models was evaluated using the fit indices produced by the model-fitting program. The chi-square is a statistical test of the lack of fit resulting from over-identifying restrictions placed on a model. The chi-square statistic is computed based upon the function minimum when the solution has converged (Bentler & Wu, 1995). Because the goal was to develop models that fit the data, a nonsignificant chi-square was desired ($p > .05$); that is, the overall fit of each of the overidentified models did not differ statistically from the fit of a saturated version of it (Klem, 1995). The chi-square statistic is sensitive to the assumption of normality and to sample size so that

additional goodness-of-fit indices were considered (Tabachnick & Fidell, 1996). First, the Bentler-Bonett Normed Fit Index (NFI) evaluates the estimated model by comparing the chi-square value of the model to the chi-square value of the independence model (in which the observed variables are assumed to be uncorrelated), providing a descriptive fit index that lies in the 0 to 1 range. High values (greater than .90) are indicative of a good-fitting model. Second, the Bentler-Bonett Nonnormed Fit Index (NNFI) is an adjustment to the NFI that incorporates the degrees of freedom in the model; that is, the value estimates the relative improvement per degree of freedom of the target model over a baseline model. The adjustment reduces the problem of underestimating the fit in good fitting models but sometimes yields numbers outside of the 0-1 range (Tabachnick & Fidell, 1996). Third, the Comparative Fit Index (CFI) estimates the relative reduction in lack of fit as estimated by the noncentral chi-square of a target model versus a baseline model. CFI values greater than .90 are suggestive of good fitting models. The CFI is normed to the 0-1 range, and it is suitable for estimating model fit even in small samples (Bentler & Wu, 1995).

Model with Frequency of Everyday Activities as Outcome of Successful Aging

The initial fit of the a priori model generated for each outcome measure was interpreted according to the same principles; therefore, a summary of the initial fit of one a priori model only is presented. This a priori model comprised age, SES, physical health, cognitive, emotional, and social support as personal resources; selection, optimization, and compensation as mediating variables; and frequency level of everyday activities as outcome of successful aging. Figure 4 illustrates this a priori model.

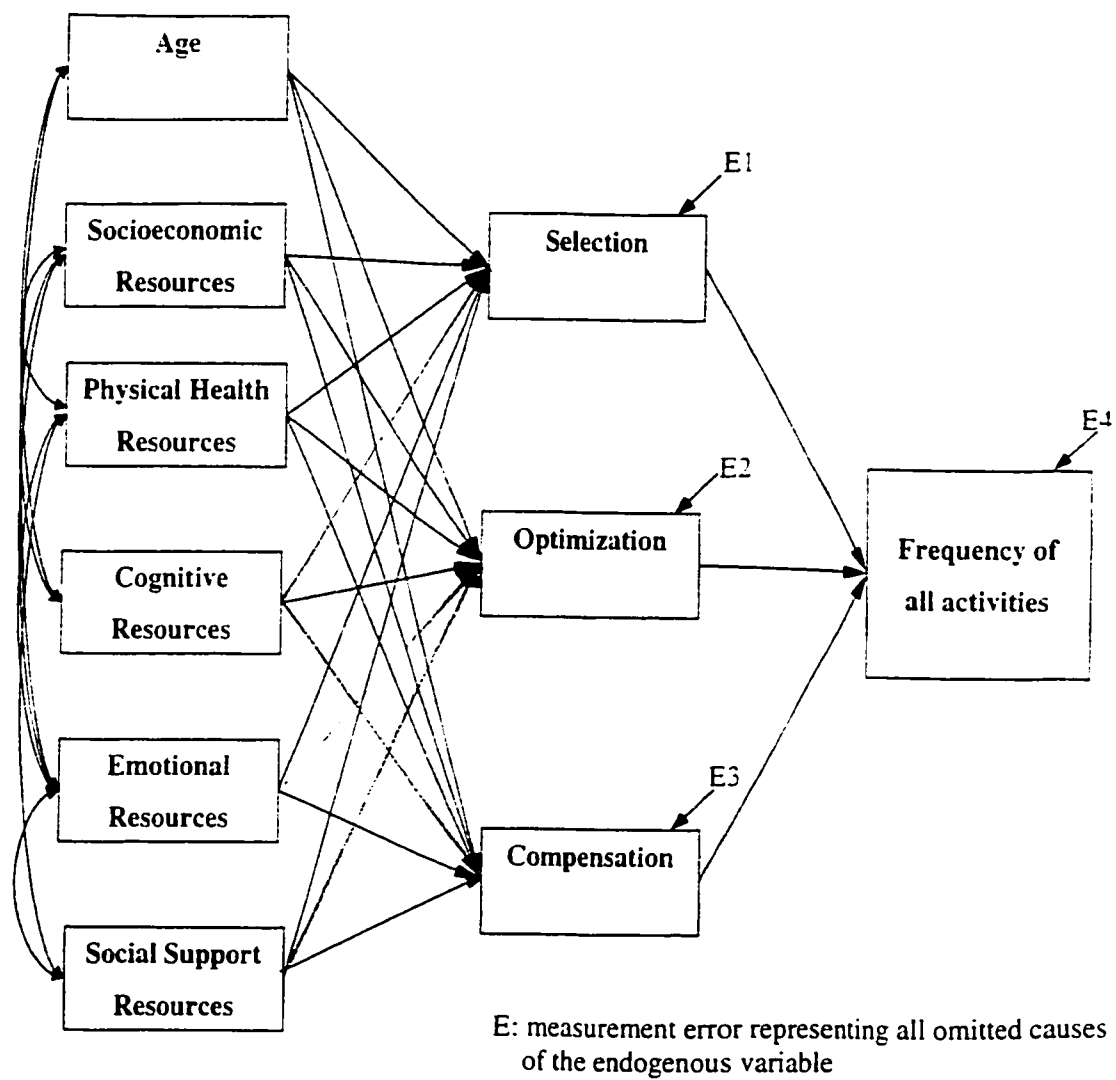


Figure 4. A priori model with frequency of everyday activities as outcome of successful aging.

The path model yielded a highly significant chi-square statistic, indicating that it differed significantly from the data, $\chi^2(16, N = 141) = 47.02, p < .001$. The other fit indices also suggested a less-than-satisfactory fit to the data (NFI = .81; NNFI = .57; CFI = .85). Note that a preliminary run of the model-fitting program showed that one case contributed to normalized multivariate kurtosis to the extent that it changed the significance of some parameters. As a result, the models were tested using 141 cases instead of 142 cases.

Model Respecification

Post hoc model modification was useful in improving the fit of the a priori model. According to a rule of thumb in the structural equation modeling literature, correlation residuals with absolute values greater than .10 suggest that the model does not explain the associated observed correlations very well (Kline, 1998). Inspection of the standardized residuals revealed possible sources for lack of fit. In particular, there was a large residual relationship between the selection and optimization variables (-.35). Given the lack of theoretical basis to specify direct or reciprocal effects between these two endogenous variables, a correlation was specified between their error terms to reflect the assumption that these two variables shared at least one common omitted cause. Note that the path model remained recursive even with the addition of the correlation between errors because there were no direct effects among the endogenous variables (Kline, 1998).

The Lagrange Multiplier test and the Wald test were implemented in an exploratory mode to provide additional guidance on how the model may be modified to yield improved fit (Bentler & Wu, 1995; Kline, 1998; Tabachnick & Fidell, 1996). The Lagrange Multiplier (LM) test evaluates the statistical necessity of one or more restrictions on a model. The restrictions that are evaluated are typically whether a

parameter that has been fixed to a given value is appropriately fixed or might better be left free to estimate, given the data. The LM test is a forward stepwise procedure that, at any stage, selects as the next parameter to be added to the multivariate test the fixed parameter that provides the largest contribution to the increment in current multivariate chi-square statistic (Bentler & Wu, 1995). The significance level for adding parameters was set at .05. The Wald test ascertains whether sets of parameters, specified as free in the model, could in fact be simultaneously set to zero without substantial loss in model fit. The model-fitting program computes a sequential, backward-stepping multivariate Wald test based on all free parameters in the model, and only those free parameters that are associated with a nonsignificant univariate increment to chi-square are added to the multivariate Wald test (Bentler & Wu, 1995). The significance level for dropping parameters was set at .05.

When the LM and Wald tests are used in an exploratory fashion, the statistical theory associated with them is compromised, and the computed probability levels may not be accurate (Kline, 1998). If numerous modifications of a model are tested in order to arrive at the best-fitting model, appropriate steps need to be taken to protect against inflated Type 1 error levels (Tabachnick & Fidell, 1996). In this study, model parameters that were added or removed according to the LM and Wald tests needed to be substantively meaningful; that is, they made sense conceptually and contributed to model parsimony in addition to being statistically significant.

The results of the Wald test on the a priori model indicated parameters that could be dropped from the a priori model without significant degradation in model fit. Cumulative multivariate statistics revealed that by dropping age and SES from the model, several parameters would be eliminated that did not contribute significantly to the fit.

These parameters were age to optimization, age to selection, age to compensation, SES to selection, SES to optimization, and SES to compensation. The measurement equations with standard errors and test statistics also showed that both age and SES had no significant direct effect on the use of selection, optimization, and compensation. Also, incorporating direct effects from age to frequency and from SES to frequency would not improve fit significantly. Consequently, both age and SES were dropped from the model (and were omitted in all subsequent models) to increase parsimony. In addition, the effects of emotional and cognitive resources on selection, the effects of emotional and social support on optimization, and the effect of cognitive resources on compensation all added nonsignificant univariate increments and were thus eliminated from the a priori model. The path from cognitive resources to optimization was not eliminated yet because the association made sense conceptually and was marginally significant. The results of the multivariate LM test suggested that a path predicting frequency level from social support resources would significantly improve the model and lead to an approximate drop in chi-square of 4.53 ($p < .05$). This path was thus added to the model.

To recapitulate, in the respecified model, covariances were indicated between emotional and social resources, between physical and emotional resources, between physical and social resources, and between the error terms of loss-based selection and optimization. Compensation was affected by emotional, social support, and physical health resources. Optimization was influenced by cognitive and physical health resources. Selection was affected by social support and physical health resources. Frequency level was influenced by social support resources, compensation, optimization, and loss-based selection.

Result of Fit of the Respecified Model

The respecified model was reestimated to obtain parameter estimates and fit statistics. The modifications resulted in a highly significant drop in the chi-square values between the hypothesized model and the revised model, χ^2 difference (3, $N = 141$) = 37.45, $p < .001$. A chi-square difference of this magnitude was a clear indication that model fit had been improved substantially (Kline, 1998). Specifically, the revised model yielded a nonsignificant chi-square, χ^2 (13, $N = 141$) = 9.6, $p > .05$. The fit indices also provided evidence of an acceptable fitting model (NFI = .95; NNFI = 1.04; CFI = 1.00). Inspection of the standardized residuals revealed that the model explained the associated correlations very well. Only two observed associations were less well explained by the model; that is, the effects of cognitive resources on frequency (-.12) and on selection (.11). The relatively small size of the univariate LM chi-square statistics reported in the steps of the LM test suggested that incorporation of these parameters into the model would lead to only trivial improvement in fit, while concomitantly eroding the parsimony of the model. The Wald test indicated that the path predicting optimization from cognitive resources could have been dropped from the model without compromising fit, but the path was kept to illustrate that cognitive resources were marginally related to only optimization.

The final model is illustrated in Figure 5. The resources included in the model explained 21% of the variance in selection use, 6% of the variance in optimization, and 14% of the variance in compensation use. The system of personal resources and adaptive processes explained 38% of the variance in level of functioning in everyday activities. In the model, the standardized path coefficients are statistically significant, except for the path predicting optimization from cognitive resources. (The critical value of the test

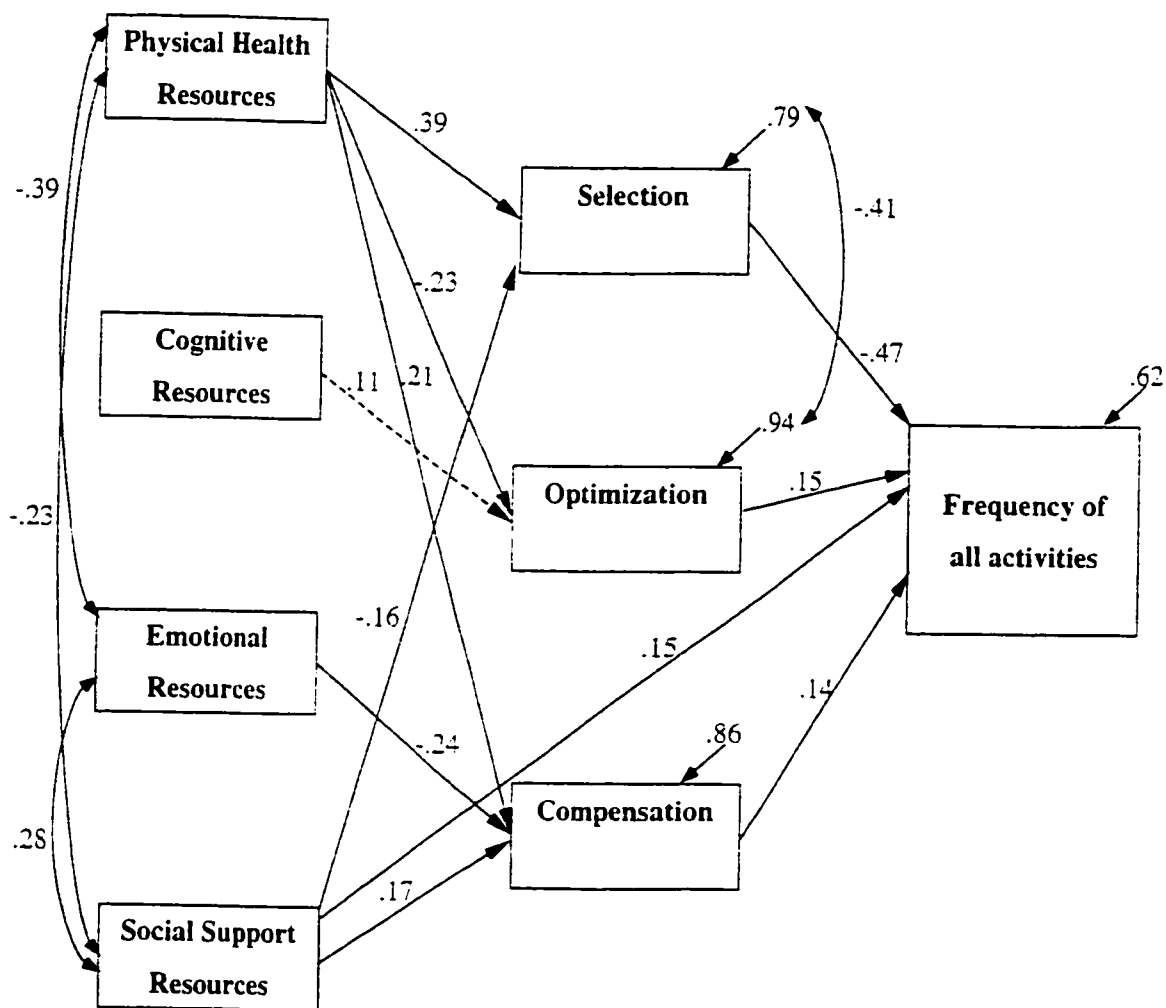


Figure 5. Model with frequency of everyday activities as outcome of successful aging.

statistic was ± 1.96 .) The values of the path coefficients generally reflect small effects with the exception of the medium effect size of selection on level of functioning.

The following section describes the significant relationships illustrated in Figure 5. First, SOC use as a function of resources is presented. Then, the frequency of activities as a function of SOC use and resources is described, emphasizing the significant direct effects on the one hand and the significant indirect effects on the other hand.

Selection, Optimization, and Compensation Use as a Function of Resources (Figure 5)

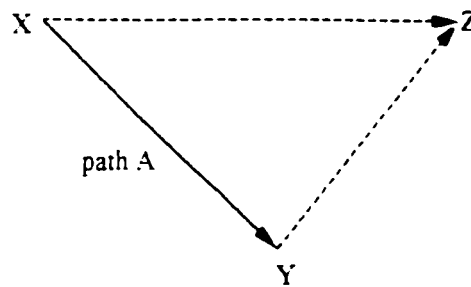
Greater selection use was determined by poorer physical health resources and poorer social support resources. Greater optimization was significantly associated with richer physical health resources. Greater compensation use was influenced directly by poorer physical health resources, poorer emotional resources, and greater social support resources. Of interest, the zero-order correlation between social support resources and compensation was nonsignificant, suggesting that their association was being suppressed.

Frequency as a Function of Selection, Optimization, Compensation, and Resources (Figure 5)

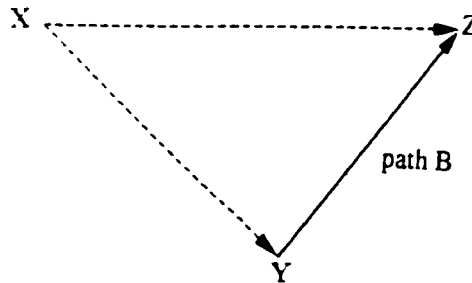
Direct effects. Social support resources had a direct effect on frequency of everyday activities. Greater selection use predicted lower levels of everyday functioning, whereas greater optimization and greater compensation use predicted higher levels of functioning. Note that the zero-order correlation between compensation and frequency was nonsignificant, but the path coefficient emerged as significant when the other variables were controlled, suggesting that the association between compensation and frequency was being suppressed.

Indirect effects. In order to elucidate the processes by which each variable was a function of another variable, tests were conducted to determine the degree of mediation in the effects found in each of the models. A variable functions as a mediator when it meets the following conditions:

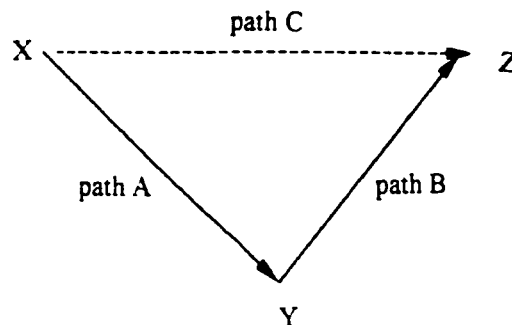
- 1) Variations in levels of the independent variable “X” significantly account for variations in the presumed mediator “Y” (path A).



- 2) Variations in the mediator “Y” significantly account for variations in the dependent variable “Z” (path B).



- 3) When paths A and B are controlled, a previously significant relation between the independent variable “X” and the dependent variable “Z” (path C) is no longer significant.



There is strong evidence for a single, dominant mediator if path C is reduced to zero when path B is added to the model (i.e. total mediation). However, if the residual path is not zero, this indicates the operation of multiple mediating factors. Partial mediation is present when path C is significantly decreased but not totally eliminated so that the independent variable has both a direct and an indirect effect on the dependent variable (Baron & Kenny, 1986; James & Brett, 1984). A description of the significant mediating effects found in Figure 5 follows.

Indirect effect of physical health resources on frequency. Physical health resources had an indirect effect on frequency level, which was mediated as a whole by selection and optimization (standardized coefficient for indirect effect = $-.19$, $p < .05$). Evidence for mediation was obtained by comparing the chi-square of a model in which the path *physical health* \rightarrow *frequency* was left free to be estimated with the chi-square of a model in which the same path was fixed to zero. The chi-square difference between the two models was nonsignificant, indicating that the direct path *physical health* \rightarrow *frequency* was not required in the model, $\chi^2(1, N = 141) = 3.01$, $p > .05$. A strong partial mediating effect through selection was supported by the finding that in a model in which the path *selection* \rightarrow *frequency* was omitted, the path *physical health* \rightarrow *frequency* was $-.27$; however, this latter effect dropped to $-.14$ when the path *selection* \rightarrow *frequency* was added to the model. Further evidence for partial mediation was obtained by comparing the chi-square of a model comprising the path *physical health* \rightarrow *frequency*, which was left free to be estimated, with the chi-square of a model in which this path was fixed to its correlation value ($r = -.29$). The chi-square difference between these two models was significant, suggesting that the path value of *physical health* \rightarrow *frequency* was

significantly different from its correlation, $\chi^2(1, N=141) = 4.51, p < .05$. In short, poorer physical health resources were related to greater selecting out of activities, which in turn contributed to lower everyday functioning. Optimization transmitted a little of the effect of physical health on frequency level. Weak partial mediation was indicated by the finding that in a model in which the path *optimization* \rightarrow *frequency* was omitted, the path *physical health* \rightarrow *frequency* was $-.15$, but this latter effect dropped to $-.14$ when the path *optimization* \rightarrow *frequency* was added to the model. Hence, richer physical health resources predicted more optimization, which led to higher everyday functioning. Note that compensation did not transmit the effect of physical health resources on frequency in a reliable way. When the path *compensation* \rightarrow *frequency* was omitted from the model, the path *physical health* \rightarrow *frequency* did not reach significance.

Indirect effect of social support resources on frequency. Social support resources also had a significant indirect effect on frequency of everyday activities, which was partially mediated by selection and compensation use (standardized coefficient for indirect effect = $.10, p < .05$). Evidence for partial mediation through selection was obtained by comparing the chi-square of a model comprising the path *social support* \rightarrow *frequency*, which was left free to be estimated, with the chi-square of a model in which this path was fixed to its correlation value ($r = .30$). The chi-square difference between these two models was significant, suggesting that the path value of *social support* \rightarrow *frequency* was different from its correlation value, χ^2 difference $(1, N = 141) = 4.93, p < .05$. Also, in a model in which the path *selection* \rightarrow *frequency* was omitted, the path *social support* \rightarrow *frequency* was $.25$, but this latter effect dropped to $.15$ when the path *selection* \rightarrow *frequency* was added to the model. In short, poorer social support resources

were related to more selection, which in turn contributed to lower everyday functioning. Note that compensation carried little of the effect of social support resources on frequency level. Weak partial mediation was substantiated by the finding of a significant chi-square difference between a model in which the value of the path *social support* → *frequency* was fixed to its correlation value of .30 and a model in which the path was free to be estimated, χ^2 difference (1, $N = 141$) = 4.93, $p < .05$.

Of interest is that when a model was fitted with the variable “partial selection” instead of the variable “partial selection and stopping”, a correlation between the error term of the variable partial selection and the error term of the variable optimization was not required by the data, suggesting that stopping may be different in nature from partial selection. In addition, the partial selection variable did not have a significant direct effect on level of functioning. Unlike the model in Figure 5, social support resources did not contribute to partial selection use, which suggests that poorer social support resources mostly influenced the stopping of activities.

Models with Different Outcomes of Successful Aging

This section presents the final models in which the outcomes of successful aging were varied. The initial fit of each of these models was interpreted and respecified according to the same principles that were used to generate the model in Figure 5. One model was fitted with frequency of instrumental activities as outcome (Figure 6) and another, with frequency of discretionary activities as outcome (Figure 7) in order to gain a more comprehensive understanding of how personal resources and SOC processes influenced level of functioning in everyday activities. Another model was tested with subjective well-being as outcome of successful aging (Figure 8). In addition, one model was fitted with frequency of instrumental activities and subjective well-being as two-

level outcomes of successful aging (Figure 9). Similarly, another model was fitted with frequency of discretionary activities and subjective well-being as outcomes (Figure 10). For each of these models, a description of the successful aging outcome as a function of SOC use and resources is given, emphasizing the significant direct effects followed by the significant indirect effects.

Model with Frequency of Instrumental Activities as Outcome of Successful Aging

The model in Figure 6 resulted in a nonsignificant chi-square, $\chi^2(14, N = 141) = 13.14, p > .05$. The fit indexes were also indicative of an adequate fit of the model to the data (NFI= .92; NNFI= 1.01; CFI= 1.00). Inspection of the standardized residuals revealed that the model explained the associated correlations very well. Only two observed associations had residuals with absolute values greater than .10; that is, cognitive resources and selection (.12) and physical health resources and frequency of instrumental activities (-.11). However, adding these direct paths to the model would have led to a trivial improvement in fit. In addition, the LM test indicated that none of the univariate Lagrange Multipliers was significant; that is, none would improve the model by leading to a significant drop in chi-square. The path *optimization* \rightarrow *frequency of instrumental activities* was kept in the model to emphasize the nonsignificant relation between the two variables, which had been hypothesized as such.

The system of personal resources and SOC processes explained 15% of the variance in level of functioning in instrumental activities, compared with 38% of explained variance in frequency of all everyday activities. The personal resources accounted for 14% of the variance in compensation, 6% of the variance in optimization, and 21% of the variance in selection. In comparison with Figure 5, Figure 6 shows that social support resources did not have a significant direct effect on frequency of

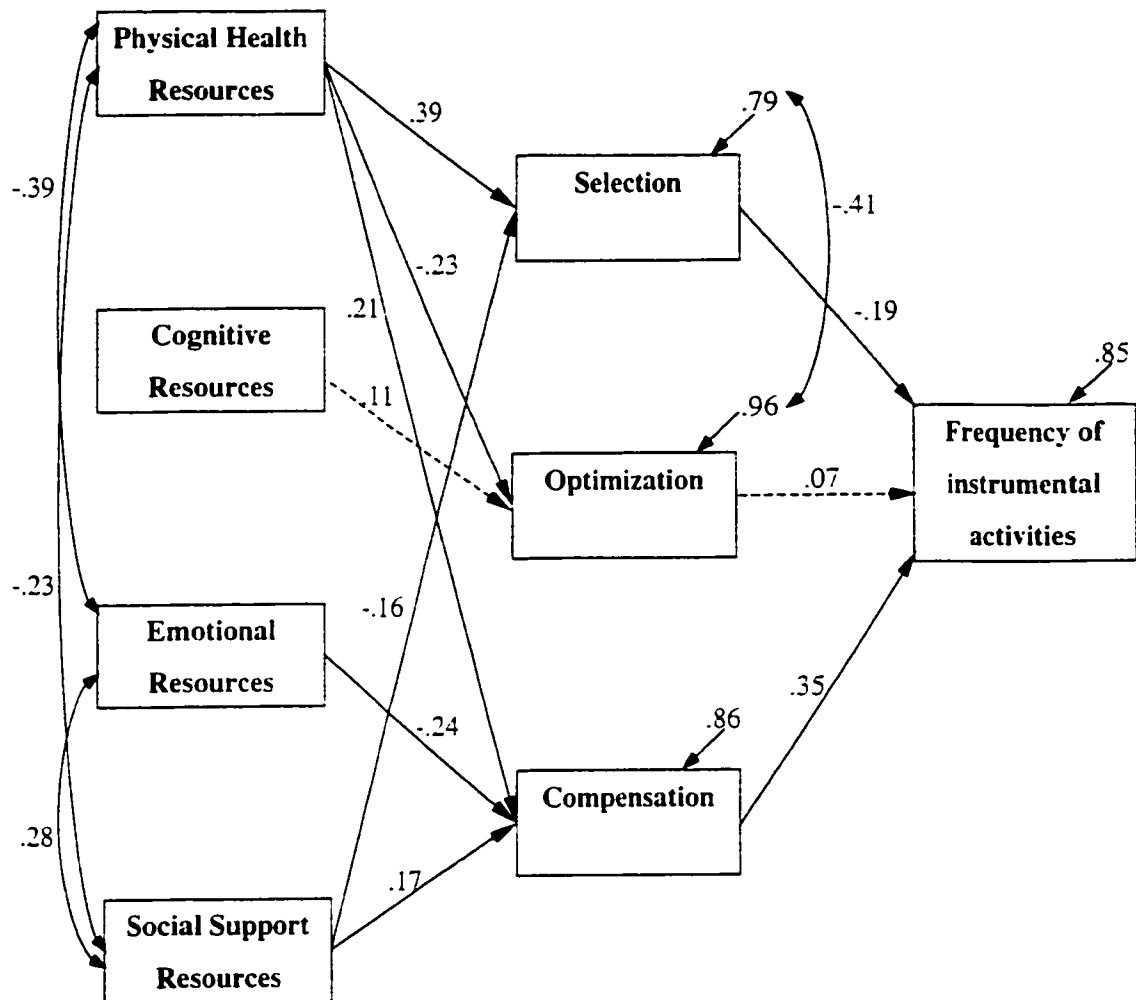


Figure 6. Model with frequency of instrumental activities as outcome of successful aging.

instrumental activities; selection had a much smaller direct effect on frequency of instrumental activities; optimization no longer influenced the outcome; and the effect of compensation on frequency of instrumental activities was larger.

Frequency of Instrumental Activities as a Function of Selection, Optimization, Compensation, and Resources (Figure 6)

Direct effects. Greater selection had a small effect size on level of functioning in instrumental activities, whereas compensation had a medium effect size. Optimization did not exert any significant influence on frequency of instrumental activities.

Indirect effect of emotional resources on frequency of instrumental activities.

Emotional resources had a small effect on frequency of instrumental activities, which was mediated by compensation (standardized coefficient for indirect effect = $-.09$). Evidence for mediation was obtained by comparing the chi-square of a model in which the path *emotional resources* \rightarrow *frequency of instrumental activities* was left free to be estimated with the chi-square of a model in which the same path was fixed to zero. The chi-square difference between these two models was nonsignificant, suggesting that the direct path *emotional resources* \rightarrow *frequency of instrumental activities* was not required in the model, χ^2 difference (1, $N = 141$) = 2.44, $p > .10$. Poorer emotional resources were related to more compensation, which in turn contributed to higher involvement in instrumental activities.

Indirect effect of social support resources on frequency of instrumental activities.

The relationship between social support resources and frequency of instrumental activities was mediated by selection and compensation (standardized coefficient for indirect effect = $.09$). Richer social support resources led to more compensation and to

higher levels of functioning, whereas poorer social support resources led to more selecting out of activities, which contributed to lower levels of functioning.

Model with Frequency of Discretionary Activities as Outcome of Successful Aging

The model in Figure 7 resulted in a nonsignificant chi-square, $\chi^2(13, N = 141) = 7.64, p > .05$. The fit indexes also provided evidence for an acceptable fit of the model to the data (NFI= .97; NNFI= 1.06; CFI= 1.00). Inspection of the standardized residuals indicated that the model explained the associated correlations very well. Only two observed associations had residuals with absolute values greater than .10; that is, cognitive resources and frequency of discretionary activities (-.14) and cognitive resources and selection (.12). However, adding these direct paths to the model would have eroded the parsimony of the model. Indeed, the LM test revealed that the addition of these two parameters would not have contributed to a significant improvement in model fit. The Wald test suggested that the path *compensation* \rightarrow *frequency of discretionary activities* could have been eliminated from the model. However, it was left in to highlight the nonsignificant relation between the two variables, which had been predicted as such.

The system of personal resources and SOC processes explained 47% of the variance in level of functioning in discretionary activities, compared with 38% of explained variance in frequency of all activities and 15% of explained variance in frequency of instrumental activities. The personal resources explained 14% of the variance in compensation, 6% of the variance in optimization, and 21% of the variance in selection. In comparison with Figure 5, Figure 7 shows that compensation no longer had a direct effect on frequency when only discretionary activities were involved and that the direct effect of social support resources on frequency was larger.

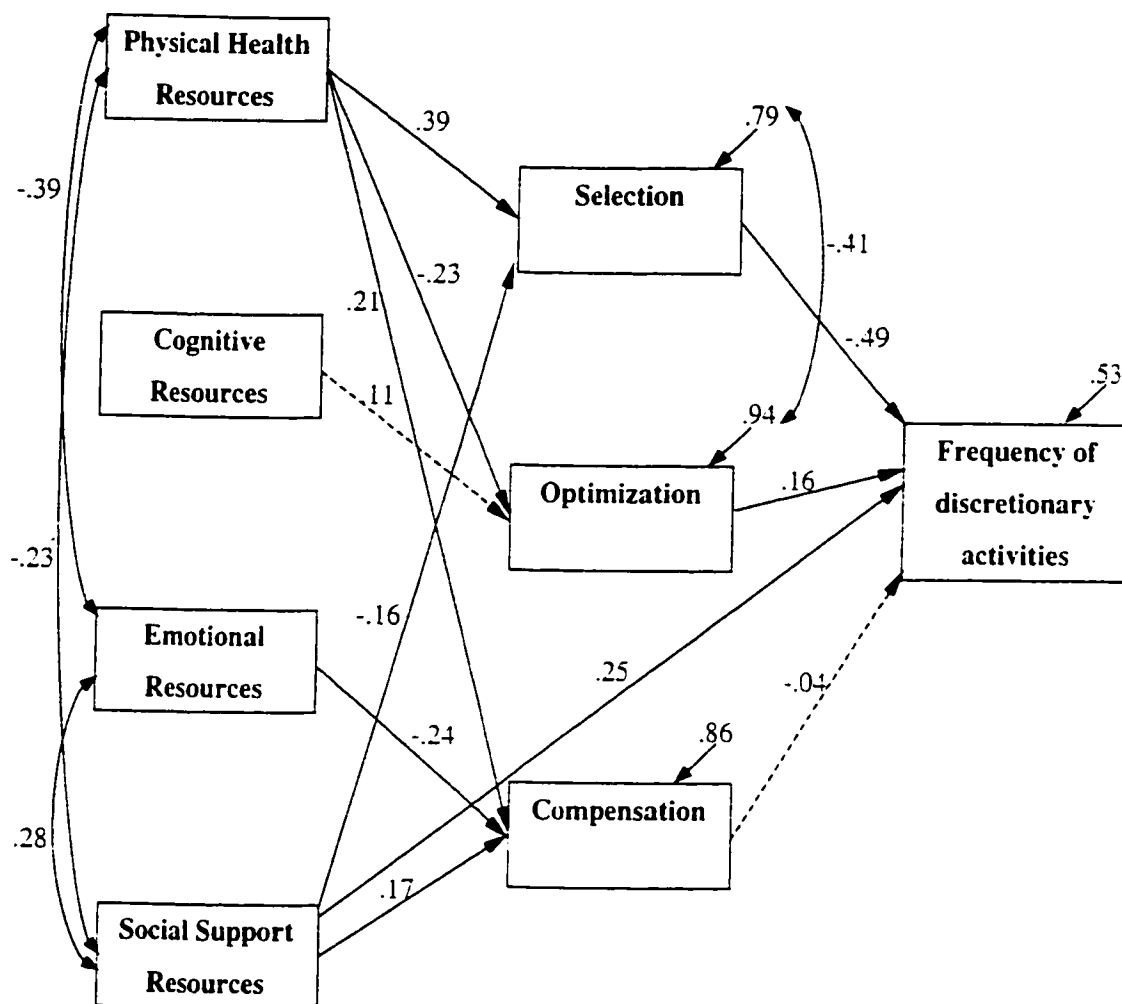


Figure 7. Model with frequency of discretionary activities as outcome of successful aging.

Frequency of Discretionary Activities as a Function of Selection, Optimization, Compensation, and Resources (Figure 7)

Direct effects. Social support resources had a significant direct effect on frequency of discretionary activities. Greater selection was associated with a decrease in frequency of discretionary activities, which is similar to the effect size of selection on frequency of all activities. Greater optimization was related to higher levels of functioning in discretionary activities, which is also similar to the effect on frequency of all activities. Compensation was unrelated to this outcome.

Indirect effect of physical health resources on frequency of discretionary activities. Physical health resources had a significant effect on frequency of discretionary activities, which was mediated as a whole by selection and optimization (standardized coefficient for indirect effect = $-.24$, $p < .05$). Evidence for mediation was obtained by comparing the chi-square of a model in which the path *physical health* \rightarrow *frequency of discretionary activities* was left free to be estimated with the chi-square of a model in which the same path was fixed to zero. The chi-square difference between the two models was nonsignificant, indicating that the direct path *physical health* \rightarrow *frequency* was not required in the model, χ^2 difference (1, $N = 141$) = 1.06 , $p > .10$. The stronger mediating effect through selection was supported by the finding that in a model in which the path *selection* \rightarrow *frequency of discretionary activities* was omitted, the path *physical health* \rightarrow *frequency* was $-.22$; however, this latter effect dropped to $-.07$ when the path *selection* \rightarrow *frequency* was added to the model. Thus, poorer physical health resources were related to more selection, which in turn was associated with lower levels of functioning in discretionary activities. Optimization transmitted less of the effect of physical health on frequency level of discretionary activities. Weak partial mediation was

substantiated by the finding that in a model in which the path *optimization* → *frequency* was omitted, the path *physical health* → *frequency* was -.09, but this latter effect only dropped to -.07 when the path *optimization* → *frequency* was added to the model.

Model with Subjective Well-Being as Outcome of Successful Aging

The model in Figure 8 provided a nonsignificant chi-square, $\chi^2(11, N = 141) = 4.89, p > .05$. The fit indexes were also adequate (NFI= .98; NNFI= 1.08; CFI= 1.00). Inspection of the standardized residuals revealed that the model explained the associated correlations very well. Only the association between cognitive resources and selection had a residual greater than .10. Yet, adding this direct path in the model would have led to a trivial improvement in fit. The LM test indicated that the addition of this parameter would not have contributed to a significant drop in chi-square. According to the Wald test, the path *optimization* → *well-being* and the path *compensation* → *well-being* could have been dropped from the model without compromising fit. Nevertheless, they were kept in the model to emphasize that among loss-based selection, optimization, and compensation, only selection was related to subjective well-being. The personal resources explained 14% of the variance in compensation, 6% of the variance in optimization, and 21% of the variance in selection. The system of personal resources and SOC processes explained 45% of the variance in subjective well-being, which was operationalized as level of happiness.

Well-Being as a Function of Selection, Optimization, Compensation, and Resources

(Figure 8)

Direct effects. Subjective well-being decreased as physical health resources decreased, decreased as emotional resources decreased, and decreased as social support

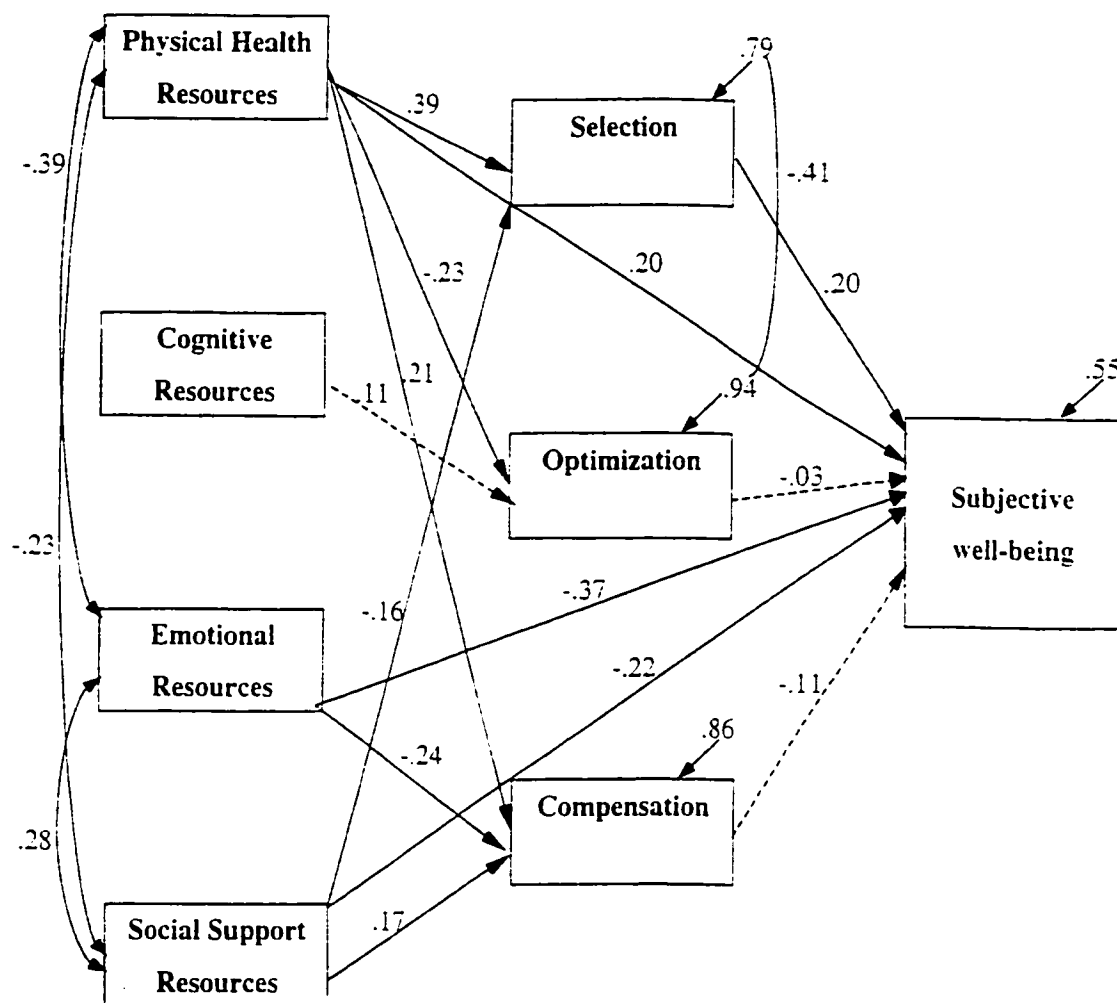


Figure 8. Model with subjective well-being as outcome of successful aging.

resources decreased. In addition, greater selection predicted lower levels of well-being. Both optimization and compensation were unrelated to well-being after all other variables were controlled.

Indirect effect of social support resources on well-being. Social support resources also had a significant indirect effect through selection use (standardized coefficient for indirect effect = $-.05$, $p < .05$). Evidence for partial mediation was obtained by comparing the chi-square of a model comprising the path *social support* \rightarrow *well-being*, which was left free to be estimated, with the chi-square of a model in which this path was fixed to its correlation value ($r = -.41$). The chi-square difference between these two models was significant, suggesting that the path value of *social support* \rightarrow *well-being* was different from its correlation value, χ^2 difference (1, $N = 141$) = 7.42 , $p < .01$. Also, in a model in which the path *selection* \rightarrow *well-being* was omitted, the path *social support* \rightarrow *well-being* was $-.25$; however, this latter effect dropped to $-.22$ when the path *selection* \rightarrow *well-being* was added to the model. In short, poorer social support resources were related to more selection, which in turn predicted lower levels of self-reported well-being.

Models with Frequency and Subjective Well-Being as Outcomes of Successful Aging

Based on the preceding findings, it was hypothesized that the negative influence of loss-based selection on subjective well-being was mediated by level of functioning in discretionary activities. This hypothesis was tested by examining the fit of one model that comprised selection, optimization, and compensation as exogenous variables and frequency of instrumental activities and well-being as endogenous variables. The fit of another model was tested, which included the same exogenous variables but had frequency of discretionary activities and well-being as endogenous variables. Note that

full models, comprising personal resources as exogenous variables and SOC variables, frequency of activities, and subjective well-being as endogenous variables, were also specified and tested. However, these models proved to be very complex, and the sample size of the study was inadequate for such complex models. Therefore, in the two models that were fitted (Figures 9 and 10), a correlation needed to be specified between the exogenous variables of selection and optimization.

The model in Figure 9 shows that the association between selection and subjective well-being was not mediated by level of involvement in instrumental activities. This model yielded a nonsignificant chi-square, $\chi^2(4, N = 141) = 0.33, p > .05$. The fit indexes also indicated an acceptable fit of the model to the data (NFI= .99; NNFI= 1.12; CFI= 1.00). Inspection of the standardized residuals revealed that the model explained the associated correlations very well. None of the univariate Lagrange Multipliers was significant. According to the Wald test, the path *optimization* \rightarrow *frequency of instrumental activities* and the path *frequency* \rightarrow *well-being* could have been eliminated from the model, but they were left in for comparison with Figure 10. The adequate fit of the model does not imply that the endogenous variables are strongly predicted. In fact, only 17% of the variance in level of involvement in instrumental activities was accounted for, and only 17% of the variance in subjective-well-being was explained, highlighting that the model reflects a lack of predictive validity.

However, Figure 10 reveals that the negative influence of selection on subjective well-being was partially transmitted by lower level of involvement in discretionary activities, which lends support to the a priori hypothesis. This model resulted in a nonsignificant chi-square, $\chi^2(4, N = 141) = 0.32, p > .05$. The fit indexes

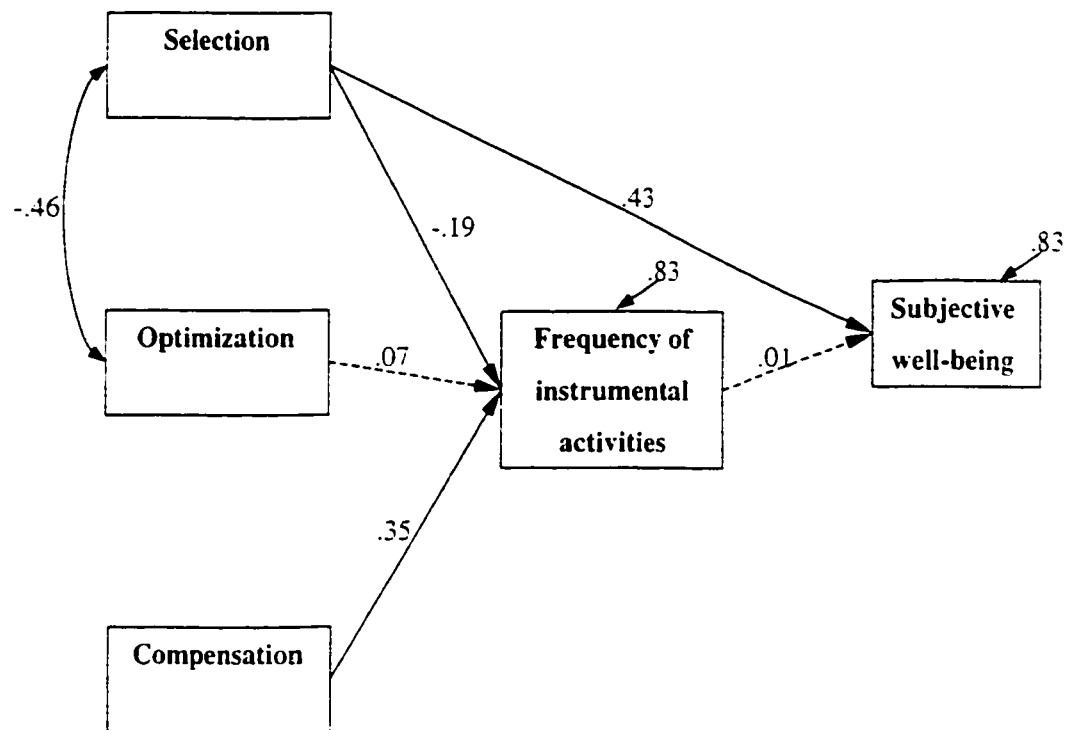


Figure 9. Model with frequency of instrumental activities and subjective well-being as outcomes of successful aging.

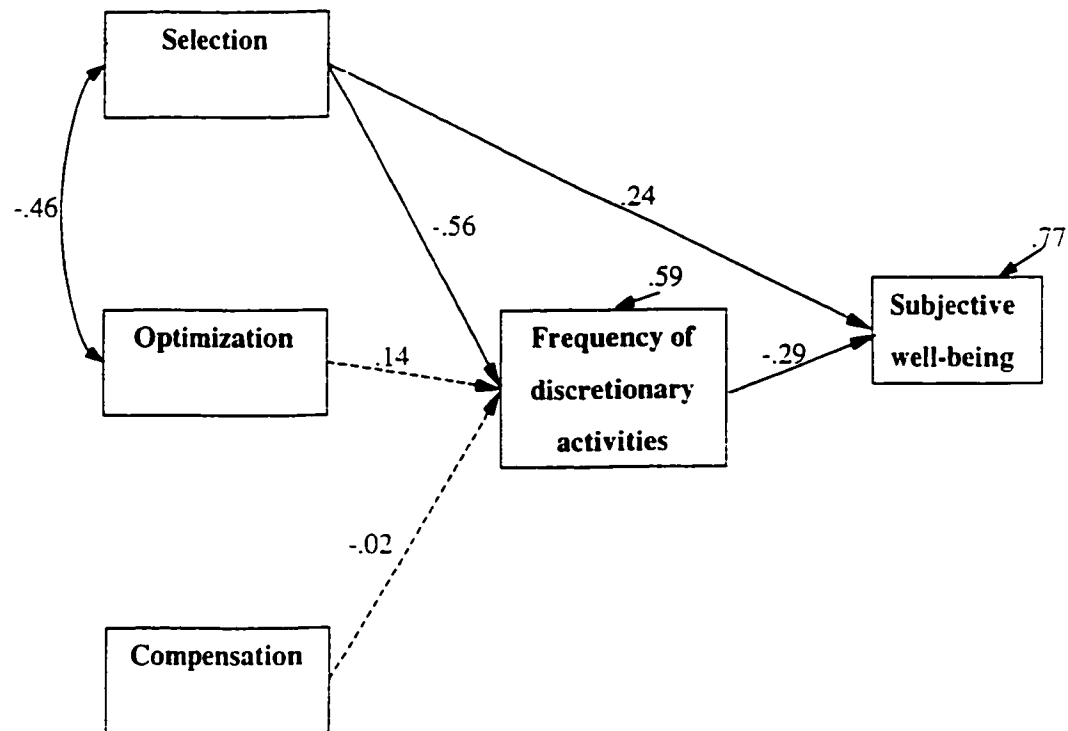


Figure 10. Model with frequency of discretionary activities and subjective well-being as outcomes of successful aging.

also suggested a suitable fit of the model to the data (NFI= .99; NNFI= 1.07; CFI= 1.00). Inspection of the standardized residuals indicated that the model explained the associated correlations very well. None of the univariate Lagrange Multipliers was significant. The Wald test revealed that the path *optimization* → *frequency of discretionary activities* and the path *compensation* → *frequency of discretionary activities* could have been dropped from the model, but they were left in the model to emphasize that only loss-based selection played a significant role. The SOC processes explained 41% of the variance in level of functioning in discretionary activities, whereas 23% of the variance in subjective well-being was accounted by the system of exogenous and endogenous variables. Selection had a significant indirect effect on subjective well-being (standardized coefficient for indirect effect = .16). In a model in which the path *frequency of discretionary activities* → *well-being* was omitted, the path *selection* → *well-being* was .43, but this latter effect dropped to .24 when the path *frequency of discretionary activities* → *well-being* was added to the model.

As a means of further exploring the data set, particularly the structural relationships among the personal resource variables, two additional models were specified and tested: 1) model with age and socioeconomic status as distal resources and 2) model with off-target verbosity as proximal resource.

Model with Age and Socioeconomic Status as Distal Resources

Contrary to physical health, emotional and social support resources, age and socioeconomic status (SES) did not explain any of the variance in SOC processes and in level of everyday functioning. An alternative model was specified based on the hypothesis that age and SES were related to more proximal personal resources, which in

turn influenced SOC processes and successful aging outcomes. The final model is shown in Figure 11. The model resulted in a nonsignificant chi-square, $\chi^2(27, N = 141) = 23.06$, $p > .05$. The fit indexes also provided evidence for a suitable fit of the model to the data (NFI = .91; NNFI = 1.03; CFI = 1.00). Inspection of the standardized residuals revealed that the model explained the associated correlations relatively well. The LM test suggested that adding other paths in the model would lead to only a trivial improvement in fit while concomitantly eroding parsimony of the model.

Worth noting in the model is that age and SES each had a direct effect on cognitive resources, which in turn was marginally related to optimization. Also, age and SES each had an effect on physical health and on social support, which were mediated by emotional resources (standardized indirect effect of age on physical health = .08, $p < .05$; standardized indirect effect of age on social support = -.06, $p < .05$; standardized indirect effect of SES on physical health = -.11, $p < .05$; standardized indirect effect of SES on social support = .08, $p < .05$). The proximal resources of physical health and social support in turn influenced SOC use and level of functioning in everyday activities.

Model with Off-Target Verbosity as Proximal Resource

One model was specified according to the hypothesis that cognitive resources affected SOC processes and level of functioning in everyday activities through the mediating variable of off-target verbosity (OTV). The final model (see Figure 12) yielded a nonsignificant chi-square, $\chi^2(20, N = 141) = 21.41$, $p > .05$. The fit indices were also good (NFI = .91; NNFI = .99; CFI = .99). Inspection of the standardized residuals revealed that the model explained less well the observed associations between cognitive

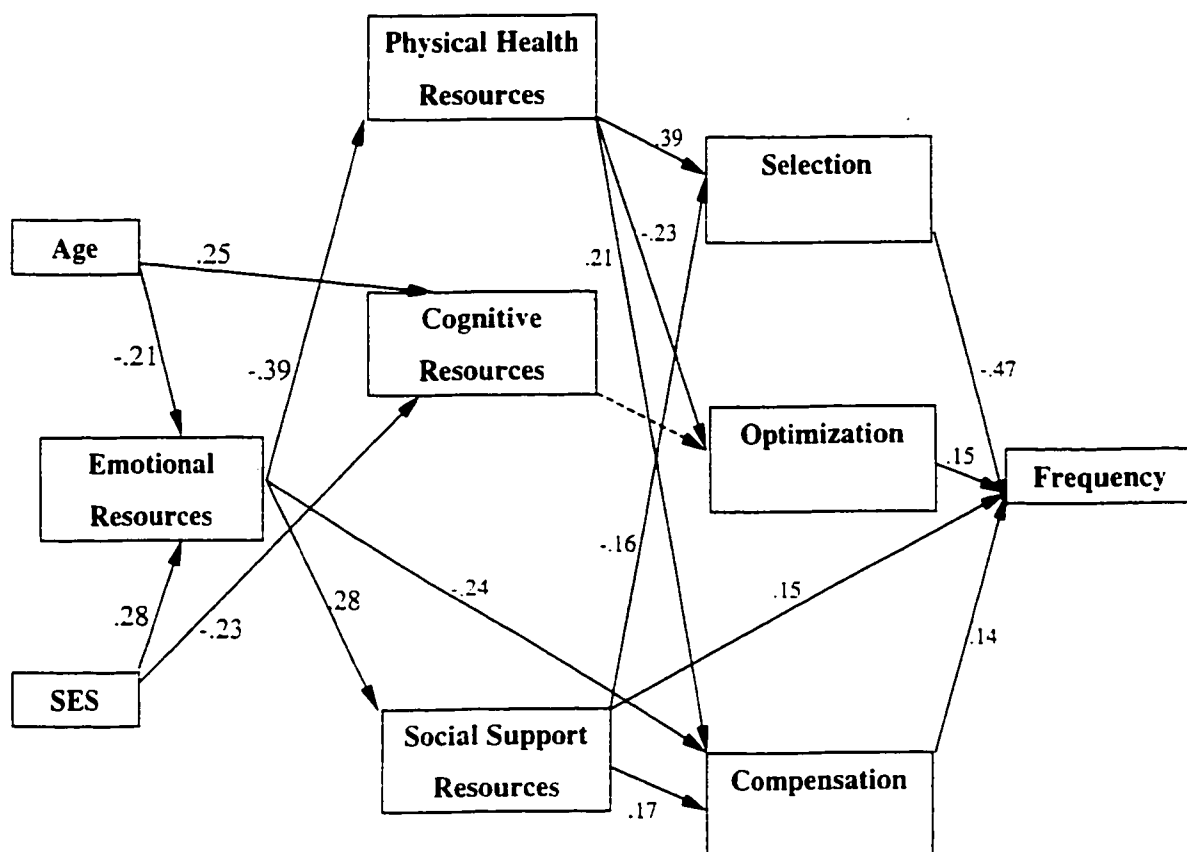


Figure 11. Model with age and socioeconomic status (SES) as distal personal resources.

Note that the error terms of the endogenous variables have been omitted in the figure to maximize clarity.

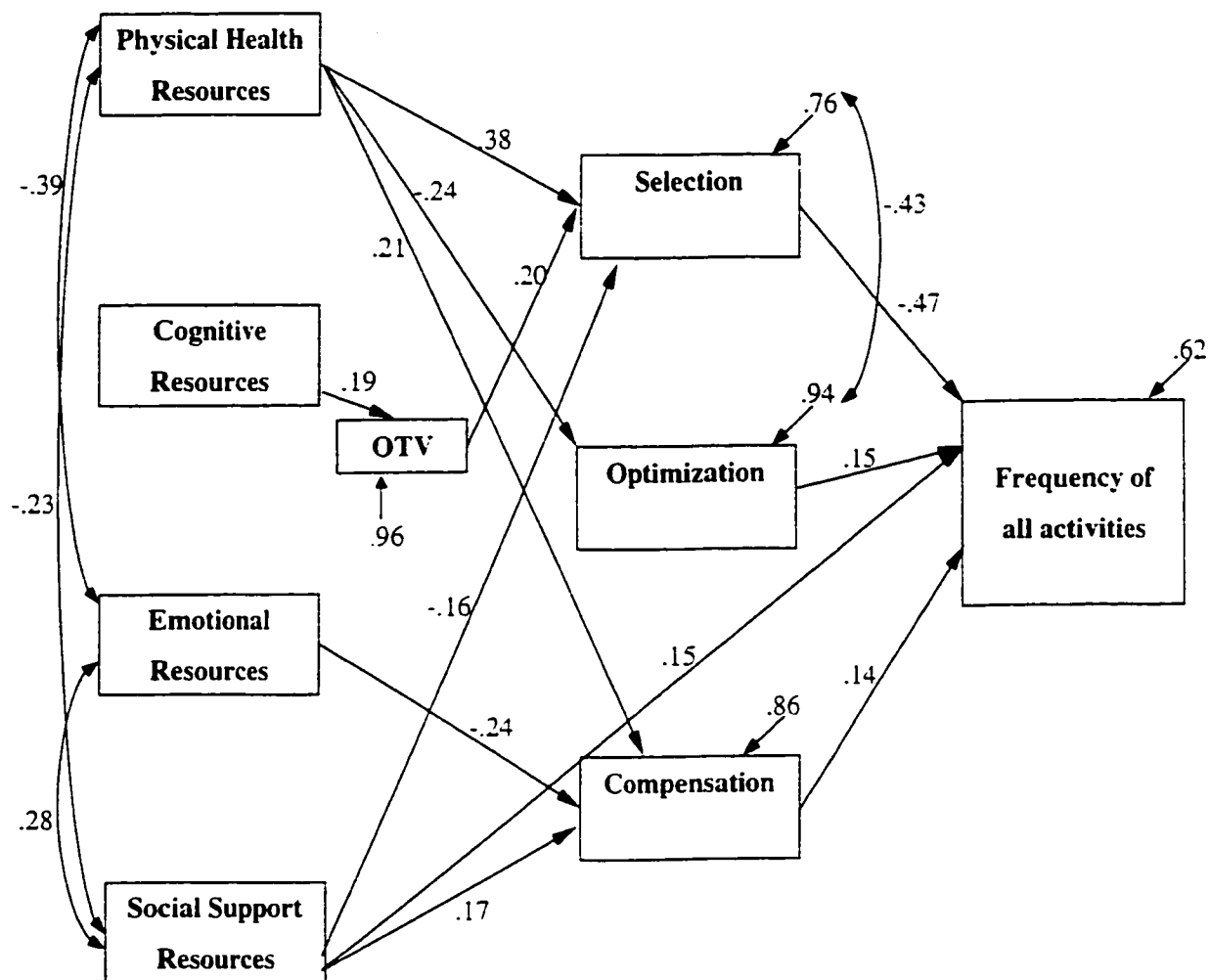


Figure 12. Model with off-target verbosity (OTV) as proximal personal resource.

resources and optimization, between OTV and compensation, and between OTV and frequency. Yet, the relatively small size of the univariate LM chi-square statistics reported in the steps of the LM test suggested that incorporation of these parameters into the model would erode the parsimony of the model. The Wald test indicated that no parameters could be dropped from the model without compromising fit. The cognitive resources explained 4% of the variance in OTV; the personal resources accounted for 24% of the variance in selection, 6% of the variance in optimization, and 14% of the variance in compensation. In addition, the system of personal resources and SOC processes explained 38% of the variance in level of functioning.

Of primary interest in this model is the significant indirect effect of OTV on frequency of activities; that is, higher OTV levels were related to greater selection use, which in turn was associated with decreased functioning in everyday activities (standardized coefficient for indirect effect = $-.10$, $p < .05$). Moreover, cognitive resources had a significant effect on frequency, which was mediated by OTV and selection (standardized coefficient for indirect effect = $-.02$, $p < .05$). Poorer cognitive resources contributed to higher OTV, which in turn was related to the selecting out of more activities, which predicted lower levels of everyday functioning.

Overall, the community-residing older adults who participated in this study used a wide range of adaptations in their everyday activities in response to age-related losses. These adaptations included efforts to compensate for losses, efforts to optimize performance, and decisions to forgo or limit activities. The results also highlighted variability in the adaptations that seniors used between instrumental and discretionary activity domains. In addition, the results showed that physical health, emotional, and

social support resources had significant effects on everyday functioning and subjective well-being, which were totally or at least partially mediated by loss-based selection, optimization, and compensation use.

Basis of Preference for Final Models

In working with structural equation models, it is very important to know when to stop fitting a model (Tabachnick & Fidell, 1996). Although there are no firm rules or regulations to guide this decision, the researcher's best yardsticks include: 1) a thorough knowledge of the substantive theory, 2) an adequate assessment of statistical criteria based on information pooled from various indices of fit, and 3) a watchful eye on parsimony (Kline, 1998). In this regard, there was a fine line between incorporating a sufficient number of parameters to yield a model that adequately represented the data and incorporating too many parameters in an attempt to attain the best fitting model statistically. Acceptable fitting models were retained on the basis of whether the theoretical assumptions being tested adequately fit the data. It is believed that the final models represent a suitable compromise between fit and parsimony. Undoubtedly, there are other models besides the ones that were tested with equally good levels of fit (i.e., equivalent models). In particular, alternative models that represent different theoretical propositions with a different configuration of paths among the same variables could have provided equally good levels of fit.

Types of Selection, Optimization, and Compensation Use

The results revealed that selection, which comprised partial selection and stopping, and optimization were significantly negatively correlated ($r = -.45$). Furthermore, the models indicated that selection was predicted by poorer resources and that it was associated with lower level of functioning and lower subjective well-being.

whereas optimization was predicted by richer resource availability in the physical health domain and contributed to higher level of functioning. Based on the finding that loss-based selection and optimization were qualitatively different and appeared to be on opposite ends of the same continuum, the characteristics of users of selection and optimization strategies were further investigated. The participants were classified into one of four strategy groups based on their level of use of selection and optimization strategies in everyday activities. Specifically, the selection and optimization variables were divided at their mean and combined to form four groups representing four combinations of high and low optimization use with high and low selection use as shown in Table 14. The results of the classification of participants on levels of selection and optimization use indicated that 28% of the sample were high optimization and low selection users, whereas 35% of the sample were high selection and low optimization users. For each of the four groups, Table 14 also presents the proportion of individuals who were above and below the mean in compensation use.

Among these four selection-optimization use groups, the group of high optimization-low selection users and the group of low optimization-high selection users appeared to have the most relevance to the theory of selective optimization with compensation, which reflects the dynamic interplay between gains and losses in human development (P. B. Baltes & Baltes, 1990). The mean differences between these two groups on selected variables (age, gender, marital status, socioeconomic status, physical health resources, cognitive resources, emotional resources, social support resources, and compensation use) were examined. Because there were several dependent variables (DVs), multivariate analysis of variance was used as a way of avoiding alpha inflation

Table 14

Distribution of Participants on Levels of Selection, Optimization, and CompensationUse (N= 142)

Optimization and Selection Use	<u>n</u>	Compensation Use	
		high	low
High optimization and low selection	39	67%	33%
High optimization and high selection	17	35%	65%
Low optimization and low selection	36	44%	56%
Low optimization and high selection	50	58%	42%

that would occur from doing a series of t-tests. With the use of Hotelling's trace criterion, the combined DVs were significantly affected by the type of selection-optimization use, multivariate $F(9, 79) = 2.90, p < .01$. As shown in Table 15, the group of low optimization-high selection users had significantly poorer physical health resources, univariate $F(1, 87) = 12.74, p < .001$, whereas the group of high optimization-low selection users reported having significantly greater social support resources, univariate $F(1, 87) = 4.66, p < .05$. The finding that resource availability, and not demographic variables, is relevant to selection and optimization use is consistent with the models that showed that age and socioeconomic status did not explain any of the variance in SOC use and in level of functioning.

Illustrative Examples of Types of Selection, Optimization, and Compensation Use

Qualitative data can clarify and illustrate quantitative findings (Miles & Huberman, 1994). The goal of this section is to provide examples of strategy use by participants from each of the four groups representing the four combinations of high and low optimization use with high and low selection use. Note that only the profiles of participants from the four optimization-selection groups who were also high compensation users will be described: 1) high optimization, low selection, and high compensation, 2) low optimization, high selection, and high compensation, 3) low optimization, low selection, and high compensation, and 4) high optimization, high selection, and high compensation. Examination of the profiles of individuals who were low compensation users regardless of optimization and selection use was less informative in that the cases did not add any new information above what was provided by the other cases.

Table 15

Comparison of High Optimization-Low Selection Users (HO-LS) and Low Optimization-High Selection Users (LO-HS) on Selected Variables

Dependent Variables	HO-LS (<u>n</u> = 39)		LO-HS (<u>n</u> = 50)		F (1, 87)
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Age	73.72	5.18	75.60	5.70	2.59
Gender ^a	.31	.47	.24	.43	0.50
Marital status ^b	.33	.48	.32	.47	0.02
Socioeconomic status factor ^c	.01	.92	.00	1.06	0.00
Physical resources factor ^d	-.28	.89	.43	.98	12.74***
Cognitive resources factor ^d	-.18	.77	.16	1.00	3.08
Emotional resources factor ^c	.07	1.04	-.26	1.02	2.33
Social resources factor ^c	.14	.99	-.34	1.08	4.66*
Compensation use	.38	.15	.36	.13	0.40

\underline{F} (9, 79) = 2.90, $p < .01$

* $p < .05$ ** $p < .01$ *** $p < .001$

^aWomen = 0, Men = 1. ^bSingle, Widowed, Divorced, or Separated = 0, Married = 1.

^cHigher scores reflect richer resources. ^dHigher scores indicate poorer resources.

High Optimization, Low Selection, and High Compensation Use

Four cases were selected from those that were high in optimization, low in selection, and high in compensation use ($n = 26$) to illustrate instances of strategies employed in everyday activities as means of sustaining and even enhancing everyday functioning in old age.

The case of one woman (#249), who was 88 years of age and living with her sister in an apartment, represents one example of successful use of optimization and compensation strategies and little loss-based selection strategies in order to adapt to age-related losses. Optimization was evidenced in mostly discretionary activities: cooking, physical activity, hobbies, organization involvement, and volunteering. In the area of cooking, she reported that she tried to eat healthier foods and that she sometimes cooked larger quantities and froze them for later use. In the domain of physical activity, she began yoga at 63 years of age. "I went to yoga camp and I liked it so much that I continued to do it. I became pretty good at it. In fact, when the teacher was absent she'd ask me to do the class...and also in my fitness class in Florida." Although she indicated that she felt that she had slowed down a little, she admitted performing at a standard that was still acceptable to her, stating, "I must say, I am doing pretty good!". In the area of hobbies, she practiced playing the piano daily and she occasionally performed in public. As for volunteering and organizational participation, she reportedly became actively involved on a weekly basis since retirement.

Compensation was manifest mostly in instrumental activities. In cooking, she felt that she "had slowed down a bit" and that physical limitations made cooking more difficult than in the past; however, she had come up with ways to adjust. "I don't like

standing on my feet too long. so when it comes to cutting I usually take it to the table and do it that way.” For housekeeping, she now received hired help every second week but still did light chores in-between. For grocery shopping, she chose stores that delivered because she found it difficult to carry the bags herself, affirming, “It makes it so much easier this way”. In the area of financial management, she now obtained the help of her son for more complicated spheres because she considered it “a little difficult now”. For medication intake, she used a pill reminder box that she filled once a week, which helped her to adhere to the medication regime. In addition, she said that she now made use of travel groups for day trips and that she took advantage of adapted services for seniors in airports. “This time, I used a wheelchair in the airport. I said to the lady pushing me, ‘Why is the counter so far away?’. She said, ‘Well I’m the one who is doing all the walking.’. I said to her, ‘Would you like to sit and I’ll push you!’.”

She employed partial selection strategies in the domains of visiting and entertaining. Specifically, she reported that she used to do more entertaining in the past. Similarly, she indicated that she had decreased the frequency of visiting, mainly because many of her friends and relatives had passed away. Nonetheless, she maintained contact with a few friends. “There is a group of six of us and we get together at someone else’s place once a week.”

One 71-year-old man (#544), who had been living alone for the past 28 years, also made use of a high level of optimization and compensation strategies in order to maintain everyday competence. He did not mention using any selection strategies. Optimization was operational in cooking, financial management, hobbies, and traveling. To illustrate, in the domain of cooking the participant indicated that he enjoyed gourmet cooking. “I’ll go through my extensive library of cookbooks, and I have taken cooking courses

incidentally...and I just work from recipes.” He also said that he felt he was much “handier now” in the kitchen than he had been earlier. He still managed all of his personal finances, but he now took advantage of his personal computer for budgeting. In the area of hobbies, the participant reported that he had dropped the hobby he had practiced during mid-adulthood (flying), but he had taken on new ones (surfing the internet, taking continuing education classes for seniors), which resulted in a greater level of involvement. In the domain of traveling, the participant expressed that he now traveled for pleasure more often, and he experienced no difficulty in doing so. “Traveling is a way of life with me. I do things on the spur of the moment.”

Compensation strategies were reported in the activities of housekeeping, medication intake, and physical activity. More precisely, the participant indicated that for housekeeping he did not clean as thoroughly as he did in the past. “I do it more efficiently now...I keep the place very messy, so my kids tell me.” He also no longer undertook heavier home-maintenance tasks. “If I cannot get the landlord to do it, then I will pay out of my own pocket to have it done. I don’t do painting anymore and I don’t do windows anymore. I just feel I don’t want to do it anymore. When I retired, I said I would do only the things that I want to do and that I like to do. And that is what I do.” For medication management, he expressed using cognitive strategies to help him remember to take his medication appropriately. In the domain of physical activity, the participant said that he performed the same types of activities but less intensely. “I try to do it on a regular basis. I pretty much work at staying fit...I do what I consider suitable but I don’t try and get that much more. While I am still fairly fit, there are things that are beyond me right now, and I accept that.”

One 84-year-old woman (#258), who lived with her husband in their house, also used several optimization and compensation strategies and little loss-based selection strategies in her everyday activities in order to adjust to age-related losses. Optimization was apparent in discretionary activities except for cooking. She reported that since she had retired she became more involved in cooking. "Because I was out at work all day, I became just a short order cook. I always had somebody around who could cook and I took advantage of that. But once I retired from work, I took up cooking with a vengeance. I love it. I experiment. I read recipes like mad. I have hundreds of recipes and I constantly experiment." She said that she was more actively engaged in entertaining. "I organize dinner for my husband and some friends at least twice a week and try to make it an interesting meal. I also have my grandchildren come once a week for a tea party. Everybody sits in the dining room and I have ice cream and cookies. Rather than having them run wild and not know what to do, we have a lovely tea party." She also had taken on cross word puzzles as a hobby. "This is new to me. I didn't use to. Now I do it and love it. I am loving this feeling of sitting at the kitchen table with coffee and a crossword puzzle and the newspaper and never having to look at the clock." She described that she and her husband were still moving to Vancouver every year during the winter months and that she still made the arrangements for renting their house.

She indicated using compensation strategies for housekeeping, in which she performed light tasks but had hired help for thorough cleaning; for medication intake, in which she used cognitive strategies; and for visiting friends and relatives, in which she needed her husband to drive her. She had stopped physical activities because of physical

limitations, stating, “It is too painful physically. I cannot walk properly without pain. I loved walking, but I can’t anymore.”.

For a 71-year-old woman (#549) who lived alone, optimization strategies were reported for social and recreational activities. She had increased the frequency of visiting friends, and she had raised the intensity level of her physical activities. To illustrate, in her mid-adulthood she played golf, but she became actively involved in bowling, walking, aerobics, and line dancing after she had retired. “Sometimes I have to push myself to do these things, but when I get there I am happy I went. I like it and it keeps me busy...I am very conscious of keeping busy.” The participant also said that in mid-adulthood she did not have any hobbies. “I used to say that one of the reasons I would not retire was because I had no hobbies, laughing.” However, she now enjoyed reading, doing crossword puzzles, and playing bridge on a daily basis. “Every day there is something...if there isn’t something, I make something to do.” Regarding organizational participation, she indicated that she was more involved now than in mid-adulthood and in different types of organizations. “When I was in my fifties, we did those things that were more connected to our work. Now they are related to entertainment. When I do a job, I intend to do it very thoroughly and well and I put all my energy into it. I wouldn’t accept a job if I didn’t do it well.” Furthermore, the participant said that it was only in recent years that she had begun to travel with various travel groups on a monthly basis. “In my fifties, I really couldn’t travel because I didn’t have enough time and we didn’t get more than two weeks vacation at a time. I couldn’t afford to travel very far... Now, I enjoy travelling...but I am going and sort of pushing myself to go. I say you have to go and keep going.”

She reported using compensation strategies for cooking, housekeeping, and entertaining. Specifically, she indicated that she consumed more prepared/frozen foods and ate out more often. "I don't prepare meals as much as I used to because I eat out a lot...Now I tend to look for short-cuts in making meals and I don't scrape carrots like I used to and I buy the little tiny potatoes that you don't have to peel and that is how I have changed time wise. There is so much available in the supermarkets and they are all ready cut and prepared for you and I just tend to buy more of that thing now." For housekeeping, the participant communicated that she received help. "I just don't like housework and I always said I worked hard all my life and so when I get older I'll have money to have someone else do those jobs for me. And that's what I do, I do the bare necessities and a cleaning lady comes in." In the area of entertaining, she described why she presently went out with friends instead of entertaining at home. "I don't entertain nearly as much as I used to. I thought when I got older that it would be so lovely to just have all these friends in for lunch and bridge and so on. And now, I can't just be bothered...It is too much trouble. It takes me all day to fix the food. So we go out and we can afford it."

This case also illustrates that different types of strategies can be used within the same activity in order to maintain acceptable performance. For instance, the participant had adopted partial selection strategies (in addition to compensation strategies) for entertaining, which she now did more informally and more simply. "I don't often entertain people of my own age. I find that the ones that I know notice everything that is in the house. They make comments about it. Where I have my goddaughter and her husband...they come and sit down and I prepare what to eat; they relax and I have a nice

visit... So in the back of my mind, if I have older people in, I have to run around and dust and fix everything up and buy flowers and make the house presentable...which I find very difficult.”

To summarize, these four cases show how some older adults can make use of more optimization and compensation strategies and less loss-based selection strategies in everyday life. As a result, they are successful in maintaining and in some cases enhancing performance in valued activity domains.

Low Optimization, High Selection, and High Compensation Use

Three cases were chosen from those that were low in optimization, high in selection, and high in compensation use ($n = 29$) to exemplify the strategies employed in instrumental and discretionary activities in order to adapt to age-related losses and maintain independence in everyday functioning.

The case of an 81-year-old woman who lived alone (#390) illustrates well how some seniors drop social and recreational activities and focus on instrumental activities as a means of adjusting to age-related losses and remaining independent in the community. This woman had selected out several discretionary activities, including visiting, entertaining, and traveling because of reported limitations in physical health (“I find it too tiring; I don’t have the strength to do it”) and cognitive functioning (“I find that I am not as alert”) as well as lack of motivation (“before you got up and you were going to do this and that and now you don’t want to do anything”). Interestingly, she kept one hobby; that is, playing cards once a week but she apparently lowered her standards of performance. “Well let’s say we play bridge. I don’t care anymore whether they win or I win or if I make little slight mistakes. It’s OK.” She maintained her independence in the community

by using several compensation strategies in her instrumental activities. For example, in the area of cooking/meal preparation, she reported that she “forgot things on the stove” so she now bought prepared foods and received meals delivered to her apartment by a community agency twice a week. She was also accompanied by a support worker to the grocery store every two weeks. Her son assisted her in managing her personal finances, and she employed other compensatory strategies such as using banking machines close to her home to alleviate the physical demands associated with going to the bank and waiting in line for services.

The case of an 88-year-old woman (#267), who lived alone in an apartment, represents another example of high use of loss-based selection and compensation strategies in everyday activities as means of maintaining independence. Of interest is that for a few activities, a mix of partial selection and compensation strategies were reported within the same activity. Loss-based partial selection was evidenced in cooking, visiting, entertaining, and organization involvement. In the domain of cooking, the participant said that she prepared simpler meals and used bought prepared foods. “I use a lot of frozen dinners and make cooking as simple as possible. I find cooking very hard. I’ve done so much of it... and now it’s tapering off you see”. She indicated that she had reduced the frequency of visiting and entertaining friends and family members. In the area of organizational participation, she had dropped past organizations but remained involved in one (church committee) even though she found it physically difficult to mobilize herself to attend meetings. The participant had stopped housekeeping because of reported physical limitations, but she received the help of her daughter and granddaughter on a weekly basis. She also had ceased performing physical activities because of physical

health limitations (“everything hurts”). Similarly, she had stopped traveling five years ago because of physical limitations. “It’s the climbing. It’s hard to get up and down the stairs. I’d hate to ask somebody to help me. It’s stupid.” These instances of partial selection and stopping illustrate the extent to which limitations in physical health resources can negatively affect level of everyday functioning, as was revealed by the path models.

Compensation strategies were reported in mainly instrumental activities: cooking, grocery shopping, financial management, medication management, and entertaining. In the area of cooking, she received the help of her daughter. “She has me over on Sundays for supper. She’ll give me a plate full, which I can take home. I divide that and make three meals out of it.” The participant used her car for grocery shopping, but she had the parcels delivered to her apartment. She expressed that this was an activity that she felt she needed to do by herself. “Anyway, I manage. It’s quite difficult but I’ve got to do it. I’d hate to ask somebody... My daughter is busy. She’s got her own life. I don’t want to depend on people. I want to stay in my own place.” For financial management, the participant made use of compensatory strategies to facilitate banking. “I have everything deposited in my bank. And the bills are paid directly from my account...Because the banks, now, you have to stand in line and I can’t stand it.” She was also assisted by her children in the more complicated aspects of her personal finances. She reportedly used compensatory cognitive strategies to help her remember to take her medication adequately. In the domain of entertaining, she indicated that she had simplified this activity. “I have a lady upstairs who loves to cook and she’s always asking me up for

supper. When she comes down to me, I'll have something that I can put in the microwave or I'll order out."

One 79-year-old woman (#125), who lived alone in her home, also made use of many selection strategies and compensation strategies in her everyday activities. Partial selection strategies were reported for cooking, entertaining, physical activity, and hobbies. To illustrate, in the domain of cooking, the participant indicated that she prepared simpler meals without difficulty, stating, "I don't make it difficult". Nonetheless, she said that eating remained an enjoyable activity. "I always sit down properly with the table set like I had company. I never stand over the sink and eat out of the tin. I have friends who open a tin can and they stand over the sink and they eat for dinner whatever is in the tin and they're through. I put place mats and the cutlery. I may just have pasta, but if somebody came by they'd see that I'm eating properly." She had restricted entertaining to family members. "When I had a husband, we used to have friends come frequently. But not anymore. I rarely do it. Well, as I get older it is just more work. I could do it and I enjoy it when I do it, but I'm not one of these social persons who is always having somebody over. Not anymore." In the domain of physical activity, she had lowered the intensity level and the number of activities because of physical limitations, but she managed to do some gardening and participated weekly in senior fitness classes. Regarding hobbies, she had dropped some of her past interests such as sewing and embroidery but kept knitting (to a lesser extent), specifying, "I usually have some knitting going on... just to keep my head".

Compensation strategies were reported for housekeeping, grocery shopping, medication intake, visiting, and traveling. The participant said that heavier housekeeping

tasks had become more difficult physically; therefore, she had someone else do them.

“There are some things that I can no longer do that I used to do.” She still shopped for groceries by herself, but she now transported them in small quantities due to her limited strength. “I don’t mind taking a lot of little bags. Sometimes the packers put too much and it’s too heavy. If they don’t change them, I change them.” For medication management, she used a pill reminder box. “I have a box with the days of the week. That’s my salvation because otherwise I would say, ‘Did I or didn’t I take the pill?’. So I load the pill box every week and leave the lid open for each day.” She indicated that visiting was now limited to family members and that the activity was facilitated by having her children drive her to their homes. In addition, she expressed several changes in her travelling habits. “I won’t drive on the highways anymore. I don’t like the heavy traffic. I don’t trust my reflexes. I also changed my habits in flying. I don’t like 6 AM flights because I can’t rush that way anymore, so I wait until there is a flight in the afternoon... I don’t like trips where you have to move everyday. I like going to one place, unpacking, and staying there.” Optimization was apparent in one discretionary activity, volunteering, in which she became more involved in the last eight years. “I volunteer in the library archives twice a week. I love it. That’s my challenge.”

In summary, these three cases exemplify how some older adults make use of many loss-based selection and compensation strategies in chosen instrumental and discretionary activities in response to losses in goal relevant means. Consequently, they are successful in maintaining independence in their everyday life.

Low Optimization, Low Selection, and High Compensation Use

One case, selected from 16 cases, is presented to illustrate the use of mainly compensation strategies as a means of adjusting to age-related losses and sustaining a given level of functioning within the same goal domain.

One 82-year-old woman (#235), who lived alone in her home, made use of greater compensation strategies in everyday activities than she did optimization and selection strategies. Compensation was found in both instrumental and discretionary activities: housekeeping, grocery shopping, medication management, entertaining, physical activity, organization involvement, and traveling. For housekeeping, the participant now put off tasks when she felt tired (“I was more on a schedule then, I think. Now I do it as the mood moves me.”) and she obtained help for heavier household tasks (“I have more help now. I don’t vacuum any longer...because of back problems.”). Similarly, she had her groceries delivered to her home because she experienced more difficulty in grocery shopping. “The deliverers put the groceries on the porch and I carry them inside. I just take items one at a time. I do it at my leisure.” Like many other participants, she had established a routine to help her to take her medication appropriately and she made use of a pill box. In the area of entertaining, she had simplified the activity, stating, “I don’t go to as much trouble as I used to. It used to be a big production, but it isn’t anymore...I have a bridge club and I have friends there. We take turns; I entertain mostly in the afternoons and it isn’t meals. It’s easier you know.”. In the domain of physical activity, she had diminished the intensity level but remained involved in the same number of activities. “It is much more difficult, more aches and pains when I do it. I don’t seem to have the breath like I used to. I think it is because I don’t do as much of it as I used to.

I'm slowing up." In the area of organization participation, she stayed active but had reduced her level of involvement. "When I was younger, I worked on the executive and now I feel I just want to sit back and attend meetings and partake in what they have to offer...If I don't feel like going, I don't have to." Compensation strategies in traveling consisted mostly of traveling with senior groups. "I find it more difficult to travel alone because of baggage and all that. When you travel in a group, everything is taken care of. I don't think I would be able to manage my own luggage and things like that."

Partial selection was reported in hobbies, in which she had stopped sewing and did less knitting and needlepoint because she felt she did not concentrate as well and did not have the same incentive as before. However, she became more engaged in reading, which seemed less demanding for her. The participant indicated that no change had occurred from mid-adulthood in the way she performed cooking, financial management, and visiting. Interestingly, these were activities in which she reported experiencing no difficulty. This case shows that some older adults are able to maintain everyday competence in valued activity domains, under conditions of age-related losses, by using mostly compensation strategies.

High Optimization, High Selection, and High Compensation Use

A closer examination of the six cases that had been classified as instances of high optimization, high selection, and high compensation use revealed that the individuals were in fact experiencing a less favorable balance of gains to losses. The credit that they had been given for optimization use within an activity tended to reflect minimal positive change or minimal increase in involvement. For example, one 80-year-old woman (#540) did not perform physical activities in mid-adulthood, but she reported that she now

walked for errands and engaged in bowling. Similarly, she did not volunteer in the past but now volunteered one month per year in church meal services. One 84-year-old man (# 505) said that he had begun bi-weekly painting classes two years ago. In addition, he was now involved in an organization, participating in the Golden Age Association once per week. In the case of a 70-year-old man (# 430), positive change was indicated for volunteering, where he had increased his level of involvement at the hospital by going for longer periods at a time, and for travelling, where he now took longer and farther trips than he had taken during mid-adulthood. In their other activities, these individuals used loss-based selection and compensation in the face of age-associated losses. To illustrate, participant #540 reported loss-based selection strategies in entertaining, hobbies, organization involvement, and travelling and compensation strategies in housekeeping, grocery shopping, financial and medication management, and travelling. For the case #505, loss-based selection strategies were indicated in cooking, entertaining, physical activities, and travelling and compensation strategies were found in cooking, housekeeping, grocery shopping, financial management, and medication management. Participant #430 reported loss-based strategies in cooking, visiting, entertaining, physical activities, and organization involvement and compensation strategies in cooking, housekeeping, and financial and medication management. Thus, it seems that the small number of cases in this group are actually similar to the cases of individuals who used mostly loss-based selection and compensation strategies in their everyday activities in order to remain independent.

Discussion

One of the strengths of the theory of selective optimization with compensation (P. B. Baltes & Baltes, 1990) is that it can be applied at several levels of analysis and with different emphases of content. The present study examined the applicability of the SOC theory to the adaptive management of resources in everyday life in old age. The focus was on physical health, cognitive, emotional, and social support resources of community-dwelling older adults as well as on their behavioral adjustments to age-related losses so as to maintain everyday functioning and subjective well-being. In order to accomplish the purpose of the study, it was necessary to be able to measure the strategic processes of selection, optimization, and compensation. Nevertheless, no such instrument was available at the time of data collection. Hence, another goal of the study was to develop a measure of selection, optimization, and compensation use in everyday activities in the form of a semi-structured interview. Building on the assumption that the availability of resources facilitates the use of adaptive strategies in everyday functioning (M. M. Baltes, Lang et al., 1999), it was hypothesized that the relationships between physical health, cognitive, emotional, and social support resources and outcomes of successful aging would be mediated by selection, optimization, and compensation processes. A mixed methodological approach that combined qualitative and quantitative methods was used. The behavioral strategies were qualitatively induced from transcribed interviews and were coded into indices of selection, optimization, and compensation. Subsequently, the structural relationships among personal resources, SOC processes, everyday functioning, and subjective well-being were tested using path analysis.

Relationships Between Personal Resources and Selection,
Optimization, and Compensation Use

It was hypothesized that age and socioeconomic status would constitute distal resources whose effect on SOC use and successful aging outcomes would be mediated by more proximal resources such as physical health, cognitive abilities, emotional functioning, and social support. The results indicated that age and socioeconomic status did not have a direct effect on SOC use and successful aging outcomes. Age and socioeconomic status were related to emotional resources, which were associated with physical health and social support, which in turn influenced SOC processes and indicators of successful aging (Figure 11). These findings are in line with other studies that have shown that the effect of age on everyday activity functioning was entirely mediated by more proximal predictors, especially health and psychosocial factors (M. M. Baltes et al., 1993, 1999).

It was anticipated that both loss-based selection and compensation use would be predicted by decreased levels of resources in the physical health, cognitive, emotional, and social support domains, whereas optimization use would be facilitated by greater resource availability in the same domains. Results revealed that individuals who had poorer physical health resources and poorer social support resources used more loss-based selection strategies, but those persons who had richer physical health resources used more optimization strategies. These findings are consistent with the prediction that optimization would likely occur under stable conditions in relation to previous level of functioning, and loss-based selection would be affected by declining resources. Greater compensation use was influenced by poorer physical health resources, poorer emotional resources, and greater social support resources, which lends support to the hypothesis that

compensation in old age would result from age-associated losses in range of plasticity and reserve capacity. Interestingly, richer social support resources predicted more compensation use, which is congruous with the conceptualization of compensation as the use of alternate means, including external resources such as human help, in order to maintain a given level of functioning (Marsiske et al., 1995). One reason why cognitive resources, surprisingly, played a nonsignificant role could be that the sample, which comprised participants who were generally well educated and functioning independently, was relatively unrepresentative of the range of cognitive ability in the general population.

These results suggest that specific personal resources facilitate the use of specific SOC processes. In particular, greater physical health resources seem relevant to the use of optimization, whereas poorer physical health appears to influence loss-based selection and compensation. Such findings are in accordance with the body of research that has shown that declining physical health and increasing frailty are major determinants of discontinuity of activities and decreased level of functioning in old age (e.g., Everard et al., 2000; Glass et al., 1995; Marsiske et al., 1997). Poorer social support seems to represent an important condition for selecting out activities or parts of activities, whereas richer social support appears to promote greater compensation use. This observation is consistent with studies that have revealed that greater social support was associated with increased functioning in old age, especially when individuals experienced increased needs and difficulties in everyday activities (e.g., Lang & Baltes, 1997; Wilcox et al., 1994).

Relationships Between Selection, Optimization, and Compensation Use and Everyday Functioning

It was hypothesized that loss-based selection would be associated with lower level of everyday functioning, whereas optimization and compensation would be associated with higher level of functioning in everyday activities. Consistent with expectations, path analysis (Figure 5) showed that greater selection use predicted lower level of everyday functioning: greater optimization and greater compensation use were related to higher level of functioning in everyday activities. Of interest, poorer cognitive resources contributed to higher off-target verbosity (OTV), which in turn was related to the selecting out of more activities and parts of activities, which predicted lower level of everyday functioning (Figure 12). The finding that high OTV predicted lower level of activity involvement is consistent with predictions made in an earlier study (Pushkar Gold & Arbuckle, 1995).

It was also expected that people would rely on a different pattern of adaptation for instrumental and for discretionary activities. Specifically, older adults would compensate for difficulties experienced with instrumental tasks rather than use loss-based selection because these activities are necessary for independent living. For optional, recreational activities older adults experiencing performance difficulties would give up or limit their participation instead of maintaining them with compensation strategies. Older adults could try to optimize their performance in selected instrumental and discretionary activities, but optimization efforts would be more frequent in freely chosen recreational activities that facilitate continued learning and development. Examination of participants' reports of the ways of adaptation by activity type lends support to these hypotheses (see Figure 3). Respondents reported stopping and limiting their participation (i.e., loss-based

selection) more often in the domain of discretionary activities than in the domain of instrumental activities. The majority of all optimization strategies reported was found in discretionary activities, whereas the greater proportion of compensation strategies were reported for instrumental activities. The models (Figures 6 and 7) are also consistent with these hypotheses. Loss-based selection had a larger effect on level of functioning in discretionary activities than level of functioning in instrumental activities. Optimization was significantly related to level of functioning in discretionary activities but was not associated with functioning in instrumental activities. On the contrary, compensation was significantly related to level of functioning in instrumental activities but was not associated with functioning in discretionary activities.

Taken together, these results support previous reports of variability in the behavioral adaptations community-dwelling seniors make across different domains of activity. One such study investigated the behavioral efforts of older adults with osteoporosis and osteoarthritis (Gignac et al., 2000). This study showed that older adults with chronic physical illness reported giving up or limiting their activities (i.e., loss-based selection) most often within the domain of discretionary activities and least often in the personal care domain. Optimization efforts were most frequent for discretionary activities and were reported significantly less frequently for personal care activities. The greatest percentage of compensation strategies was reported for in-home mobility and personal care activities, whereas the smallest proportion of compensation efforts was found in valued activity domains.

Relationships Between Selection, Optimization, and Compensation Use and Subjective Well-Being

In accordance with the large body of literature on the relationship between

resources in the physical, emotional, and social domains and subjective well-being (e.g., Antonucci & Akiyama, 1997; Flammer, 1995; Pinqart & Sörensen, 2000; Smith et al., 1999; Staudinger, Fleesom et al., 1999), the results revealed that poorer physical health resources, poorer emotional resources, and poorer social support resources predicted lower subjective well-being (Figure 8). As for the nonsignificant effect of cognitive resources, it may be that as long as cognitive deficits do not markedly influence everyday life, they are likely to have a lesser influence in old age than other resource deficits.

It was hypothesized that selecting out activities or parts of activities would be associated with lower levels of subjective well-being and that optimization and compensation use in everyday activities would be related to higher levels of subjective well-being. Contrary to predictions, only loss-based selection was related to level of well-being; both optimization and compensation were unrelated to well-being after all other variables were controlled (Figure 8). One interesting finding was that the effect of loss-based selection on subjective well-being was partially transmitted by level of involvement in discretionary activities (Figure 10). Greater loss-based selection was associated with lower level of functioning in discretionary activities, which was related to lower levels of subjective well-being. This result is consistent with the general consensus in gerontology that continuity, quantity, and quality of a wide range of activities are essential ingredients for general well-being in old age (Atchley, 1989, 1993; Kelly & Ross, 1989; Lawton, 1987; Rowe & Kahn, 1997). Age-related losses in internal and external resources may restrict preferred discretionary activities that have been a source of pleasure and life satisfaction and thus influence well-being. Maintenance of instrumental activities, which is facilitated by compensation strategies, may be more

likely to affect autonomy and independence than well-being. It is surprising that optimization in everyday activities did not relate to well-being given that optimization involves the enhancement of means in order to maximize one's functioning in a selected domain of functioning, under conditions where no age-related losses have occurred. There is a need for future studies to thoroughly address the question of whether discretionary activities that have been developed over time and require effort and resources are likely to yield greater subjective well-being in old age. Results of studies related to this matter appear to be mixed (Kelly & Ross, 1989; Mannell, 1993; Pushkar et al., 1997).

These findings differ from results of one study that indicated that a composite of selection, optimization, and compensation made a unique contribution to subjective indicators of successful aging, including subjective well-being, absence of loneliness, and positive emotions (Freund & Baltes, 1998). Freund and Baltes also found that individual differences in self-reported selection showed the weakest associations with the outcome indicators when the relative importance of selection, optimization, and compensation was compared. Most of the predictive variance of optimization and compensation was shared between the two. The discrepancy in results could be attributable to differences in measurement of SOC processes between the two studies and the completely different pattern of correlations among SOC variables for the two methods of measurement. In the domain-general questionnaire used by Freund and Baltes, loss-based selection emphasized the reconstruction of one's goal hierarchy with a focus on retaining the most important goals when losses are not recoverable, whereas in the domain-specific measure the focus of loss-based selection was on the number of activities stopped and partly

dropped. One can think that the emotional impact would be different when the focus is on what was selected out rather than on the importance of what was retained. Additional studies are thus required to better understand the effect of loss-based selection, optimization, and compensation use in everyday activities on subjective well-being in old age.

Usefulness of the Theory of Selective Optimization With Compensation for
Understanding the Relationship Between Resource Availability
and Successful Aging Outcomes

The SOC theory was developed in order to inform and guide other theoretical work within particular domains, from which could be derived testable propositions and operationalizations (Marsiske et al., 1995). In this study, the focus was on empirically testing whether the SOC theory can be considered a model of successful (adaptive) aging in the context of everyday activities. To be acceptable as such a model, SOC use should add explanatory power to our understanding of how everyday functioning and subjective well-being are affected by changes in personal resources. Specifically, information on self-reported SOC use in everyday activities should evince predictive validity when controlling for resource availability in the physical health, cognitive, emotional, and social support domains, which are often used in the predictive study of subjective successful aging. Statistically, the use of loss-based selection, optimization, and compensation in everyday activities should mediate the relationship between the availability of personal resources and level of everyday functioning and the relationship between resource availability and subjective well-being.

The SOC theory served as a useful framework for classifying strategies used by seniors to adapt to age-related losses. Participants reported selection, optimization, and

compensation-like strategies as they described the changes they had made in the way they were performing everyday activities since their mid-adulthood, which represented initial evidence that the SOC theory applies to the adaptive management of resources in everyday life.

Overall, the results revealed that SOC processes played a mediating role in the relationship between resource availability and successful aging outcomes. To reiterate, physical health resources had a significant indirect effect on frequency level of everyday activities through loss-based selection and optimization use, and social support resources had a significant indirect effect through loss-based selection and compensation use (see Figure 5). Emotional resources had a small indirect effect on level of functioning in instrumental activities through compensation, and social support resources, through compensation and loss-based selection (see Figure 6). When the outcome was frequency of discretionary activities, physical health had a significant effect that was mediated by loss-based selection and optimization (see Figure 7). As for subjective well-being, social support resources had a significant indirect effect through loss-based selection (see Figure 8). In short, more loss-based selection (i.e., selecting out activities and parts of activities) was predicted by poorer resource availability and was associated with lower levels of everyday functioning and subjective well-being. However, availability of resources, especially in the domains of physical health and social support, facilitated adaptive changes of everyday functioning related to optimization and compensation. Thus, invoking the SOC theory was valuable in the search for a greater understanding of the relationship between resource availability and successful aging outcomes. It seems that in addition to personal resource availability, use of resources through selection,

optimization, and compensation strategies is relevant for adaptation to age-related losses in everyday activities.

Selection, Optimization, and Compensation Strategies
and the Dynamic Between Losses and Gains in Old Age

The SOC theory reflects the dynamic interplay between gains and losses across the life-span and takes on a particular significance in old age because of increasing losses in physical, psychological, and social reserves (P. B. Baltes & Baltes, 1990). In terms of the life-span perspective on the interplay between growth and decline, one can think that when older adults stop activities and select out parts of activities, they are in a period in which losses exceed gains. Alternatively, those individuals who are high users of optimization strategies in everyday activities may be in a period in which gains are still equivalent to losses or even exceed losses.

Such an interpretation is consistent with the theoretical conceptualization of loss-based selection and optimization (M. M. Baltes & Carstensen, 1996, 1999; P. B. Baltes & Baltes, 1990; Freund & Baltes, 2000; Marsiske et al., 1995). Loss-based selection is seen as the function that regulates loss. It comprises behaviors that organize functioning at lower levels when maintenance of goal relevant means is no longer possible because of unrecoverable losses of functioning. It is assumed that under conditions of loss, it is the adaptive task of the person to reduce the number of goals and domains in order to free and conserve energy and motivation for more important goals. Loss-based selection thus involves a convergence of environmental demands and individual motivations, skills, and biological capacity. Optimization is viewed as a function of growth in old age. It is apparent where no direct or indirect aging losses have occurred and where maximization of means can be found. It is assumed that to reach optimal levels of functioning in

selected domains, the person needs to acquire, allocate, and refine resources. One instance is the regulation of time investments for activities across domains such as physical leisure, cultural-intellectual leisure, and social engagement.

The results revealed no systematic relation between compensation and optimization nor between compensation and loss-based selection. Theoretically, compensation is conceptualized as a means of maintenance. It comprises behaviors involved in sustaining levels of functioning in the face of a new contextual challenge or a loss in potential (P. B. Baltes & Baltes, 1990; Freund & Baltes, 2000). Although people of all ages appear to be motivated to engage in compensatory behaviors when anticipating or experiencing loss in goal-relevant means, the need for compensation might be higher in old age given that losses are prevalent in many life domains. In the context of everyday functioning, compensation differed from optimization in that means were invested in the interest of avoiding loss in goal achievement, especially within the domain of instrumental activities, rather than in the interest of enhancing performance under stable conditions of resources. Compensation differed from selection in that the goal was to maintain the activity rather than reduce it or lose it completely. Thus, new means were enlisted to compensate for a behavioral deficiency in order to maintain prior functioning. In the face of age-related losses, compensation would be more likely to occur than loss-based selection when there are both sufficient resources and alternative means available to reach the same goal. It seems that older adults who use primarily compensation strategies in daily life are not necessarily in a period where losses are greater than gains. However, when losses occur in a number of domains, resources that can be deployed for compensation become equally scarce so that it might be more

adaptive to use loss-based selection in order to disengage from goals that are subject to loss rather than to invest in compensatory efforts (Freund & Baltes, 2000).

Method of Measuring Selection, Optimization, and

Compensation Use in Everyday Activities

The operationalization of the SOC theory can proceed along various methods of data collection, experimentation, and levels of analysis (Freund & Baltes, 1998). The domain-specific measure that was used in this study was based on an ad hoc classification of adaptive strategies in everyday activities, which offered advantages and drawbacks.

To illustrate, use of open-ended questions to assess adaptive strategies in the face of age-related losses permitted flexibility in probing. Yet, it may have yielded an incomplete repertoire of adaptive strategies. During the interview participants may not have recalled all of the changes in the ways that they were performing their everyday activities. Some of the adaptive strategies may have been more amenable to recall than others, which could have resulted in the underreporting of some processes over others (Gignac et al., 2000). For instance, the loss that comes from having stopped or limited everyday activities may have been more salient to individuals with greater resource limitations such that they were more likely to recall loss-based selection strategies as compared with efforts to compensate or optimize their performance. In addition, qualitative analysis of the content of the interviews entailed the immersion in the specifics of the participants' responses in order to allow the categories of strategies to emerge. Qualitative methodology generated a wealth of detailed information on idiosyncrasies and was useful in examining SOC adaptive processes in everyday life. Nevertheless, the qualitative approach can be criticized on issues of time demands of

processing and coding the data and adequacy of sampling when only a few cases can be managed (Miles & Huberman, 1994).

In spite of the statistical error inherent in the development of this domain-specific measure, use of it in subsequent quantitative analyses enabled significant relations to be detected. One avenue for future developments in the measurement of SOC in everyday functioning in old age would be to derive a categorical list of SOC strategies most often used by seniors in instrumental and discretionary activities in order to adapt to age-related losses, and then to conduct tests of reliability and validity. Once the psychometric properties are shown to be satisfactory, researchers could benefit from using the standardized, domain-specific SOC checklist. The qualitative induction of strategies from interviews on everyday activities, as was carried out in this study, represents a first step in this direction.

Clinical Implications of the Results

Path analysis indicated that selecting out activities fully and in part was related to lower levels of subjective well-being and that this effect was partially mediated by level of functioning in discretionary activities (Figure 10). The SOC theory predicts that selecting out optional recreational activities when maintenance is no longer feasible can be adaptive in order to sustain everyday competence in old age. However, the results suggest that loss-based selection associated with lower frequency of discretionary activities can have a negative emotional impact on the person. This raises the possibility that cognitive therapy could be useful in helping these older adults to attenuate the negative emotional effect of loss and increase their subjective well-being. From the perspective of the dual-process model of assimilation and accommodation (Brandtstädter

& Wentura, 1995), duration and severity of depressive and unhappy feelings are seen as depending on efficacy and control beliefs as well as the person's readiness to relinquish barren self-definitions and readjust personal preferences. A core function of accommodation consists of neutralizing experiences of loss and mitigating the emotional load that is related to such experiences. Thus, it could be helpful to explore with older adults who are experiencing negative emotional states the subjective meanings of the relinquished discretionary activities. Cognitive therapy could focus on the accommodation of preferences and goals, which would involve targeting cognitive contents that enhance devaluation of barren commitments and promote acceptance of initially aversive developmental outcomes. Nonetheless, some goals may be subjectively so central for a person's sense of leading a meaningful life that giving them up would lead to stronger feelings of loss than continuing to engage in compensatory efforts (Freund & Baltes, 2000).

On a more general level, knowledge of how use of SOC processes in the context of everyday activities can promote adaptive aging has implications for clinicians working with the elderly. In particular, the SOC model provides a framework for examining with elderly clients which activities have been actively or passively reduced or selected out, which activities have been retained, which have been added, and what value these activities have for the individual. When dealing with everyday functioning, seniors face many challenges that require the reorganization of priorities, and some individuals may have difficulty adapting successfully (M. M. Baltes & Carstensen, 1996). One can think that selecting out valued activities could lead to boredom and loss of purpose and meaning if these goals are not replaced. Hence, cognitive-behavioral therapy with older

adults might focus on helping find suitable replacement activities. In addition, knowledge of the dynamic interplay among SOC processes in everyday life can also guide clinicians in their work in looking at what means can be enhanced in order to optimize the person's functioning in valued discretionary activities. The finding that compensation is useful, when aging losses have occurred, in maintaining instrumental activities that are essential for sustaining independence in the community emphasizes the importance of considering several alternative means and resources with clients, including external aids and social support.

The results stressed the value of personal resource availability in the adaptation to age-related losses in everyday activities. Recent literature in gerontology suggests that many elderly individuals, in principle, have the necessary resources and reserves to maintain and even optimize aspects of daily functioning, but face restrictive environments (e.g., Pushkar & Arbuckle, 1998; Rowe & Kahn, 1997). Therefore, greater societal resources could be allocated to seniors to further facilitate adaptation to aging losses in everyday activities. For example, accessible transportation needs to be provided to seniors in order to help them to maintain participation in discretionary activities despite physical limitations. Community leisure programs should be designed for older men and older women that take into account their unique history and preferences. Environments that reinforce dependency behaviors in seniors who are still capable of undertaking certain tasks independently should be minimized (M. M. Baltes, 1996).

Limitations of the Study

The above findings are subject to a number of caveats. First, some of the shared variance between selection, optimization, and compensation and level of everyday

functioning indicated by the frequency of activities can be attributed to an overlap in the meaning of the variables. Specifically, selection, optimization, and compensation were used to define how daily activities were dealt with in old age. The SOC strategies enabled older adults to decrease (selection), increase (optimize), and manage and maintain (compensate) their level of activity involvement. Thus, no measure of activity parameter (e.g., duration, frequency) could be operationalized independently of the meaning of SOC strategies, suggesting a built-in relationship inherent to the SOC theory when it is applied within the context of everyday functioning. Note that the same is not true for the significant relationship between loss-based selection and subjective well-being. The items of the Memorial University of Newfoundland Scale of Happiness (Kozma & Stones, 1983) were different in content from the strategies that made up loss-based selection in the domain of everyday activities.

Some factors limit the generalizability of the study's findings and should be addressed in future research. The sample comprised volunteers who were able to come to the laboratory for testing and who had taken part in two previous studies of a larger project. Participants, mainly women, were generally well educated and healthy physically and emotionally so that the characteristics of the sample may be positively biased. Although considerable richness and specificity were gained by focussing on independent seniors living in an urban centre, the results need to be replicated and extended to seniors living in rural areas. In addition, the sample consisted largely of participants aged 80 years and younger, and the individuals at the older end of the age range may be highly selected and may not be a true representation of the old-old. More research should be undertaken with seniors in advanced old age (about 80 years of age and older) in order to

examine the interplay among SOC processes at this stage and the various ways that SOC use may be shaped by situational features. Indeed, there is initial evidence that individuals in their 70's, 80's, and 90's experience distinct life situations. The more specific losses in intellectual and physical functioning observed in younger old age appear to extend to a general decline of performance across all abilities in very old age. Old-old age seems to reflect a state of functioning in which biological, psychological, and social conditions are qualitatively different from young-old age, lending preliminary support for the existence of a "4th age" (Mayer et al., 1999; Smith & Baltes, 1997, 1999).

The structural models were specified and modified using a single sample, which causes the current findings to run the risk of sample specificity (Kline, 1998). In other words, model fitting could have been influenced by chance characteristics of the sample, and the models may not generalize beyond the sample at hand. To minimize this possibility, the model generation procedure was approached with caution; that is, any modifications made to the original model had to be substantively meaningful and justifiable (Klem, 1995).

Despite the factors that limit generalizability of the results, it is worth emphasizing the similarities in methodology and results between this study and the study conducted by Gignac et al. (2000), who used a different sample of community-dwelling seniors. The data from this study had been collected and analyzed before Gignac et al.'s study was published. Yet, we had used a similar approach to measuring SOC use in everyday activities, qualitatively deriving categories of adaptive strategies from open-ended interviews on changes in everyday activities and subsequently coding the strategies as instances of loss-based selection, optimization, and compensation. Gignac et al. found

a similar pattern of variability in the use of selection, optimization, and compensation between instrumental and discretionary activities, which serves to validate part of the current results.

Structural equation modeling (SEM) is a large sample technique. Covariances, on which SEM is based, are less stable when estimated from small samples (Tabachnick & Fidell, 1996). Also, more complex models require larger samples than do more parsimonious models in order for the parameter estimates to be comparably stable (Kline, 1998). There are no absolute standards in the SEM literature about the relation between sample size and model complexity. Kline (1998) cautions that if the ratio of the number of participants to the number of parameters is less than 5:1, then the statistical stability of the results may be doubtful. The three-level models in this study had between 6 to 6.4 participants per parameter and the four-level models had 5 to 5.2 participants per parameter. Worth noting is that this study was exploratory, and the sample size was mostly determined by limitations posed by qualitative data collection and analysis.

Structural equation modeling does not permit the inference of causality, which requires more than just acceptable correspondence between the model and the data (Kline, 1998). Because the variables were concurrently measured, it is not possible to demonstrate time precedence. Nevertheless, the concurrent correlations were consistent with theory-driven predictions that resource availability predicts SOC use and that SOC use predicts successful aging outcomes such as level of everyday functioning and subjective well-being. Longitudinal research on changes in resources and SOC use would allow the prospective relationships to be tested. For instance, it could be that SOC use in everyday activities also contributes to the maintenance of resources. One can think, though, that modeling of temporally ordered longitudinal data would be complicated by

the fact that a given constellation of selection, optimization, and compensation strategies is not fixed and is likely to undergo changes with time and with contextual constraints and opportunities. Thus, the history of acquisition and the functional status of strategies in a given context would need to be specified when classifying them as instances of selection, optimization, or compensation (Freund et al., 1999).

Conclusion

Age-related losses in resources increase the pressure on older adults to restrict the domains of activity in which they participate. Nonetheless, there is great variation in the activities seniors perform, and many older adults continue to engage in demanding activities that facilitate continued learning and development. The theory of selective optimization with compensation pays attention to the heterogeneity in aging, takes gains and losses jointly into account, and considers successful adaptation in the face of losses as the result of the interplay among three processes: selection, optimization, and compensation. The SOC theory provided a useful framework for viewing how independent older adults cope with age-associated losses in the context of everyday activities. The present study has contributed to our understanding of the relationship between personal resource availability and successful aging outcomes by examining the mediating role of selection, optimization, and compensation use in everyday life. Given the changing demography of our society, the task of sustaining everyday competence in old age has become a primary societal concern. The study of how older adults are able to adapt to age-related losses and age more successfully takes on particular relevance that goes beyond scientific interest. Greater knowledge of how resources relate to the use of adaptive processes in everyday activities and how they influence level of everyday

functioning and subjective well-being will have implications for prevention of anticipated losses and intervention with this segment of our population.

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Appendix A

Non-Standardized Measures

Table A1

Time 1 Life History Interview

In this part of the session, I will be asking you some questions about your personal history and your life experiences. I'm interested particularly in your education, your employment history, and in learning a bit about your family.

I. Education

Let's start with your education.

	OUTS	EXTS
1. How much education did you get?	_____	_____
2. What year did you finish your education?	_____	_____
3. What did you study in school?	_____	_____
4. What special training did you have, if any?	_____	_____
5. What did you do immediately after you finished or graduated?	_____	_____
6. What job did you do?	_____	_____
7. What did you do in your job?	_____	_____
8. Did you get promoted?	_____	_____
9. How long did you stay there?	_____	_____
10. How old were you when you left? (Repeat these work questions as many times as necessary until you reach retirement or present time.)	_____	_____
11. Did you do that kind of work until you retired or did you change your work?	_____	_____

II. Finances

One of the big concerns for people over 65, especially once they retire, is money.

12. How much is money a concern for you?	_____	_____
13. That is, how financially comfortable would you say you are?	_____	_____

OUTS EXTS

14. Would you describe your situation as being?

- 1) Very difficult, I can't manage at all.
- 2) Difficult, I can't afford some necessities.
- 3) Fairly difficult, I can't afford many luxuries.
- 4) Not bad, I can manage.
- 5) Fairly comfortable, I can afford all necessities.
- 6) Comfortable, I can afford everything I need as well as some luxuries.
- 7) Very comfortable, I can afford everything I need or want.

15. How financially comfortable would you say you are compared to other people you know of the same age?

- 1) Much worse off than most.
- 2) Worse off than most.
- 3) Slightly worse off than most.
- 4) About the same as most.
- 5) Slightly better off than most.
- 6) Better off than most.
- 7) Much better off than most.

III. Family

Now I'd like to know a bit about your family life.

Note: If participant has been married more than once, ask questions 17-22 (those with asterisks) for each spouse the person reports.

16. Are you married?

*17. When did you get married?

*18. How old were you when you got married?

*19. If married, how long have you been married? (If widowed or divorced, how long were you married?)

*20. What kind of work did your husband/wife do?

*21. How far did your husband/wife go in school?

OUTS EXTS

*22. If widowed, when did your husband/wife die?

(If divorced, when did you divorce?)

*23. What did she/he die of?

24. Do you have any children?

25. How many children do you have?

26. How many sons do you have?

27. How many daughters do you have?

28. How old are your sons?

29. How old are your daughters?

30. How old were you when your first child was born?

(If children are adopted, how old were you when you adopted?)

31. You mention that you have _____ children. Where does your oldest child live? (Repeat for each child.)

How often are you in touch with your children?

(For each child, indicate whether he/she sees the child daily, weekly, etc.)

Person

Type of contact

Frequency

32.

33.

34.

35.

36.

Any other members of your family that you are in touch with? Sisters, brothers, cousins? For each person named, indicate the amount of time as above.

<u>Person</u>	<u>Type of contact</u>	<u>Frequency</u>	OUTS	EXTS
37.			_____	_____
38.			_____	_____
39.			_____	_____
40.			_____	_____
41.			_____	_____
42. How many people live with you at home?			_____	_____
43. As you know, this study is about conversations. Different people have different conversational styles. For some people, time spent talking with others is very important, while other people are more reserved and prefer to keep to themselves. What percentage of your conversation is with close friends and relatives as opposed to casual acquaintances like neighbours, bank tellers, store clerks, etc.			_____	_____
44. When you do talk to casual acquaintances like store clerks, bank tellers, or the mailman, do you enjoy taking the time to chat about topics other than the task at hand?			_____	_____
45. Conversations can have many purposes. Please read over this list, and check off those items that very often represent the main purpose of your conversation with close friends and family.				
1. to get to know each other better 2. to reminisce about the past 3. to accomplish a specific task 4. to discuss mutual interests 5. to be polite 6. because conversation is pleasurable			_____	_____
46. Check off those items that very often represent the main purpose of your conversations with casual acquaintances and people you encounter while doing day-to-day activities and errands (e.g., bank tellers)				
1. to get to know each other better 2. to reminisce about the past 3. to accomplish a specific task				

4. to discuss mutual interests
5. to be polite
6. because conversation is pleasurable

Table A2

Time 3 Interview on Life Changes Since Time 1 Interview

I want to start by thanking you for agreeing to participate in this third stage of our research programme on conversation and how it relates to well-being in aging. The first time that you came to Concordia University to participate in our conversation study was in _____. At that time, we asked you a number of questions about your life history and about your everyday life. Today, I would like to know how you have been and what has been happening to you since then. I'm interested particularly in any changes that have occurred in your life since then.

How have you been? (Don't rate this question.)

Health (Refer to Phase 1 health questionnaire)

The first time that you were seen here, you indicated that you had these health problems. (Briefly list the checked items.)

1. Have there been any changes in your health since then that affect you presently?
2. Do you still have _____ ? (Repeat the question for each condition.)
3. Do you have any new conditions now? If so, what are they?
4. How would you say that your health presently is overall? (Give the 5-point health rating scale.)

Finances (Refer to Phase 1 financial interview ratings.)

Last time you had indicated that your financial situation was _____.

5. Have there been any changes in your financial situation since we last saw you?
6. Would you describe your situation now as being?
 - 1) very difficult, I can't manage at all
 - 2) difficult, I can't afford some necessities
 - 3) fairly difficult, I can't afford many luxuries
 - 4) not bad, I can manage

- 5) fairly comfortable, I can afford all necessities
- 6) comfortable, I can afford everything I need as well as some luxuries
- 7) very comfortable, I can afford everything I need or want

7. How financially comfortable would you say you are now, compared to other people you know of the same age?

- 1) Much worse off than most
- 2) Worse off than most
- 3) Slightly worse off than most
- 4) About the same as most
- 5) Slightly better off than most
- 6) Better off than most
- 7) Much better off than most

Family

I'd like to know what changes have occurred in your family life.

8. Are you still (married, single, etc)?

(If no changes have occurred, go to family contact items. If a change has occurred, specify the change.)

9. If widowed, when did your husband/wife die?

If divorced, when did you divorce?

If married, when did you marry?

If widowed or divorced:

10. Your life has certainly changed. How have you been coping with this?

If newly married:

11. How has your life changed as a result of your marriage?

(Refer to the family contact interview section.)

12. Have there been any changes in how often you now see your children?

13. Have there been any changes in how often you now see any other member of your family?

(Refer to the Saranson Social Support Questionnaire: Last time you indicated that the following people were people that you felt you could count upon to provide you with help or support: _____)

14. Have there been any changes in this area? Are these still people that you can count upon to provide you with help or support?

Residence

15. Have you moved or changed your residence?
16. Why did you move?
17. Are you now happily settled in your new home?

General Changes

18. Have there been any other changes in your life since we last saw you?

Table A3

Interview on Strategies of Adaptation in Everyday Activities

Preamble. We want to ask you a few questions about some activities of your daily life (e.g., grocery shopping, leisure and social activities). We are particularly interested in any changes that have occurred in the way you do these activities now compared to when you were in your fifties. The reason we are asking is that we want to have a better idea of how independent seniors manage certain daily activities. Some questions may be about activities that you cope with very well, but we will ask you to describe them anyway.

I- Cooking/Meal Preparation

1) In the past, was cooking/ meal preparation part of your routine activities?

0= No. Why? (go to following question)

1= Yes (go to following question)

2) Do you routinely cook/ prepare meals now?

0= No. Why? (stop here)

1= Yes (go to following question)

3) How often do you cook/ prepare meals?

1= not every day

2= once every day

3= twice every day

4= three times per day

4a) Do you find that there is any difference in the way you do this now compared to your mid-adulthood? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty making complete meals? (Have participant describe types of difficulties experienced).

5) How difficult is it for you to make complete meals?

1=not difficult at all

2= somewhat difficult

3= very difficult

II- Housekeeping/Home Maintenance

1) In the past, did you regularly perform household tasks and/or home maintenance tasks?
 0= No. Why? (go to next question)
 1= Yes (go to next question)

2) Do you perform household tasks and/or home maintenance tasks now?
 0= No. Why? (stop here)
 1= Yes. (go to next question)

3) How often do you perform these tasks?
 1= less than once a month
 2= monthly
 3= weekly
 4= daily

4a) Do you find that there is any difference in the way you do this now compared to your mid-adulthood? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty performing these tasks? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to perform these tasks?
 1= not difficult at all
 2= somewhat difficult
 3= very difficult

III- Grocery Shopping

1) In the past, was grocery shopping part of your routine activities?
 0= No. Why ? (go to next question)
 1= Yes (go to next question)

2) Do you shop for groceries now?
 0= No. Why? (stop here)
 1= Yes (go to next question)

3) How often do you shop for groceries?
 1= less than once a month
 2= monthly
 3= weekly
 4= daily

4a) Do you find that there is any difference in the way you do this now compared to your mid-adulthood? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty shopping for groceries? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to shop for groceries?

1= not difficult at all

2= somewhat difficult

3= very difficult

IV- Management of Personal Finances

1) In the past, was managing personal finances part of your routine activities? (e.g. bill paying, banking, budgeting, keeping income tax returns...)

0= No. Why? (go to next question)

1= Yes (go to next question)

2) Do you still manage your finances now?

0= No. Why? (stop here)

1= Yes. What kind ? (go to next question)

3) How often do you take care of personal finances?

1= less than once a month

2= monthly

3= weekly

4= daily

4a) Do you find that there is any difference in the way you do this now compared to your mid-adulthood? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty managing your finances? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to manage personal finances?

1= not difficult at all

2= somewhat difficult

3= very difficult

V- Medication Management

1) Do you presently take medication on a regular basis?

0= No (stop here)

1= Yes (go to next question)

2) How many different medications do you have to take on a regular basis?

1

2

3

4 or more

3a) Do you find that there is any difference in the way you do this now compared to when you were younger? (Have participant describe changes made.)

*if not already answered by subject in 3a:

3b) Do you feel that you have difficulty taking your medications on schedule? (Have participant describe types of difficulties experienced.)

4) How difficult is it for you to take your medications on schedule?

1=not difficult at all

2=somewhat difficult

3= very difficult

VIa and VIb- Visiting and Entertaining

1) In the past, was visiting/ entertaining friends and relatives part of your routine activities?

0= No. Why? (go to next question)

1= Yes (go to next question)

2) Do you still visit / entertain friends and relatives?

0= No. Why? (stop here)

1= Yes (go to next question)

3) How often?

1= less than once a month

2= monthly

3= weekly

4= daily

4a) Do you find that there is any difference in the way you do this now compared to your mid-adulthood? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty visiting / entertaining? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to visit / entertain?

1=not difficult at all

2=somewhat difficult

3= very difficult

VII- Helping Family Members and Friends

1) In the past, was helping family members and friends part of your routine activities?

0= No. Why? (go to next question)

1= Yes (go to next question)

2) Do you help family members and friends now?

0= No. Why? (stop here)

1= Yes. (go to next question)

3) How often do you do this activity?

1= less than once a month

2= monthly

3= weekly

4= daily

4a) Do you find that there is any difference in the way you do this now compared to your mid-adulthood? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty helping others? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to help family members/ friends?

1= not difficult at all

2= somewhat difficult

3= very difficult

VIII- Physical Activities

1) In the past, did you engage in physical activities? (e.g. exercise, walking, swimming, gardening)

0=No. Why? (go to next question)

1= Yes (go to next question)

2) Do you engage in physical activities now?

0=No. Why? (stop here)

1=Yes. (go to next question)

3) How often do you perform physical activities?

1= less than once a month

2= monthly

3= weekly

4= daily

4a) Do you find that there is any difference in the way you do this now compared to when you were younger? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty doing physical activities? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to perform physical activities?

1= not difficult at all

2= somewhat difficult

3= very difficult

IX- Crafts, Hobbies, and Creative Activities

1) In the past, did you have any hobbies (e.g. knitting, stamp collecting, or any other activities involving a regular routine or pattern) or did you do crafts or creative activities (e.g. play an instrument, write, paint, surf the internet)?

0=No (go to next question)

1=Yes (go to next question)

2) In the present, do you have crafts, hobbies, or creative activities?

0= No. Why? (stop here)

1= Yes. (go to next question)

3) How often do you perform the activity?

1= less than once a month

2= monthly

3= weekly

4= daily

4a) Do you find that there is any difference in the way you do this now compared to when you were younger? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty performing this? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to perform the activity?

1= not difficult at all

2= somewhat difficult

3= very difficult

X- Organizations

1) In the past, did you participate in organizations (e.g. social clubs, professional associations)?

0= No. Why? (go no next question)

1= Yes (go to next question)

2) Do you participate in organizations now?

0= No. Why? (stop here)

1= Yes. (go to next question)

3) How often do you participate in organizations?

1= less than once a month

2= monthly

3= weekly

4= daily

4a) Do you find that there is any difference in the way you do this now compared to when you were younger? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty participating in organizations? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to participate in organizations?

1= not difficult at all

2= somewhat difficult

3= very difficult

XI- Volunteer Work

1) In the past, did you do volunteer work?

0= No. Why? (go to next question)

1= Yes (go to next question)

2) Do you do volunteer work now?

- 0= No. Why? (stop here)
 1= Yes. (go to next question)

- 3) How often do you volunteer?
 1= less than once a month
 2= monthly
 3= weekly
 4= daily

4a) Do you find that there is any difference in the way you do this now compared to when you were younger? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty doing volunteer work? (Have participant describe types of difficulties experienced.)

- 5) How difficult is it for you to do volunteer work?
 1= not difficult at all
 2= somewhat difficult
 3= very difficult

XII- Travelling

- 1) In the past, was travelling part of your routine activities?
 0= No. Why? (go to next question)
 1= Yes (go to next question)

- 2) Do you do any travelling now (e.g. day trips, holidays, recreational trips)?
 0= No. Why? (stop here)
 1= Yes. (go to next question)

- 3) How often do you travel?
 1= less than once a month
 2= monthly
 3= weekly
 4= daily

4a) Do you find that there is any difference in the way you do this now compared to when you were younger? (Have participant describe changes made.)

*if not already answered by subject in 4a:

4b) Do you feel that you have difficulty travelling? (Have participant describe types of difficulties experienced.)

5) How difficult is it for you to travel?

1= not difficult at all

2= somewhat difficult

3= very difficult

Appendix B

Coding Manual

The Coding Manual is an adjunct to the Coding Scheme for the Interview on Everyday Activities. It contains exemplars to clarify the coding categories that may be ambiguous and specific instructions to facilitate reliable coding.

Continuity/Discontinuity with Mid-Adulthood

- group 2 “did not do in past and does now”: for instrumental activities code as “doing now” if the activity was taken on voluntarily or because of circumstances (e.g., husband who began to cook meals when his wife died, who prepared meals while they were married)
- for Housekeeping/ Home-Maintenance: if the person only receives help for heavier chores, code as “doing the activity now”; if the person receives help for all housekeeping tasks except dish washing, code as “not doing now”
- for Medication Management: code either as group 5 (does not take medication presently) or group 6 (does take medication presently)
- for Organization Involvement: if the person is involved in an organization in which part of the tasks are to serve the community, do not also score as volunteering

Change in Activity Performance

- “no change” implies no difference in activity performance; “change” implies that activity performance has incurred change in behavior, which can include “did not do in past and now does” for the 7 leisure and social activities
- for instrumental activities, if the person “did not do the activity in the past and does the activity now” because of circumstances and if the person reports no change in performance since doing the activity, then score as “no change”
- if the only change reported is “now doing with difficulty” (but no mention of behavioral adaptive strategy), then score as “no change” and score “type of difficulty”
- for Physical Activities: “no change” indicates that the physical activities are performed with the same intensity level and that the number of physical activities performed has remained the same
- for Hobbies and Creative Activities: “no change” indicates same type of activities, same frequency, and same standards of performance
- for Organization Involvement: “no change” indicates same activities or same type of activities, same frequency, and/or level of involvement
- for Volunteering: “no change” indicates same activities or same type of activities, same frequency, and/or level of involvement

-for Travelling: “no change” indicates same type of travelling, same frequency (by self or with others)

Global Change Type

-if the behavioral change is due to technological changes in everyday life that require the acquisition of new behaviors for everyone (e.g., automatic teller machines), do not code as a loss-based adaptive strategy

- “stopped” category implies not performing the activity at all; for instrumental activities the person is dependent on others

- “modified way of doing activity” category can include one partial selection strategy and one optimization strategy

Use of External Help

-code as present if the person is still doing the activity in part but is assisted by someone or if the person is fully dependent on others to do the activity

Strategy Categories for Each Activity

-for Cooking and Meal Preparation:

- category 1: e.g., frozen meals several times per week, canned goods
- category 2: do not code as present if meals have always been “simple”
- category 4: do not code as present if only goes to restaurant occasionally

-for Grocery Shopping: category 4 “use of mechanical aids” does not include use of automobiles

-for Physical Activities: the behavioral strategy categories are mutually exclusive (only code the presence of one category)

Intensity level based on metabolic equivalent level (taken from Taylor, H. L., Jacobs, D. R., Schucker, B., Knudsen, J., Leon, A. S., & DeBacker, G. (1978). A questionnaire for the assessment of leisure time physical activities. Journal of Chronic Disease, 31, 741-755.)

-light intensity activities (e.g., bowling, walking for errands, golfing with power cart, bicycling for errands)

-moderate intensity activities (e.g., home exercises to increase flexibility or strength, gardening, walking less than one mile per week, swimming for pleasure, golfing- pulling cart or carrying clubs, square and ballroom dancing)

-heavy intensity activities (e.g., swimming lapses in lake or pool, aerobic exercise classes, walking at least 10 miles per week, jogging, ice skating)

-very heavy intensity activities (e.g., badminton, tennis, hiking, back-packing, cross-country skiing, running at least 10 minutes)

-for Hobbies and Creative Activities: the behavioral strategy categories are mutually exclusive (only code the presence of one category)

Types of hobbies and creative activities:

-crafts

i.- manual activities (e.g., sewing, knitting, making handicrafts)

-creative activities

i- cognitive (e.g., continuing education at MILR and Thomas Moore Institute; reading; doing cross-word puzzles)

ii- playing instruments/ writing/ painting/ sculpting

-hobbies (activities involving regular pattern or routine)

i- social (e.g., bridge-playing, bingo-playing)

ii- playing with computer/technology

iii- object collecting (e.g., stamp collecting)

iv- gardening (indoor and outdoor), tree planting

v- fishing

-for Organization Involvement: the behavioral strategy categories are mutually exclusive (only code the presence of one category)

Types of organizations:

-social (e.g., Golden Age Club, Creative Social Centre, sports clubs, bowling clubs, bridge clubs)

-community (e.g., Meals on Wheels executive committee, Foundation for Handicaps, Addictions Anonymous, Legion)

-public affairs (e.g., political, school-related, professional associations, auxiliary board in hospital)

-religious (e.g., church-related groups)

-cultural/educational (e.g., Zoo Society, Travel Club board member, computer clubs, McGill Institute of Learning at Retirement faculty, stamp collectors clubs, print collectors clubs, book review clubs)

-for Volunteering: the behavioral strategy categories are mutually exclusive (only code the presence of one category)

Types of volunteering:

-community/ service-oriented (e.g., volunteer with Meals on Wheels, volunteer at hospital)

-public affairs (e.g., political, school-related)

-religious (e.g., church-related, choir)

-cultural/ educational (e.g., teaching)

Types of Difficulties Reported

-only score the type of difficulties experienced in activities that the person is currently performing

-category 1: physical:

e.g., fatigue, "slowed down", rigidity in extremities, loss of strength, mobility difficulties, sensory problems, illnesses

Appendix C

Coding Scheme for Interview on Strategies of Adaptation in Everyday Activities

I- Cooking/ Meal Preparation

Theme 1: Activity (presence/ absence in past and present)

(Only code one of six possibilities)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now (asked why stopped)

Group 2: Did not do activity in past/ does activity now (asked other questions)

Continuity

Group 3: Did not do activity in past/ does not do activity now (not questioned further)

Group 4: Did activity in past/ does activity now (asked other questions)

Group 5: for medication activity only

Group 6: for medication activity only

Theme 2 (excludes those who never did and don't do activity now)

Change Variable I:

No Change (code 0) -----

Change (code 1) -----

e.g., different way of doing reported by subject

Global Change Type Variable I (only code one below):

1. Has stopped doing activity now;

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who "dropped some of past types of activities, but kept some now"; includes individuals using external help to do activity;

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category;

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level);

Using External Help Variable -I (code 0/1 for each item)

1. now using human help -----

2. now using physical/mechanical aids to daily living -----

3. now sharing activity with another person -----

Strategy Use- I (code 0/1)

-Stopped (dropped) activity (code 0)

-Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Heats up “bought prepared/frozen foods”, uses convenience foods
2. Prepares self “simpler meals” (especially for main meal), simple combination of items
3. Cooks large quantities, freezes it, heats it up later/ buys in bulk and freezes portions
4. Goes to restaurant several times per week or buys take out (compensation)
5. Allows self more time to do tasks involved in activity
6. Changed one’s eating habits (more health conscious, eats better now, prevention, correction)
7. Mentioned that skips meal
8. Improvement (mentions now feels is better cook; trying out new recipes)
9. Explicit mention of help from another person; still doing partly
10. Now shares tasks with another person

Theme 3Difficulties reported (code one below):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constrained (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties (code 0/1 for each):

Category 1: physical -----

i. general (fatigue, slowed down, rigidity in extremities) -----

ii. specific body (functional) problems -----

Category 2 : cognitive -----

Category 3 : emotional/ motivational -----

Category 4 : other -----

II- Housekeeping/ Home-MaintenanceTheme 1: Activity (presence/ absence in past and present)

(Only code one of six possibilities)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now (asked why stopped)

Group 2: Did not do activity in past/ does activity now (asked other questions)

Continuity

Group 3: Did not do activity in past/ does not do activity now (not questioned further)

Group 4: Did activity in past/ does activity now (asked other questions)

Group 5: for medication activity only

Group 6: for medication activity only

Theme 2 (excludes those who never did and don't do activity now)

Change Variable:

No change in way of doing (code 0) -----

Change in way of doing (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable II (same across activities; only code one of below):

1. Has stopped doing activity now;

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who "dropped some of past types of activities, but kept some now"; includes individuals using external help to do activity;

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -II (code 0/1 for each item)

1. now using human help -----

2. now using physical/mechanical aids to daily living -----

3. now sharing activity with another person -----

Strategy Use- II (specific to each activity; code 0/1)

-Stopped (dropped) activity (code 0)

-Use of «strategy» (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Puts off task if feeling tired/ does task when "feels like it"

2. Allows self more time to do task / breaks up task and takes pauses in-between

3. Does not let tasks accumulate (does light chores on daily basis)

4. Only does when necessary/ only does what is necessary; decrease in frequency and /or thoroughness
5. Explicit mention of help from another person (informal and formal) for housekeeping (for those still partly doing activity but dropped heavier tasks; receives outside help)
6. Explicit mention of help from another person for homemaintenance (for those still partly doing activity but dropped heavier tasks; receives outside help)
7. Now shares tasks with another person (i.e. shares in doing tasks)

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1: physical -----

i- general (fatigue, slowing down, lack of strength) -----

ii- specific body (functional) problems -----

Category 2: cognitive -----

Category 3: emotional /motivational -----

Category 4: other -----

III- Grocery Shopping

Theme 1: Activity (presence/ absence in past and present)

(Only code one of six possibilities)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4: Did activity in past/ does activity now

Group 5: for medication activity only

Group 6: for medication activity only

Theme 2 (excludes those who never did and don't do activity now)

Change Variable II (0/1 code):

No change (code 0) -----

Change (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable III (same across activities; only code one of below):

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -III (code 0/1 for each item)

1. now using human help -----

2. now using physical/mechanical aids to daily living -----

3. now sharing activity with another person -----

Strategy Use-III (code 0/1)

-Stopped (dropped) activity (code 0)

-Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Buys small quantities more often

2. Buys in bulk so doesn't need to go to store as often

3. Now has grocery delivered

4. Use of mechanical aids

5. Explicit mention of help from another person (informal and formal)

6. Now shares tasks with another person

Theme 3Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)

2. Stopped because of internal constraints (loss-based)

3. Now doing activity with no difficulties

4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1: physical -----

i- general (fatigue, slowing down, lack of strength) -----

ii- specific body (functional) problems -----

Category 2: cognitive -----

Category 3: emotional/ motivational -----

Category 4: other -----

IV- Management of Personal FinancesTheme 1: Activity (presence/ absence in past and present)

(Only code one of six possibilities)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4: Did activity in past/ does activity now

Group 5: for medication activity only

Group 6: for medication activity only

Theme 2 (excludes those who never did and don't do activity now)Change Variable IV (0/1 code):

No Change (code 0) -----

Change (code 1) -----

e.g. use of strategy, different way of doing reported by subject

Global Change Type Variable IV(only code one below):

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who "dropped some of past types of activities, but kept some now"; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable-IV (code 0/1 for each)

1. now using human help -----
2. now using physical/mechanical aids to daily living -----
3. now sharing activity with another person -----

Strategy Use- IV (code 0/1)

- Stopped (dropped) activity (code 0)
- Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below)

1. Compensatory strategy to facilitate banking/ bill paying: use of banking machines (explicitly mentioned as way of avoiding bank lines, easier); use of automated withdrawals; use of phone service to pay bills

2. Improvement

3. Explicit mention that now uses help from family/friend/formal services for investments and/or taxes (change from past)

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)/
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties (code 0/1 for each item below):

Category 1: physical -----

Category 2: cognitive -----

Category 3: emotional / motivational -----

Category 4: other -----

V- Medication Management

Theme 1: Activity (presence/ absence in past and present)

(only code 5 or 6)

Group 5: past not asked/ doesn't take medication now

Group 6: past not asked/ does take medication now

Theme 2

Change Variable V

(missing for medication management activity)

Global Change Type Variable V (only code one below):

1. Has stopped doing activity now
2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level)
3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category
4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -V

1. now using human help -----
2. now using physical/mechanical aids to daily living -----
3. now sharing activity with another person -----

Strategy Use- V

Does activity:

- No reported use of "strategy" (code 0)
- Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below)

1. Routine (e.g., cognitive strategies: keeps medication bottles in sight, uses ways to know that medication has been taken)
2. Prepares in advance pill intake for the day or the week (with pill bottles or pill reminder box)
3. Explicit mention of help from another person

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1: physical -----

Category 2: cognitive -----

Category 3: emotional/motivational -----

Category 4: other -----

Vla- Visiting Family and FriendsTheme 1: Activity (presence/ absence in past and present)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4 : Did activity in past/ Does activity now

Theme 2Change Variable VIa (code 0/1):

No Change (code 0) -----

Change (code 1) -----

e.g. use of strategy, different way of doing reported by subject

Global Change Type Variable VIa (only code one of below) :

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -VIa (code 0/1 for each item)

1. now using human help

2. now using physical/mechanical aids to daily living

3. now sharing activity with another person

Strategy Use- VIa (code 0/1)

-Stopped visiting both friends AND family/ stopped visiting friends OR family (code 0)

-Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below)

1. Restricts visiting periods (decrease in frequency); includes dropping friends or family and keeping one of them only

2. Visits more (increase in frequency)

3. Going out with friends (instead of visiting at friends' homes)

4. Explicit mention of help from another person

Theme 3Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)

2. Stopped because of internal constraints (loss-based)

3. Now doing activity with no difficulties

4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1 : physical -----

Category 2 : cognitive -----

Category 3 : emotional/ motivational -----

Category 4 : other -----

VIb- Entertaining Family and FriendsTheme 1: Activity (presence/ absence in past and present)Discontinuity:

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity:

Group 3: Did not do activity in past/ does not do activity now

Group 4 : Did activity in past/ does activity now

Theme 2Change Variable- VIb (code 0/1):

No change (code 0) -----

Change (code 1) -----

e.g. use of strategy, different way of doing reported by subject

Global Change Type Variable- VIb (only code one of below) :

1. Has stopped doing activity now
2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity
3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category
4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -VIb (code 0/1 for each item)

1. now using human help -----
2. now using physical/mechanical aids to daily living -----
3. now sharing activity with another person -----

Strategy Use- VIb (code 0/1)

-Stopped entertaining friends AND family/ Stopped entertaining friends OR family (code 0)

-Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Change in way of entertaining: keeps it simple
2. Restricts entertaining periods/ decrease in frequency
3. Entertains more now than in past (increase)
4. Going out with friends instead of formal entertaining at home
5. Takes family to restaurant instead of formal entertaining at home
6. Explicit mention of help from another person

Theme 3

Difficulties reported:

1. Stopped by choice (or spousal-related)

2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1 : physical (e.g. too tiring, too much of an effort) -----

Category 2 : cognitive -----

Category 3 : emotional/ motivational -----

Category 4 : other -----

VIII- Physical Activities

Theme 1: Activity (presence/ absence in past and present)

(Only code one of six possibilities)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4: Did activity in past/ does activity now

Theme 2

Change Variable VIII (0/1 code):

No Change (code 0) -----

Change (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable VIII (only code one of below):

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -VIII (code 0/1 for each)

1. now using human help -----
2. now using physical/mechanical aids to daily living -----
3. now sharing activity with another person -----

Strategy Use- VIII

- Stopped (dropped) activity (code 0)
- Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Same intensity level of activities; change in number of activities reported doing
 - 1.i- Same intensity level of activities; decrease in number of activities (highest intensity activity remains from past to present)
 - 1.ii- Same intensity level of activities; increase in number of activities (same intensity for activities in past and for activities in present)
2. Decrease in intensity level of activities; change in number of activities reported doing
 - 2.i- Decrease in intensity level of activities ; decrease in number of activities (present activities less intense than in past + present activities are less in number)
 - 2.ii- Decrease in intensity level of activities ; increase in number of activities (present activities are more numerous + are less intense than in past)
 - 2.iii- Decrease in intensity level of activities ; same number of activities (present activities are less intense than in past, but same in number)
 - 2.iv- Doing same activities, but less intensely (decrease in intensity)
3. Increase in intensity level of activities; change in number of activities reported doing
 - 3i- Increase in intensity level of activities (present activity is higher intensity): decrease in number of activities
 - 3ii- Increase in intensity level of activities (present activity is higher intensity): increase in number of activities
 - 3iii- Increase in intensity level of activities (one present activity is higher in intensity); same number of activities
4. Past no physical activities; now active (i.e. increase)

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties

4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1 : physical -----

i- general (fatigue, slowing down, lack of strength) -----

ii- specific body (functional) problems -----

Category 2 : cognitive -----

Category 3 : emotional/ motivational -----

Category 4 : other -----

IX-Crafts, Hobbies, and Creative Activities

Theme 1: Activity (presence/ absence in past and present)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4: Did activity in past/ does activity now

Theme 2

Change Variable- IX (code 0/1):

No Change (code 0) -----

Change (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable- IX (only code one of below) :

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g.. number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category; can involve some change in level of involvement

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -IX (code 0/1 for each)

1. now using human help -----
2. now using physical/mechanical aids to daily living -----
3. now sharing activity with another person -----

Strategy Use- IX (code 0/1)

- Stopped (dropped) activity (code 0)
- Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Doing same activities now, but change in frequency/ or standards of performance
 - 1.i- increase in frequency/ increase in standards of performance
 - 1.ii- decrease in frequency/ decrease in standards of performance
2. Dropped some of past activities, but kept some of them now (decrease)
3. Dropped some/all past activities (or not fully dropped but decrease from past), but does new activities now (substitution-undetermined level of involvement)
4. Dropped some/all past activities (or not fully dropped but decrease from past), but does new activities now (substitution-increase in level of involvement)
5. Dropped some/all past activities (or not fully dropped but decrease from past), but does new activities now (substitution-decrease in level of involvement)
6. Kept all past activities (at same level of involvement), and does some new activities too (increase)
7. Past no hobbies/crafts/creative activities, but now does activity (increase)

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

- Category 1: physical -----
- Category 2: cognitive -----
- Category 3: emotional/ motivational -----
- Category 4: other -----

X- Organizations

Theme 1: Activity (presence/ absence in past and present)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4: Did activity in past/ does activity now

Theme 2**Change Variable X** (code 0/1):

No change (code 0) -----

Change (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable X (code one of below) :

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category; can involve some change in level of involvement

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -X (code 0/1 for each)

1. now using human help -----

2. now using physical/mechanical aids to daily living -----

3. now sharing activity with another person -----

Strategy Use- X

-Stopped (dropped) activity (code 0)

-Use of « strategy » (code 1)

Strategy Types: (code 0/1 for each listed below):

1. Involved in same organizations (or same type) now, but change in frequency/ or level of involvement

1.i- increase in frequency/ increase in level of involvement

1.ii- decrease in frequency/ decrease in level of involvement

2. Dropped some past organizations, but kept some of them now (decrease)
3. Dropped some/all past organizations (or not fully dropped but decrease from past), but involved in new organizations now (substitution-undetermined level of involvement)
4. Dropped some/all past organizations (or not fully dropped but decrease from past), but involved in new organizations now (substitution-increase in level of involvement)
5. Dropped some/all past organizations (or not fully dropped but decrease from past), but involved in new organizations now (substitution-decrease in level of involvement)
6. Kept all past organizations (at same level of involvement), and also involved in different organizations now (increase)
7. Past not involved in organizations, now involved (increase)

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

Category 1: physical -----

Category 2: cognitive -----

Category 3: emotional/motivational -----

Category 4: other -----

XI- Volunteering

Theme 1: Activity (presence/ absence in past and present)

Discontinuity

Group 1: Did activity in past/ stopped doing activity now

Group 2: Did not do activity in past/ does activity now

Continuity

Group 3: Did not do activity in past/ does not do activity now

Group 4: Did activity in past/ does activity now

Theme 2

Change Variable XI (code 0/1):

No change (code 0) -----

Change (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable XI (only code one of below) :

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity

3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category; can involve some change in level of involvement

4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable -XI (code 0/1 for each)

1. now using human help -----

2. now using physical/mechanical aids to daily living -----

3. now sharing activity with another person -----

Strategy Use- XI (specific to each activity)

-Stopped (dropped) activity (code 0)

-Use of « strategy » (code 1)

Strategy Types- XI: (code 0/1 for each listed below):

1. Involved in same volunteer activities (or same type), but change in frequency now/level of involvement

1.i- increase in frequency/level of involvement

1.ii- decrease in frequency/level of involvement

2. Dropped some past volunteer activities, but kept some now (decrease)

3. Dropped some/all past volunteer activities (or not fully dropped but decrease from past), but now involved in different volunteer activities (substitution-undetermined level of involvement)

4. Dropped some/all past volunteer activities (or not fully dropped but decrease from past), but now involved in different volunteer activities (substitution-increase in level of involvement)

5. Dropped some/all past volunteer activities (or not fully dropped but decrease from past), but now involved in different volunteer activities (substitution-decrease in level of involvement)

6. Kept all past volunteer activities (at same level of involvement), but also involved in new ones now (increase)
7. Past not involved in volunteering; now volunteers (increase)

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

- Category 1: physical -----
 Category 2: cognitive -----
 Category 3: emotional / motivational-----
 Category 4: other -----

XII- Travelling

Theme 1: Activity (presence/ absence in past and present)

Discontinuity:

- Group 1: Did activity in past/ stopped doing activity now -----
 Group 2: Did not do activity in past/ does activity now

Continuity:

- Group 3: Did not do activity in past/ does not do activity now
 Group 4 : Did activity in past/ does activity now -----

Theme 2

Change Variable XII (code 0/1):

No change (code 0) -----

Change (code 1) -----

e.g. use of strategy; different way of doing reported by subject

Global Change Type Variable- XII (only code one of below):

1. Has stopped doing activity now

2. Has modified way of doing activity now to reduce workload / has decreased activity (e.g., number, intensity, frequency, performance level); includes those who “dropped some of past types of activities, but kept some now”; includes individuals using external help to do activity
3. Mixed strategy, i.e. has dropped some/all past types of activities in this activity category, but has substituted some/all past types for some different types of activities in this activity category
4. Has made positive change in activity (e.g., number, intensity, frequency, performance level)

Using External Help Variable –XII (code 0/1 for each)

1. now using human help -----
2. now using physical/mechanical aids to daily living -----
3. now sharing activity with another person -----

Strategy Use- XII (code 0/1)

- Stopped (dropped) activity (code 0)
- Use of « strategy » (code 1)

Strategy Types (code 0/1 for each listed below):

1. Travels with tour groups now
2. Modified travelling conditions (i.e. changes in mode of transportation/ ways of travelling)
3. Modified travelling habits
4. Modified type of trip/ destination (e.g. needs comfort, less moving around)
5. Stays “more locally” (but still travels) due to constraints (decrease)
6. Stays locally now- due to choice (decrease)
7. Trips now limited to family visitations (decrease in amount of recreational travelling)
8. Increase in travelling

Theme 3

Difficulties reported (code one of below only):

1. Stopped by choice (or spousal-related)
2. Stopped because of internal constraints (loss-based)
3. Now doing activity with no difficulties
4. Now doing activity with difficulties (includes financial, limited by spouse)

Nature of self-reported difficulties:

- Category 1: physical -----
- Category 2: cognitive -----
- Category 3: emotional/ motivational -----
- Category 4: externally-based reasons -----