

Developmental Changes in Personal Goal Orientation From Young to Late Adulthood: From Striving for Gains to Maintenance and Prevention of Losses

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Using a multimethod approach, the authors conducted 4 studies to test life span hypotheses about goal orientations across adulthood. Confirming expectations, in Studies 1 and 2 younger adults reported a primary growth orientation in their goals, whereas older adults reported a stronger orientation toward maintenance and loss prevention. Orientation toward prevention of loss correlated negatively with well-being in younger adults. In older adults, orientation toward maintenance was positively associated with well-being. Studies 3 and 4 extend findings of a self-reported shift in goal orientation to the level of behavioral choice involving cognitive and physical fitness goals. Studies 3 and 4 also examine the role of expected resource demands. The shift in goal orientation is discussed as an adaptive mechanism to manage changing opportunities and constraints across adulthood.

Keywords: life span development, motivation, goal orientation, approach–avoidance, resources

What people want in life and how they go about attaining their goals is one of the forces driving development across the life span (Baltes & Baltes, 1990; Brandstädter, 1999; Heckhausen, 1999). Within biological, personal, and social constraints—and in interaction with them—people’s personal goals shape who they become and what behaviors and environments they select and offer people a frame for evaluating how well they are doing (Freund & Riediger, 2006). The purpose of this research is to embed an action-theoretical perspective in research on personal goals into a life span theoretical framework considering age-related changes in various domains of functioning (e.g., physical and cognitive functions) across adulthood using the theoretical framework of selection, optimization, and compensation (SOC; Baltes, 1997; Freund & Baltes, 2000; Staudinger & Lindenberger, 2003).

In the context of life span developmental theory, two features are most relevant for the period of adulthood and aging. First, life span psychology holds that lifelong development comprises both gains and losses in all phases of life. Second, it assumes that during the second half of life, because of an overall age-related decline in biological and cognitive resources, there is a shift in the proportion of gains to losses toward a less positive balance (Baltes, 1987, 1997; Labouvie-Vief, 1981). Age-related changes in cognitive and physical functioning are examples of these increasingly negative changes with advancing age (Baltes & Smith, 2003, 2004; Cleary, Zaborski, & Ayanian, 2004; Schaie, 2005).

The SOC model (Baltes & Baltes, 1990; Freund & Baltes, 2000) proposes that successful management of a shifting balance of internal and external resources needs to take into account processes geared at maximizing growth and gains and processes directed at minimizing losses. Growth-related processes entail the development, delineation, and commitment to new goals aimed at achieving higher levels of functioning (i.e., *elective selection*) as well as the pursuit of these very goals through the acquisition, practice, and refinement of goal-relevant skills and resources (i.e., *optimization*). Loss-related processes entail adjusting one’s goals in response to losses in goal-relevant resources (i.e., *loss-based selection*) as well as counteracting impeding or actual losses by investing remaining resources into maintaining or regaining functioning (i.e., *compensation*). According to the SOC model, successful development is characterized by flexibly responding to available resources by focusing on the maximization of growth and gains or the minimization of losses across the life span.

In addition to varieties of positive (gain) and negative (loss) changes, lifelong development involves periods of constancy or stabilization. Maintenance and stability are characterized by no change or alteration in levels of functioning. Under these assump-

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tions, development across the life span can be described as multidirectional (Baltes, 1987, 1997; Brandtstädter & Wentura, 1995; Labouvie-Vief, 1981): It can be directed toward growth, maintenance of functional levels, and prevention of losses in the face of challenge and loss. These constitute the three general functions of development (Baltes, Lindenberger, & Staudinger, 1998; Staudinger, Marsiske, & Baltes, 1995).

Typically, young adulthood provides levels of biological plasticity, grants social environments that offer maximum access to resources, and favors acquisition of skills and improvement of functions. Accordingly, the primary goal focus in younger adults is expected to be maximizing growth. With advancing age, however, personal goals are expected to shift toward an increasingly stronger focus on maintenance and prevention of loss (Baltes, 1987; Brandtstädter, 1986; Freund & Baltes, 2000; Heckhausen, Dixon, & Baltes, 1989; Staudinger et al., 1995). The increasing salience of resource limitations in older age makes it more and more necessary, and also more beneficial, to invest resources into maintaining one's functional level and avoiding losses instead of primarily striving for gains.

The central hypothesis of the present work is that changes in developmental opportunities and constraints across adulthood (Baltes, 1997) are reflected in personal goal orientation—that is, the orientation of a goal toward growth and gains (e.g., “I want to improve my physical fitness”), maintenance (e.g., “I want to stay physically fit”), or prevention of loss (e.g., “I do not want my physical fitness to deteriorate”). Moreover, we posit that the proposed shift from a primary goal orientation toward growth in young adulthood to a stronger orientation toward maintenance and loss prevention in middle and older adulthood is associated with positive outcomes because it helps people manage the changing balance between gains and losses.

Research on motivational orientation offers further insights into the dynamic of gains and losses. The differentiation of goal orientation toward growth and gains or maintenance and prevention of loss roughly translates into the motivational constructs of approach and avoidance motivation (Freund & Ebner, 2005). According to the basic hedonic principle (Davidson, 1993; Elliot, 1999; Gray, 1990), all living beings are motivated to approach pleasure—that is, appetitive, desired end states (approach goals)—and avoid pain—that is, aversive, undesired end states (avoidance goals; e.g., Elliot & Sheldon, 1997; Emmons, 1996; Higgins, 1997). An example of an approach goal is, “I want to become healthy,” whereas the equivalent avoidance goal is, “I do not want to be sick.” Life span psychology introduces a third dimension of goal orientation, namely the dimension of maintenance of functioning or goal-related resources. So far, this third dimension is a theoretical assumption that has not been put to empirical test. *Growth orientation* refers to striving for gains and positive, desired change; *loss prevention orientation* refers to avoiding negative, undesired change; and *maintenance orientation* refers to processes that ensure stability of functional levels (e.g., “I want to stay healthy”). Whereas growth and prevention of loss denote goals with a focus on (positive vs. negative) change, maintenance orientation goals aim at stability.

The literature on approach–avoidance motivation suggests that in early adulthood, goals are predominantly oriented toward gains (Elliot, Sheldon, & Church, 1997; Emmons, 1996). Moreover, in young adulthood, approach motivation is associated with persistence in goal pursuit, task performance, and subjective well-being

(Coats, Janoff-Bulman, & Alpert, 1996; Freund, 2006; Friedman & Förster, 2001; Roney, Higgins, & Shah, 1995). To date, only very few studies have addressed the question of age-related differences in goal orientation, yielding partly supporting and partly inconsistent results (for overviews, see Ebner, 2005; Freund & Ebner, 2005). Heckhausen (1997), for instance, found that, compared with younger and middle-aged adults, older adults reported more goals in life domains reflecting loss avoidance. Ogilvie, Rose, and Heppen (2001) showed that older adults' goals more often reflected maintenance orientation than did the goals of middle-aged adults or adolescents (as rated by external raters). In Ogilvie et al.'s study, however, an orientation toward acquiring gains was most frequent in all age groups. Moreover, Ogilvie et al. did not find differences between the age groups related to prevention or compensation of losses. This finding is consistent with Freund and Baltes's (1998, 2002) studies using self-report measures of SOC. All of these studies, however, exclusively used self-report measures. In addition, the researchers did not assess goal orientation explicitly but relied on external ratings of goal orientation.

To our knowledge, no studies have explicitly assessed how adults of different ages frame their personal goals regarding growth, maintenance, and prevention of loss and thus have assessed individuals' subjective representations of goal orientation rather than external ratings of goal orientations. Therefore, one aim of our studies (Studies 1 and 2) is to assess personal goal orientation across adulthood by having participants rate their goals along the three dimensions of goal orientation and, in doing so, trying to assess subjective representations of goal orientation and to solve the inconsistencies on age-related differences found in the literature. Moreover, Studies 1 and 2 also address age differences in the relation of goal orientation to indicators of well-being, a link that has not been investigated in prior research. Complementing self-report measures, Studies 3 and 4 use behavioral measures of goal selection, allowing generalization of the findings across different assessment measures. Finally, Studies 3 and 4 also directly address the impact of expected resource demands on goal orientation. Our expectation was that when growth and maintenance or prevention of loss goals were described as equally resource demanding (i.e., requiring equal amounts of energy), younger adults would differ from older adults in their primary goal orientation and show a stronger goal orientation toward growth. Making participants explicitly aware of threatening resource losses with respect to specific goal-relevant resources by describing growth goals as more resource demanding than goals directed at maintenance or loss prevention, however, would influence goal orientation in favor of maintenance and loss regulation. Because of a departure from the typical expectation of younger adults, we hypothesized this effect to be especially strong in young adulthood.

Study 1

Study 1 uses a three-dimensional conceptualization of personal goal orientation comprising the dimensions of growth, maintenance, and prevention of loss. The study consists of two measurement points (Time 1 and Time 2), approximately 2 weeks apart ($M = 14.4$ days, $SD = 2.5$), primarily to assess the short-term temporal stability of personal goal orientation.

Method

Participants

To obtain a heterogeneous sample stratified by age, gender, and educational status, a survey research institute sampled 49 younger (18–26 years; $M = 22.3$, $SD = 2.0$), 43 middle-aged (40–59 years; $M = 45.6$, $SD = 4.2$), and 41 older adults (65–84 years; $M = 69.7$, $SD = 5.3$).¹ Forty-nine percent of the younger, 47% of the middle-aged, and 43% of the older sample had reached a primary or lower secondary level of education (comparable to completion of high school or junior high school, respectively). Fifty-one percent of the younger, 53% of the middle-aged, and 66% of the older adults had reached a higher secondary level of education (comparable to 2 years of college or more).

Cognitive performance was measured with two performance-based tests (Spot-a-Word; Lehrl, 1977; and Digit-Symbol Substitution; Wechsler, 1982) and with a single item on subjective cognitive functioning. Physical performance was measured via grip strength (Steinhagen-Thiessen & Borchelt, 1993) and subjective health (Bullinger & Kirchberger, 1998). With respect to age-group differences in cognitive and physical characteristics, the present sample was comparable to those reported in the literature (e.g., Li et al., 2004). Both performance-based cognitive tests revealed significant age-group differences demonstrating the dissociation between decline in fluid mechanics and maintenance of crystallized pragmatics of intelligence (Baltes, 1997).²

Procedure and Measures

Participants were tested in groups of varying size (with 2–18 participants). In an introduction at the beginning of the session, participants were informed about the testing procedure before signing a consent form. After participants filled out the questionnaires, three behavioral measures were applied: Spot-a-Word, Digit-Symbol Substitution, and grip strength. Each session (Time 1 as well as Time 2) typically took between 60 and 90 min. At the end of Time 2, all participants were debriefed and reimbursed with €30 (approximately \$25).

Generation of personal goals. At the beginning of Time 1, participants generated a list of their six most important personal goals in a procedure modified after Little (1983). To facilitate goal generation, we included a short explanation of the concept of personal goals, which included sample goal domains and goals. Participants were instructed to list two goals in any life domain they wished (“Please write down what you wish for personally, what you would like, and what you would not like at present and in the following weeks, months, and years”), two goals relating to the domain of cognitive functioning (“in the domain of thinking and cognition”), and two goals relating to physical functioning (“in the domain of physical activity and fitness”).

There were two reasons for asking participants to indicate their cognitive and physical functioning goals in addition to freely generated goals. First, this allowed the investigation of domains that show prototypical age-related changes. Both domains are characterized by age-associated decline but offer potentials for gains through exercise and training into older age (Baltes & Smith, 2003). Second, redefining specific goal contexts allowed us to control for age-related changes in importance ratings of specific domains (Nurmi, 1992) and their influence on age-group differences in personal goal orientation. The goal questionnaire always asked for goals referring to self-selected goal domains first, followed by cognitive or physical functioning goals. The order in which cognitive and physical goals were listed was counterbalanced.

Personal goal orientation in self-generated goals. Respondents’ ratings were used to assess personal goal orientation. Participants rated each of their six self-generated goals separately on each of the dimensions of growth (“With this goal, I want to improve something or achieve something new”), maintenance (“With this goal, I want to maintain something”), and prevention of loss (“With this goal, I want to prevent a loss”) using an 8-point rating scale. The same scales were used at Time 1 and Time 2.

Aggregating the ratings of the respective dimensions of goal orientation, we computed separate mean scores as indicators of a person’s average goal orientation toward growth, maintenance, and prevention of loss. For each component, we calculated general indicators of personal goal orientation across all six goals as well as domain-specific indicators. Cronbach’s alpha ($.71 \leq \alpha_{\text{Time 1}} \leq .78$ and $.78 \leq \alpha_{\text{Time 2}} \leq .85$) and test-retest stabilities ($.71 \leq r_{\text{Time 1-Time 2}} \leq .76$) were good for goal orientation across the six self-generated goals and were medium to high for goal orientation relating to freely chosen life domains and cognitive and physical functioning ($.41 \leq \alpha_{\text{Time 1}} \leq .77$, $.55 \leq \alpha_{\text{Time 2}} \leq .81$, and $.55 \leq r_{\text{Time 1-Time 2}} \leq .70$, respectively).

General subjective well-being. To cover different aspects of the multifaceted construct of subjective well-being, at both measurement points we had participants respond to four scales assessing different facets of well-being: the Ryff Scale (positive psychological functioning; Ryff & Keyes, 1995), the Life Evaluation Scale (cognitive, subjective life satisfaction; Ferring, Filipp, & Schmidt, 1996), the Positive and Negative Affect Schedule (positive and negative reflected emotional well-being; Watson, Clark, & Tellegen, 1988), and the General Depression Scale (general depressive affect, reflected; Hautzinger & Bailer, 1993). Exploratory factor analyses using principal-components extraction with oblimin direct rotation for the total sample and separately for the younger, middle-aged, and older subsamples consistently yielded solutions with one factor (eigenvalues > 1) accounting for 71.7% of the variance. Factor loadings ranged from .91 to .77. Thus, one single factor unambiguously reflected general subjective well-being in the total sample and in the three subsamples. Cronbach’s alpha ($\alpha_{\text{Time 1}} = .89$, $\alpha_{\text{Time 2}} = .90$) and test-retest stabilities ($r_{\text{Time 1-Time 2}} = .93$) of the composite score were highly satisfactory.

Control variables. We assessed the tendency to respond in socially desirable ways (Social Desirability Scale 17; Stöber, 1999) and the “Big Five” personality traits of Neuroticism, Extraversion, Openness to New Experiences, Agreeableness, and Conscientiousness (NEO Five-Factor Inventory; Costa & McCrae, 1992). Cronbach’s alpha was satisfactory for social desirability ($\alpha = .71$), Neuroticism ($\alpha = .80$), and Conscientiousness ($\alpha = .71$) but low for Extraversion ($\alpha = .54$), Openness ($\alpha = .23$), and Agreeableness ($\alpha = .61$).

Results

The results are presented in two parts. First, we address the question of age-group differences regarding orientation toward growth, maintenance, and prevention of loss in younger, middle-aged, and older adults. Second, we report the findings on age-differential associations of personal goal orientation and indicators of subjective well-being.

¹ After Time 1, for health reasons, 1 older man and 2 older women and, for no indicated reason, 1 middle-aged woman dropped out from the originally recruited sample.

² The three age groups differed in their perceptual-motor speed performance, $F(2, 132) = 28.63$, $p < .05$, $\eta^2 = .31$. Younger adults ($M = 56.82$, $SD = 9.13$) scored higher than middle-aged ($M = 49.84$, $SD = 8.70$) and older adults ($M = 42.41$, $SD = 9.14$). In addition, younger adults ($M = 21.91$, $SD = 4.04$) performed worse in the Spot-a-Word task, which measured knowledge, than middle-aged ($M = 26.93$, $SD = 3.67$) and older adults ($M = 27.90$, $SD = 3.29$), $F(2, 132) = 34.7$, $p < .05$, $\eta^2 = .35$. The three age groups did not differ in their self-indicated cognitive functioning, $F(2, 132) = 0.63$, ns , $\eta^2 = .01$, $1 - \beta = .15$, nor in subjective health, $F(2, 132) = 0.36$, ns , $\eta^2 = .01$, $1 - \beta = .11$. Finally, younger ($M = 27.17$, $SD = 8.47$) and middle-aged adults ($M = 28.16$, $SD = 9.50$) showed higher scores in grip strength than older adults ($M = 19.93$, $SD = 8.54$), $F(2, 131) = 10.89$, $p < .05$, $\eta^2 = .14$.

Age-Group Differences in Personal Goal Orientation of Self-Generated Goals

Results of analyses of variance (ANOVAs) supported our hypotheses regarding age differences in personal goal orientation. A 3 (age group: young vs. middle aged vs. older) \times 3 (goal orientation: growth vs. maintenance vs. prevention of loss) \times 3 (goal domain: self-generated vs. cognitive vs. physical) repeated measures ANOVA with goal orientation and goal domain as the two within-subject factors revealed significant main effects for age group, $F(2, 129) = 6.61$, $MSE = 70.17$, $p < .05$, $\eta^2 = .09$; goal orientation (Wilks's $\lambda = .80$), $F(2, 128) = 15.99$, $p < .05$, $\eta^2 = .20$; and goal domain (Wilks's $\lambda = .94$), $F(2, 128) = 4.05$, $p < .05$, $\eta^2 = .06$. The Goal Orientation \times Age Group interaction (Wilks's $\lambda = .83$), $F(4, 256) = 6.20$, $p < .05$, $\eta^2 = .09$, and the Goal Domain \times Goal Orientation interaction (Wilks's $\lambda = .84$), $F(4, 126) = 6.05$, $p < .05$, $\eta^2 = .16$, proved significant. Finally, the analysis yielded a significant Goal Domain \times Goal Orientation \times Age Group three-way interaction (Wilks's $\lambda = .80$), $F(8, 252) = 3.66$, $p < .05$, $\eta^2 = .10$. No other interactions were significant. To follow up the two-way Goal Orientation \times Age Group interaction and the three-way Goal Domain \times Goal Orientation \times Age Group interaction, we ran 3 (age group) \times 3 (goal orientation) multivariate ANOVAs, followed by univariate ANOVAs, separately across the two goals referring to self-generated domains, the two cognitive functioning goals, and the two physical functioning goals.

The results from these analyses are summarized in Figure 1 and Table 1. Overall, the results support the hypotheses regarding age-associated differences in personal goal orientation. As Figure 1 graphically presents, across all self-generated goals, the primary goal orientation of younger adults was toward growth, whereas older adults reported a stronger goal orientation toward maintenance and loss prevention than did younger adults. Middle-aged adults' goal orientation toward maintenance and loss prevention was between younger and older adults' orientations. Furthermore, as expected, across the two goals referring to the self-generated domains as well as in the cognitive domain, older adults reported a significantly lower goal orientation toward growth than younger and middle-aged adults, and both middle-aged and older

adults reported a stronger orientation toward maintenance than younger adults. Unexpectedly, there were no age-group differences in the personal goal orientation of physical functioning goals (see Table 1).

To control for differences in the Big Five and the tendency to respond in socially desirable ways, we used these variables as covariates in multivariate analyses of covariance (MANCOVAs) separately across the two goals referring to self-generated domains, the two cognitive functioning goals, and the two physical functioning goals. In all three control analyses, the effect of age on goal orientation remained significant: For two goals referring to self-generated domains (Wilks's $\lambda = .70$), $F(6, 244) = 7.86$, $p < .05$, $\eta^2 = .16$; for the two cognitive functioning goals (Wilks's $\lambda = .86$), $F(6, 244) = 3.29$, $p < .05$, $\eta^2 = .08$; and for two physical functioning goals (Wilks's $\lambda = .89$), $F(6, 242) = 2.41$, $p < .05$, $\eta^2 = .06$. The covariates were not significant, with the exception of Extraversion in the analysis across two goals referring to self-generated domains (Wilks's $\lambda = .93$), $F(3, 122) = 3.06$, $p < .05$, $\eta^2 = .07$. This result indicates that the age-related differences in personal goal orientation remained largely stable after we controlled for the influence of the Big Five personality traits and the tendency to respond in socially desirable ways.

Age-Differential Associations Between Personal Goal Orientation and Subjective Well-Being

As predicted, there were age-differential correlations between personal goal orientation and subjective well-being (see Figure 2). In particular, the age groups differed in their associations between subjective well-being and goal orientation toward maintenance ($r_{\text{younger}} = -.19$, ns ; $r_{\text{middle aged}} = .22$, ns ; and $r_{\text{older}} = .30$, $p < .05$; younger vs. middle aged, $z = -1.92$; younger vs. older, $z = -2.29$, $p < .05$) and toward prevention of loss ($r_{\text{younger}} = -.37$, $p < .05$; $r_{\text{middle aged}} = -.10$, ns ; and $r_{\text{older}} = -.01$, ns ; younger vs. older, $z = -1.73$, $p < .05$). That is, younger adults' goal orientation toward loss prevention was negatively related to subjective well-being 2 weeks later. In contrast, for middle-aged and older adults, no such negative association existed. In fact, older adults who reported a stronger focus on maintenance also reported higher

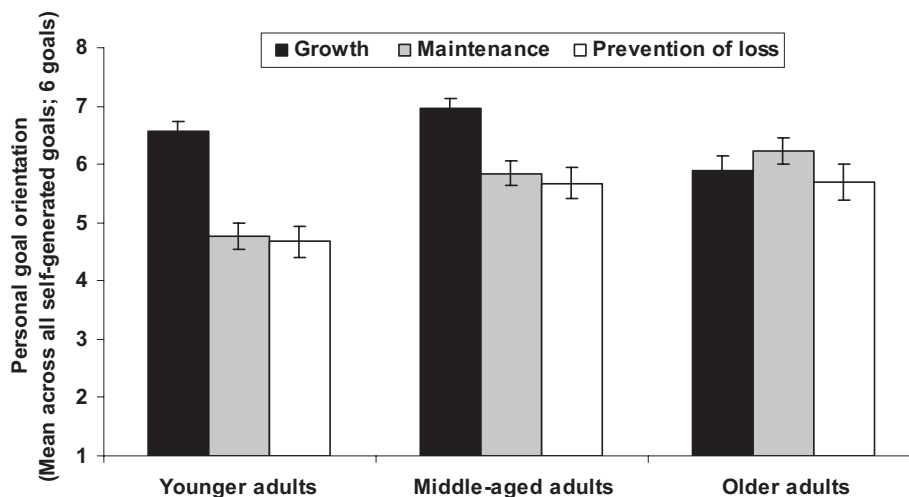


Figure 1. Study 1: Age-group differences in personal goal orientation across all self-generated goals (six goals; Time 1). Error bars represent two standard errors.

Table 1
Study 1: Age-Group Differences in Personal Goal Orientation of Self-Generated Goals (Time 1): Multi- and Univariate Follow-Up Analyses

Goal orientation ^a	<i>F</i> ^b	<i>MSE</i>	η^2
Across self-generated domains (two goals)			
Growth	9.63***	19.33	.13
Maintenance	13.27***	54.75	.17
Prevention of loss	4.70*	25.02	.07
	Wilks's $\lambda = .70$, $F(6, 256) = 8.24$, $p < .01$, $\eta^2 = .16$		
Across cognitive domain (two goals)			
Growth	5.08***	12.86	.07
Maintenance	6.30***	22.64	.09
Prevention of loss	4.04	18.73	.06
	Wilks's $\lambda = .84$, $F(6, 256) = 3.96$, $p < .01$, $\eta^2 = .09$		
Across physical domain (two goals)			
Growth			
Maintenance			
Prevention of loss			
	Wilks's $\lambda = .89$, $F(6, 254) = 2.47$, ns , $\eta^2 = .06$, $1 - \beta = .83$		

^a Refers to composite score across self-generated domains (two goals), across cognitive domain (two goals), or across physical domain (two goals), respectively. ^b *F* values had 2, 130 degrees of freedom across self-generated domains and across the cognitive domain; *F* values had 2, 129 degrees of freedom across the physical domain, because one young person did not report any physical functioning goals and was therefore dropped from all respective analyses.

* $p < .05$. *** $p < .017$ (alpha-level adjustment for three repeated analyses).

well-being over the 2-week interval. Contrary to expectations, however, there were no age-differential associations of goal orientation toward growth and general subjective well-being ($r_{\text{younger}} = .09$, ns ; $r_{\text{middle aged}} = .13$, ns ; and $r_{\text{older}} = -.12$, ns). These findings suggest that the age groups differed in their relations between personal goal orientation and subjective well-being.

Discussion

The results of Study 1 confirm our central hypotheses regarding age-related differences in personal goal orientation and the age-differential associations between goal orientation and subjective well-being. Younger adults showed, on average, a stronger orientation toward growth than toward maintenance or prevention of loss. Middle-aged adults showed an increase in goal orientation toward maintenance and prevention of loss but still reported a primary focus on growth. This was not true for older adults. Confirming our predictions, older adults showed a significantly lower orientation toward growth when compared with younger or middle-aged adults. Older adults rated their goals to similar degrees as being oriented toward growth, maintenance, and loss prevention.

These results were robust when we statistically controlled for differences in the tendency to respond in socially desirable ways as well as in the Big Five personality traits. The pattern was replicated across self-generated³ and cognition-related goals. In the domain of physical functioning, however, no age-related differences emerged. One reason for this might be that the older adults in this study were relatively healthy and physically fit. In sum, the findings suggest that they might not yet have experienced many losses with respect to their physical fitness and might have felt that they still had substantial potential for gains and growth.

Study 1 provides the first evidence for age-differential adaptiveness of goal orientation. As expected, there were age-related differences in the associations between personal goal orientation and self-reported well-being. In particular, younger adults' well-being was negatively related to orientation toward the prevention of losses. This was not true for middle-aged and older adults. Older adults actually profited from a maintenance orientation. This finding qualifies previous research on approach and avoidance goals that was conducted exclusively with younger adults. The results of Study 1 suggest that, under certain circumstances, such as losses in goal-relevant resources, wanting to maintain functioning or to prevent losses can be beneficial. Future research needs to specify situations in which a maintenance and loss prevention goal orientation is beneficial and to uncover how personal goal orientation contributes to well-being. For instance, it might be that setting goals in accordance with available resources increases goal achievement and satisfaction with goals. As one step in this direction, Study 2 includes a more specific measure of satisfaction with goal attainment rather than general subjective well-being.

The newly developed self-report measure of personal goal orientation showed good test-retest stabilities over the 2-week time

³ To extend the finding that age-related changes in personal goal orientation exist in the two most important, freely generated goals, in pilot work, in which we tested various methods to assess self-reported goal orientation, we asked 26 younger and 26 older adults to list all of their personal goals referring to any freely chosen goal domain (open-ended assessment of personal goals) and, in a next step, to rate their goal orientation for each of their personal goals. Results supported the finding of a primary goal orientation toward growth in younger adults and a stronger orientation toward maintenance and prevention of loss in older adults across all self-generated goals.

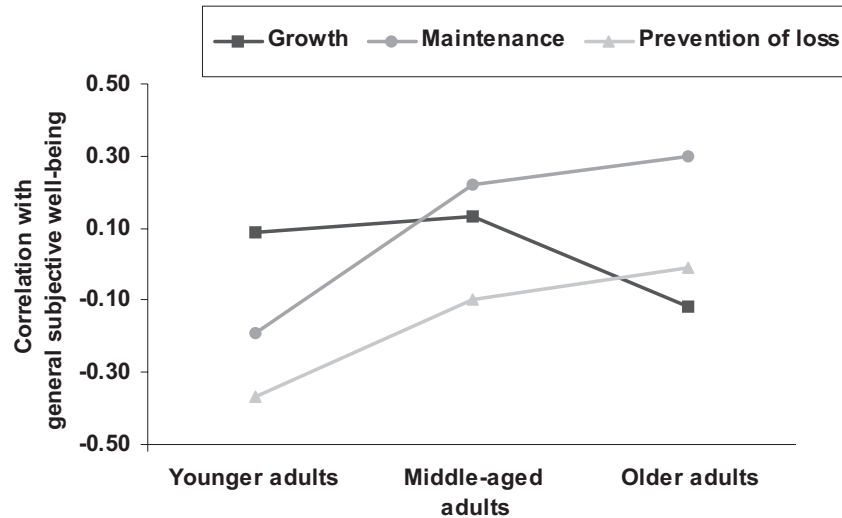


Figure 2. Study 1: Age-differential pattern of the associations between personal goal orientation and general subjective well-being (bivariate Pearson correlations).

interval for all three dimensions of goal orientation across all self-generated goals in all age groups. The high temporal stability suggests that the concept was reliably measured in the present context and was stable over at least a short period of time. As reliability of our measure of personal goal orientation was satisfactory, the next question is whether the distinction of the three dimensions was warranted. In the literature, approaching gains and avoiding losses are typically treated as opposites on a single dimension. If this assumption is true, growth and prevention of loss orientations should show a substantial negative association. This was not the case in our data. Post hoc analyses found that the two dimensions were unrelated across all self-generated goals and across younger, middle-aged, and older adults ($r = -.02, ns$). In addition, growth goal orientation did not correlate with goal orientation toward maintenance ($r = -.08, ns$). This is an interesting and important finding because it forces us to reconceptualize goal orientation as a one-dimensional characteristic of personal goals. One goal seems to encompass different facets, some of which are related to gains and others to maintenance or loss prevention.

In contrast to our expectation that maintenance would constitute a third dimension of goal orientation (a theoretically derived assumption that so far has not been tested explicitly), post hoc analyses of Study 1 suggest that maintenance and prevention of loss represent only one dimension. The interrelations between these two dimensions were relatively high ($r = .61, p < .05$), and there were no age-group differences in these correlations. Further supporting this interpretation, exploratory factor analyses using principal-components extraction with oblimin, direct rotation, conducted for the total sample and separately for the three age groups, consistently yielded solutions with two factors (eigenvalues ≥ 1) and small factor correlations ($r_{\text{total}} = -.05$; $r_{\text{younger}} = .14$; $r_{\text{middle aged}} = .00$; $r_{\text{older}} = -.16$), accounting for 87.2% of the variance (younger adults, 86.5%; middle-aged adults, 85.9%; older adults, 85.9%). With factor loadings of at least .86, these two factors unambiguously reflect personal goal orientation toward growth and toward maintenance/prevention of loss in the total sample and in the subsamples. Thus, the theoretical suggestion that there are three dimensions of goal orientation is not supported in this study.

Accordingly, growth goal orientation seems to represent a construct that is largely independent of maintenance and prevention of loss. Maintenance and loss prevention, however, were strongly positively correlated and thus measure partly overlapping aspects of personal goal orientation. Thus, in contrast to our theoretical reasoning, in which we have argued for the triad of growth, maintenance, and prevention of loss, the empirical findings of Study 1 do not suggest that maintenance and prevention of loss are two distinct categories. This implies that, at some level, participants in our study did not differentiate between these two dimensions but possibly saw them as two sides of the same coin: Wanting to maintain one's current level of functioning and not wanting to lose one's current level of functioning (prevention) can both result in a goal that is directed toward remaining at the same level of functioning.

As the correlational and factor-analytic results suggest that maintenance and prevention of loss represent one factor, in Study 2 we collapse these two dimensions into one component. In Study 2 we therefore differentiate growth from maintenance/prevention of loss as the two independent aspects of personal goal orientation. It is, however, necessary to note that our results show that maintenance and prevention of loss did not fully correlate and thus did not exhibit complete overlap. Collapsing them into one dimension also leads to lack of information. Our analyses on age-differential associations between personal goal orientation and subjective well-being, for instance, indicate that maintenance and prevention of loss were differentially related to well-being. One explanation is that maintenance could be seen as the more positive version of loss prevention, which would explain the positive relation between maintenance and general subjective well-being, whereas this positive relation did not exist for prevention of loss. Further investigation of these differential associations in future research should examine the two dimensions separately.

Study 2

Study 2 has three interrelated objectives. One is to explore the use of the two-dimensional, more parsimonious conceptualization

of personal goal orientation. The second is to replicate the general pattern of findings of age-related differences in self-reported goal orientation. Finally, the study aims at the investigation of age-group differences in the associations between goal orientation and goal-specific satisfaction.

Method

In large parts, the methods of Study 2 followed those of Study 1 to ensure comparability. For reasons of parsimony, in Study 2 we focused exclusively on younger and older adults as well as the two specific goal contexts of cognitive and physical functioning.

Participants

A survey research institute recruited a sample stratified by age, sex, and educational status, composed of 48 younger (18–25 years; $M = 20.8$, $SD = 2.0$) and 52 older adults (64–86 years; $M = 72.1$, $SD = 6.0$). Thirty-eight percent of the younger and 48% of the older sample had reached a primary or lower secondary level of education. Sixty-two percent of the younger and 52% of the older adults had reached a higher secondary level of education.

We used the same measures in Study 2 as in Study 1 to assess participants' cognitive and physical functioning. An exception is that in Study 2, for reasons of time, we did not measure objective physical functioning. With respect to cognitive and physical functioning, the present sample did not differ from the younger (Wilks's $\lambda = .96$), $F(4, 92) = 0.56$, ns , $\eta^2 = .04$, $1 - \beta = .31$, and older adults (Wilks's $\lambda = .94$), $F(4, 86) = .56$, ns , $\eta^2 = .07$, $1 - \beta = .44$, assessed in Study 1.

Procedure and Measures

Testing procedures were the same as in Study 1. The sessions typically took between 60 and 90 min. At the end of the session, participants were debriefed and reimbursed with €15 (approximately \$12) for participation in the study.

Generation of personal goals. Participants were asked to generate their four most important personal goals in the cognitive and physical domains (two goals for each domain). The procedure was identical to the one used in Study 1. The order of goal domains was counterbalanced.

Personal goal orientation in self-generated goals. On the basis of the results of Study 1, in Study 2 we conceptualized personal goal orientation as comprising only two components: (a) growth and (b) maintenance/prevention of loss. The questionnaire described growth goal orientation as being directed toward improving functions or trying to achieve something new ("With this goal, I want to improve something or achieve something new"). Goal orientation toward maintenance/prevention of loss was characterized by a focus on maintenance of functioning and prevention of negative outcomes and losses ("With this goal, I want to maintain something or prevent a loss"). Participants evaluated each of their four self-generated goals separately with respect to growth and maintenance/prevention of loss. The order of dimension evaluation was counterbalanced across participants.

In totaling the ratings of the respective dimensions, we aggregated separate mean scores as indicators of goal orientation toward growth and maintenance/prevention of loss. For each component, we computed a general indicator of personal goal orientation across all four goals. In addition, we calculated domain-specific indicators for the two goals relating to cognitive functioning and the two goals relating to physical functioning. Internal consistencies for growth and maintenance/prevention of loss were acceptable across all goal domains ($\alpha = .60$ and $\alpha = .69$, respectively) but low in the cognitive and physical domains ($.31 \leq \alpha \leq .48$).

Goal-specific satisfaction. For each of their four self-generated goals, participants indicated their degree of (a) satisfaction with their attain-

ment and (b) satisfaction with their goal progress. Internal consistencies were satisfactory ($\alpha = .80$ and $\alpha = .68$, respectively).

Control variables. In Study 2 we measured the same two control constructs as in Study 1, namely (a) the tendency to respond in socially desirable ways and (b) the Big Five personality traits. Cronbach's alpha was acceptable for social desirability ($\alpha = .70$), Neuroticism ($\alpha = .69$), and Conscientiousness ($\alpha = .74$) but low for Extraversion ($\alpha = .39$), Openness ($\alpha = .44$), and Agreeableness ($\alpha = .51$).

Results

First, we tested whether the dimensions of personal goal orientation represented two independent goal characteristics. Second, we tested age-related differences in goal orientation using the more parsimonious, two-dimensional operationalization. Finally, we investigated correlations of goal orientation with a goal-specific indicator of satisfaction.

As in Study 1, goal orientations toward growth and maintenance/prevention of loss were not significantly correlated across all self-generated goals ($r = .11$, ns). There were, however, age-group differences in the correlations between growth and maintenance/prevention of loss ($r_{\text{younger}} = .09$ vs. $r_{\text{older}} = .45$; $z = -1.91$, $p < .05$).

Replication of the General Pattern of Age-Group Differences in Personal Goal Orientation

A 2 (age group: young vs. older) \times 2 (goal orientation: growth vs. maintenance/prevention of loss) \times 2 (goal domain: cognitive vs. physical) repeated measures ANOVA with goal orientation and goal domain as the two within-subject factors indicated significant main effects for age group, $F(1, 98) = 15.48$, $MSE = 65.01$, $p < .05$, $\eta^2 = .14$, and goal orientation (Wilks's $\lambda = .89$), $F(1, 98) = 12.66$, $p < .05$, $\eta^2 = .11$. The Goal Orientation \times Age Group interaction (Wilks's $\lambda = .63$), $F(1, 98) = 57.06$, $p < .05$, $\eta^2 = .37$, and the Goal Domain \times Goal Orientation interaction (Wilks's $\lambda = .95$), $F(1, 98) = 5.16$, $p < .05$, $\eta^2 = .05$, proved significant. No other effects were significant. The nonsignificant Goal Domain \times Goal Orientation \times Age Group interaction indicated that the age-group differences in goal orientation did not differ for the domains of cognitive and physical functioning. To follow up the Goal Orientation \times Age Group interaction, we conducted univariate ANOVAs on age-group differences in goal orientation toward growth and maintenance/prevention of loss across all self-reported goals.

In sum, using the parsimonious two-component conceptualization of personal goal orientation in Study 2, we replicated the general pattern of results on age-related differences in self-reported goal orientation manifested in Study 1: Younger adults reported a primary growth orientation, whereas older adults focused more on maintenance/prevention of loss in their personal goals. The findings were even more pronounced in Study 2 than in Study 1. Figure 3 and Table 2 summarize these results.

To test the robustness of the age-group differences in goal orientation, we statistically controlled for differences in the tendency to respond in socially desirable ways and for personality traits in a MANCOVA across all self-generated goals. The effect of age on goal orientation was still significant after we statistically controlled for the rival predictors (Wilks's $\lambda = .72$), $F(2, 91) = 18.05$, $p < .05$, $\eta^2 = .28$. The only significant covariates were Extraversion (Wilks's $\lambda = .93$), $F(2, 91) = 3.61$, $p < .05$, $\eta^2 = .07$, and Openness to New Experiences (Wilks's $\lambda = .91$), $F(2,$

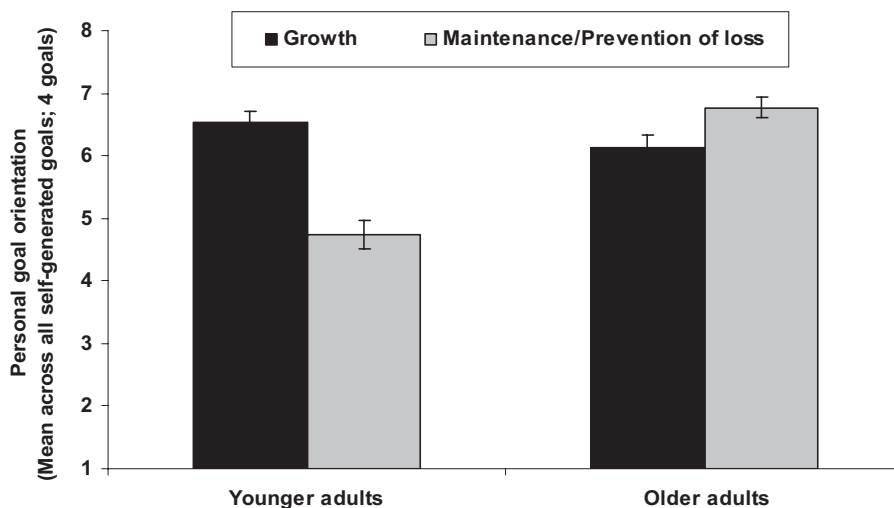


Figure 3. Study 2: Age-group differences in personal goal orientation across all self-generated goals (four goals). Error bars represent two standard errors.

91) = 4.42, $p < .05$, $\eta^2 = .09$. Thus, as in Study 1, the age-related differences in personal goal orientation were largely independent of the influence of the Big Five personality traits and the tendency to respond in socially desirable ways.

Age-Differential Associations Between Goal Orientation and Goal-Specific Satisfaction

Satisfaction with goal attainment was positively related to goal orientation toward growth ($r = .36$, $p < .05$) and toward maintenance/prevention of loss ($r = .32$, $p < .05$). As expected, the relations between satisfaction with goal attainment and goal orientation revealed an age-differential pattern. The significant positive relation with maintenance/prevention of loss was only present in older, not in younger, adults ($r_{\text{younger}} = .19$ vs. $r_{\text{older}} = .63$; $z = -2.66$, $p < .05$). This finding shows that older, as opposed to younger, adults reported higher satisfaction with attaining their goal the stronger their goal orientation was toward maintenance/prevention of loss. Finally, the association between satisfaction with goal progress and maintenance/prevention of loss orientation was positive ($r = .38$, $p < .05$) but did not differ for the two age groups.

Discussion

The results largely confirm life span hypotheses about age-related differences in personal goal orientation and age-differential

associations of goal orientation and satisfaction with goal attainment. First, as expected, in Study 2 we found that older adults reported a stronger focus on maintaining their status quo and preventing losses than did younger adults. Unexpectedly, however, younger and older adults did not differ regarding their orientation toward growth. In contrast to Study 1, Study 2 also demonstrates the expected age-related differences for the domain of physical functioning.

Second, participants reported more satisfaction with goal progress the more they focused on maintenance/prevention of loss. Expected age-group differences emerged in the relation between goal orientation toward maintenance/prevention of loss and satisfaction with goal attainment. The stronger the goal orientation was toward maintenance/prevention of loss, the more satisfied older adults tended to be with their goal attainment. For younger adults, this relation was not significant. In line with Study 1's findings on age-group differences in the associations between goal orientation and well-being, this result supports the hypothesis that in older age it becomes beneficial to focus on maintaining functional levels and counteracting losses.

Similar to Study 1, correlational findings of Study 2 show that growth and maintenance/prevention of loss across all self-generated goals were not significantly interrelated in the total sample. This finding implies that they represent two independent constructs. In contrast to Study 1, however, the age groups differed in this correlation. In particular, for older—but not for younger—adults, the dimensions of growth and maintenance/prevention of loss were positively correlated. This is an interesting finding because it suggests that for older adults, goals are more likely to comprise both growth and maintenance/prevention of loss. This might be the case because maintaining functioning or preventing losses might take on a different meaning for older than for younger adults. For older adults, maintenance might be something positive in the face of threat of decline in many functional domains. This interpretation awaits further examination but is consistent with the finding that maintenance/prevention of loss was positively related to satisfaction with goal attainment (Study 2) and that maintenance

Table 2
Study 2: Age-Group Differences in Personal Goal Orientation Across All Self-Generated Goals: Univariate Follow-Up Analyses

Goal orientation	$F(1, 98)$	MSE	η^2
Across all self-generated goals (four goals)			
Growth	2.35	3.86	.02
Maintenance/prevention of loss	52.17**	101.84	.35

** $p < .025$ (alpha-level adjustment for two repeated analyses).

orientation was positively related to general well-being (Study 1) for older adults only. In sum, the results of Study 2 demonstrate that using the more parsimonious, two-dimensional approach to personal goal orientation allowed us to replicate the observed age-associated differences that we obtained when we defined personal goal orientation as a three-component concept.

Studies 1 and 2 exclusively used self-report measures of personal goal orientation. It is necessary to note that self-report measures constitute a potential source of bias. Using self-report presumes that people are able to accurately reflect on their goals and their goal orientations and report about them. That means the goals have to be consciously represented. Consciously accessible goals, however, represent only one motivational aspect influencing human action and development (Bargh, 1990). The awareness and accuracy with which people evaluate their goal orientation and their willingness to report about it might be limited (Wilson, 2002). Self-reported goals and goal orientation might be a consequence of a person's post hoc rationalizations and explanations of his or her actions. Furthermore, a person's tendency to respond in socially desirable ways (although control analyses in our studies speak against this) as well as processes of self-deception or demand characteristics can bias personal reports and the evaluation of goals. Finally, memory biases and features of the specific context might play a role in this regard, especially for older adults (Schwarz, Park, Knäuper, & Sudman, 1999). To overcome these problems as well as to investigate to what degree age-related differences in goal orientation are also represented on a less conscious level, we added a more behavioral measure of personal goal orientation in Studies 3 and 4 by measuring individuals' preference behavior.

Another limitation of Studies 1 and 2 is that we did not directly test mechanisms underlying age-related differences in personal goal orientation. Age is a carrier variable, not an explanatory construct. Therefore, one additional objective of Studies 3 and 4 is to investigate more directly the role of hypothesized factors that might explain the age-related differences by experimentally manipulating expected resource demands for goal attainment and by testing whether personal goal orientation changes accordingly.

Study 3

Study 3 has two interrelated aims. One purpose is to confirm the age-group differences in self-reported goal orientation reported in Studies 1 and 2 on the behavioral level by assessing preference behavior for goals directed at growth or maintenance/prevention of loss. The second objective is to study the role of expected resource demands for goal attainment (i.e., energy needed to achieve a goal) as one of the underlying factors. To do so, we manipulate information on expected resource demands to attain growth as opposed to maintenance/prevention of loss goals and test the influence of this manipulation. To provide participants with a specific context for selecting their goals, in Study 3 we investigate behavioral preference for personal goal orientation in the domain of cognitive functioning.

Method

Participants

The sample comprised 55 younger (19–28 years; $M = 21.8$ years, $SD = 2.3$) and 58 older adults (64–84 years; $M = 70.9$, $SD = 5.2$). Half of the participants were drawn from a preexisting participant pool. The other half

were recruited through posters, handouts, and newspaper advertisements. Men and women were equally represented in the two age groups, $\chi^2(1, N = 113) = 0.71$, *ns*. Younger and older adults differed significantly in their overall educational status when we compared primary and lower with higher secondary education, $\chi^2(1, N = 113) = 5.15$, $p < .05$. Seventy-one percent of the younger and 50% of the older sample had reached a higher secondary level of education.

To assess cognitive functioning, in Study 3 we used the same performance-based tests as in Studies 1 and 2. Younger adults in Study 3 differed in their cognitive performance from younger adults recruited in the context of Studies 1 and 2 (Wilks's $\lambda = .89$), $F(4, 296) = 4.65$, $p < .025$, $\eta^2 = .06$. In particular, younger adults in Study 3 obtained slightly higher scores on the Spot-a-Word test than younger adults in both other samples. Older adults did not differ across the studies (Wilks's $\lambda = .94$), $F(4, 290) = 2.36$, *ns*, $\eta^2 = .03$, $1 - \beta = .68$.

Procedure and Materials

In the process of recruiting participants for Study 3, we informed potential participants that the experiment was concerned with a personal training of cognitive functions. Participants arrived in groups of 1 to 3 people and were seated in front of computers separated by partition walls. In an introduction at the beginning of the session, participants were informed about the testing procedure before signing a consent form. They were then instructed to set up their individual cognitive training program by selecting between training goals with different goal orientations presented to them on the computer. Participants were told that they would have to work on these training goals later in the course of the session. The computer program provided written instructions on the training program in general, the specific tasks to work on, and the different goal orientations of the goals to pursue during the training. After participants had set up their training program, they were debriefed and told that they would not actually have to work on the training program. At the end of the session, respondents received €10 (approximately \$8) for participation in the study.

We assessed behavioral preferences for personal goal orientation toward growth versus maintenance/prevention of loss in the context of the computer task. Participants completed the experiment on an individual basis. Subsequently, five cognitive training tasks were presented on the screen in a randomized order. The tasks, which covered some of the main cognitive components, were (a) solving crossword puzzles (knowledge), (b) matching geometrical figures (geometrical reasoning), (c) recalling words (memory), (d) solving arithmetic problems (mathematical skills), and (e) recognizing words (vocabulary). Participants were informed that each of the tasks could be approached in two different ways. One approach would aim at improving functions (i.e., growth goal orientation), whereas the other would aim at maintaining functions and preventing losses (i.e., goal orientation toward maintenance/prevention of loss). In addition to this within-subject factor, Study 3 comprised two experimental conditions (between-subjects factor): Participants were informed about the expected resource demands required by the two different approaches to each of the tasks. In one condition, growth and maintenance/prevention of loss goals were described as equally resource demanding (i.e., equal expected resource demands). That is, participants were told that both approaches to the task required the same demands and that, afterward, energy for other domains would still be available. In the other condition, goals directed toward growth were described as requiring more resources than goals oriented toward maintenance/prevention of loss (i.e., unequal expected resource demands). In this condition, the specific instruction was that to work at and to solve the growth-oriented task was more resource demanding and that, afterward, energy for other domains temporarily would no longer be available. With respect to the task oriented toward maintenance/prevention of loss, participants were told that this approach was less demanding and that, afterward, energy for other domains would still be available.

Younger and older adults were randomly assigned to one of the two experimental conditions. Twenty-eight younger and 28 older adults participated in the condition on equal expected resource demands. Twenty-seven

younger and 30 older adults worked on the computer task providing information on unequal expected resource demands. Results of a manipulation check at the end of the session suggested that the two approaches to the tasks were perceived as different with respect to the goal orientation and, in the unequal resource condition, also with respect to the expected resource demands for attaining the respective goals.

Participants were asked to choose between the growth and the maintenance/prevention of loss approaches to each of the five cognitive tasks. The assignment of goal orientation to the left or right key on the keyboard was counterbalanced across participants. The individual number of cognitive growth goals selected represented the indicator of a person's behavioral preference for growth goal orientation. That is, the higher the respective score was, the stronger was a person's orientation toward growth (and the weaker was his or her orientation toward maintenance/prevention of loss) in the cognitive domain.

Results and Discussion

Analyses revealed age-group differences in behavioral preference for personal goal orientation toward growth and supported the role of expected resource demands as one of the underlying factors. A 2 (age group: young vs. older) \times 2 (resource information: equal vs. unequal expected resource demands) univariate ANOVA yielded significant main effects for age group, $F(1, 109) = 7.96$, $p < .05$, $\eta^2 = .07$, and resource information, $F(1, 109) = 18.87$, $p < .05$, $\eta^2 = .15$. The Age Group \times Resource Information interaction, however, did not reach significance, $F(1, 109) = 0.06$, ns , $\eta^2 = .00$, $1 - \beta = .06$ (see Figure 4). These findings indicate that both age groups selected growth goals more frequently when growth and maintenance/prevention of loss goals were described as requiring equal amounts of resources than when growth goals were characterized by higher resource demands than maintenance/prevention of loss goals.

Separately for each age group, we conducted one-sample t tests to explore younger and older adults' primary goal orientation on the behavioral level. We tested behavioral preference for growth goal orientation against a test value of 2.5 (i.e., chance level, the expected mean number of growth endorsements if there were no difference between growth and maintenance/prevention of loss).

Younger adults more frequently selected growth goals under the condition of equal expected resource demands than would be expected by chance. Under the condition of unequal expected resource demands, they did not select growth goals less frequently than would be expected by chance. Older adults' selection of growth goals under the condition of equal expected resource demands did not differ from chance, but they did select growth goals less frequently than expected by chance under the condition of unequal expected resource demands (see Table 3).

Taken together, these results suggest that there were age-group differences in personal goal orientation toward growth on the behavioral level in the cognitive domain. Compared with older adults, younger adults selected more growth goals under both experimental conditions, equal and unequal expected resource demands. Unexpectedly, only under the condition of unequal expected resource demands did older adults show a primary behavioral preference for goal orientation toward maintenance/prevention of loss. Finally, there was evidence that our experimental manipulation of information on expected resource demands (which pointed out resource losses when participants pursued growth, as opposed to maintenance/prevention of loss, goals) influenced goal selection behavior in both age groups in favor of maintenance/prevention of loss goals over growth goals. These findings clearly show that age-related differences in personal goal orientation also exist on the behavioral level. They furthermore underscore the role of expected resource demands for goal attainment as one of the underlying mechanisms of differences in the goal orientation of younger and older adults.

Study 4

The major aim of Study 4 is to replicate results obtained in the context of Study 3 in the domain of physical functioning. Therefore, the general methods of Study 4 follow those of Study 3 to ensure comparability, but the specific tasks refer to the physical domain.

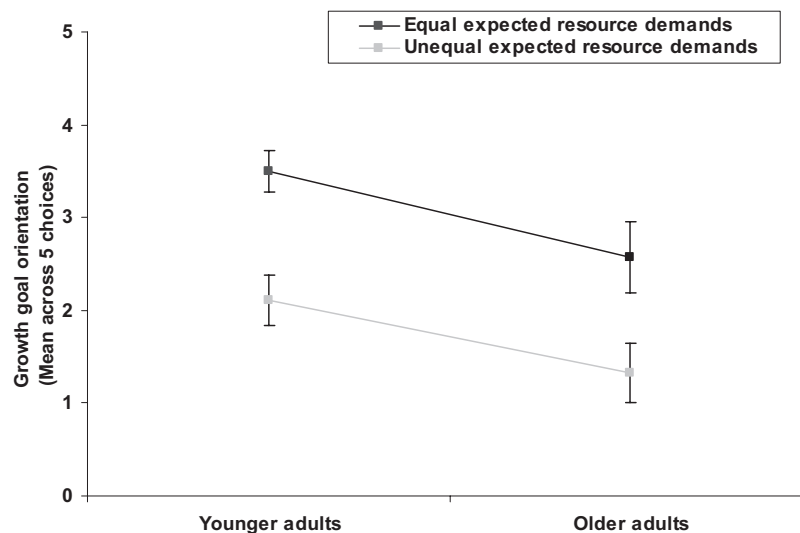


Figure 4. Study 3: Age-group differences in behavioral preference for personal goal orientation and the role of expected resource demands (cognitive functioning). Error bars represent two standard errors.

Table 3
*Study 3: Within Age-Group Differences in Behavioral Preference for Personal Goal Orientation Toward Growth: One-Sample *t* Test Analyses*

Information about resources	Growth		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SE</i>		
Younger adults				
Equal expected resource demands	3.50	0.22	4.65**	27
Unequal expected resource demands	2.11	0.27	-1.40	26
Older adults				
Equal expected resource demands	2.57	0.38	0.19	27
Unequal expected resource demands	1.33	0.32	-3.70	29

** $p < .025$ (alpha-level adjustment for two repeated analyses).

Method

Participants

The sample of Study 4 consisted of 52 younger (19–31 years; $M = 24.2$, $SD = 2.9$) and 49 older adults (60–86 years; $M = 69.4$, $SD = 5.6$). Men and women were equally represented in both age groups, $\chi^2(1, N = 101) = 0.00$, *ns*. Younger and older respondents differed in their overall educational status when we compared primary and lower with higher secondary education, $\chi^2(1, N = 100) = 30.29$, $p < .05$. Ninety-four percent of the younger and 43% of the older sample had reached a higher secondary level of education.

The same performance-based tests were administered as in Study 3. With respect to cognitive functioning, younger adults in the present sample differed from younger adults recruited in the other studies (Wilks's $\lambda = .85$, $F(6, 398) = 5.72$, $p < .025$, $\eta^2 = .08$). That is, younger adults in Study 4 scored slightly higher on the Spot-a-Word test than younger adults in Studies 1 and 2. Older adults did not differ across these samples (Wilks's $\lambda = .94$, $F(6, 386) = 2.01$, *ns*, $\eta^2 = .03$, $1 - \beta = .73$).

Procedure and Materials

Participants received the information that the experiment was concerned with a personal training of physical functions. The computer program to assess behavioral preference for goal orientation was equivalent to the one used in Study 3. The respective five physical training tasks covered five central physical functions: (a) lifting free weights (muscle strength), (b) walking or jogging on a treadmill (endurance), (c) working out on a rowing machine (speed), (d) bicycling (lung function), and (e) walking or jogging under heart rate control (cardiovascular function).

Younger and older adults were randomly assigned to one of the two experimental conditions (i.e., equal vs. unequal expected resource demands). Again, a manipulation check was included at the end of the session. It showed that goal orientation and resource instructions operated as intended. Twenty-eight younger and 24 older adults participated in the condition on equal expected resource demands. Twenty-four younger and 25 older adults worked on the computer task providing information on unequal expected resource demands.

As in Study 3, we calculated the indicator of a person's behavioral preference for growth goal orientation by adding the individual number of growth goals selected. The higher the respective score was, the stronger a person's goal orientation was toward growth (and the lower was his or her orientation toward maintenance/prevention of loss) in the physical domain.

Results

Again, our analyses reveal age-group differences in behavioral preference for growth goal orientation and support the role of expected resource demands. A 2 (age group: young vs. older) \times 2

(resource information: equal vs. unequal expected resource demands) univariate ANOVA yielded significant main effects for age group, $F(1, 97) = 39.39$, $p < .05$, $\eta^2 = .29$, and resource information, $F(1, 97) = 29.41$, $p < .05$, $\eta^2 = .23$. In contrast to Study 3, the Age Group \times Resource Information interaction reached significance, $F(1, 97) = 8.51$, $p < .05$, $\eta^2 = .08$. This suggests that younger and older adults were differently influenced in their goal selection by our manipulation of information about the expected resource demands to attain growth goals and maintenance/prevention of loss goals.

To further investigate the influence of the experimental manipulation on behavioral preference for growth goal orientation within the age groups, we ran two univariate ANOVAs (one for each age group) with resource information as the between-subjects factor. These analyses revealed a significant main effect for resource information in the younger, $F(1, 50) = 31.52$, $p < .025$, $\eta^2 = .39$, but not in the older subsample, $F(1, 47) = 3.57$, *ns*, $\eta^2 = .07$, $1 - \beta = .46$. Younger adults selected growth goals more frequently when both goal orientations were described as demanding equal amounts of resources than when growth goals were characterized by more resource demands than goals directed at maintenance/prevention of loss. In contrast, older adults did not differ in their behavioral preference for growth goal orientation as a function of resource information (see Figure 5). This finding suggests that manipulating the information about expected resource demands to attain goals with different goal orientations only influenced younger adults' goal selection, not that of older adults, in the domain of physical functioning.

As in Study 3, separately for each age group, we ran one-sample *t* tests to explore younger and older adults' primary orientation on the behavioral level. We tested behavioral preference for growth goal orientation against the test value of 2.5. These analyses revealed that younger adults selected growth goals more frequently under equal expected resource demands and less frequently under the condition of unequal expected resource demands than would be expected by chance. Older adults, in contrast, selected growth goals less frequently under both experimental conditions than would be expected by chance (see Table 4). In sum, these results indicate that younger and older adults also differed in their growth goal orientation of physical functioning goals on the behavioral level. Again, these results clearly speak for expected resource demands for goal attainment as one of the underlying factors of age-group differences in personal goal orientation.

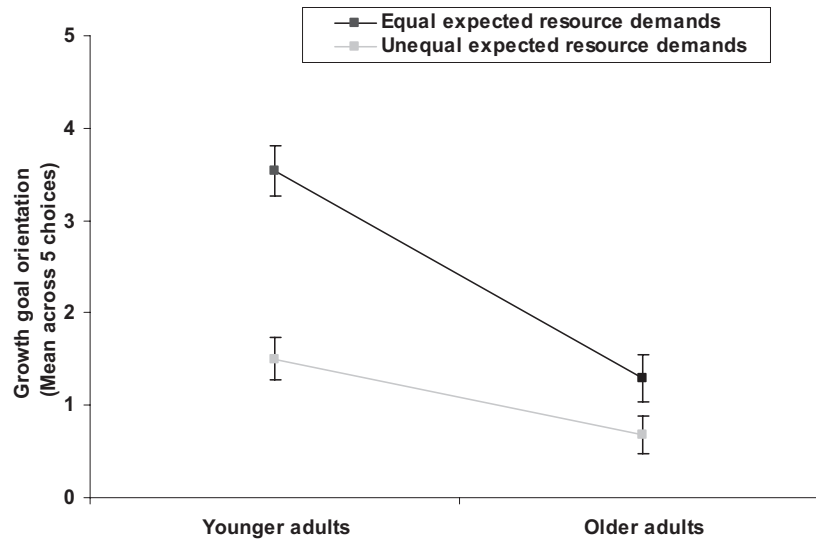


Figure 5. Study 4: Age-group differences in behavioral preference for personal goal orientation and the role of expected resource demands (physical functioning). Error bars represent two standard errors.

Discussion

The results of Studies 3 and 4 suggest that age-related differences in self-reported goal orientation are also reflected on the level of preference behavior. As expected, younger adults showed a primary orientation toward growth in the cognitive and the physical domains when both types of goals were characterized as equally resource demanding. Older adults selected fewer growth goals than expected by chance in the physical domain. With regard to cognitive goals, however, they selected growth goals as often as expected by chance, thus showing no primary personal goal orientation in this domain.

Moreover, as hypothesized, both studies consistently demonstrated that when growth goals were described as requiring the investment of more energy and resources than goals directed at maintenance/prevention of loss, both age groups showed a less strong behavioral preference for growth goals than when both types of goals were described as requiring equal amounts of resources. This finding suggests that the selection of goals oriented toward growth or maintenance and loss prevention is a function of the amount of resource investment needed to attain the goal (i.e., the expected resource demands). This result underscores that it is not age per se that drives the shift in goal orientation across adulthood. Instead, high expected resource demands constitute one context in which younger persons select age-inconsistent goal orientations (in this case, a stronger orientation toward maintenance/prevention of loss than toward growth). Future research is needed to address under what conditions age-inconsistent goal orientations are also more adaptive. Younger adults might profit when selecting goals oriented toward maintenance and loss prevention instead of setting (unrealizable) growth goals when their future time perspective is limited. When time is perceived as rather open and fairly unrestricted, in contrast, older adults might successfully set and pursue growth goals.

It is interesting that the age-related differences in goal orientation and the influence of expected resource demands on the behavioral preference for growth goal orientation were more pro-

nounced in the physical than in the cognitive domain. One possible interpretation is that physical functioning, as compared with cognitive functioning, is more important for older than for younger adults. Post hoc analyses support this assumption: Older adults rated both domains as more important than younger adults, and they evaluated the physical domain as more important than the cognitive domain.⁴ Alternatively, it is possible that the specific physical tasks presented (e.g., lifting free weights) were less familiar and interesting to older adults than the tasks presented in the cognitive domain (e.g., solving crossword puzzles). Moreover, older adults might have felt more competent to solve the cognitive tasks, and this could have led to their stronger growth orientation in the cognitive compared with the physical domain.

General Discussion

Life span psychology holds that, to maximize gains and minimize losses throughout adult life, people need to adapt to and master changing developmental opportunities and constraints. According to the SOC model, one way of managing the balance of gains to losses is by selecting age-appropriate goals and by shifting the orientation of one's goals from growth toward maintenance and loss prevention (Baltes, 1997; Freund, in press; Freund & Ebner, 2005). The evidence from the four studies presented in this article supports these life span expectations of the directional organization of personal goals.

First, we found robust age-related differences in personal goal orientation in self-report and on the behavioral level of concrete goal choices. Younger adults reported a primary goal orientation

⁴ A 2 (goal domain: cognitive vs. physical) \times 2 (age group: young vs. older) univariate ANOVA on importance of goal domain across Studies 3 and 4 yielded significant main effects for goal domain, $F(1, 158) = 32.53$, $p < .05$, $\eta^2 = .17$, and age group, $F(1, 158) = 22.54$, $p < .05$, $\eta^2 = .13$. In addition, the Goal Domain \times Age Group interaction reached significance, $F(1, 158) = 9.82$, $p < .05$, $\eta^2 = .06$.

Table 4
Study 4: Within Age-Group Differences in Behavioral Preference for Personal Goal Orientation Toward Growth: One-Sample t Test Analyses

Information about resources	Growth		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SE</i>		
Younger adults				
Equal expected resource demands	3.54	0.27	3.77**	27
Unequal expected resource demands	1.50	0.23	-4.44	23
Older adults				
Equal expected resource demands	1.29	0.26	-4.67**	23
Unequal expected resource demands	0.68	0.20	-9.21	24

** $p < .025$ (alpha-level adjustment for two repeated analyses).

toward growth, whereas maintenance and loss prevention were more prevalent in middle adulthood and older age. This finding is also in line with earlier empirical results on age-related differences in motivational orientation (Heckhausen, 1997; Ogilvie et al., 2001). In contrast to the present work, however, none of these earlier studies used an explicit assessment of goal orientation. Thus, the present research adds to our knowledge of a life span shift in motivational orientation by more explicitly investigating age-related differences in subjective representations of goal orientation.

The present studies also show that growth goal orientation remains salient in middle-aged and older adults. This finding suggests that middle-aged and older adults—at least in a sample as cognitively and physically fit as in the present studies—may still perceive many chances for positive future development and increase of their potential. They do not give up their focus on improvement of functions and acquisition of skills but rather aim at maximizing their functional capacities as long as possible.

Second, the adult age groups differed in their associations between goal orientation and measures of subjective well-being and goal-specific satisfaction. These relations have not been investigated in any earlier study. The obtained age-differential associations of goal orientation and well-being can be interpreted as indicating that older adults profit from adopting a maintenance orientation, whereas younger adults are negatively affected by a goal orientation toward prevention of loss. Obviously, correlation does not speak to causation, and further research is needed to test these links longitudinally. Nevertheless, we submit that results of the present studies provide first evidence for the importance of contextualizing the concept of goal orientation into a life span perspective. This integration of life span theory and the action-theoretical perspective allows for an understanding of goal orientation as a dynamic construct that changes over time and with changing life situations (Freund & Ebner, 2005).

Unexpectedly, growth goal orientation was not related to subjective well-being. However, goal orientation toward loss prevention was negatively related to subjective well-being in younger adults. This result is in line with studies that have found that younger adults profit from a motivational orientation toward approaching positive aspects, whereas a focus on avoiding negative outcomes implies negative effects (Coats et al., 1996; Elliot & Sheldon, 1997; Friedman & Förster, 2001). One explanation for this finding is that younger adults are still in the process of acquiring new skills and expanding their potentials. They may not

yet have acquired enough resources that they could protect. Thus, for them, it is too early and even maladaptive (also because it would deviate from the norm in various life domains) to primarily focus on maintenance and loss prevention, as this could imply the risk of missing chances to maximize resources.

As expected, the significant negative relation between goal orientation toward prevention of loss and subjective well-being did not hold for middle-aged or older adults. Setting goals directed at counteracting losses seems to be dysfunctional for younger adults but not for middle-aged or older adults. In contrast, for older adults, maintenance orientation was even positively related to subjective well-being. Consistent with Hobfoll's (1998; Freund & Riediger, 2001) notion of the importance of protecting resources for well-being, it seems especially important for older adults to maintain their functional levels as they face more and more resource losses. Furthermore, older adults may not regard maintenance as negative but rather may reinterpret maintenance of functional states in a positive direction. Maintenance could be the more positive version of loss prevention, which would explain the positive relation between maintenance and general subjective well-being, whereas this positive relation did not exist for prevention of loss. In this sense, maintaining one's functional level is already seen as a great achievement in older age and may even be redefined as a gain. The findings suggest that shifting one's goal orientation from promoting gains toward maintaining the status quo and preventing losses from early to late adulthood is one mechanism to successfully adapt to changes in opportunities and constraints of life.

To complement the self-report measures and to overcome some of their shortcomings (e.g., effects of social desirability, self-deceptive processes and individual constructions of reality, demand characteristics, and inadequate memory and lack of conscious representation), we also used a more behavioral measure of personal goal orientation, a preferential choice paradigm. This measure provided additional evidence for age-related differences in goal orientation, confirming the results of the self-report studies. Maybe even more important, experimentally manipulating the information about expected resource demands for goal attainment demonstrated that expected resource demands play a crucial role in explaining the age-related differences in personal goal orientation. When goals directed at growth and maintenance/prevention of loss were described as demanding equal amounts of resources, younger adults primarily selected growth goals in the cognitive and the physical domains, whereas older adults tended to more strongly

focus on maintenance and loss avoidance in the physical domain. When we characterized growth goals as requiring more resources than goals oriented toward maintenance/prevention of loss—and thus made individuals aware of threatening losses related to the pursuit of growth goals—both age groups showed a primary orientation toward maintaining their status quo and avoiding further losses. This finding suggests that flexibly adjusting one's goal orientation is a function of the awareness of resources necessary for goal attainment. The present study is the first one to investigate potential underlying factors of age-group differences in personal goal orientation.

The present approach comprises various samples and assessment methods and refers to different contexts. This multimethod design has helped us to overcome problems of exclusive reliance on participants' evaluation and self-report of their behavior and allowed us to obtain robust and converging evidence on age-related differences in personal goal orientation. Future research needs to tease apart the effects of situational conditions (e.g., declines in aging-relevant domains, e.g., cognitive and physical functioning) from long-term shifts in individual preferences in younger, middle-aged, and older adults. Situational affordances that favor growth, as opposed to maintenance and loss prevention, in the different age groups could be assessed with experience-sampling methods. These approaches provide information about a large variance of situations and time points and thus allow investigation of changes in goal orientation as a function of alterations in specific situations. Furthermore, they allow one to track ecologically valid, real-life choices in natural experimental designs. Alternatively, systematic experimental manipulation of situational constraints that hold a strong potential for losses in young adulthood (e.g., increased stress, less leisure time, less capacity for peak athletic performance) as well as situational conditions that provide a strong potential for gains in older age (e.g., less stress and more leisure time, self-determination) would help to disentangle aging-related from situational effects. It is our hope that the results of this article will spur more research in this direction.⁵

In all, our investigation was informed by two lines of research. The first follows from life span theory about the changes in developmental opportunities and constraints across life associated with a shift in profile involving growth, maintenance, and prevention of loss. The second follows from action-theoretical and motivational research on personal goals and the distinction between approach and avoidance goals. Linking these two lines of inquiry has allowed us to supplement life span research with motivational theory as well as to better understand adaptive goal selection across the life course.

⁵ We have taken a first step in this direction in pilot work on age-group differences in personal goal orientation in the domain of social interaction and social relationships. Similar to the procedure described in Studies 1 and 2, 24 younger and 26 older adults were asked to generate their most important goals in the domain of social interaction and social relationships and to rate the goal orientation of each of their listed goals. The finding showed that, in a domain in which one could presume that younger and older adults have comparable levels of gains and losses, there were no age-related differences in personal goal orientation. This suggests that the shift in personal goal orientation away from growth toward maintenance and loss prevention reflects the changes in opportunities across the life span, not an overall change in individuals' preferences for striving for gains opposed to preventing losses. However, more systematic research on the

comparison of different life domains is needed before we can draw more definite conclusions.

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