

Perceived Control Over Development and Subjective Well-Being: Differential Benefits Across Adulthood

Frieder R. Lang
Humboldt-Universität zu Berlin

Jutta Heckhausen
University of California, Irvine

The relationship between perceived control over development (PCD) and subjective well-being (SWB) across adulthood was examined in 3 studies. In Study 1, with 480 adults aged between 20 and 90 years, PCD was closely related to SWB. Chronological age moderated the associations between PCD and SWB beyond individual differences in health, intelligence, social support, and socioeconomic status. In the longitudinal Study 2, with 42 older adults, strong PCD was associated with increased positive affect only when desirable events had occurred previously. In Study 3, older adults experienced greater satisfaction when attributing attainment of developmental goals to their ability, whereas younger adults were more satisfied when attributing such successes to their own efforts. Findings point to adaptive adjustments of control perceptions to age-related actual control potentials across adulthood.

Individuals are happy and satisfied when they believe they can successfully master the goals and tasks of their everyday life. Perceiving control over one's development is a critical component of the adaptivity and psychological resilience that characterizes the human species (M. M. Baltes & Carstensen, 1996; P. B. Baltes, Staudinger, & Lindenberger, 1999; Filipp, 1996). In fact, having a strong sense of control over one's development has consistently been shown to contribute to improved well-being throughout the life cycle (e.g., Bandura, 1997; Grob, Little, Wanner, & Wearing, 1996; Lachman & Weaver, 1998; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). One possible explanation is that when individuals perceive themselves as agentic in mastering developmental goals or tasks, they are encouraged to engage in striving for desirable goals and, in consequence, are more likely to experience success,

and thereby feel better. However, it is assumed that perceptions of personal control have different implications for the hedonic system depending on the individual's position in the life cycle (e.g., Brandstädter, 1999). According to the life span theory of control (Heckhausen & Schulz, 1995; Schulz & Heckhausen, 1996) the use of control strategies, including enhanced or deflated control perceptions, is adapted to the inverted U-shaped trajectory of primary control potential (i.e., the capacity to influence outcomes in the external world) across the life span. During young adulthood, when potentials for primary control are ample, control strategies focus on promoting such pursuits. This involves, for example, enhanced perceptions of control and hopefulness for reaching one's goals. With increasing age, however, functional losses and restricted future time perspectives call for cognitive strategies to neutralize negative effects for the individual's motivational resources and subjective well-being. One strategy of such secondary control is to deflect self-blame by deflating self-attributed control capacity (Heckhausen, 1999).

Proceeding from such considerations, the research reported here explores ways in which perceptions of control over development are differently associated with subjective well-being across the adult life span. Specifically, we explored whether particular components of perceived control (e.g., perceived personal causation of one's success) contribute differently to subjective well-being in early, middle, and later adulthood. Young adults are expected to benefit from having a sense of control over their malleable resources (e.g., effort) to mastering future tasks, whereas older adults are expected to feel better when stable resources such as their perceived personality or abilities are in accordance with the challenges of everyday life.

Three studies are reported. In a first study, the relationship between perceived personal control and three indicators of subjective well-being was examined across a broad age range from early to late adulthood and in relation to age-associated covariates (health, cognitive functioning, social support, and socioeconomic status). We examined whether the associations of perceived control and subjective well-being differ across the adult life span

Frieder R. Lang, Department of Education, Humboldt-Universität zu Berlin; Jutta Heckhausen, Department of Psychology and Social Behavior, University of California, Irvine.

Parts of the present research were supported by Grant Ba 902/11–2 from the Deutsche Forschungsgemeinschaft to Margret M. Baltes and Frieder R. Lang together. Margret M. Baltes passed away on January 28, 1999, before she was able to complete her research. Data collection for Study 1 and Study 2 took place while Frieder R. Lang was at the Free University, Berlin, Germany; data collection for Study 3 was done at the Max Planck Institute for Human Development and Education, Berlin, Germany.

We are profoundly grateful to Margret M. Baltes, who inspired this work with her ideas. Frieder R. Lang wishes to express his deep gratitude for her influence as a mentor over many years. We are thankful to Ute Kunzmann, Jens Asendorpf, and Franz Neyer for their valuable comments to an earlier version and to Iain Glen for stylistic corrections. Our thanks also go to the many students whose commitment in the process of data sampling and data management made this work possible and to Jutta Hundertmark and Carsten Wrosch for their work on the original data set of Study 3.

Correspondence concerning this article should be addressed to Frieder R. Lang, Humboldt-Universität zu Berlin, Department of Education (Faculty of Arts IV), Geschwister-Scholl-Strasse 7, 10099 Berlin, Germany. Electronic mail may be sent to flang@rz.hu-berlin.de.

above and beyond the effects of covariates. In a follow-up study with a subsample of older adults, relations between perceived control and subjective well-being were examined with respect to the moderating influence of desirable life events and personal resources across a 6-month time interval. A third study explored age-related differences in the perceived causality of developmental (goal) success in relation to life satisfaction.

Perceived Personal Control Over Development, Chronological Age, and Subjective Well-Being

Positive and negative emotional experiences are reliably found to constitute distinct dimensions that are typically not correlated or only weakly correlated (e.g., Diener, 2000; Watson & Tellegen, 1985). Moreover, cognitive aspects of subjective well-being relating to the evaluation of one's life satisfaction appear to capture different facets than experiences of positive and negative affect (e.g., Diener, Suh, Lucas, & Smith, 1999; Shmotkin, 1990).

How Is Perceived Control Over Development Related to Subjective Well-Being?

In a meta-analysis of personality traits and subjective well-being, DeNeve and Cooper (1998) reported that constructs relating to sense of control, such as internal locus of control (Emmons & Diener, 1985) or desire for control (e.g., Burger, 1992), are among the most potent personality correlates of subjective well-being. For example, on the basis of 19 studies with a total of 3,685 respondents, perceived control correlated .29 (weighted mean; median = .39) with subjective well-being.

Perceived personal control is a broad and heterogeneous construct that includes several dimensions and has been used in a wide range of different contexts. Skinner (1996) reviewed 100 definitions of the control construct, and classified concepts of perceived control according to underlying assumptions about the relationships between agent (e.g., self), means (e.g., effort, competence), and ends (e.g., success, goal attainment). For example, *agent-end beliefs* of control over development pertain to perceptions of influencing (or producing) one's developmental success and of successfully accomplishing one's personal goals. In contrast, *agent-means beliefs* refer to the extent to which individuals believe they have access to the means that they perceive as causal for their success (e.g., effort, ability, luck). In the following studies, the concept of *perceived control over development* refers to the extent to which individuals perceive themselves as agentic in producing desirable developmental outcomes (e.g., Peterson, 1999). This includes perceptions about self-related causes that lead to one's developmental success (i.e., agency beliefs). Perceived control over development here is thus viewed as a motivational resource that fuels one's self-regulation to accomplish one's personal projects (e.g., McGregor & Little, 1998), personal strivings (e.g., Emmons, 1992), developmental goals (e.g., Heckhausen, 1997), or life tasks (Cantor & Kihlstrom, 1987). Rather than addressing goals and goal contents, we focus on how perceptions of internal causes for and perceived control over goal attainment correlate with subjective well-being.

However, perceived control over development may not be associated in uniformly positive ways with subjective well-being throughout adulthood (e.g., Clark-Plaskie & Lachman, 1999). Burger (1989) suggested that a strong sense of control may result

in negative affective responses when individuals perceive (a) a great responsibility to use their potentials, (b) an urgency to be successful, and (c) a strong attentional focus toward prevention of undesirable events. As a result, individuals in certain life situations (such as older adulthood) may choose to relinquish control when control is too costly. In a different line of reasoning, it has been argued that the beneficial effects of subjective control may be related to the perceived source of one's control or to one's attributional style (e.g., Anderson, Miller, Riger, Dill, & Sedikides, 1994; Needles & Abramson, 1990). For example, perceptions of control may be attributed to more malleable causes of success or failure (e.g., effort) in earlier adulthood and to more reliable and stable sources in later adulthood (e.g., ability). Such perceptions of personal causation or of control over development may be differentially related to subjective well-being at various phases of the adult life span.

What Are the Age Effects on Subjective Well-Being?

The relationship between chronological age and subjective well-being has been examined in an impressive number of cross-sectional and longitudinal studies (for a comprehensive series of reviews on this issue, see Schaie & Lawton, 1998). However, few studies have covered a broad age range from early to late adulthood (e.g., Diener & Suh, 1998; Gross et al., 1997; Stacey & Gatz, 1991). Although the picture that has emerged from this research is contradictory, some patterns of findings appear to be relatively robust: First, individuals do not experience negative affect more frequently in later adulthood than in early adulthood. Some studies found no or a negligible relationship between age and the frequency of negative affect (e.g., Diener & Suh, 1998; Malatesta & Kalnok, 1984; Shmotkin, 1990; Stacey & Gatz, 1991), and some studies even revealed that older adults experience negative affect less frequently than younger adults (e.g., Charles, Reynolds, & Gatz, 2001; Gross et al., 1997). Second, when not controlled for other predictors, chronological age is associated with a reduced frequency of positive emotional experiences (e.g., Argyle, 1999; Diener & Suh, 1998). Third, life satisfaction is not related or is only weakly positively related to chronological age (e.g., Diener et al., 1999; Filipp, 1996; Myers & Diener, 1995).

Are There Age-Specific Benefits of High Perceived Control?

The extent to which individuals can actively shape or change the living conditions in their external worlds varies as a function of their position in the life cycle. A strong sense of control may be more adaptive in earlier phases of life, when it "provides the motivation to engage in the environment at a time when the organism is rapidly developing" (Schulz & Heckhausen, 1996, p. 706). Consequently, perceived control may contribute to mastering experiences of failure in early adulthood. For example, a strong sense of control and thus responsibility for a regretted life event was associated with fewer negative emotions among young adults, whereas older adults experienced more negative emotions when they felt in control over the regretted event (Wrosch & Heckhausen, 2001). When desirable outcomes do not occur, young adults may nevertheless expect their investments to pay off in other phases of their life cycle. This implies that a strong sense of control may be more closely related to reduced negative affect

among young adults than among older adults. In contrast, a match between the individual's perceptions of personal control and the actual outcomes in reality may be more adaptive in later adulthood. For example, older individuals may have a more limited capacity to respond flexibly to experiences of failure. Consequently, an unrealistically strong sense of control in later life may be associated with a greater risk of experiencing a decrease in subjective well-being.

The Present Research and Major Hypotheses

Three studies are reported that explore the associations between chronological age, perceived personal control over development, and indicators of subjective well-being. The first study examined the relationship between perceived control and subjective well-being in a sample of 480 adults between 20 and 90 years old. In particular, the modifying role of chronological age on the relationship between perceived control and subjective well-being was examined. In the second study with 42 older adults between 70 and 90 years old, moderation effects of minor life events on the relationship between perceived control and subjective well-being were examined at two measurement occasions separated by a 6-month interval. The third study addressed the perceived controllability of developmental goals in relation to different types of control (i.e., perceptions about causal factors of goal attainment), probability of goal attainment, and life satisfaction in a sample of 510 adults between 20 and 84 years old.

The following hypotheses were formulated for this research: (1) Perceived control over development is strongly related to subjective well-being. (2) Perceived control is differently related to subjective well-being in early, middle, and later adulthood in that (a) perceived control is expected to be a more potent predictor of affective well-being in early adulthood as compared with later adulthood; (b) in early adulthood, individuals benefit more strongly from beliefs about effort as a causal factor of developmental progress, whereas in later adulthood, individuals are expected to benefit more strongly from beliefs about their abilities as causal factors for success; and (c) in later life, the association between perceived control and subjective well-being depends on positive events that reaffirm the individual's sense of mastery in everyday life.

Study 1

The first study examined the relationship between perceived control over one's development and subjective well-being across adulthood in a heterogeneous sample covering a broad age range from 20 to 90 years. Participants were recruited through probability sampling from the local registration office in Berlin in 1997 (in Germany each citizen must be registered), stratified by year of age cohort and sex. In each birth year, 8 participants, 4 men and 4 women, participated.

Method

Participants

All 480 participants completed a two-session interview schedule that included medical, psychological, and sociological assessment instruments. Three age-cohort groups were distinguished. Young adults were 20 to 40 years old ($M = 30.7$, $SD = 5.7$, $n = 160$), middle-aged adults were 45 to 65

years old ($M = 55.7$, $SD = 5.8$, $n = 160$), and older adults were 70 to 90 years old ($M = 80.7$, $SD = 5.9$, $n = 160$). Average years of education (including apprenticeship or professional training) was 13.0 ($SD = 2.9$). Of the 480 participants, 48.8% were married, 17.5% were widowed, 9.2% were divorced, and 24.6% had never been married. A total of 66.5% of participants had at least one living child. Middle-aged adults were most likely to be married. Older adults were more likely to be widowed and more likely to not be currently occupied in a profession as compared with middle-aged or young adults. In contrast, young adults reported more years of education and were less likely to have children. There were no significant age differences with respect to the social prestige of the current or last job.

Measures

Perceived personal control over development. Participants expressed their agreement with each of the following four items: (a) "I am able to make my goals come true," (b) "My abilities and efforts are significant to my success," (c) "I believe that I can influence my development," and (d) "I have strong will." Items were adapted from the Personal Control Inventory (Pulkkinen & Rönkä, 1994). Participants indicated agreement on a 5-point scale ranging from 5 (*very strongly agree*) to 1 (*very strongly disagree*). Cronbach's alpha was .72. *T*-transformed factor scores were used in the analyses ($M = 50$, $SD = 10$) with higher values indicating a stronger belief of personal control. For the structural equation modeling, two subscales were built by adding Items a and b, and Items c and d. The items were selected randomly for this pairing procedure.

Life satisfaction. Participants expressed their agreement with each of the following four items: (a) "I am as happy now as when I was young," (b) "I am satisfied with my life these days," (c) "As I get older, life is better than I thought it would be," and (d) "I sometimes feel that life is not worth living" (item reversed). Items were taken from a German version of the Philadelphia Geriatric Morale Scale (Lawton, 1975). A 5-point scale ranging from 5 (*very strongly agree*) to 1 (*very strongly disagree*) was used. Alpha was .65. For the structural equation modeling, the four items were grouped randomly to build two subscales by adding Items a and b, and Items c and d. *T*-transformed scores were used in the analyses with higher values indicating stronger life satisfaction.

Positive affect and negative affect. Positive affect and negative affect were assessed with the Positive Affect and Negative Affect Schedule (PANAS; see Watson, Clark, & Tellegen, 1988; Kunzmann, Little, & Smith, 2000). Participants rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very often*) how often they felt each of 10 positive affect states (interested, strong, inspired, excited, alert, active, proud, enthusiastic, determined, and attentive) and each of 10 negative affect states (nervous, guilty, scared, hostile, distressed, irritated, ashamed, jittery, afraid, and upset) over the past year. Scale mean for positive affect was 3.56 ($SD = .49$, minimum/maximum = 2/5) and 2.25 ($SD = .51$, minimum/maximum = 1/3.9) for negative affect. Alpha was .83 for Positive Affect (PA) and .82 for Negative Affect (NA). A principal-components analysis with a varimax rotation of all 20 PANAS items yielded two dominant factors accounting for 39.8% of the total variance. All of the items had strong primary loadings on the appropriate factor. NA items loaded on the first factor (loadings ranged from .44 to .71; $M = .61$). PA items loaded on the second factor (loadings ranged from .51 to .74; $M = .63$). Five items showed secondary factor loadings greater than or equal to .10 (secondary loadings ranged from $-.20$ to $.20$). PANAS means showed convergent validity with life satisfaction (PA: $r = .30$, $p < .01$; NA: $r = -.37$, $p < .01$). The 10 items of each of the two scales of positive and negative affect were grouped to build three subscales. Subscales were grouped identically to those reported by Kunzmann et al. (2000).

Covariates

Socioeconomic status (SES). SES referred to two measures, years of education and occupational prestige of household. Participants reported

their highest educational level and their highest professional qualification. Answers were recoded on the basis of the average number of years needed to earn the respective degree or qualification. Note that the term *years of education* thus also includes professional training. On average, participants had 13.8 years of education and professional training ($SD = 2.7$). Occupational prestige of household pertained to ratings of the relative social status of the participant's or their partner's current or last job (Mayer, Maas, & Wagner, 1999) according to the International Standard Classification of Occupations. Scores ranged from 20 to 187 ($M = 80.7$, $SD = 31.1$) with higher values indicating higher SES. A unit-weighted sum composite of SES was computed on the basis of the standardized scores of years of education and occupational prestige ($\alpha = .69$).

Negative social support. This variable was assessed with a scale of negative social exchanges that consisted of five items on annoyance with others, feelings of being overly demanded, feeling obstructed by others, dissatisfaction with partners, and unfulfilled need for support. To measure unfulfilled need for support, we had participants report in "yes/no" format whether they had desired any of three types of support but had not received any (Lang & Carstensen, in press). Participants also rated how often they felt annoyed and overly demanded by others during the past 4 weeks on a scale ranging from 5 (*very often*) to 1 (*not at all*). Dissatisfaction with one's social partners was assessed on a rating scale ranging from 5 (*very dissatisfied*) to 1 (*very satisfied*). Finally, participants indicated their agreement with the item "Others have hindered me in achieving my goals" on a scale ranging from 5 (*very true*) to 1 (*not true at all*). Alpha was .62.

Cognitive functioning. Performance in two word fluency tasks (Letter "S," Animal-Naming), one verbal knowledge test (Spot-a-Word), and two perceptual speed tasks (Digit Letter, Digit Symbol Substitution) were assessed (for a detailed description of these cognitive tests, see Lindenberger, Mayr, & Kliegl, 1993). A unit-weighted sum composite of all five standardized test scores was computed ($\alpha = .76$). All values were transformed to *T* scores with higher values indicating better cognitive abilities.

Health functioning. Health functioning referred to objective mobility (i.e., gait) consisting of a sequence of five forms of Romberg's trial (Steinhagen-Thiessen & Borchelt, 1999; Tinetti, 1986). The test was originally designed to test health functioning among older adults but was found to reliably indicate health functioning across all age groups. The five tests were designed to have increasing difficulty. In the first two tests, participants stand upright, with their feet together, arms stretched out ahead, and eyes closed (first simple test) and, in a second test, also with their head bent back. In the subsequent three tests, participants stand upright again with arms stretched out ahead, but with their feet in a row, with eyes open (first tandem test), eyes closed (second tandem test), and eyes closed and their head bent back (third tandem test). All five tests were performed twice and the better of two trials was used. When participants had difficulty with the performance on one test, further tests were skipped. Performance on each trial was qualitatively evaluated on a 6-point scale ranging from 0 (*no sway*) to 5 (*cannot stand without support*). Internal consistency of all five trials was .91 (for 443 participants who completed all five trials). To gain a homogeneous assessment of mobility performance across age groups, we used a unit-weighted mean composite for subsequent analyses. The resulting scale was transformed into *T* scores with higher values indicating greater mobility.

Statistical Analyses

Statistical analyses mostly relied on structural equation modeling (SEM) using the LISREL 8.2 package (Jöreskog & Sörbom, 1993). For additional analyses, the statistical software package SPSS 6.1.1 for Macintosh (1995) was used. Before examining the parameter estimates, we also tested the factorial invariance across age groups (i.e., constraining the factor loadings and item variances across groups to be equal). Factorial invariance was accepted when significance level of chi-square change of nested models was above .05. Invariance of constructs can be seen as indicating that latent constructs are composed of equivalent information and are therefore comparable across different groups. Analyses of latent constructs in SEM relied

on subscales instead of items. This procedure provides more reliable results by reducing the influence of response biases and distribution characteristics of single items (MacCallum & Austin, 2000).

We used the following criteria of fit statistics to evaluate the model fit: The chi-square value divided by its associated degrees of freedom being smaller than 2; the root-mean-square error of approximation (RMSEA) being below .05; and the nonnormed fit index (NNFI) and the comparative fit index (CFI) being close to 1 (Hu & Bentler, 1998). For the purpose of identification, we fixed variances of all latent factors to 1. All subscales were allowed to load only on the appropriate factor. All factor covariances in this model were freely estimated. We fixed all other loadings and correlations among error residuals to 0. Covariance matrices were analyzed by applying the maximum likelihood procedure for the estimation of parameters. All fitted models were based on measurement models estimating all possible correlation coefficients among factors.

Table 1 shows the factor loadings and subscale communality of the measurement model for perceived control over development, life satisfaction, positive affect, and negative affect. Goodness-of-fit indices of this measurement model were acceptable, $\chi^2(65, N = 480) = 103.2, p = .002$ (RMSEA = .035, NNFI = .98, CFI = .99). As shown in Table 1, factor loadings of the measurement model accounted for more than 50% of the variance of the subscales, with one exception (i.e., Subscale 2 of life satisfaction).

To test for structural invariance of factor loadings and item variances, we fitted the identical measurement model as reported above to each of the three age cohort groups allowing all parameters to be freely estimated within the multiple-group structural equation model. The goodness of fit of this model was again acceptable, $\chi^2(195, N = 480) = 234.7, p = .000$ (RMSEA = .036, NNFI = .97, CFI = .98). In a second step, all factor loadings were fixed to be equal across all three age cohort groups. This did not result in a significant change of the chi-square value of the measurement model, $\Delta\chi^2(32, N = 480) = 36.8, p > .05$. In a third step and in addition to Model 2, all item variances were fixed to be equal across the three age cohorts. Again, no significant change of the chi-square value was observed, $\Delta\chi^2(20, N = 480) = 20.1, p > .05$. Finally, when we constrained factor covariances to be equal across age groups in the fourth step, a significant change of the chi-square value resulted, $\Delta\chi^2(80, N = 480) = 196.2, p < .001$. This indicates that the correlations of the latent constructs differ among the three age groups.

Results

The findings of Study 1 are reported in two parts. In the first part, the associations between perceived control and subjective well-being are examined. In the second, regression coefficients of perceived control predicting subjective well-being are compared among young, middle-aged, and older adults. In this analysis, we aimed at identifying possible moderating effects of age on the associations between perceived control and well-being.

Perceived Control and Subjective Well-Being

Table 2 shows the correlations among observed constructs in the total sample below the diagonal and the correlations among latent constructs when constrained to be equal across all three age groups above the diagonal. Strong perceived control over development was consistently associated with greater life satisfaction, more frequent positive affect, and less frequent negative affect. With one exception, no significant sex differences in the mean-level of perceived control and subjective well-being were observed: Women reported slightly more negative affect than men ($d = .28$; $\eta^2 = .020, p < .01$).

Table 1
Loadings and Community of the Latent Factor Model for Perceived Control Over Development, Positive and Negative Social Exchanges, Positive Affect, and Negative Affect

Factor and subscale	Unstandardized loading ^a	T	R ²	Standardized solution ^b
Perceived control over development				
Subscale 1: I have a strong will; I can influence my development	.67 (.04)	17.8	.63	.61
Subscale 2: I can realize plans; My own efforts lead to success	.60 (.04)	16.4	.54	.58
Life Satisfaction				
Subscale 1: I am as happy now as when I was younger; I am satisfied with my life these days	.68 (.04)	17.2	.68	.67
Subscale 2: As I get older, life is better than I thought it would be; I sometimes feel that life is not worth living	.51 (.04)	14.3	.46	.52
Positive Affect				
Subscale 1: excited, alert, active, proud	.57 (.03)	20.9	.69	.54
Subscale 2: interested, strong, inspired	.55 (.03)	18.2	.57	.54
Subscale 3: enthusiastic, determined, attentive	.62 (.03)	19.9	.65	.61
Negative Affect				
Subscale 1: nervous, guilty, scared, hostile	.55 (.03)	19.3	.63	.53
Subscale 2: distressed, irritable, ashamed	.53 (.03)	18.8	.61	.52
Subscale 3: jittery, afraid, upset	.62 (.03)	20.6	.69	.58

Note. Fit of model: $\chi^2(65, N = 480) = 103.2, p = .002$; root-mean-square error of approximation = .035, nonnormed fit index = .98, comparative fit index = .99. Age and covariates were included as single indicators with error residuals fixed to 0. For the purpose of identification all factor variances were fixed to 1.

^a Standard errors of loadings are given in parentheses. ^b Standardized loadings refer to the common metric standardized solution of multiple groups model with loadings constrained to be equal across age groups.

Age-Differential Effects of Perceived Control on Subjective Well-Being

Moderation effects of age group on the association between perceived control and indicators of subjective well-being above and beyond effects of covariates were tested within the same structural equation model. Table 3 displays the standardized coefficients of the structural equation model predicting PA, NA, and life satisfaction. All correlations among covariates were freely estimated within the same structural equation model.

As shown in Table 3, all predictors together accounted for 57% of the variance of PA. The predictor model was found to be comparable across all three age groups. With one exception, the

association between the predictors and PA did not differ significantly between age groups. Receiving negative social support was associated with reduced PA only among young adults but not among old adults. One reason may be that age was associated with experiencing less negative support ($r = -.39, p < .01$).

Perceived control over development correlated differently with negative affect across the age groups. Perceived control over development was associated with less frequent negative affect among young ($\beta = -.33, p < .01$) and middle-aged adults ($\beta = -.57, p < .01$) but not among older adults ($\beta = -.03, ns$). Negative social support was found to be a strong predictor of negative affect across all three age groups. (When excluding one

Table 2
Correlations of Observed and Latent Constructs and Covariates

Variable	1	2	3	4	5	6	7	8	9	10
Construct										
1. Perceived control	—	.50	.72	-.28	-.05	-.03	-.12	.13	.08	.07
2. Life satisfaction	.35	—	.51	-.49	.02	.01	-.40	.13	.03	.19
3. Positive Affect	.58	.40	—	-.28	-.03	.05	-.12	.16	.19	.14
4. Negative Affect	-.13	-.36	-.15	—	-.07	.17	.44	-.04	.12	-.05
5. Age cohort	-.29	-.02	-.23	.25	—	.00	-.09	-.12	-.24	-.20
Covariates										
6. Sex ^a	-.02	.01	.04	.14	-.00	—	.04	-.11	.16	-.10
7. Negative soc. support	.03	-.27	.02	.46	-.39	.04	—	.10	.12	.00
8. SES	.15	.12	.18	-.00	-.15	-.11	.15	—	.45	.20
9. Cognitive functioning	.19	.04	.27	.21	-.49	.14	.29	.45	—	.28
10. Health	.26	.14	.27	.16	-.74	-.07	.30	.23	.51	—

Note. Coefficients below the diagonal represent correlations of raw constructs for total sample ($N = 480$); coefficients above the diagonal represent correlations of latent constructs across the three age groups and are constrained to be equal across groups. Age and covariates were used as single indicator constructs in the model. Coefficients printed in bold are significant ($p < .05$). Variances of latent constructs were fixed to 1. soc = social; SES = socioeconomic status.

^a 2 = female 1 = male

Table 3
Standardized Regression Coefficients of Structural Equation Model Predicting Positive Affect, Negative Affect, and Life Satisfaction (N = 480)

Predictor variable	Positive affect				Negative affect				Life satisfaction			
	Young	Middle	Old	All	Young	Middle	Old	All	Young	Middle	Old	All
Perceived control	.71	.77	.69	.72	-.24 _a	-.55 _a	.02 _b	-.23	.30_a	.45_{a,b}	.58_b	.46
Age cohort	.08	.00	.16	.13	-.06	-.06	-.01	-.18	.09 _{a,b}	.19_a	-.17 _b	.16
Covariates												
Negative soc. support	-.21 _a	-.05 _{a,b}	.11 _b	-.04	.40	.49	.38	.42	-.41 _a	-.45 _a	-.18 _b	-.38
Socioeconomic status	-.06	.07	-.01	.01	-.01	-.12	-.13	-.08	.13 _{a,b}	.25_a	-.08 _b	.12
Cognitive functioning	.08	.04	.21	.13	.13	.16	.14	.12	-.19	-.08	.03	-.07
Health functioning	.08	-.01	.19	.12	.06	-.11	-.06	-.04	-.02	.18	.19	.26
Sex ^a	.01	.00	.13	.05	.12	.20	.10	.11	.21_a	.07 _{a,b}	-.03 _b	.07
R ²	.57	.59	.55	.57	.28	.49	.22	.33	.39	.52	.52	.41

Note. Coefficients printed in bold are significant ($p < .05$). In the total sample, age ranges from 20 to 90 years. Within each age group, age refers to a rectangular distribution across 20 years. All age-specific parameters were estimated within one model. Coefficients with different subscripts differ significantly according to change of chi-square of model fit when coefficients are constrained to be equal across age groups. soc = social.

^a 2 = female, 1 = male.

item of the negative support scale [i.e., "others annoyed me"] that overlapped with negative affect items [i.e., upset, irritated], no change of results was observed.)

A different picture emerged with respect to life satisfaction. In all three age groups, perceiving strong control was associated with greater life satisfaction. However, there were significant age differences in the magnitude of this effect. Among older adults, perceiving strong perceived control was the most potent predictor of life satisfaction. In addition, health and experiencing less negative support also correlated with greater life satisfaction. In contrast, among young and middle-aged adults, effects of perceived control on life satisfaction were significantly lower, whereas less negative support and higher SES correlated strongly with greater life satisfaction. Life satisfaction showed a curvilinear association with chronological age as indicated by the significantly different age correlations across age groups. Young women reported greater satisfaction with their lives than young men did.

To sum up, perceived control over development was found to be a potent predictor of positive emotional experience and life satisfaction, which in addition moderated age-related differences in subjective well-being. Experiencing negative social support was found to be a potent predictor of negative affect above and beyond these effects. Although life satisfaction was strongly associated with perceived control among older adults, a strong sense of control over development was unrelated to lowered negative affect in later adulthood.

Discussion of Study 1

In this study, associations between perceived control and three indicators of subjective well-being were explored in a sample of young, middle-aged, and older adults. Across adulthood, perceived control was found to be strongly associated with subjective well-being. The study used a randomly selected, heterogeneous sample of adults with a broad age range that represented each birth cohort equally well. This allowed maximal power for statistical tests of age and sex differences. Structural equation modeling was used to establish structural invariance of factor loadings of subscales across groups of men and women and across young, middle-aged, and older adults. This also provided a reliable basis for age group

comparisons of relationships between perceived control and subjective well-being.

Perceived Control and Subjective Well-Being

Perceived control over development was strongly associated with positive affect across all three age groups. When adults are intrinsically motivated and think they can achieve positive outcomes in their life, they feel better.

Consistent with the theoretical assumptions, perceived control was related to less frequent experiences of negative emotions among young and middle-aged adults but not among older adults. This finding suggests that in early and middle adulthood perceiving control over one's development may be more relevant to the down regulation of negative emotional experiences. A strong sense of control appears to protect against detrimental effects of failure more effectively among young and middle-aged adults than among older adults. For example, when experiencing failure or loss, young and middle-aged adults who have a strong sense of control may choose from a wider range of possible primary control strategies (i.e., changing one's environment) to reduce negative affect. In contrast, older adults who have a strong sense of control may have to rely more on secondary control strategies such as positive appraisals of one's life situation. This may also explain why negative affect and life satisfaction follow different correlational patterns.

In later adulthood, perceiving a strong sense of control was strongly correlated with positive evaluations of one's life but unrelated to the frequency of negative emotional experiences. This result points to the potential risks of a strong sense of control in later adulthood. Older adults who have a strong sense of control may cognitively evaluate their life in more positive terms (i.e. secondary control). However, this does not appear to work as a buffer against negative affect. This finding also underscores that cognitive and emotional well-being constitute distinct components of well-being that may serve different functions across the adult life span (e.g., Ryff & Keyes, 1995).

In addition, experiencing negative emotions may activate high-control individuals to engage in efforts to change their adverse situation (Schulz & Heckhausen, 1998). However, this may con-

tribute to greater subjective well-being only when individuals are actually able to remove or change the sources of undesirable situations. In later adulthood, many life circumstances cannot easily be altered, if at all. Consequently, when it is difficult or not possible at all to change one's situation, older individuals may rely on different reference standards when evaluating their life. A strong sense of control may amplify the beneficial effects of such cognitive adjustments to the aging process.

Chronological Age and Subjective Well-Being

Findings concerning age differences in subjective well-being are consistent with reports from other studies. For example, in later adulthood instances of negative affect were reported less frequently than in early adulthood (Gross et al., 1997). Unlike in the study of Mroczek and Kolarz (1998), there was no significant indication of gender-differential age effects.

Findings concerning age differences in positive affect and life satisfaction were more complex and only partly consistent with reports from other studies. Positive affect was found to be inversely related to chronological age. Older adults reported experiencing positive emotions less frequently than middle-aged adults and young adults. This is in accordance with findings based on large and nationwide U.S. samples (e.g., Argyle, 1999).

Limitations of Study 1

Some caveats of Study 1 ought to be considered when interpreting the findings. First, because of the cross-sectional character of this study, it is not possible to disentangle effects relating to aging from differences relating to cohort phenomena. Also, no conclusions on the stability of subjective well-being across the adult life span can be drawn from the results of this cross-sectional study. The correlational character of the study obstructs any interpretation of causal relationships among variables. For example, feeling better may also lead to a stronger sense of control over one's development.

Another caveat relates to the broadly inclusive measure of perceived developmental control used in this research. Delving further into the different types of perceived control, (i.e., relating to agent-end beliefs and to agent-means beliefs) appears a promising venue. For example, different types of agent-means beliefs (e.g., effort, ability) may serve different functions in the hedonic system in early and late adulthood. Some authors have also pointed to the necessity to assess perceived control in the context of domain-specific tasks and goals (e.g., Lachman, 1986). This implies an assessment of controllability with respect to personal goals or tasks in everyday life. These issues are addressed in Study 3.

Furthermore, evaluations of life satisfaction and affect relied exclusively on retrospective self-reports. Schwarz and Strack (1999) report that subjective judgments of life satisfaction may be biased by current mood states or by differential comparison standards in one's immediate environment. This also pertains to the measure of life satisfaction, which contained two items involving a time frame of reference (e.g., "I am as happy now as when I was young"). For example, older adults may have compared their current satisfaction with when they were "young" as a child, or "young" as a middle-aged adult. One implication is that the measure of life satisfaction used here may have confounded evaluations of one's satisfaction with cognitive reappraisals (e.g., com-

paring one's life time now with times that were not satisfying). Also, assessing in situ judgments of perceived control and subjective well-being may yield different results (e.g., Larson, 1989).

Summary

The findings of Study 1 suggest that perceptions of control over development serve different functions in the hedonic system in early or middle adulthood as compared with later adulthood. In young and middle adulthood, a strong sense of control appears to be more relevant for buffering experiences of failure and loss known to be associated with negative affect. In later adulthood, in contrast, a strong sense of control appears to operate through cognitive appraisals as is expressed in a positive evaluation of one's life situation. One possible consequence of this is that older adults who have a strong sense of control also benefit more from events that they can evaluate positively. This possibility was explored in Study 2.

Study 2

In the first study, perceived control over development differently predicted subjective well-being depending on chronological age. However, although this finding was based on cross-sectional data, no conclusions were possible about the effects of perceived control on short-term changes of subjective well-being over time. On the basis of the idea that such changes are most likely to be observed in later adulthood in relation to the demands of everyday life, we conducted a longitudinal follow-up study with a subsample of older adults.

One goal of the second study was to examine whether the relationship between perceived control and subjective well-being depends on the extent to which individuals have experienced positive life events. Some authors have emphasized that a strong sense of control may only be adaptive when an individual has the control potential for experiencing success in life (e.g., Bandura, 1997; Heckhausen & Schulz, 1995). One explanation for this is that individuals who hold strong control beliefs are less flexible in adjusting their cognitive appraisals of their life situation when confronted with failures or loss (e.g., Clark-Plaskie & Lachman, 1999). This may constitute a risk factor in later life especially when there are fewer resources to exert primary control (e.g., M. M. Baltes & Lang, 1997). Therefore, unpleasant events should have more detrimental effects among older individuals who have a strong sense of control.

A related explanation is that individuals who have a strong sense of control may also be better at capitalizing on positive life experiences (e.g., Langston, 1994). For example, individuals who believe in their general abilities to achieve success may also be more likely to perceive themselves as more deserving or as generally more lucky when experiencing pleasant events in everyday life. Consequently, perceived control should be associated with increased subjective well-being when positive life events occur.

Proceeding from these considerations, Study 2 explored two hypotheses. First, we expected that perceived control over development and minor life events predict changes in subjective well-being across a 6-month interval. Second, it was hypothesized that the relationship between perceived control over development and subjective well-being differs depending on the extent to which older adults experience desirable life events.

Method

Within the 18 months following the first study ($M = 13.0$ months, $SD = 3.0$, minimum/maximum = 7.4/17.8), 42 of the older participants of Study 1 participated in an additional study. To have a more powerful test of change in subjective well-being across the 6-month time interval, those participants who had either low or high scores on a composite scale consisting of measures of cognitive functioning, health functioning, and education (as described above) were selected for participation. This procedure made it possible to test whether older adults, who were relatively poor in these resources, showed different changes in subjective well-being as compared with participants who were relatively rich in the same resources.

Participants

The 42 participants of Study 2 (i.e., 24 men, 18 women) were between 70 and 90 years old ($M = 81.8$ years, $SD = 5.9$). Most male participants were married (62.5%). In contrast, 50.0% of women were widowed and only 16.7% were married. With one exception, all participants were living in a private household (one older woman lived in a nursing home).

Participants reflected two extreme groups of older adults identified in Study 1. A first group ($n = 22$) consisted of relatively healthy, well-educated, and cognitively well-functioning individuals (i.e., resource rich). A second group consisted of participants with low levels of education and low levels of functioning in the domains of health and cognition (i.e., resource poor). Magnitude of effects sizes differentiating the two groups were 1.5 standard deviations for cognitive functioning, 1.3 standard deviations for health functioning, and 0.5 standard deviations for years of education. Resource-group membership was used as a covariate in all analyses of Study 2. No additional information from Study 1 variables was used.

Procedure

All participants took part in two measurement occasions within an average time interval of 5.8 months ($SD = 0.60$; minimum/maximum = 5.0/7.3 months). To minimize the length of the interview schedule for these older participants, we carried out both measurement occasions in two separate interview sessions within a time interval of 1 month between them. Participants also took part in two additional sessions that took place between the first and second measurement occasion, the results of which are not reported in the following description.

Measures

In Study 2, the identical instruments of Perceived Control Over Development, Life Satisfaction, and the PANAS were used again (see above Study 1). In addition, participants also completed a questionnaire on minor positive and negative life events.

The reference point for T transformations of Perceived Control Over Development and subjective well-being were the means and variances of the respective constructs among the same participants at the measurement occasion of Study 1 ($N = 42$). Means of constructs at the first measurement occasion of Study 2 thus contain information about mean changes across the 13 months since the Study 1 measurement occasion. The 13-month stability of constructs across these two measurements was .60 for Perceived Control Over Development, .49 for PA, .54 for NA, and .74 for Life Satisfaction ($n = 42$). Table 4 gives an overview of the internal consistencies (α s), and 6-month stability of all six constructs between the first and second measurement occasion of Study 2.

As shown in Table 4, there was a significant decrease in perceived control, positive and negative life events, positive affect, negative affect, and life satisfaction between the first and second measurement of Study 2.

Table 4

Means, Standard Deviations, Internal Consistency (Alpha), and Stability of Measured Constructs in Study 2 ($N = 42$)

Construct	M	SD	α	Mean-level change (η^2)	6-month stability ^a
Perceived control over development					
1st measurement	51.6	9.2	.73		
2nd measurement	48.2	9.0	.68	.167**	.66
Positive life events					
1st measurement	17.9	6.0	.80		
2nd measurement	15.6	6.5	.83	.181**	.69
Negative life events					
1st measurement	6.2	3.8	.60		
2nd measurement	4.6	2.8	.73	.262**	.69
Life Satisfaction					
1st measurement	52.6	8.3	.65		
2nd measurement	49.6	10.1	.74	.155**	.75
Positive Affect					
1st measurement	51.4	10.3	.78		
2nd measurement	42.9	11.4	.86	.426**	.58
Negative Affect					
1st measurement	51.5	9.8	.69		
2nd measurement	46.5	9.4	.69	.221**	.52

Note. Constructs were standardized on the basis of M s and SD s of the 42 participants in Study 1. Scores of positive events ranged from 3 to 26.5. Scores of negative events ranged from 0 to 14.

^a 6-month stability refers to stability between first and second measurement of Study 2.

** $p < .01$.

Table 4 summarizes the internal consistencies of the six constructs at the first and last measurement. Alpha values varied between .60 and .86.

Minor life events. These were assessed with a 20-item questionnaire on positive and negative life events (Ferring & Filipp, 1992). Participants rated on a 4-point scale ranging from 0 (*never*) to 3 (*often*) how often they had experienced each of 10 positive events and each of 10 negative events over the past weeks (see Appendix for a list of all items). Two sum composites, one for positive life events and one for negative life events, were used, with higher scores indicating more frequent experience of life events. Internal consistency of both subscales was .69.

Health functioning. Health functioning was measured with the first two simple trials of the five forms of Romberg's trial that were used in Study 1 (for a description, see above, Study 1). The two simple trials were assessed at the first and second measurement of Study 2.

Statistical procedure. Statistical analyses were based on hierarchical linear regression analyses. All analyses were done with observed variables rather than latent variables. Because of the small sample size, no SEM of variables seemed appropriate. Interaction effects in the regression analyses were tested and interpreted following the recommendations of Aiken and West (1991). All variables were centered to their respective means before they were entered into the regression models.

Results

Table 5 shows the bivariate correlations of perceived control over development, positive and negative life events, life satisfaction, PA, and NA at the first and second measurement occasion. As shown in Table 5, positive life events were more strongly related to the three dimensions of subjective well-being than were negative life events. Table 6 summarizes the results of three hierarchical multiple regression analyses that were computed to explore whether minor life events and perceived control are associated with changes in subjective well-being. Perceived control and pos-

Table 5
Correlations of Age Cohort, Perceived Control, Life Events, and Subjective Well-Being at the First and Second Measurement (N = 42)

No. of variables	1st occasion						2nd occasion					
	1	2	3	4	5	6	7	8	9	10	11	12
1st occasion												
1. Perceived control	—	.30	-.24	.27	-.10	.37	.66	.31	-.15	.43	-.23	.59
2. Positive events		—	.12	.45	-.40	.55	.31	.69	.06	.65	-.05	.42
3. Negative events			—	-.04	.29	-.26	-.27	.15	.69	-.21	.08	-.33
4. Positive Affect				—	-.23	.43	.40	.37	-.01	.58	-.22	.43
5. Negative Affect					—	-.53	-.24	-.29	.25	-.32	.52	-.41
6. Life Satisfaction						—	.51	.44	-.24	.50	-.33	.75
2nd occasion												
7. Perceived control							—	.36	-.33	.57	-.24	.60
8. Positive events								—	.09	.55	-.03	.38
9. Negative events									—	-.09	.13	-.19
10. Positive Affect										—	-.14	.62
11. Negative Affect											—	-.42
12. Life Satisfaction												—
Covariates												
Age cohort	-.21	-.27	.19	-.11	.20	-.20	-.06	-.18	.18	-.19	.13	-.10
Sex	-.20	-.05	-.12	.09	-.03	-.09	-.16	-.06	-.09	-.11	.16	.14
Resource group	-.29	-.30	.18	-.29	.32	-.44	-.41	-.27	.16	-.51	.45	-.62
Health (1st occ)	-.32	-.47	.19	-.08	.26	-.44	-.23	-.24	.07	-.30	.28	-.47
Health (2nd occ)	-.20	-.35	-.05	-.01	.09	-.27	-.19	-.14	-.11	-.18	.12	-.30

Note. Coefficients printed in bold are significant ($p < .05$). Stability coefficients of constructs are printed in italics. occ = occasion.

itive and negative life events were included in the regression equation after controlling for stability effects. As shown in the right column of Table 6, perceived control over development at the first measurement was associated with increased life satisfaction

after 6 months, above and beyond the effects of resource group membership. Life events were not significantly associated with increased life satisfaction. With respect to negative affect, there was no significant effect of perceived control or minor life events.

Table 6
Results of Three Hierarchical Multiple Regression Analyses of Change of Life Satisfaction, Positive Affect, and Negative Affect on Life Events and Perceived Control (N = 42)

Predictor variable	Outcome variables (last occasion)					
	Positive affect		Negative affect		Life satisfaction	
	B	ΔR^2	B	ΔR^2	B	ΔR^2
Constant	-6.28		8.44*		-10.56**	
Stability coefficient (1st occasion)	0.31*	.332**	0.60**	.267**	0.54**	.521**
Resource group ^a	3.18	.130**	-5.53*	.090*	6.93**	.114**
Negative weekly events		.024		.015		.030
1st occasion	-0.79*		-0.73		-0.58	
Change ^b	0.38		0.28		0.65	
PWE		.178**		.080		.005
1st occasion	1.14*		0.41		-0.01	
Change ^b	0.14		0.19		0.01	
PCD		.037		.059		.077*
1st occasion	-0.04		-0.23		0.32*	
Change ^b	0.24		0.03		0.09	
Interaction Effects						
PCD (1st) × PWE (1st)	0.08**	.086**	ns		ns	
Final R^2		.774**		.510**		.747**

Note. Significance of unstandardized coefficients refers to unique contribution (after controlling for all other effects). Variables were centered to the mean. ΔR^2 pertains to additional explained variance when entering predictors in the shown order. No further interaction effect among predictors reached significance. Effects remain unchanged when statistically controlling for age and health. PWE = positive weekly events; PCD = perceived control.

^a 2 = rich, 1 = poor. ^b Last occasion.

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

Negative affect showed a strong rank-order stability but decreased more strongly among resource-rich than among resource-poor individuals ($\Delta R^2 = .090, p < .01$).

An increased frequency of positive emotions was observed when individuals experienced positive events at the first measurement ($\Delta R^2 = .178, p < .01$). However, this relationship was modified by an interaction effect of positive events and perceived control over development ($\Delta R^2 = .086, p < .01$). No other significant interaction effects of life events, perceived control, and covariates at the first or second measurement were observed.

Figure 1 illustrates the interaction effect of perceived control over development and positive life events on change in positive affect after 4 months. For illustrative purposes, we used a tercile split of perceived control in the figure. Perceived control modified the relationship between positive life events and changes in positive affect. When individuals reported high levels of perceived control at the first measurement and a high frequency of positive life events, frequency of positive emotional experiences increased. Decreases in the frequency of positive affect were observed among individuals who perceived low control and reported few positive life events. All effects remained unchanged when we controlled for effects of age, sex, resource-group membership, and health at the first and second measurement.

One possible explanation is that the observed effects of positive events are related to the controllability of these events (Reich & Zautra, 1981; Zautra & Reich, 1980). To test this consideration, we computed the regression analyses again with two separate variables for self-caused positive events (i.e., "origin events"; see Appendix, composite of Items 1, 3, 6, 8, and 19) and for not self-caused positive events (i.e., "pawn events"; see Appendix, composite of Items 2, 4, 10, 13, and 17). Whereas the significant interaction effect of perceived control and pawn events on positive affect did not reach significance ($\Delta R^2 = .001, ns$), the interaction effect of perceived control and self-caused positive events remained significant ($\Delta R^2 = .098, p < .001, \text{total } R^2 = .819$), and was unchanged as illustrated in Figure 1. A comparable post hoc analysis for negative events did not change the results.

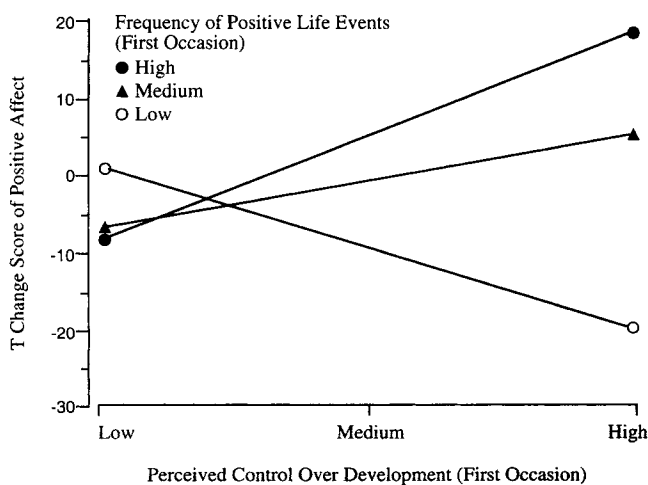


Figure 1. Change of positive affect across 6 months. Change is differently associated with perceived control over development depending on prior frequency of positive life events ($N = 42$). A tercile split is used for the purpose of illustration.

Discussion of Study 2

The second study examined the associations of perceived control and life events with change of subjective well-being among older adults across a 6-month interval. Older adults who had a strong sense of control experienced an increase of positive emotions over this short time interval when many controllable positive life events had occurred. When few positive events had occurred, a strong sense of control was associated with experiencing reduced positive affect after 6 months. This finding adds to the literature on the potential risks of high perceived control (e.g., Burger, 1989; Schulz & Heckhausen, 1996).

The results converge with research on the benefits of congruence between an individual's motivational resources and the environmental affordances for self-regulation (e.g., Higgins, Grant, & Shah, 1999; Sheldon & Elliot, 1999). A strong sense of control was associated with greater subjective well-being only when positive events had occurred that were personally caused. As Reich and Zautra (1981; Zautra & Reich, 1980) have suggested in their research, personal causation appears to be central for subjective well-being. The frequency of positive emotional experience decreased most among individuals who had a strong sense of control but reported few self-caused positive events. In contrast to the findings of Zautra and Reich (1980), positive events that were not self-caused were unrelated to subjective well-being.

No comparable effects were found in relation to changes of life satisfaction and negative affect. Although there was a general decrease in life satisfaction over time, strong perceived control was associated with increased life satisfaction after 6 months. As in Study 1, perceived control was robustly associated with life satisfaction among older adults above and beyond the effects of covariates. The frequency of negative affect was more stable and exclusively related to the individual's resource-group membership 1 year prior to the assessments.

Limitations of Study 2

There are some caveats that need to be considered when interpreting the findings of Study 2. First, participants did not reflect the heterogeneity of older adults, as was the case in the first study. Rather, participants represented two groups of very well-functioning (resource-rich) and very poor-functioning (resource-poor) older adults. This strategy of sampling extreme groups has advantages, but also limitations. For example, regression to the mean may have occurred. Mean scores of most variables decreased from the first to the last measurement. Note, however, that no substantial declines in any of the indicators of subjective well-being were observed between Study 1 and the first measurement of Study 2. Second, participants reported frequencies of positive and negative emotions during the last year twice within a 6-month interval. Nevertheless, stability coefficients were unexpectedly low. In contrast, life satisfaction and positive and negative life events showed greater stability. Some older adults may have been better at remembering specific positive or negative events in the last weeks than remembering the frequency of specific emotions. Clearly, retrospective evaluations of events and emotional experiences are especially problematic in later adulthood and should be interpreted with care.

Summary

In this study, only those older respondents who jointly held high control perceptions and experienced many positive events showed increases in well-being over a 6-month period. High control beliefs proved detrimental for subjective well-being when coupled with few positive events in everyday life.

Study 3

The first and second study relied on a broadly inclusive construct of perceived control over development that did not differentiate agent-end beliefs from agent-means beliefs (Skinner, 1996). However, differentiating between perceptions of one's influence on outcomes and of the internal causes that lead to success allows a better understanding of the processes mediating between a strong sense of control and subjective well-being.

Attribution theory has addressed the ways in which individuals perceive causes for what happens to them in their lives (e.g., Weiner, 1985). In this tradition, two basic styles of how people perceive self-related causes of events in their life have been distinguished (e.g., Anderson et al., 1994). Behavioral explanations attribute the cause of an outcome to a modifiable source in the self (i.e., one's behavior). Characterological explanations attribute the cause of an outcome to a relatively stable source in the self (e.g., one's ability). Generally, behavioral explanatory styles have been shown to be more adaptive (e.g., associated with reduced depression) than characterological explanatory styles (Anderson et al., 1994). Such effects have mostly been found for bad events and less for good events. The role of chronological age on associations between perceived (internal) causes and subjective well-being is not yet well understood. For example, perceiving characterological causes for one's success may be more adaptive when potentials for primary control are reduced in later life and when appraising one's past accomplishments may compensate for possible failures in the presence.

One possible explanation for the age differences in the correlations between perceived control and subjective well-being is that older adults attribute their developmental success to other, more stable causes (ability) than younger adults do. Young adults benefit more when they perceive the cause of their success in their unstable and specific behavior (effort), because this is associated with greater growth potential in the future. For Study 3, we formulated two specific hypothesis: (1) In early adulthood, life satisfaction is more strongly associated with perceiving one's effort as causal for success and (2) in later adulthood, life satisfaction is more strongly associated with perceiving one's abilities as causal for success.

Method

The study was based on a reanalysis and extension of a larger research project that was conducted between April 1991 and February 1992 at the Max Planck Institute for Human Development and Education (for a detailed description, see Heckhausen, 1997). Participants completed the interview session (1.5 h) in groups consisting of 10 to 15 respondents. Participants were given a booklet with the various questionnaires arranged in fixed order with open-ended questions (on developmental goals) preceding item ratings.

Participants

All 510 participants were volunteers, recruited by newspaper advertisements in Berlin. They were paid 30 DM (approximately \$15) for a 1.5-h session. Of the sample, 162 were young adults (20–35 years; $M = 28.7$, $SD = 4.3$), 173 were middle-aged (40–55 years; $M = 47.8$, $SD = 4.9$), and 175 were older than 60 years ($M = 66.3$, $SD = 5.3$). There were 255 women and 255 men. Occupational status was equally distributed across the age cohort and sex groups. There were 125 teachers, 131 engineers, 128 clerks, and 126 skilled or semiskilled workers.

Measures

Probability and controllability of goal attainment. Participants reported up to five of the "most important personal hopes, plans, and goals for the next 5 to 10 years" (for details, see Heckhausen, 1997). Most participants reported a total of five goals (84.2%); 15.9% reported less than five goals ($M = 3.32$). Older adults were more likely to report less than five goals ($M = 4.56$) than young ($M = 4.87$) and middle-aged adults ($M = 4.77$), $F(2, 507) = 9.49$, $p < .01$, $\eta^2 = .036$. For each of the nominated goals, participants reported perceived controllability of goal attainment ("How much influence do you think you have over attaining this goal?") on a scale of 1 (*very little*) to 5 (*very much*; $M = 3.53$, $SD = .80$). For each goal, participants also indicated their agreement to a roster of items describing potential causes of attaining that goal on a scale of 1 (*not at all*) to 5 (*very much*); namely, ability ("I have the abilities required to reach this goal"; $M = 3.47$, $SD = .74$), effort ("I invest effort to reach this goal"; $M = 3.86$, $SD = .71$), and luck ("I am a lucky person to reach this goal"; $M = 2.82$, $SD = .83$). Composite means of perceived controllability and causes of goal attainment were computed across all reported goals.

Subjective success probability. Participants reported for each of the named goals the subjective probability of goal attainment ("In your view, how likely is it that this goal will be realized?") on a range of 0% to 100%. *Subjective success probability* refers to the mean subjective probability across all named goals ($M = 68.1$, $SD = 16.8$).

Life satisfaction. Three items assessed the participants' satisfaction with their life ("How satisfied are you with your current life?"), the meaning and purpose of life ("How satisfied are you with the meaning and purpose in your current life?"), and their general life perspective ("How do you evaluate your life in general?"; rated on a scale of 1 [*very unpleasant*] to 4 [*neutral*] to 7 [*very pleasant*]). Alpha was .81. A *T*-transformed mean composite of items was computed ($M = 50$, $SD = 10$). Life satisfaction and subjective success probability correlated at .34.

Statistical procedure. The focus of our statistical analyses was on age-differential associations between life satisfaction, perceived probability, controllability, and causality of goal attainment. An analyses of age differences in the number and contents of goals is reported by Heckhausen (1997). The results reported here are based on a reanalysis including new and additional data on participant's perceptions of causal factors that lead to goal attainment. Statistical analyses relied on analyses of variance and hierarchical linear regression analyses. Again, interaction effects were tested and interpreted following the recommendations of Aiken and West (1991).

Results

Life Satisfaction, Perceived Controllability, and Causality of Goal Attainment

Life satisfaction was not significantly correlated with chronological age ($r = .05$, *ns*). There were significant age differences with respect to subjective success probability, $F(2, 507) = 7.7$, $p < .001$, $h^2 = .030$, perceptions of controllability of goal attainment, $F(2, 507) = 40.7$, $p < .001$, $h^2 = .138$, and perceived effort, $F(2, 507) = 11.0$, $p < .001$, $h^2 = .042$, and perceived luck, $F(2,$

507) = 9.7, $p < .001$, $h^2 = .037$, as causes of goal attainment. Notably, there was no age difference in the extent to which personal abilities were perceived as being causal for goal attainment, $F(2, 507) = 2.0$, *ns* ($M = 3.47$). Older adults felt that they had less control over attaining their goals ($M = 3.20$) than middle-aged ($M = 3.48$) and young adults ($M = 3.93$). Young ($M = 4.01$) and middle-aged adults ($M = 3.92$) experienced their efforts as a stronger cause for goal attainment than older adults did ($M = 3.67$). Subjective success probability was greater in young adulthood ($M = 72.3\%$) compared with middle ($M = 65.4\%$) and older adulthood ($M = 66.9\%$).

Associations of Perceived Controllability and Causality of Goal Attainment With Life Satisfaction and Subjective Success Probability

Table 7 gives an overview of the results of two hierarchical regression analyses of life satisfaction and subjective success probability on beliefs about controllability and causality of attaining one's goals. Table 7 also presents the standardized regression coefficients of predictors within each of the three age groups to illustrate and facilitate interpretations of the observed significant interaction effects. There were two significant interaction effects of Age Group \times Perceived Ability and of Age Group \times Perceived Effort on life satisfaction and on subjective success probability. As shown in Table 7, there were no significant age differences with respect to the associations between perceived controllability and perceived luck with life satisfaction or subjective success probability.

However, there were two significant interaction effects of age group with perceived ability, $t(499) = 2.68$, $p < .01$, and perceived effort, $t(499) = -2.71$, $p < .01$, as causal factors. Perceiving one's abilities as causal for goal attainment was associated with lower life satisfaction among young adults ($\beta = -.20$, $p < .05$) but not among older adults ($\beta = .11$, *ns*). In contrast, perceiving one's

effort as causal for success was associated with greater life satisfaction among young adults ($\beta = .20$, $p < .05$) and with lower life satisfaction among older adults ($\beta = -.15$, $p < .05$). Similar significant interaction effects of age group with perceived ability, $t(499) = 4.0$, $p < .01$, and age group with perceived effort, $t(499) = -4.3$, $p < .01$, were found with respect to subjective success probability. Perceiving one's abilities as causal was related to perceiving a greater probability to succeed among older adults ($\beta = .40$, $p < .05$) but not among young adults ($\beta = -.10$, *ns*). In contrast, perceived effort was positively associated with subjective success probability among young adults ($\beta = .17$, $p < .05$) but negatively associated with success probability among older adults ($\beta = -.38$, $p < .05$).

Discussion of Study 3

In Study 3, we explored age-related differences in specific types of causality perceptions in relation to life satisfaction and subjective success probability. Consistent with findings of Study 1, perceptions of control over developmental goal were found to be associated with subjective well-being. Age differences were identified with regard to perceptions of internal causes that lead to goal attainment, but not for beliefs about general controllability of goal attainment. Young adults were more satisfied when they attributed their success to their efforts rather than to their abilities. In contrast, older adults were more satisfied when they attributed their success to their abilities.

Moreover, older adults experienced a greater probability to be successful when they thought that their personality (i.e., ability) was causal for their goal attainment. This also points to the fact that older adults prefer different goals than younger adults. Heckhausen (1997) found that the goals of older adults are more likely to be formulated as loss avoidance goals (e.g., "stay healthy," "not become unemployed") rather than as striving for gains (e.g., "improve my physical fitness," "get a better paid job"). The stronger

Table 7
Standardized Regression Coefficients of Two Hierarchical Multiple Regression Analyses of Life Satisfaction and Subjective Success Probability on Beliefs About Controllability and Causality of Goal Attainment (N = 510)

Predictor variable	Life satisfaction				Subjective success probability			
	Young	Middle	Old	All	Young	Middle	Old	All
Age cohort	.05	.02	.17	.19	-.01	-.16	.00	.05
Sex	-.05	.03	.06	.01	.03	.00	.19	.09
Controllability of goal attainment	.28	.28	.28	.28	.34	.38	.46	.45
Causality of goal attainment								
Ability	-.20 _a	-.12 _{a,b}	.11 _b	-.06	-.10 _a	.14 _a	.40 _b	.18
Effort	.20 _a	-.01 _b	-.15 _b	-.02	.17 _a	.02 _a	-.38 _b	-.13
Luck	.24	.20	.26	.24	.05	.09	.18	.13
Age \times Controllability				-.09				-.02
Age \times Ability				.15				.20
Age \times Effort				-.15				-.22
Age \times Luck				-.02				.04
Final R^2	.175	.118	.196	.160	.156	.271	.389	.296

Note. Coefficients that do not share a common subscript differ at $p \leq .05$, post hoc test of interaction effect in the regression model. Coefficients printed in bold are significant ($p < .05$). No additional interaction effects were significant.

associations between perceived causality of one's success and life satisfaction in later adulthood may also be related to a more resigned choice of attainable goals. This is consistent with the assumption that older adults make greater use of adapting their internal standards to fit with their environmental opportunities (Heckhausen & Schulz, 1995). Older adults feel better when they control their developmental goals in congruence with their abilities. Younger adults, in contrast, feel more likely to be successful and satisfied when they believe that their efforts cause their achievements.

The results of Study 3 did not replicate the age differential patterns of correlations between life satisfaction and perceived control. Note, though, that the broadly inclusive measure of perceived control over development used in Study 1 also involved perceptions of causes for developmental success such as one's abilities (i.e., "I am able to make my goals come true"). Some of the age differences in the correlational pattern between perceived control and subjective well-being in Study 1 may have been related to the different implications associated with ability-related perceptions of perceived control.

Again, there are some caveats that need to be considered when interpreting the findings of this study. The limitations associated with the cross-sectional and correlational study design of Study 1 also pertain to Study 3. In contrast to Study 1, Study 3 was based on a self-selected sample of volunteers. Participants may therefore represent an above-average active and interested population of individuals, a situation that may have also led to a greater homogeneity with respect to perceived control and life satisfaction. This may also have affected the covariances between perceived control and life satisfaction.

General Discussion

Findings of all three studies suggest a strong association between perceived control over development and subjective well-being. This association was found to depend on chronological age (Study 1), the experience of (controllable) positive life events (Study 2), and beliefs about the internal causes (effort, ability) of one's goal attainment (Study 3). Feeling happy and satisfied or not feeling sad are not privileges of a particular phase in the human life course. However, there are age-specific conditions to strong subjective well-being. One such condition appears to be related to the age-related differences in the potential for primary control (e.g., Heckhausen & Schulz, 1995). Depending on one's position in the life course, perceiving strong control appears to serve different functions for the hedonic system.

In early and middle adulthood, a strong sense of control may be more relevant for the compensation of failures and the enhancement of future growth potentials. This is reflected in the result that perceived control was related to fewer negative emotional experiences among young and middle-aged adults and in the finding that among young adults perceiving one's efforts as causal for one's success was associated with greater satisfaction. These results suggest that in early adulthood, perceived control promotes the activation of primary control to avoid negative events and strive for positive events and developmental growth.

In later life, a strong sense of control may be selectively adaptive for the mastery of everyday demands, especially when there is potential for positive events. In view of the challenge for older people to flexibly adjust their internal standards, more general

perceptions of high personal control represent a risk for well-being, because they lead to overestimating oneself and disappointment with one's actual primary control potential (e.g., Brandtstädter, 1992, 1999; Heckhausen, 1999). This interpretation is consistent with the result of Study 2 that a strong sense of control over development was associated with reduced subjective well-being when older adults experienced few self-caused positive life events and with the result of Study 3 that older adults were more satisfied when perceiving their abilities as causal for their success.

What are the implications of our findings? Perceiving high control over one's development does not appear to be associated with benefits at all phases of the life cycle. During young adulthood and midlife when actual control resources may be ample (including a long-term-future time perspective), high positive perceptions of control can fuel primary control striving, and thus lead to objective improvements in life quality and to developmental growth. In contrast, older adults may command less objective action potentials (including a severely constrained future perspective) and benefit from perceived control only when experiencing plentiful and self-caused positive events. In the absence of self-caused everyday uplifts, strong and unrealistic beliefs in one's own control are more likely to be associated with lowered subjective well-being. Thus, in later adulthood, perceptions of control appear to be more adaptive when they are flexibly adjusted to situational demands and reflective of a positive evaluation of one's general abilities.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Anderson, C. A., Miller, R. S., Riger, A. L., Dill, J. C., & Sedikides, C. (1994). Behavioral and characterological attributional styles as predictors of depression and loneliness: Review, refinement, and test. *Journal of Personality and Social Psychology*, *66*, 549–558.
- Argyle, M. (1999). Causes and correlates of happiness. In D. Kahnemann, E. Diener, & N. Schwarz (Eds.), *Well-being* (pp. 353–373). New York: Russell Sage Foundation.
- Baltes, M. M., & Carstensen, L. L. (1996). The process of successful aging. *Ageing and Society*, *16*, 397–422.
- Baltes, M. M., & Lang, F. R. (1997). Everyday functioning and successful aging: The impact of resources. *Psychology and Aging*, *12*, 433–443.
- Baltes, P. B., Staudinger, U. M., & Lindenberger, U. (1999). Lifespan psychology: Theory and application to intellectual functioning. *Annual Review of Psychology*, *50*, 471–507.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Brandtstädter, J. (1992). Personal self-regulation of development: Cross-sequential analyses of development-related control beliefs and emotions. *Developmental Psychology*, *25*, 96–108.
- Brandtstädter, J. (1999). Sources of resilience in the aging self: Toward integrating perspectives. In T. M. Hess & F. Blanchard-Fields (Eds.), *Social cognition and aging* (pp. 123–141). San Diego, CA: Academic Press.
- Burger, J. M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology*, *56*, 246–256.
- Burger, J. M. (1992). *Desire for control: Personality, social, and clinical perspectives*. New York: Plenum Press.
- Cantor, N., & Kihlstrom, J. F. (1987). *Personality and social intelligence*. Englewood Cliffs, NJ: Prentice Hall.
- Charles, S., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology*, *80*, 136–151.

- Clark-Plaskie, M., & Lachman, M. E. (1999). The sense of control in midlife. In S. L. Willis & J. D. Reid (Eds.), *Life in the middle: Psychological and social development in middle age* (pp. 181–208). San Diego, CA: Academic Press.
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, *124*, 197–229.
- Diener, E. (2000). Subjective well-being. The science of happiness and a proposal for a national index. *American Psychologist*, *55*, 34–43.
- Diener, E., & Suh, E. M. (1998). Subjective well-being and age: An international analysis. In K. W. Schaie & M. P. Lawton (Eds.), *Annual review of gerontology and geriatrics: Focus on emotion and adult development* (Vol. 17, pp. 304–324). New York: Springer.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*, 276–302.
- Emmons, R. A. (1992). Abstract versus concrete goals: Personal striving level, physical illness, and psychological well-being. *Journal of Personality and Social Psychology*, *62*, 292–300.
- Emmons, R. A., & Diener, E. (1985). Personality correlates of subjective well-being. *Personality and Social Psychology Bulletin*, *11*, 89–97.
- Ferring, D., & Filipp, S. -H. (1992). *Die Skala zur Erfassung von Alltagsbelastungen* [Questionnaire of everyday life demands]. Unpublished manuscript, University of Trier.
- Filipp, S. -H. (1996). Motivation and emotion. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (pp. 218–235). New York: Academic Press.
- Grob, A., Little, T. D., Wanner, B., & Wearing, A. J. (1996). Adolescents' well-being and perceived control across 14 sociocultural contexts. *Journal of Personality and Social Psychology*, *71*, 785–795.
- Gross, J. J., Carstensen, L. L., Pasupathi, M., Tsai, J., Göttestam-Skorpen, K., & Hsu, A. (1997). Emotion and aging: Experience, expression, and control. *Psychology and Aging*, *12*, 590–599.
- Heckhausen, J. (1997). Developmental regulation across adulthood: Primary and secondary control of age-related challenges. *Developmental Psychology*, *33*, 176–187.
- Heckhausen, J. (1999). *Developmental regulation in adulthood*. New York: Cambridge University Press.
- Heckhausen, J., & Schulz, R. (1995). A life span theory of control. *Psychological Review*, *102*, 284–302.
- Higgins, E. T., Grant, H., & Shah, J. (1999). Self-regulation and quality of life: Emotional and non-emotional life experiences. In D. Kahnemann, E. Diener, & N. Schwarz (Eds.), *Well-being* (pp. 244–266). New York: Russell Sage Foundation.
- Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*, 424–453.
- Jöreskog, K., & Sörbom, D. (1993). *LISREL 8: User's reference guide*. Chicago: Scientific Software.
- Kunzmann, U., Little, T. D., & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin Aging Study. *Psychology and Aging*, *15*, 511–526.
- Lachman, M. E. (1986). Locus of control in aging research: A case for multidimensional and domain-specific assessment. *Psychology and Aging*, *1*, 34–40.
- Lachman, M. E., & Weaver, S. L. (1998). The sense of control as a moderator of social class differences in health and well-being. *Journal of Personality and Social Psychology*, *74*, 763–773.
- Lang, F. R., & Carstensen, L. L. (in press). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging*.
- Langston, C. A. (1994). Capitalizing on and coping with daily life events. Expressive responses to positive events. *Journal of Personality and Social Psychology*, *67*, 1112–1125.
- Larson, R. (1989). Is feeling "in control" related to happiness in daily life? *Psychological Reports*, *64*, 775–784.
- Lawton, M. P. (1975). The Philadelphia Geriatric Center Morale Scale: A revision. *Journal of Gerontology*, *30*, 85–89.
- Lindenberger, U., Mayr, U., & Kliegl, R. (1993). Speed and intelligence in old age. *Psychology and Aging*, *8*, 207–220.
- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, *51*, 201–226.
- Malatesta, C. Z., & Kalnok, M. (1984). Emotional experience in younger and older adults. *Journal of Gerontology*, *39*, 301–308.
- Mayer, K. U., Maas, I., & Wagner, M. (1999). Socioeconomic conditions and social inequalities in old age. In P. B. Baltes & K. U. Mayer (Eds.), *The Berlin Aging Study* (pp. 227–255). New York: Cambridge University Press.
- McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning on doing well and being yourself. *Journal of Personality and Social Psychology*, *74*, 494–512.
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology*, *75*, 1333–1349.
- Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science*, *6*, 10–19.
- Needles, D. J., & Abramson, L. Y. (1990). Positive life events, attributional style, and hopefulness. Testing a model of recovery from depression. *Journal of Abnormal Psychology*, *99*, 156–165.
- Peterson, C. (1999). Person control and well-being. In D. Kahnemann, E. Diener, & N. Schwarz (Eds.), *Well-being* (pp. 288–301). New York: Russell Sage Foundation.
- Pulkkinen, L., & Rönkä, A. (1994). Personal control over development, identity formation, and future orientation as components of life orientation: A developmental approach. *Developmental Psychology*, *30*, 260–271.
- Reich, J. W., & Zautra, A. (1981). Life events and personal causation: Some relationships with satisfaction and distress. *Journal of Personality and Social Psychology*, *41*, 1002–1012.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*, 419–435.
- Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*, 719–727.
- Schaie, K. W., & Lawton, M. P. (Eds.). (1998). *Annual review of gerontology and geriatrics: Vol. 17. Focus on emotion and adult development*. New York: Springer.
- Schulz, R., & Heckhausen, J. (1996). A life span model of successful aging. *American Psychologist*, *51*, 702–714.
- Schulz, R., & Heckhausen, J. (1998). Emotion and control: A life-span perspective. In K. W. Schaie & M. P. Lawton (Eds.), *Annual review of gerontology and geriatrics* (pp. 185–205). New York: Springer.
- Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahnemann, E. Diener, & N. Schwarz (Eds.), *Well-being* (pp. 61–84). New York: Russell Sage Foundation.
- Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, *76*, 482–497.
- Shmotkin, D. (1990). Subjective well-being as a function of age and gender: A multivariate look for differentiated trends. *Social Indicators Research*, *23*, 201–230.
- Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, *71*, 549–570.
- SPSS 6.1.1 for Macintosh [Computer software]. (1995). Chicago: SPSS Inc.
- Stacey, C. A., & Gatz, M. (1991). Cross-sectional age differences and longitudinal change on the Bradburn Affect Balance Scale. *Journals of Gerontology*, *46*, 76–78.

- Steinhausen-Thiessen, E., & Borchelt, M. (1999). Morbidity, medication, and functional limitations in very old age. In P. B. Baltes & K. U. Mayer (Eds.), *The Berlin Aging Study* (pp. 131–166). Cambridge, England: Cambridge University Press.
- Tinetti, M. E. (1986). Performance-oriented assessments of mobility problems in elderly patients. *Journal of the American Geriatrics Society*, *34*, 119–126.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology*, *54*, 1063–1070.
- Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, *98*, 219–235.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, *92*, 548–573.
- Wrosch, C., & Heckhausen, J. (2001). *Perceived control of life regrets: Good for young and bad for old adults*. Manuscript submitted for publication, Carnegie-Mellon University.
- Zautra, A., & Reich, J. W. (1980). Positive life events and reports of well-being: Some useful distinctions. *American Journal of Community Psychology*, *8*, 657–660.

Appendix

Minor Life Events Scale

The instructions read: "In the following I will read a list of pleasant and not so pleasant events that people may experience in their everyday life. When considering the past weeks, how often have you experienced any of these events?"

The sentence stems were: "During the past weeks, this happened to me . . ." Response options were 0 (*never*), 1 (*rarely*), 2 (*occasionally*), and 3 (*often*). Numbers in parentheses indicate the order of items as used in the questionnaire.

Positive Life Events

Origin Events

- (1) I bought something nice for myself.
- (3) I enjoyed eating and drinking.
- (6) I had a good conversation.
- (8) I felt physically in good shape
- (19) I recalled a pleasurable event.

Pawn Events

- (2) A wish came true.
- (4) Someone hugged me tenderly.
- (10) Someone was very nice to me.

- (13) I experienced a particularly nice event.
- (17) I received a long-awaited visitor.

Negative Life Events

Origin events

- (5) I lost something.
- (11) I had a small accident.
- (14) I did not achieve something that was important to me.
- (16) I worried about my health.
- (18) I forgot to do something that was important to me.

Pawn Events

- (9) I waited for someone in vain.
- (7) I wanted to buy something but could not afford it.
- (12) I was annoyed by something.
- (15) I was treated unfriendly by someone.
- (20) I had a quarrel with someone.

Received August 9, 2000
 Revision received February 26, 2001
 Accepted March 28, 2001 ■