Managing Life Through Personal Goals: Intergoal Facilitation and Intensity of Goal Pursuit in Younger and Older Adulthood

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Two studies varying in design (cross-sectional and longitudinal) and methods (questionnaires, diaries, and objective information) support the notion that personal goals are among the phenomena that show positive development throughout adulthood: Older adults ($M = 64$ years) reported more mutual facilitation among their personal goals and were more engaged in goal pursuit than were younger adults ($M = 25$ years). Results were robust when age-group differences in education and disposable time were controlled for, and they also emerged in a context where younger and older participants had one goal in common, namely, to start regular physical exercise. Mediational analyses showed that the older adults' higher intensity of goal pursuit was partly mediated by their higher level of intergoal facilitation.

CURRENT developmental theories acknowledge the importance of motivational and volitional processes for understanding human development in general and successful aging in particular. These theories share the assumption that people, within limits given by social, cultural, and biological constraints, actively shape their own development (e.g., Brandtstädter & Lerner, 1999; Heckhausen, 2000; Lerner & Busch-Rossnagel, 1981; Nurmi, 1991; Salmela-Aro, Nurmi, Saisto, & Halmesmaeki, 2000). Setting and pursuing goals plays an important role in this respect, particularly in adolescence and adulthood. Goals are "desired states that people seek to obtain, maintain, or avoid" (Emmons, 1996, p. 314). Through them, people give direction to development; through effective goal-directed actions, they shape their life course in aspired directions (cf. the Selection, Optimization, and Compensation model, e.g., Freund & Baltes, 2000).

Life-span developmental psychologists further propose that adult development is characterized by decline and loss as well as by a potential for continuing gains (e.g., Baltes, 1987, 1997; Labouvie-Vief, 1981; Ryff, 1985). Empirical evidence of developmental losses in later adulthood, and particularly in very old age, is overwhelming (e.g., decreasing cognitive processing speed, increasing physical vulnerability). The empirical evidence of developmental gain throughout adulthood, however, is relatively scarce. To date, this evidence stems primarily from studies on potential age-related gains in knowledge-associated aspects of cognitive functioning (Baltes, Lindenberger, & Staudinger, 1998), as well as from research in personality-associated domains of functioning such as coping (e.g., Aldwin, 1994; Diehl, Coyle, & Labouvie-Vief, 1996) or emotion regulation (e.g., Gross et al., 1997).

In light of the increasing interest in the active role that adults of all ages play in shaping their development, it is surprising how little we know about age-related changes in motivational and volitional processes. There is evidence of age-related shifts in the content of people's goals that reflect age-graded developmental tasks (e.g., Nurmi, 1992). In addition, research has recently begun to show that personal goals may be among the phenomena that show positive development throughout adulthood. For example, Sheldon and Kasser (2001) reported that older adults, as compared with younger adults, tend to (a) select their goals more with a sense of choice and self-expression and less because they would otherwise feel ashamed, guilty, or anxious; (b) aim in their goals more toward intrinsic values (e.g., community involvement) and less toward extrinsic values (e.g., property); and (c) be more concerned with "mature" issues sensu Erikson (e.g., 1959), namely, generativity and ego integrity, and less concerned with identity formation. Similarly, Bauer and McAdams (2004) reported that older adults are more likely than younger adults to express in their goals the aspiration to grow personally.

In the present research we investigated whether age-associated differences in goal-related processes are also evident from other perspectives. We focused on the nature of interrelations among people's goals and on people's engagement in goal-directed action.

Intergoal Relations in Younger and Older Adults

It has been repeatedly claimed that adult development is characterized by higher levels of structural integration of different aspects of life and personality (e.g., Erikson, 1959; Jung, 1933; see also Werner, 1967). Specifying this general assumption in the context of a person's goals renders it accessible to empirical research. Psychological growth in adulthood should become apparent in structural attributes of people's goal systems. In the present research, we focused on one such attribute, namely, the nature of relations among an individual's goals. (Other structural attributes that were not within the focus of the present research are relations between specific goals and broader motivational themes, such as possible selves, life goals, or motives, e.g., Brunstein, Schultheiss, & Grässman, 1998, and Sheldon & Emmons, 1995, and relations between goals of different persons, e.g., Lewis, Reitsma,

Wilson, & Zigurs, 2001, or between individual and team or organizational goals, e.g., Kristof-Brown & Kay Stevens, 2001.)

People typically have several goals at once that are not necessarily independent of each other. They may influence each other in positive (facilitating) and negative (interfering) ways (e.g., Emmons & King, 1988; Little, 1983). In our definition, intergoal facilitation occurs when the pursuit of one goal simultaneously increases the likelihood of success in reaching another goal. It may result from instrumental relations among goals and from overlapping goal-attainment strategies (Riediger & Freund, 2004; Wilensky, 1983). Instrumental relations exist when progressing toward one goal also represents a step in progressing toward another goal (e.g., when being profession-ally successful helps to finance one's children's education). Overlapping goal-attainment strategies exist when the same strategy is instrumental for more than one goal. For instance, attending language classes may help both to learn a new language and to get to know new people.

In contrast, we define intergoal interference as occurring when the pursuit of one goal impairs the likelihood of success in reaching another goal. It may result from resource limitations and from incompatible goal-attainment strategies (Riediger & Freund, 2004; Wilensky, 1983). Resource limitations can lead to interference among goals when several goals require the same, insufficiently available resources. Establishing a career, for instance, may take a lot of time that cannot be spent on other goals. The second form of intergoal interference results when strategies for attaining different goals are incompatible, as is the case for the goals *to keep my relationships on a 50–50 basis* and *to dominate, control, and manipulate people and situations*, two examples of conflicting goals given by Emmons and King (1988, p. 1042).

(Note that our definitions of intergoal facilitation and interference are related to previous concepts, such as those of goal instrumentality and conflict by Emmons and King. The central difference is that we conceptualize intergoal facilitation and interference as two independent dimensions rather than as mutually exclusive opposites. For empirical evidence in support of this proposition, see Riediger and Freund, 2004.)

Research on intergoal relations has mostly focused on young adults (e.g., Emmons & King, 1988; King, Richards, & Stemmerich, 1998; McKeeman & Karoly, 1991; Sheldon & Kasser, 1995), and studies that investigated other samples did not specifically focus on potential age-group differences (e.g., Kehr, 2003; Locke, Smith, Erez, Chah, & Schaffer, 1994; Michalak & Schulte, 2002; Palys & Little, 1983; Perring, Oatley, & Smith, 1988).

One of our aims in the present research was to investigate adult age-group differences in intergoal relations. Our hypoth-esis was that, with increasing age, adults report less interference and more mutual facilitation among their goals. This prediction is in line with the notion of adulthood advances in structural aspects of functioning (e.g., Erikson, 1959; Jung, 1933; Werner, 1967). The decreasing ratio of resource gains to resouce losses throughout adulthood (e.g., Baltes, 1987) requires one to select, manage, and pursue goals in an increasingly resource-efficient manner. Although with increasing age individuals might gain in social status, material belongings, or practical knowledge, other important resources such as physical functioning or time to live decrease. Therefore, it should be an adaptive strategy for older

adults to invest their remaining resources "economically" into goals that do not interfere with, but ideally facilitate, each other. Moreover, life experience in resource management might increase throughout adulthood, leading to an improved competence in creating nonconflicting, facilitative goal systems. Finally, older adults might have more freedom in choosing their goals than younger adults for whom clear social norms of what goals they are expected to pursue exist.

To our knowledge, no information on age-related differences in intergoal facilitation is currently available. Our prediction regarding intergoal interference receives preliminary empirical support by Locke and colleagues (1994) and Kehr (2003), who report in sidenotes that older participants tended to report less intergoal interference than younger participants. The size of these associations was small to moderate. Both studies, how-ever, were not explicitly developmental, and they focused on specific populations (professors and managers).

Goal Pursuit in Younger and Older Adults

Goal setting does not necessarily lead to goal pursuit. In fact, many goals remain exactly that: goals. Wanting to lead a healthy life and exercising regularly are examples of goals many people hold but do not pursue. Shaping one's life in aspired directions requires goal-directed action. Only together can processes of setting *and* pursuing goals describe people's active role in their development. Therefore, in addition to investigating goal characteristics (intergoal relations) in the present research, we also focused on people's intensity of goal pursuit. In our definition, intensity of goal pursuit refers to the extent to which people engage in goal-relevant actions. We hypothesized that adulthood advances in goal-related processes are also evident in older adults' being, on average, more engaged in goal-relevant actions than younger adults. On the basis of empirical findings showing that low interference and, in particular, high facilitation among goals enhance goal pursuit (Emmons & King, 1988; Gebhardt & Maes, 1998; McKeeman & Karoly, 1991; Riediger & Freund, 2004), we hypothesized that high intensity of goal pursuit in older adulthood might, at least in part, be a behavioral consequence of low interference and high facilitation among older adults' goals.

Summary and Overview of the Present Studies

We conducted two studies to investigate the following predictions: (a) older adults report less interfering and more mutually facilitating goals than younger adults; (b) older adults pursue their goals more intensely than younger adults; and (c) older adults' higher intensity of goal pursuit is partly medi-ated by less interfering and more facilitating intergoal relations.

We measured the degree of interference and facilitation among four important personal goals of younger and older adults and followed a multimethod approach for assessing goal pursuit. In Study 1, we used a cross-sectional design and a self-report measure of goal pursuit. Study 2 had a prospective design. All participants shared one common goal: to start regular physical exercise. This allowed us to partly control for age differences in goal content and to obtain objective information on goal pursuit (i.e., exercise frequency). In addition, we used a diary method to assess goal pursuit in everyday life. The diary method also allowed us to control for age differences in dis-posable time.

Study 1

METHODS

Participants

Participants were 53 younger adults (20.0–30.0 years, M = 24.3) and 58 older adults (59.9–77.7 years, M = 65.2); 56.6% of the younger and 63.8% of the older participants were female. The majority of the younger participants were university students (88.7%), and the majority of the older participants had retired (89.7%).

Procedure

In small groups, participants completed a set of questionnaires. They were reimbursed DM 40 (approximately $18).

Instruments

Personal goals.—Participants were instructed to describe four goals they had for the near future (i.e., coming months or years) that they currently judged to be the most important and that they expected would still be important in coming months. The instructions included a brief explanation of the concept of goals as well as sample life domains and sample goals. (Examples of goals reported by a 24-year-old male participant are first, *to be able to make decisions and have the courage to stand up for it*; second, *to not always conform to others*; third, *to overcome lethargy, be active, stay tuned, don't give in so soon*; and fourth, *to finish my first book*. Examples of goals reported by a 61-year-old female participant are first, *to remain in dialogue with my grandchildren and observe their development*; second, *to work part time to pass on my professional experience of many years*; third, *to reconsider the partnership with my husband now that we are retired, to undertake new things together*; and fourth, *to live healthy, eat less, reduce weight*.)

Intergoal facilitation and interference.—Participants then responded, for each of the 12 pairwise combinations of these four goals, to the Intergoal Relations Questionnaire (IRQ, Riediger & Freund, 2004). Using 5-point rating scales, the IRQ measures intergoal interference in terms of time, energy, and financial constraints as well as incompatible goal-attainment strategies. Intergoal facilitation is assessed in terms of instrumental goal relations and overlapping goal-attainment strategies. In all, participants responded to 72 items (for item wordings, see the Appendix; for further details on measurement characteristics of the IRQ, see Riediger & Freund, 2004).

Averaging the interference and facilitation items yielded the interference (M = 2.16, SD = .58, Cronbach's α = .94) and facilitation composites (M = 2.94, SD = .76, Cronbach's α = .90), respectively. The bivariate association between the composites was small (r = .19, $p < .05$, two-tailed), and it was not significantly different between both age groups (i.e., age-group interaction $p > .05$, two-tailed).

Goal pursuit.—For each of the four goals under study, participants responded to the following items: (a) How much do you do for this goal? (b) How often do you think about this goal? (c) How much time do you invest in this goal? (d) How much does this goal determine your everyday life? (e) How much do

Table 1. Intergoal Facilitation and Interference and Intensity of Goal Pursuit in Younger and Older Adults: Study 1

Construct	Younger		Older		ANOVA		ANCOVA	
	M	SD	M	SD	$F(1)$	η^2	$F(1)$	η^2
Intergoal facilitation	2.71	.73	3.14	.74	9.54**	.08	9.30**	.08
Intergoal interference	2.18	.57	2.14	.60	0.16	.00	0.37	.00
Goal pursuit	−0.15	.61	0.14	.44	8.43**	.07	8.18**	.07

Notes: ANOVA = analysis of variance; ANCOVA = analysis of covariance. For the ANCOVA, the covariate is educational level. For both the ANOVA and ANCOVA, the η^2 is partial.
**$p < .01$, one-tailed.

you invest yourself into the realization of this goal? Items (a) to (d) were responded to on a 7-point rating scale, and item (e) was responded to on a 5-point rating scale. We z-transformed the items (to make the unit of measurement for all variables the same) and computed a single score (mean of all items across all four goals) indicating the participants' average intensity of goal pursuit (M = .00, SD = .54, Cronbach's α = .88).

Educational level.—Because of historical shifts in education, we included educational level as a control variable. Participants indicated whether they had obtained their highest school-leaving certificate in 8th grade (younger, 0%; older, 14.0%), 10th grade (younger, 1.9%; older, 42.1%), 12th or 13th grade (younger, 88.7%; older, 8.8%), or from a university (younger, 9.4%; older, 35.1%). Responses were coded from 1 (*lowest*) to 4 (*highest*).

Significance testing.—Because our hypotheses were directional, we used one-tailed tests of significance.

RESULTS

Intergoal Relations and Goal Pursuit in Younger and Older Adults

As we predicted, there were age-group differences in intergoal relations and goal pursuit: multivariate age-group effect, $F(3, 107) = 5.25$; $p = .001$, one-tailed; partial $\eta^2 = .13$. Univariate follow-up analyses (see Table 1) showed that younger participants reported significantly less intergoal facilitation and goal-pursuit intensity than older participants. There were no age-group differences in intergoal interference. Including educational level as covariate did not change the pattern of results (see Table 1).

Mediational Analyses

Using the multiple regression approach outlined by Baron and Kenny (1986) indicated that older adults' higher intergoal facilitation partially mediated their higher intensity of goal pursuit: First, age group (coding: younger = 1, older = 2) significantly predicted goal pursuit: $B = .290(SE = .099)$; $p = .002$, one-tailed; $R^2 = .07$. Second, age group significantly predicted facilitation: $B = .432(SE = .139)$; $p = .001$, one-tailed; $R^2 = .08$. Third, facilitation significantly predicted goal pursuit when age group was controlled for: $B = .164(SE = .066)$; $p = .007$, one-tailed; $R^2 = .12$. In this third regression, the effect of age group on goal pursuit (with facilitation controlled for) was

significant: $B = .219(SE = .101)$; $p = .015$; one-tailed. According to the modified Sobel test (Baron & Kenny, 1986; see also Kenny, Kashy, & Bolger, 1998), the reduction of the effect of age group on goal pursuit when facilitation was introduced as mediator (24.5%) was significant ($Z = 1.88$, $p = .03$, one-tailed).

Study 2

To rule out the possibility that the results in Study 1 are solely attributable to age differences in goal content, one purpose of Study 2 was to investigate whether the findings were replicable in the context of a goal that was shared by all participants. We chose starting regular physical exercise as such a common goal because it is relatively frequent and potentially relevant for younger and older adults. Furthermore, the reasons underlying this goal are easily accessible and can thus be included as control variables.

A second purpose of Study 2 was to use various measures of goal pursuit. To include objective measures (rather than to exclusively rely on self-reports as in Study 1), we obtained, in a subsample of participants, information on longer-term exercise adherence. In another subsample, we further assessed day-to-day goal pursuit by using a diary method.

The diary method also allowed us to investigate whether the older adults' higher intensity of goal pursuit could be attributed to the fact that they have more free time than younger adults, who are typically highly involved in education or work.

METHODS

Participants

Participants were 99 younger (19.2–35.4 years, $M = 25.1$) and 46 older (55.5–78.1 years, $M = 63.8$) exercise beginners. Both subsamples were predominantly female (71.7% women in the younger and 80.4% in the older subsample). As in Study 1, the majority of the younger participants were university students (82.8%), and most of the older participants had retired (71.7%). Among participants, 89.9% of the younger and 32.6% of the older ones were high school graduates (i.e., held a German Abitur) or graduates of a higher educational program.

Procedure

Participants completed a set of questionnaires and gave their sports facilities written authorization to pass on information about their attendance. These sessions are subsequently referred to as Time 1 (T1). Participants at T1 were reimbursed DM 40 (approximately $18).

Sports facilities were contacted to obtain objective information on exercise frequency. Such information was available for 102 participants ($n_{younger} = 67$, $n_{older} = 35$). For each of the five months following T1, we derived this information from attendance lists and electronic attendance registration data.

A subsample of 81 participants ($n_{younger} = 52$, $n_{older} = 29$) took part in an additional diary phase, which started with an instruction session shortly after T1 ($M = 8.67$ days, $SD = 7.75$). Participants then kept nine diaries during three periods of 3 consecutive days. Intervals of 6 days separated the three diary periods. The first diary period started on the day following

instruction. Diary periods covered 6 weekdays (Monday through Friday) and 3 weekend days (Saturday or Sunday).

Each diary consisted of three diary entries to be completed at 12:00 noon, 6:00 p.m., and immediately before going to bed. Participants mailed each diary on the day after its completion. To minimize missing data, participants completed an additional diary for each incomplete diary they provided; 16 participants kept one, 4 participants kept two, and 2 participants kept three additional diaries. After the first diary period, 1 participant discontinued participation. Participants in the diary phase were reimbursed DM 145 (approximately $65).

Instruments

Intergoal facilitation and interference.—All participants shared the goal to start exercising and reported, in addition, three important goals they had besides exercising. The instruction was the same as in Study 1. Participants responded to the IRQ with respect to all four goals (exercise goal and three additional goals). We followed the procedure described in Study 1 to obtain indicators of overall intergoal facilitation and interference (facilitation, $M = 2.99$, $SD = .78$, Cronbach's $\alpha = .91$; interference, $M = 2.20$, $SD = .56$, Cronbach's $\alpha = .94$). In addition, we aggregated indicators of the extent to which the participants evaluated their *exercise goal* as being interfering with, and facilitative for, the other goals (and vice versa). Here, we included only the 36 IRQ items that involved comparisons of the exercise goal with the other three goals (exercise-specific facilitation, $M = 2.90$, $SD = .88$, Cronbach's $\alpha = .87$; exercise-specific interference, $M = 2.09$, $SD = .54$, Cronbach's $\alpha = .88$). Bivariate associations between the interference and facilitation composites were not significant, and there were no significant age-group interactions: $ps > .05$, two-tailed. (Note that the various subsamples investigated in Study 2 did not differ in terms of reported intergoal relations. Within both age groups, there were no significant differences in the levels of overall and exercise-specific intergoal facilitation and interference between participants for whom objective information on exercise frequency was available and participants for whom this information was not available, and between participants who took part in the diary phase and those who did not; all $ps > .10$, two-tailed. There also were no respective age-group interactions; all $ps > .10$, two-tailed.)

Goal pursuit indicator 1: Exercise frequency.—For a subsample of participants, we were able to obtain objective information on their exercise frequency in each of the 5 months following T1. Averaging across the first to third months yielded a score indicating the participants' average monthly exercise frequency in the first part of the study interval. This information was available for 102 participants ($n_{younger} = 67$, $n_{older} = 35$; $M = 3.11$, $SD = 2.33$). Averaging across the fourth and fifth months yielded an indicator of the participants' average monthly exercise frequency in the second part of the study interval. This information was available for 101 participants ($n_{younger} = 67$, $n_{older} = 34$). We adjusted two univariate within-age-group outliers—one in the younger subsample (z score $= 5.38$) and one in the older subsample (z score $= 3.26$)—to the closest raw values in the within-age-group distributions ($M = 2.04$, $SD = 1.95$). (Note that, to avoid distortions of statistical analyses, we

tested all variables for univariate within-age-group outliers, which we defined—in accordance with Tabachnick and Fidell [1996]—as cases with z scores close to, or in excess of, 3.29 [i.e., with z scores at $p \leq .001$, two-tailed]. To reduce the impact of the few identified outliers on statistical analyses, we assigned the outlying cases raw scores corresponding to the closest nonoutlying value in the within-age-group distribution. This approach is appropriate because there was no indication that the identified cases did not belong to the target population. None of these cases had extreme values on any of the other investigated variables, or represented a multivariate outlier in the combination of investigated variables [according to Mahalanobis distance at $p < .001$, there were none at all]. We also tested for univariate outliers in the total sample [where applicable, following transformations]. There were none.)

Within both age groups, there were no significant differences in the exercise frequencies in the first and second part of the study interval between participants who took part in the diary phase and those who did not (all $ps > .10$, two-tailed). There also were no respective age-group interactions (all $ps > .10$, two-tailed).

Goal pursuit indicator 2: Everyday goal pursuit.—In each of the three diary entries per day, participants of the diary phase ($n_{younger} = 52$, $n_{older} = 29$) chronologically listed the activities they had engaged in during the preceding hours. For each activity, participants indicated separately for each of the four goals elicited at T1 how relevant the activity had been for that goal. Responses ranged from 0 (*activity did not further that goal*) to 3 (*activity very much furthered that goal*). Averaging these ratings across all activities and goals yielded an indicator of the participants' everyday goal pursuit. We adjusted two univariate within-age-group outliers—one in the younger subsample (z score = 5.14) and one in the older subsample (z score = 4.78)—to the closest raw values in the within-age-group distributions ($M = .63$, $SD = .35$).

Control variables.—First, to control for historical shifts in education, we again included educational level (assessed as in Study 1) as a control variable. Second, we assessed participants' exercise motives by using the 24-item Reasons for Exercise Inventory (Silberstein, Striegel-Moore, Timko, & Rodin, 1988). There were age-group differences ($ps < .05$, two-tailed) in three exercise motives (i.e., attractiveness, health, and enjoyment), which we therefore included as control variables. Third, from the diary reports, we determined how much of their time participants had spent with different types of activities. There were age-group differences ($ps < .05$, two-tailed) in the proportion of time spent with leisure activities (younger adults, $M = .14$, $SD = .05$; older adults, $M = .21$, $SD = .05$) and study or work activities (younger adults, $M = .10$, $SD = .05$; older adults: $M = .02$, $SD = .03$), which we therefore included as control variables.

RESULTS

Intergoal Relations and Goal Pursuit in Younger and Older Adults

Results of Study 2 replicated and extended those of Study 1. Table 2 shows the means of the intergoal facilitation, interference, and goal pursuit composites in the younger and older

Table 2. Intergoal Facilitation and Interference and Intensity of Goal Pursuit in Younger and Older Adults: Study 2

Construct	Younger		Older		ANOVA		ANCOVA	
	M	SD	M	SD	F(1)	η²	F(1)	η²
Overall intergoal relations (across all four goals; $n = 145$)								
1. Intergoal facilitation	2.81	.64	3.37	.92	17.97**	.11	9.02**	.06
2. Intergoal interference	2.29	.52	1.99	.59	9.65**	.06	6.47**	.04
Exercise-specific intergoal relations ($n = 145$)								
3. Intergoal facilitation	2.68	.75	3.36	.97	21.04**	.13	13.01**	.09
4. Intergoal interference	2.16	.50	1.94	.59	5.32*	.04	4.19*	.03
Goal pursuit								
5. Exercise adherence 1[a] ($n = 102$)	2.93	2.28	3.46	2.41	1.22	.01	.02	.00
6. Exercise adherence 2[b] ($n = 101$)	1.51	1.75	3.07	1.93	16.77**	.15	4.12*	.04
7. Everyday goal pursuit[c] ($n = 81$)	.51	.25	.85	.39	22.81**	.22	12.09**	.14

Notes: ANOVA = analysis of variance; ANCOVA = analysis of covariance. For the ANCOVA, the covariates are, for analyses 1–6, educational level and exercise motives (attractiveness, health, and enjoyment), and for analysis 7, educational level, exercise motives (attractiveness, health, and enjoyment), and relative amount of time spent with leisure and study or work activities. For both the ANOVA and ANCOVA, the η^2 is partial.
[a]Average monthly exercise frequency in months 1 to 3.
[b]Average monthly exercise frequency in months 4 and 5.
[c]Day-to-day goal pursuit assessed during the diary phase.
*$p < .05$, one-tailed; **$p < .01$, one-tailed.

participants: multivariate age-group effect, $F(7, 43) = 4.63$; $p < .001$, one-tailed; partial $\eta^2 = .43$. Consistent with Study 1, univariate analyses (see Table 2) showed that younger participants reported significantly less intergoal facilitation (both overall and exercise specific) than older participants. Different than Study 1, younger participants also reported significantly more intergoal interference (both overall and exercise specific) than older participants. These results remained robust when educational level and exercise motives were included as covariates (see Table 2).

Younger and older adults did not differ in their average monthly exercise frequency in the first 3 months of the study interval. Older participants, however, exercised more frequently in the fourth and fifth month than younger participants. These results remained robust when educational level and exercise motives were included as covariates (see Table 2).

Older participants of the diary phase were also more engaged in everyday goal pursuit than younger participants. These results remained robust when educational level, exercise motives, and time spent with leisure and study or work activities were included as covariates (see Table 2).

Mediational Analyses 1: Do Exercise-Specific Intergoal Relations Account for Older Adults' Higher Longer-Term Exercise Adherence?

Consistent with Study 1, results indicate partial mediation of the older adults' higher exercise frequency in the later part of the

study interval by their higher exercise-specific intergoal facilitation (assessed at T1). First, age group (coding: younger = 1, older = 2) significantly predicted exercise frequency: $B = 1.559(SE = .376)$; $p < .001$, one-tailed; $R^2 = .15$. Second, age group significantly predicted exercise-specific facilitation: $B = .768(SE = .173)$; $p < .001$, one-tailed; $R^2 = .16$; and interference: $B = -.228(SE = .107)$; $p = .02$, one-tailed; $R^2 = .04$. Third, exercise-specific facilitation significantly predicted exercise frequency when age group and exercise-specific interference were controlled for: $B = .433(SE = .207)$; $p = .02$, one-tailed; $R^2 = .19$. Exercise-specific interference did not significantly predict exercise frequency when age group and exercise-specific facilitation were controlled for: $B = -.275(SE = .333)$; $p = .20$, one-tailed. In this third regression, the effect of age group on exercise frequency (with facilitation and interference controlled for) was significant: $B = 1.162 (SE = .408)$; $p = .002$, one-tailed. The total reduction in this effect as compared with the unmediated effect was 25.5%, with 21.4% that was due to facilitation and 4.1% that was due to interference as mediators. According to the modified Sobel test, the reduction that was due to facilitation was significant ($Z = 1.85$; $p = .03$, one-tailed), but the reduction that was due to interference was not ($Z = .71$; $p = .24$, one-tailed).

Mediational Analyses 2: Do Intergoal Relations Account for Older Adults' Higher Everyday Goal Pursuit?

Regarding all four goals, we obtained similar results indicating partial mediation of older adults' higher everyday goal pursuit during the diary phase by intergoal facilitation (but not interference). First, age group significantly predicted everyday goal pursuit: $B = .339(SE = .071)$; $p < .001$, one-tailed; $R^2 = .22$. Second, age group significantly predicted overall intergoal facilitation: $B = .482(SE = .177)$; $p = .004$, one-tailed; $R^2 = .09$; and interference: $B = -.389(SE = .123)$; $p = .001$, one-tailed; $R^2 = .11$. Third, facilitation significantly predicted goal pursuit when age group and interference were controlled for: $B = .132(SE = .042)$; $p = .001$, one-tailed; $R^2 = .31$. In contrast, interference did not significantly predict goal pursuit when age group and facilitation were controlled for: $B = -.035(SE = .06)$; $p = .28$, one-tailed. The effect of age group on goal pursuit was significant when facilitation and interference were controlled for: $B = .262(SE = .073)$; $p < .001$, one-tailed. The total reduction in this effect as compared with the unmediated effect was 23%, with 18.8% that was due to facilitation and 4.2% that was due to interference. The reduction that was due to facilitation was significant ($Z = 2.00$; $p = .02$, one-tailed), but the reduction that was due to interference was not ($Z = .55$; $p = .29$, one-tailed).

GENERAL DISCUSSION

Life-span developmental psychology emphasizes that adult development is not just characterized by loss and decline but also by a potential for developmental gain (e.g., Baltes, 1987; Labouvie-Vief, 1981). One area in which such gains might be expected is the domain of intentional self-development as described in current theories of life-span development (e.g., Selection, Optimization, and Compensation model, Freund & Baltes, 2000). Within this general framework, our purpose in this research was to compare younger ($M = 25$ years) and older

adults ($M = 64$ years) regarding two characteristics—intergoal relations and intensity of goal pursuit.

In Study 1, older participants reported more intergoal facilitation (as indexed by instrumental intergoal relations and overlapping goal-attainment strategies) and, to some degree mediated by this, a higher goal-pursuit intensity than younger participants.

In Study 2, we extended our research in several respects. One aim was to increase the overlap between the younger and older participants' goals, thus partly controlling for age-group differences in goal content. We accomplished this by recruiting younger and older adults who had one goal in common: to start exercising. (Strictly speaking, a complete test of the impact of goal content on age differences in the nature of intergoal relations would require that *all* goals under consideration be the same for all participants. Given the idiosyncratic nature of personal goals, however, this is not possible to achieve in field research.)

Older participants not only reported more intergoal facilitation but also less intergoal interference (associated with limitations in time, money, and energy, and with incompatible goal-attainment strategies) than younger participants. As this finding was not obtained in Study 1, it should not be generalized. Interestingly, other evidence indicating that intergoal interference decreases with age has also been obtained in rather specific populations (i.e., managers, Kehr, 2003; and professors, Locke et al., 1994).

Another aim of Study 2 was to obtain, in a prospective design, additional indicators of goal pursuit. Objective attendance information showed that older participants maintained their exercise adherence longer than younger participants. An additional diary phase further showed that older participants were more engaged in the everyday pursuit of their goals.

The findings of Study 2 were robust when we controlled for age-group differences in educational level and reasons to exercise. The diary component also allowed us to control for age-group differences in the proportion of time spent with different types of activities. The older adults' higher intensity of goal pursuit during the diary phase could not be attributed to the fact that they had available more time for leisure activities and were less involved in work or study than younger adults.

Consistent with Study 1, the older participants' higher exercise adherence in the later part of the study interval, as well as their higher intensity of goal pursuit during the diary phase, were partially mediated by their higher intergoal facilitation (but not by their lower intergoal interference). Noteworthy is that these findings involve a short-term longitudinal design. Age-group differences in intergoal relations, assessed at T1, were predictive of behavior variations occurring later in time. This supports our interpretation that a behavioral function of facilitative intergoal relations in older adulthood is to ensure high levels of goal pursuit in a reality of increasingly limited resources (e.g., time to live). However, the available information is correlational. Well-controlled experiments will be necessary to allow definite conclusions about causality.

Another limitation of the present research is the cross-sectional design, which does not provide information on intraindividual change as people age. Furthermore, the findings are based on samples of limited age ranges and can therefore not be generalized to middle-aged and very old adults.

Nevertheless, the presented studies complement the evolving line of research showing that goals may be among the phenomena that show positive adult developments (Bauer &

McAdams, 2004; Sheldon & Kasser, 2001). An open question is this: Which characteristics, strategies, or life circumstances underlie the observed age-group differences? Our research indicates that intergoal facilitation may, in part, contribute to higher goal pursuit in older adulthood. Our interpretation is that mutually facilitative goals can be pursued simultaneously with little or no additional effort. Thus, intergoal facilitation allows an efficient utilization of older adults' limited resources in the interest of their goals. But *why* do older adults report more intergoal facilitation than younger adults? Do they select goals that are a priori more facilitative? Do they perceive their goals differently? Do they have greater skills in integrating goals into a facilitative system? Does environment play a role? Or is it a combination of several of these factors?

Empirically, the present research leaves these questions open to future research. One might speculate that older adults are more likely than younger adults to have goals that are similar to each other and therefore mutually facilitative (for a related argument, see Sheldon & Emmons, 1995). This might have to do with "objective" as well as with "perceived" goal similarity. For example, older adults might contextualize their goals more broadly than younger adults and perceive their goals more in interrelation to, rather than in isolation from, each other. Similarly, older adults might be more adept in actively constructing facilitative relations among their goals. They might, for example, create and use instrumental goal relations or seek contexts and ways that allow several goals to be pursued simultaneously. The observed differences might also result from the fact that social expectations of what goals are important to pursue are more pronounced for younger than for older adults (e.g., Maddox, 1994). Older adults may have a larger freedom in deciding which goals they want to pursue.

In conclusion, our research supports predictions from life-span theory and related models of adaptive development suggesting that adult development involves a potential for continued growth. It shows that older adults have more mutually facilitative goals than younger adults and, likely to some degree as a consequence of this, are more engaged in goal pursuit. An important open question pertains to mechanisms that underlie these age-group differences. We suggested possible fields of investigation and emphasized the necessity of longitudinal designs and representative samples in future studies.

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APPENDIX

The Intergoal Relations Questionnaire

Construct	Item	Response Options
Time constraints	How often can it happen that, because of the pursuit of goal A, you do not invest as much time into goal B as you would like?	1 (never/very rarely) to 5 (very often)
Financial constraints	How often can it happen that, because of the pursuit of goal A, you do not invest as much money into goal B as you would like?	1 (never/very rarely) to 5 (very often)
Energy constraints	How often can it happen that, because of the pursuit of goal A, you do not invest as much energy into goal B as you would like?	1 (never/very rarely) to 5 (very often)
Incompatible strategies	How often can it happen that you do something in the pursuit of goal A that is incompatible with goal B?	1 (never/very rarely) to 5 (very often)
Strategy overlap	How often can it happen that you do something in the pursuit of goal A that is simultaneously beneficial for goal B?	1 (never/very rarely) to 5 (very often)
Instrumental relations	The pursuit of goal A sets the stage for the realization of goal B.	1 (not at all true) to 5 (very true)

Notes: Participants responded to these items for each possible combination of two of the four goals (i.e., 12 goal pairs). Each item explicitly specified the two to-be-compared goals; questionnaire is from Riediger and Freund (2004).