3. METHOD

The empirical investigation comprised two parts. Younger and older exercise beginners were recruited in a variety of Berlin sports facilities. They participated in a questionnaire study with two measurement points and an average interval of 4.2 months (study part 1). The purpose of this part of the study was to investigate the cross-sectional and longitudinal associations between intergoal relations and various facets of psychological well-being, goal progress, and exercise participation, as well as potential differences between younger and older adults. A subsample additionally participated in a diary phase (study part 2). These participants kept an average of nine detailed diaries in three weeks following the first questionnaire session. The purpose of this part of the study was to investigate associations of intergoal relations and affective experiences, conflict situations, and goal pursuit in everyday life, as well as potential age-group differences. Below, I will describe the sample, measures, and procedures of the empirical investigation. Each part of the study is presented separately. Figure 2 gives an overview of the study design.
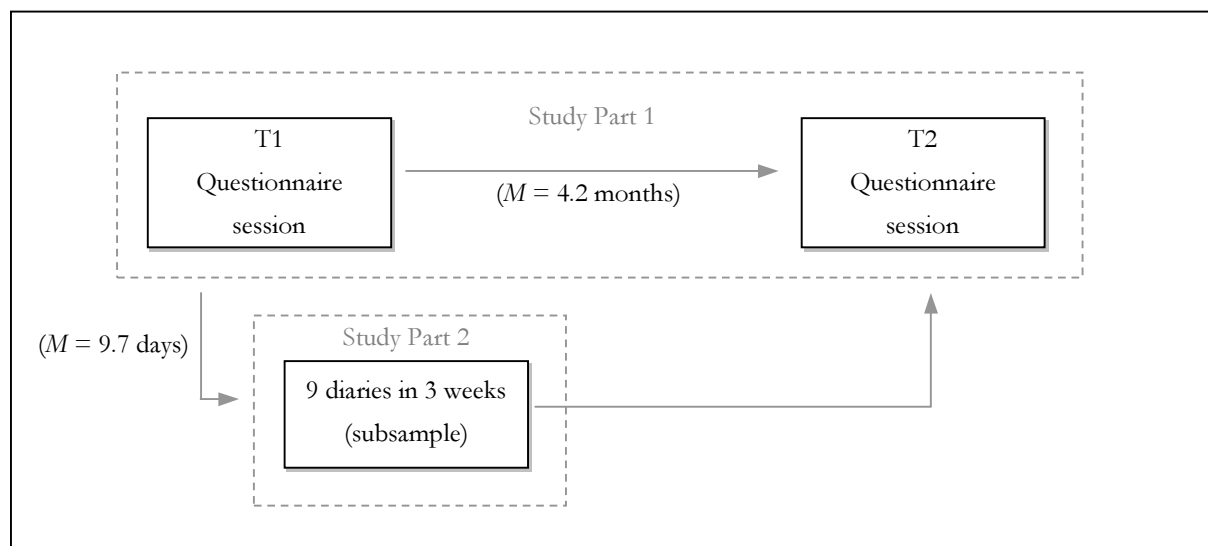

Figure 2. *Overview of the Study Design*

3.1. Study Part 1: Short-Term Longitudinal Questionnaire Study

3.1.1. Participants

Recruitment. Participants were recruited from 28 Berlin sports facilities. These facilities had agreed, upon written consent of the participant, to provide objective information on the participant's exercise attendance during the study interval. Specifically, there were 14 fitness centers, three sports clubs, three university sports programs, and eight other public institutions offering sports classes with trainers (e.g., senior centers). Below, I will refer to them as "cooperating sports facilities." Requirements for participation in the study were that the person (a) was about to begin or had recently begun a sport in the cooperating sports facility, (b) had not regularly engaged in that sport for at least the preceding nine months, and (c) was either between 19 and 35 years old (younger adults) or older than 55 years (older adults). About one third of the participants were recruited through information material that had been distributed in the cooperating sports facilities (i.e., posters and brochures with information on the study, participation requirements, and contact persons). The majority of participants were recruited in person at the end of exercise courses and on registration sites of university sports programs. Recruitment took place during six months, from September 1999 to January 2000.

Two younger adults originally recruited were excluded from the sample because attendance information revealed that they were not exercise beginners. The resulting sample size at the first measurement point (in the following referred to as T1) was $N_{T1} = 145$ ($n_{T1} = 99$ younger and $n_{T1} = 46$ older participants). Approximately four months after T1, participants were contacted via telephone to make appointments for the second measurement point (in the following referred to as T2). Two younger participants (one male, one female) could not be reached, and one older participant (female) refused participation. The sample size at the second measurement point was therefore reduced to $N_{T2} = 142$ ($n_{T2} = 97$ younger and $n_{T2} = 45$ older participants).

Socio-demographic characteristics. Both the younger and the older subsamples were predominantly female with no significant age-group difference in the gender distribution (71.7% and 80.4% female participants at T1, respectively; $\chi^2(1) = 1.26$, $p = .26$). The majority of the younger participants were university students (82.8% at T1), whereas the majority of the older participants were retired (71.7% at T1). The younger subsample had

a higher educational status than the older subsample. At T1, 89.9% of the younger versus 22.6% of the older participants were high school graduates (i.e., held a German Abitur) or graduates of a higher educational program. Table 4 gives an overview of socio-demographic characteristics of the younger and older subsamples at the first measurement point.

Table 4. *Socio-Demographic Sample Characteristics at T1*

	Younger (n_{T1} = 99)		Older (n_{T1} = 46)	
Age (in years)				
Range	19.2 – 35.4		55.5 – 78.1	
M	25.1		63.8	
SD	3.9		5.1	
Gender				
Male	28	(28.3%)	9	(19.6%)
Female	71	(71.7%)	37	(80.4%)
Marital Status				
Unmarried	89	(89.9%)	3	(6.5%)
Married	7	(7.1%)	14	(30.4%)
Divorced	3	(3.0%)	16	(34.8%)
Widowed	0	(0.0%)	13	(28.3%)
Education				
Elementary/Junior high (8th grade) [a]	1	(1.0%)	11	(23.9%)
Secondary school level 1 (10th grade) [b]	9	(9.1%)	20	(43.5%)
High school (12th/13th grade) [c]	80	(80.8%)	6	(13.0%)
(Technical) College/University [d]	9	(9.1%)	9	(19.6%)
Current Occupation [e]				
Full-time/self employed	11	(11.1%)	5	(10.8%)
Part-time employed	12	(12.1%)	2	(4.3%)
Unemployed	1	(1.0%)	4	(8.7%)
Retired	0	(0.0%)	33	(71.7%)
Trainee	2	(2.0%)	0	(0.0%)
Student	82	(82.8%)	0	(0.0%)
Housewife/-man	0	(0.0%)	3	(6.5%)
Military/Civil service	1	(1.0%)	0	(0.0%)
Other	4	(4.0%)	1	(2.2%)

(a) German: Grund-/Hauptschule
(b) German: Mittlere Reife/Fachschule
(c) German: (Fach-) Abitur
(d) German: Fach-/ Hochschulstudium
(e) One person can belong to multiple categories (percentages do not add up to 100)

Exercise-related characteristics. Exercise programs and facilities typically target particular age groups. Consequently, there was little overlap in exercise contexts (i.e., the type of sports facility) between younger and older participants. Most of the younger participants were recruited from university sports programs (68.7%) and fitness centers targeting younger age groups (26.3%). Most of the older participants were recruited from fitness centers targeting older age groups (50%) and seniors sport courses with trainers (41.3%). Because of the heterogeneity of cooperating facilities, the sample was heterogeneous with respect to planned kinds of sport and exercise-related characteristics. There were a number of age-group differences (for details, see Figure 3 and Table 4): At the first measurement point, the majority of younger participants (59.6%) had not yet begun exercising, whereas the majority of the older participants had already started, 60% of them more than one month earlier. There were no age-group differences in terms of planned weekly exercise frequency and the number of different kinds of sport planned for the study interval. All participants planned to exercise at least once a week, most of them two to three times per week. 29.7% of the participants planned to engage in more than one kind of sport during the months to follow. The kinds of sport planned were diverse, but were mostly geared toward general fitness and health (see Figure 3). Younger participants listed more diverse kinds of sport than did older participants. Younger participants also reported a higher number of prior phases during which they had exercised at least once a week for at least three consecutive months. 7.1% of the younger and 37% of the older participants had no such prior exercise experience. Most of the older participants with exercise experience reported one, most of the younger two or more prior phases of regular exercising. The age groups did not differ in the average duration of their prior exercise experience. When participants had had prior phases of regular exercising, these phases lay further in the past for the older than for the younger ones.

In sum, the sample was heterogeneous with respect to exercise-specific characteristics; there were a number of age-group differences as well. Therefore, detailed information on exercise motivation, current exercise phase, exercise contexts, exercise-specific person characteristics (i.e., exercise-specific self-efficacy, intention strength, exercise enjoyment), and exercise biography was obtained and controlled for when testing the exercise-specific predictions of the study.
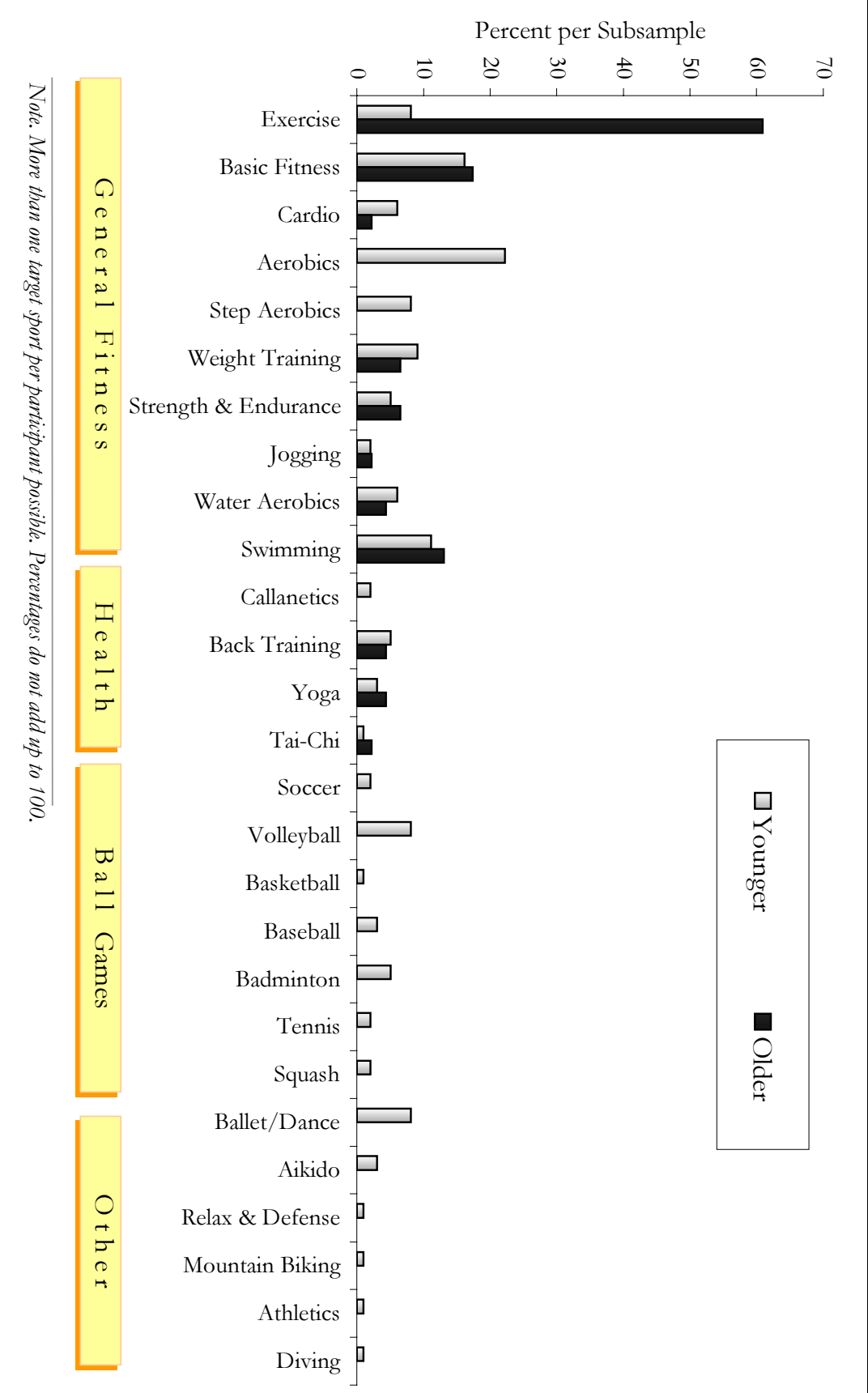
Figure 3. *Exercise Goals of Younger and Older Participants: Planned Kinds of Sport*

Note. More than one target sport per participant possible. Percentages do not add up to 100.

Table 5. *Exercise-Specific Sample Characteristics at T1 and Tests for Age-Group Differences*

	Total (N_{T1} = 145)		Younger (n_{T1} = 99)		Older (n_{T1} = 46)	
A) Recruitment						
Cooperating Facility						
Fitness centers	49	(33.8%)	26	(26.3%)	23	(50.0%)
Sports clubs	6	(4.1%)	2	(2.0%)	4	(8.7%)
University sports programs	68	(46.9%)	68	(68.7%)	0	(0.0%)
Other (courses with trainer)	22	(15.2)	3	(3.0%)	19	(41.3%)
					$\chi^2(3) = 70.54, p = .00$	
B) Exercise Phase at T1 [a]						
Not yet started	64	(44.4%)	59	(59.6%)	5	(11.1%)
Less than one month	43	(29.9%)	30	(30.3%)	13	(28.9%)
More than one month [b]	37	(25.7%)	10	(10.1%)	27	(60.0%)
					$\chi^2(2) = 46.36, p = .00$	
C) Exercise Plans for Coming Months						
Planned Weekly Exercise Frequency						
"Less than once"	0	(0.0%)	0	(0.0%)	0	(0.0%)
"Once" and "once to twice"	52	(35.9%)	34	(34.3%)	18	(39.1%)
"Twice" and "two to three times"	63	(43.4%)	43	(43.4%)	20	(43.5%)
"Three" and "three to four times"	20	(13.8%)	14	(14.1%)	6	(13.0%)
"Four times and more"	10	(6.9%)	8	(8.1%)	2	(4.3%)
					$\chi^2(3) = .86, p = .83$	
Number of Planned Kinds of Sport						
One	102	(70.3%)	65	(65.7%)	37	(80.4%)
Two	32	(22.1%)	25	(25.3%)	7	(15.2%)
Three or more	11	(7.6%)	9	(9.1%)	2	(4.3%)
					$\chi^2(2) = 3.34, p = .19$	
D) Exercise Biography [c]						
Number of Prior Phases of Regular Exercising						
None	24	(16.6%)	7	(7.1%)	17	(37.0%)
One	61	(42.1%)	39	(39.4%)	22	(47.8%)
Two	35	(24.1%)	29	(29.3%)	6	(13.0%)
Three or more	25	(17.2%)	24	(24.2%)	1	(2.2%)
					$\chi^2(3) = 29.79, p = .00$	

(table continues)

Table 5 *(continued)*

	Total (N_{T1} = 145)	Younger (n_{T1} = 99)	Older (n_{T1} = 46)
Total Duration of Prior Phases of Regular Exercising (in Years) [d]			
Range	.00 – 50.00	.00 – 18.92	.00 – 50.00
M	6.25	5.70	7.44
Md	4.83	4.83	4.50
SD	6.94	4.78	10.11
			t(143) = .98, p = .33 [e]
Years Since End of Last Phase of Regular Exercising [f]			
Range	.00 – 51.08	.00 – 14.33	.00 – 51.08
M	7.32	4.26	17.03
Md	3.42	2.50	12.84
SD	9.82	3.76	15.47
			t(119) = 3.45, p = .00 [e]

(a) Information missing for one older participant

(b) Duration of current exercise phase for participants who had been exercising longer than one month (n = 36): M = 2.42 months, SD = 1.48; younger (n = 10): M = 2.48 months, SD = 1.44; older (n = 27): M = 2.39 months, SD = 1.52; $t(34)$ = .15, p = .88

(c) Information aggregated from a questionnaire in which participants listed all previous phases (lasting at least three consecutive months) of regular physical exercise (at least once a week) with respective beginning and ending dates (excluding children's or school sports, bicycling as transportation, and physical therapy)

(d) Cases with no prior exercise experience set at zero

(e) Transformed distribution used to accommodate normality assumption of t test (see Appendix B, Table B 8 for detailed description of transformation)

(f) Only persons with one or more prior phases of regular exercising (N_{total} = 121; $n_{younger}$ = 92; n_{older} = 29). Three participants (2 younger, 1 older) were planning to begin a new kind of sport (aerobics and basic fitness training) in addition to continuing another physical activity (dancing, Thai Chi, and exercise). For them the variable was set at zero.

3.1.2. Procedure

The first questionnaire sessions (T1) took place at the Max Planck Institute for Human Development, Berlin, within days after the participant's recruitment. These sessions were typically conducted in small groups of varying sizes (30 sessions with 2 to 15 participants). For seven older participants, individual appointments were made to ensure a small time interval between recruitment and T1. Younger and older participants attended

separate sessions.[15] The majority of younger adults participated at T1 between September and October, 1999, the majority of older adults, between November and December, 1999.

Each session was conducted in a standardized manner by one of three trained persons. The person conducting the session informed participants about study procedures, data protection, and the participant's right to terminate participation at any time. They also familiarized the participants with the concept of personal goals and the response formats in the questionnaire. Following this introduction, participants signed an informed consent form in which they declared that they had been informed about the purposes and procedures of the study and were willing to participate. They also gave their sports facility written authorization to pass on information about their attendance for purposes of this study.

Participants then completed a set of questionnaires. Detailed written instruction preceded each questionnaire. Furthermore, the person conducting the session was available the entire time for explanations. Because pilot testing had revealed considerable variation in the amount of time people needed to complete the questionnaires, the package was split into two parts. The first part ("Questionnaire 1") assessed the main variables of the empirical predictions. All participants completed this part during the session. The smaller second part ("Questionnaire 2") measured several additional and control variables. Participants could decide whether to complete the second part during the session or later at home. About 20% of the younger and about 50% of the older participants decided to postpone completion of Questionnaire 2. They received prestamped return envelopes and were instructed to complete the entire questionnaire without interruption as soon as possible in a quiet environment, and to send it back within one week. The completion of both questionnaires typically took between 60 to 75 minutes in the younger, and between 90 to 105 minutes in the older subsample. All participants were reimbursed with DM 40 (approximately $ 18).

The second questionnaire sessions (T2) took place after an average of $M = 4.2$ months ($SD = .48$) between January and June, 2000. The sessions were also conducted in small groups of varying sizes (23 sessions with 2 to 16 participants) at the Max Planck

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[15] Pilot research had revealed that younger adults took considerably less time to complete the questionnaires than older adults.

Institute for Human Development, Berlin. In 8 cases (3 younger and 5 older participants), single appointments were made to ensure comparable study intervals across participants. Separate sessions were held for each age group. A trained research assistant conducted all sessions in a standardized manner. Participants were familiarized with the response formats prior to completing the questionnaires. Each questionnaire was preceded by detailed written instructions. Furthermore, the research assistant was available for questions. Again, the questionnaire package was split in two parts ("Questionnaires 3 and 4"). Questionnaire 3 assessed the main variables and was completed during the session. Participants could decide whether to complete the shorter Questionnaire 4 (measuring a number of additional and control variables) during the session or later at home. Participants who decided to postpone completion of Questionnaire 4 (about 20% of the younger and about 50% of the older participants) were provided with prestamped return envelopes, and instructed to complete the questionnaire as soon as possible in a quiet environment and to return it within one week. Again, completion of both parts of the questionnaire typically took between 60 and 75 minutes in the younger, and between 90 and 105 minutes in the older subsample. All participants were reimbursed with DM 40 (approximately $ 18).

At the end of the data collection phase, the cooperating sports facilities provided objective attendance data from attendance lists and electronic attendance registrations.

3.1.3. Measures

Table 6 gives an overview of the instruments applied in the short-term longitudinal questionnaire study (i.e., study part 1). I will describe the main dependent and independent variables in more detail in the sections below. Appendix A contains further information on the instructions, as well as on additional, and control variables.

Table 6. *Overview of Instruments in Study Part 1*

Construct	Assessed at	Instrument/Item	Source	Comment
A) Main Independent Variables				
Intergoal relations (among three self-reported and one exercise goal)	T1	Intergoal Conflict and Facilitation Questionnaire Subscales: time, energy, financial constraints, incompatible strategies, overlap in goal attainment strategies, instrumental intergoal relations	Newly developed	See 3.1.3.2
	T1	Striving Instrumentality Matrix	Emmons and King (1988)	Item wording modified, see 3.1.3.2
B) Hypothesized Antecedents of Goal Conflict				
Habitual strategies in managing multiple goals	T1	Managing multiple goals Subscales: prioritizing/sequencing, compromising, distancing	Newly developed	See 3.1.3.3
Resource intensity of personal goals	T1	Resource intensity Subscales: time, energy, money (responded to for each of the four goals under study)	Newly developed	See 3.1.3.3
C) Main Dependent Variables				
Subjective Well-Being				
Positive psychological functioning	T1, T2	Ryff Scales Subscales: autonomy, self-acceptance, environmental mastery, personal growth, positive relations, purpose in life	Ryff (1995)	Short version (18 items), German translation by Staudinger, Fleeson, and P. B. Baltes (1999a), see 3.1.3.4

(table continues)

Table 6. *(continued)*

Construct	Assessed at	Instrument/Item	Source	Comment
Emotional well-being	T1, T2	Mehrdimensionaler Befindlichkeitsfragebogen (Multidimensional affect scale) Subscales: positive and negative affect	Steyer, Schwenkmezger, Notz, and Eid (1997)	Instruction and subscale aggregation modified, see 3.1.3.4
Life satisfaction	T1, T2	Skala zur Lebensbewertung (Life evaluation scale) Subscales: current, retrospective, prospective life satisfaction	Ferring, Filipp, and Schmidt (1996)	See 3.1.3.4
	T1, T2	Veränderungsdruckskala (Pressure-to-change scale)	Filipp and Ferring (1991)	Life domains modified, see 3.1.3.4
Goal-specific satisfaction	T1, T2	Goal satisfaction item (for each of the four goals under study)	Brandtstädter (1984)	Response options modified, see 3.1.3.4
Goal progress	T2	Goal progress item (for each of the four goals under study)	Brandtstädter (1984)	Response options modified, see 3.1.3.5
Self-Reported Exercise Behavior in Study Interval				
Monthly exercise duration	T2	Exercise duration item (for each of the five calendar months of the study interval)	Newly developed	See 3.1.3.6
Monthly exercise frequency	T2	Exercise frequency item (for each of the five calendar months of the study interval)	Newly developed	See 3.1.3.6

(table continues)

Table 6. *(continued)*

Construct	Assessed at	Instrument/Item	Source	Comment
Monthly exercise regularity	T2	Exercise regularity item (for each of the five calendar months of the study interval)	Newly developed	See 3.1.3.6
Realization of intended exercise rate	T2	Ratio of realized and intended monthly exercise frequency (self-report; computed for each of the five calendar months of the study interval)	Newly developed	See 3.1.3.6
Objective Exercise Behavior in Study Interval				
Monthly exercise frequency	T2	Data from attendance lists or electronic attendance registration devices	Cooperating sports facility	
D) Additional and Control Variables				
▪ *General*				
Socio-demographic characteristics	T1	Age, sex, marital status, education, current occupation	Arbeitsgruppe "Altern und Gesellschaftliche Entwicklung" (1990)	Items selected from the intake assessment of the Berlin Aging Study
Ambiguity tolerance	T1	Ungewißheitstoleranzskala (Ambiguity tolerance scale)	Dalbert (1999)	See Appendix A, Table A8
Tendency to respond in socially desirable ways	T1	Soziale-Erwünschtheits-Skala-17 (Social desirability scale 17)	Stöber (1999)	One item excluded (item 4 "tried out drugs"), see Appendix A, Table A8

(table continues)

85

Table 6. *(continued)*

Construct	Assessed at	Instrument/Item	Source	Comment
Personality traits	T1	NEO-Five-Factor Inventory Subscales: neuroticism, extraversion, openness to experience, agreeableness, conscientiousness	Costa and McCrae (1992)	German translation by Borkenau and Ostendorf (1993), short version (30 items selected by Staudinger et al., 1999a), see Appendix A, Table A8
Life-management strategies	T1	SOC Questionnaire Subscales: elective selection, loss-based selection, optimization, compensation	P. B. Baltes, M. M. Baltes, Lang, Freund (1995; 1999)	24 item version, see Appendix A, Table A8
Goal involvement in study interval	T2	Goal involvement item (for each of the four goals under study)	Newly developed	See Appendix A, Table A8
■ *Control over Goal Attainment*				
Internal control	T1	Autonomous control item (for each of the four goals under study)	Brandtstädter (1984)	Response options modified, see Appendix A, Table A8
External control	T1	Heteronomous control item (responded to for each of the four goals under study)	Brandtstädter (1984)	Response options modified, see Appendix A, Table A8
■ *Exercise-Specific Control Variables*				
Exercise motivation	T1	Reasons for Exercise Scale Subscales: attractiveness, enjoyment, fitness, health, mood, tone, weight control	Silberstein, Striegel-Moore, Timko, and Rodin (1988)	Back translation process see Appendix A, Table A8

(table continues)

Table 6. *(continued)*

Construct	Assessed at	Instrument/Item	Source	Comment
Exercise-specific intention strength	T1	Concreteness of exercise plans (two items: frequency and schedule)	Newly developed	See Appendix A, Table A8
Exercise-specific self-efficacy	T1	Skala zur Erfassung der Selbstwirksamkeit zur sportlichen Betätigung (Exercise-specific self-efficacy scale)	Fuchs and Schwarzer (1994)	See Appendix A, Table A8
Duration of current exercise phase	T1	Begin of current or planned exercise phase (exact date)	Newly developed	Difference to date of T1
Number of kinds of sport planned	T1	Unstructured listing of kinds of sport planned	Newly developed	Number of kinds of sport
Number of prior phases of regular exercise	T1	Exercise biography (listing of all prior phases of exercising at least once a week for at least three consecutive months with beginning and ending dates)	Newly developed	Number of exercise phases
Total duration of prior phases of regular exercise	T1	Exercise biography	Newly developed	Computed from beginning and ending dates
Years since end of last phase of regular exercise	T1	Exercise biography	Newly developed	Difference between end of last phase of regular exercising and T1
Exercise context characteristics	T2	Exercise context Subscales: accessibility of social contact, exercise-specific information and instruction, wellness and care facilities	Newly developed	See Appendix A, Table A8
Exercise Enjoyment	T2	Exercise enjoyment items	Newly developed	See Appendix A, Table A8

3.1.3.1. *Personal Goals*

At T1, participants were asked to describe three goals besides exercising. To elicit goals at an intermediate hierarchy level, participants were instructed to describe goals that they had for the near future (i.e., the coming months or years), currently judged to be important, and that they expected would still be important in a couple of months. The instruction included a brief explanation of the concept of goals as well as sample life domains and sample goals (see Appendix A, Box A 1). Participants were asked to describe their goals with a few words or short sentences, but with sufficient detail to be understood by others. Box 1 shows examples of goals listed by two younger and two older participants.

Box 1. *Sample Goals*

Female, 22.8 years, part-time and self-employed:

- Really take time for myself and relax.
- Become more stress-resistant or handle stress better.
- Improve my quality of life by exploring other cultures and new experiences.

Male, 25.2 years, student:

- Improve my financial situation so I can study without having to worry about finances.
- To maintain my current circle of friends; to preserve old friendships and build up new ones.
- Avoid serious arguments with my partner, live harmoniously with her.

Female, 58.9 years, unemployed:

- Live my life as I want to.
- Health – physical and mental.
- Be more independent from my spouse and family.

Female, 64.7 years, retired:

- Visit my son in Canada.
- Help my partner overcome his alcohol problem.
- Read many books, attend concerts, and visit museums.

Two independent trained coders assigned the reported goals to life domains.[16] Interrater reliability was satisfactory (Cohen's κ = .89). Goals with initially deviating categorizations were discussed and coded according to consensus.

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[16] The coding taxonomy was developed on the basis of the modified pressure-to-change scale (Veränderungsdruckskala, Filipp & Ferring, 1991). This questionnaire assesses the desire for change in specific life domains. For the purposes of this study, I modified the scale to encompass life domains frequently mentioned in
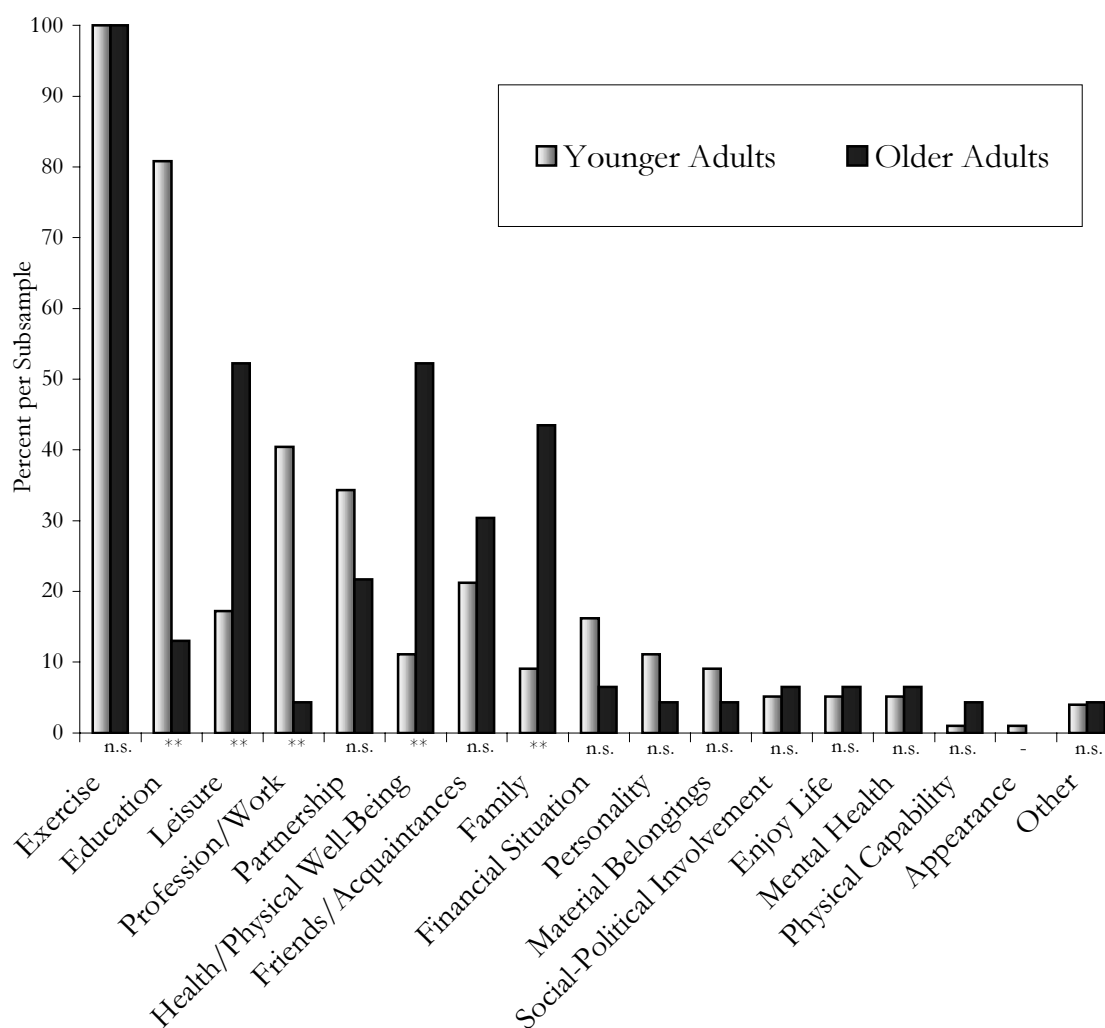
Note. Test for age group differences (chi-square test): ** p < .001, n.s. p > .05

Figure 4. *Life Domains of Goals Reported by Younger and Older Participants*

Figure 4 shows the percentages of younger and older participants who reported at least one goal pertaining to the various life domains. Younger adults most frequently reported goals in the life domains of education (80.8%), profession/work (40.4%), and partnership (34.3%).[17] Older participants most frequently reported goals pertaining to the life do-

goals of healthy younger and older adults (see 3.1.3.4). An additional life domain (social-political involvement) was included after screening the content of the reported goals. One of the coders developed the coding system and conventions. The second coder was independent. Both coders underwent a training procedure involving the coding and subsequent discussion of 135 goals elicited in pilot research.

[17] One younger (male) participant reported only two (instead of three) personal goals besides exercising.

mains leisure (52.2%), health/physical well-being (52.2%), and family (43.5%). These are typical patterns for the respective age groups (e.g., Heckhausen, 1997; Nurmi, 1992; Staudinger & Pasupathi, 2000).

3.1.3.2. The Extended Intergoal Conflict and Facilitation Questionnaire

Assessment procedure. To assess the interrelations among the participant's four goals (one exercise goal and three additional goals), I followed and extended the procedure used by Emmons and colleagues (e.g., Emmons & King, 1988). At T1, participants paired each of the four goals with each of the other three goals. For each of these goal pairs, participants responded to seven items. These items addressed intergoal conflict due to (a) time constraints, (b) financial constraints, (c) energy constraints, and (d) incompatibility of goal attainment strategies, and intergoal facilitation due to (e) overlap of goal attainment strategies, and (f) instrumental relationships between the two goals. The seventh item, which was modified from the Striving Instrumentality Matrix (Emmons & King, 1988), requested a global evaluation on a bipolar scale ranging from conflict to facilitation.[18] Table 7 shows the seven items and their response options. With the exception of the modified Striving Instrumentality Matrix item, all items were developed for this study.

Because intergoal relations are not necessarily symmetrical, each goal pair was evaluated twice, namely, once in each relational direction (i.e., impact of pursuing goal A on goal B and impact of pursuing goal B on goal A). Each item specified the to-be-compared goals. In all, participants responded to a total of 84 items addressing intergoal relations in 12 pairs of goals.

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[18] Pilot participants had reported that a literal German translation of the item's original wording "Does being successful in this striving have a helpful, a harmful, or no effect at all on the other striving?" (Emmons & King, p. 1042) had an ambiguous meaning in the context of the other items. The item's wording was therefore adjusted to the other items and modified to "Overall, how does the pursuit of goal A influence the realization of goal B?"

Table 7. *Items of the Intergoal Conflict and Facilitation Questionnaire*

	Item [a]	Response options
Conflict 1:		
Time constraints	How often could it happen that, **because of the pursuit of goal A,** you do not invest as much *time* into your exercise activities as you would like to? *(Original German wording: Wie häufig kann es wegen der Verfolgung von Ziel A vorkommen, dass Sie nicht so viel Zeit für die sportliche Betätigung aufwenden, wie Sie dies gerne tun würden?)*	1 (never/very rarely) to 5 (very often)
Conflict 2:		
Financial constraints	How often could it happen that, **because of the pursuit of goal A,** you do not invest as much *money* into your exercise activities as you would like to? *(Original German wording: Wie häufig kann es wegen der Verfolgung von Ziel A vorkommen, dass Sie nicht so viel Geld für die sportliche Betätigung aufwenden, wie Sie dies gerne tun würden?)*	1 (never/very rarely) to 5 (very often)
Conflict 3:		
Energy constraints	How often could it happen that, **because of the pursuit of goal A,** you do not invest as much *strength and energy* into your exercise activities as you would like to? *(Original German wording: Wie häufig kann es wegen der Verfolgung von Ziel A vorkommen, dass Sie nicht so viel Kraft und Energie für die sportliche Betätigung aufwenden, wie Sie dies gerne tun würden?)*	1 (never/very rarely) to 5 (very often)

(table continues)

Table 7. *(continued)*

	Item [a]	Response options
Conflict 4:		
Incompatible strategies	How often could it happen that you do something in **the pursuit of goal A** that is incompatible with your exercise activities? *(Original German wording: Wie häufig kann es vorkommen, dass Sie im Hinblick auf Ziel A etwas tun, das sich nicht mit dem Vorhaben "Sportliche Betätigung" vereinbaren lässt?)*	1 (never/very rarely) to 5 (very often)
Facilitation 1:		
Strategy overlap	How often could it happen that you do something in **the pursuit of goal A** that is *simultaneously* beneficial for your exercise activities? *(Original German wording: Wie häufig kann es vorkommen, dass Sie etwas für Ziel A tun, das gleichzeitig dem Vorhaben "Sportliche Betätigung" zuträglich ist?)*	1 (never/very rarely) to 5 (very often)
Facilitation 2:		
Instrumental relations	The **pursuit of goal A** provides good preconditions for the realization of my exercise activities. *(Original German wording: Die Verfolgung von Ziel A schafft gute Voraussetzungen für die Realisierung sportlicher Betätigung.)*	1 (not at all true) to 5 (very true)
Overall evaluation		
Striving Instrumentality Matrix (modified)	Overall, how does the **pursuit of goal A** affect the realization of your exercise activities? *(Original German wording: Insgesamt gesehen, wie wirkt sich die Verfolgung von Ziel A auf die Verwirklichung sportlicher Betätigung aus?)*	–2 (impairs very much) to 0 (neither nor) to +2 (helps very much)

(a)   Item wording by example of evaluating the impact of goal A on the exercise goal. 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.

Item characteristics. Table A 1 in Appendix A contains descriptions of all 84 items of the Extended Intergoal Conflict and Facilitation Questionnaire. The table shows for each single item the absolute and the relative frequency of endorsements of the available response options, the distribution characteristics, item difficulty, and item discriminability in the total sample and in the subsamples of younger and older adults. Overall, item characteristics were favorable in all samples. Item discriminabilities, the item's ability to discriminate between persons with varying levels of intergoal conflict and facilitation as defined by the questionnaire, were in the intermediate to high range (i.e., the majority of corrected item-total correlations were above .30 or above .50; Lienert & Raatz, 1994). Item difficulties were largely in the desirable intermediate range (Lienert & Raatz, 1994), that is, between 20 and 80% of item responses were in affirmative directions, indicating a satisfactory variability of the responses (see the notes in Table A 1 for more detailed descriptions of the procedure for determining item difficulties).

One exception is the bipolar item of the modified Striving Instrumentality Matrix. Item difficulties and discriminabilities were obtained for both poles of the response scale (i.e., for intergoal conflict and intergoal facilitation). The percentages of item responses indicating an overall evaluation of intergoal facilitation fell within the desirable intermediate range. Particularly in the older age group, however, noticeably lower percentages of the item responses indicated an overall evaluation of intergoal conflict. Item-total correlations were satisfactorily high for the total facilitation score, but were considerably lower and often below .30 for the total conflict score (see the notes in Table A 1 for more detailed descriptions of procedures).

Overall, the psychometric properties of the conflict and facilitation items were satisfactory, warranting their utilization to test the hypotheses in this study.

Subscale aggregation. Averaging the same item across all 12 pairs of goals yielded the conflict and facilitation subscales. The items of the modified Striving Instrumentality Matrix were recoded prior to mean computation. Ratings of extreme and moderate facilitation were recoded into values "1" and "2," respectively, of independence to "3," and of moderate and extreme conflict into values "4" and "5," respectively. Examination of subscale distributions revealed substantial departures from normality in the subscales (a) intergoal conflict resulting from financial constraints, (b) intergoal facilitation caused by overlap in goal attainment strategies, (c) intergoal facilitation resulting from instrumental relations between goals, and (d) overall evaluations of intergoal relations with the modi-

fied Striving Instrumentality Matrix. With one exception, all distributions could be satis-factorily symmetrized by logarithmic or square root transformations (as indicated by absolute ratios of skewness and kurtosis to their respective standard errors being smaller than two, Tabachnick & Fidell, 1996; for detailed descriptions, see Appendix A, Table A 2).[19] Quadratic transformation of the "financial constraints scale" was the best in improving the subscale's distribution, but did not result in sufficient symmetry. The analyses of the questionnaire structure reported below were based on the transformed subscales.

Subscale correlations. Table 8 shows the subscale correlations. For reliable assessments of significance, Spearman Rank Correlations are shown, instead of Pearson's Correlations, for the nonnormally distributed subscale assessing intergoal conflict resulting from financial constraints. To assess potential age-group differences in subscale correlations, I used SPSS UNIANOVA to test the model *Subscale 1 = Age group + Subscale 2 + Age group * Subscale 2* for each combination of two subscales. Only three of the 21 models tested yielded significant interactions ($p < .05$), indicating that the bivariate relationships between respective subscales differed between age groups. For these three subscale combinations, Table 8 also shows the correlations separately for both age groups .

Overall, the correlational patterns were highly similar in the younger and older participants: The four conflict subscales were substantially positively correlated as were the two facilitation subscales. There were also substantial correlations between the modified Striving Instrumentality Matrix and all but one of the other subscales. The exception was the nonsignificant correlation between the Striving Instrumentality Matrix and the subscale assessing intergoal conflict due to financial constraints. Conflict and facilitation are commonly assumed to be opposite poles of a single dimension, which would be supported by substantial negative correlations between the conflict and facilitation subscales. Contrary to this assumption, there were no such systematic associations between these subscales.

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[19] The ratio of kurtosis to its standard error remained slightly larger than two for the subscale "incompatible goal attainment strategies" in the total sample, and the modified Striving Instrumentality Matrix in the younger sub-sample. These departures were, however, small and therefore tolerated (see Appendix A, Table A 2).

Table 8. *Correlations of the Intergoal Conflict and Facilitation Subscales*[20]

	Conflict				Facilitation	
	I	II [a]	III	IV	I	II
Conflict						
I Time constraints	1.00					
II Financial constraints [a]	.47 **	1.00				
III Energy constraints	.88 **	.46 **	1.00			
IV Incompatible strategies	.64 **	.36 **	.59 **	1.00		
Facilitation						
I Strategy overlap	.09	.10	.11	.07	1.00	
II Instrumental relations	-.14	-.00	-.07 [b]	-.04	.78 [c] **	1.00
Overall Evaluation						
SIM [d]	.45 **	.16	.33 **	.35 **	-.55 **	-.74 [e] **

** $p < 0.01$

Notes. All correlations were tested for age-group differences. Unless otherwise indicated, they were not significant (i.e., $p > .05$).

[a] Spearman Rank Correlations

[b] Significant age-group difference ($p < .05$): $r_{young} = .19$ n.s.; $r_{old} = -.18$ n.s.

[c] Significant age-group difference ($p < .05$): $r_{young} = .80$**, $r_{old} = .72$**

[d] Striving Instrumentality Matrix (after Emmons & King, 1988), higher scale scores indicate more unfavorable intergoal relations

[e] Significant age-group difference ($p < .05$): $r_{young} = -.61$**, $r_{old} = -.82$**

Exploratory factor analyses. To further explore the questionnaire's structure, I subjected the subscale correlations to exploratory factor analyses. First, I performed generalized least squares extractions with oblimin, direct rotation on the intergoal conflict and facilitation subscales for the total sample and for the subsamples of younger and older adults using SPSS FACTOR. These preliminary analyses consistently yielded solutions with two factors (Eigenvalues greater than one) and small factor correlations ($r_{total} = -.10$; $r_{younger} = -.04$; $r_{older} = -.14$).

I then repeated the analyses using principal components extraction with Varimax rotation. Again, the analyses yielded two components with Eigenvalues greater than one.

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[20] Where appropriate, transformed variables were used for analyses. Correlations involving the transformed Striving Instrumentality Matrix were reversed to fit the original (recoded) scaling, where higher scale scores indicate more unfavorable overall assessments of intergoal relations.

Component loadings reflected a highly consistent pattern in the total sample as well as in the subsamples of younger and older adults (see Table 9). With a cut of .30 for the allocation of subscales to components, all conflict subscales loaded unambiguously on one component and all facilitation subscales, on the other. The overall evaluation of intergoal relations with the modified Striving Instrumentality Matrix consistently loaded on both components, more highly so on the intergoal facilitation component.

The subscale scores in all three analyses were well-defined by these two-component solutions, as was indicated by substantial communality values (with the exception of intergoal conflict due to financial constraints). Furthermore, the solutions accounted for substantial amounts (about three-fourths) of the variance in all three analyses. Table 9 summarizes loadings of subscales on components, communalities, and percentages of the variance explained. Subscales are ordered by size of loading to facilitate interpretation.[21]

Table 9. *Principal Component Analyses With Varimax Rotation of the Intergoal Conflict and Facilitation Subscales in the Total Sample and the Subsamples of Younger and Older Adults*

	C1 (Conflict)	C2 (Facilitation)	h^2 [a]
A) Total Sample (N = 145)			
Time constraints	**.93**	-.11	.87
Energy constraints	**.91**	-.03	.82
Incompatible strategies	**.78**	-.06	.61
Financial constraints	**.62**	.04	.38
Instrumental relations	-.03	**.95**	.90
Strategy overlap	.19	**.89**	.84
Overall evaluation (modified SIM) [b]	**.40**	**-.82**	.83
Percent explained variance	40.89	34.09	
Cumulative percent explained variance	40.89	74.98	

(table continues)

[21] Exploratory factor analyses revealed that the two-factor structure of the instrument did not only exist with respect to the entire set of four goals, but also with respect to specific pairs of goals. I performed, separately for each of the 12 pairs of goals, generalized least squares extraction with oblimin, direct rotation on the items assessing the degree of intergoal conflict and facilitation characterizing this particular goal pair. In 11 of these analyses, two factors with Eigenvalues greater than one were extracted (accounting for 65.04 to 71.18% of variance; mean factor correlation: -.19, range: -.07 to -.42). With a critical factor loading of ≥ .30, these two factors unambiguously reflected intergoal conflict and intergoal facilitation. Only one analysis did not replicate this two factor solution.

Table 9 *(continued)*

	C1 (Conflict)	C2 (Facilitation)	h2 (a)
B) Younger subsample (n = 99)			
Time constraints	**.93**	.03	.86
Energy constraints	**.87**	.15	.79
Incompatible strategies	**.81**	-.09	.66
Financial constraints	**.63**	.03	.39
Instrumental relations	.11	**.93**	.87
Strategy overlap	.27	**.87**	.83
Overall evaluation (modified SIM) (b)	**.37**	**-.80**	.77
Percent explained variance	41.25	32.64	
Cumulative percent explained variance	41.25	73.89	
C) Older subsample (n = 46)			
Time constraints	**.92**	-.14	.86
Energy constraints	**.91**	-.13	.85
Incompatible strategies	**.72**	.15	.54
Financial constraints	**.71**	-.14	.52
Instrumental relations	-.09	**.94**	.89
Strategy overlap	.16	**.88**	.79
Overall evaluation (modified SIM) (b)	**.37**	**-.85**	.87
Percent explained variance	41.02	35.01	
Cumulative percent explained variance	41.02	76.03	

Note. Subscales are ordered by size of loading to facilitate interpretation. Bold font highlights factor loadings > .30.

(a) Communalities

(b) Modified Striving Instrumentality Matrix (after Emmons & King, 1988), higher scores indicate more unfavorable intergoal relations

Implications for testing of hypotheses. The two-factor structure of the Extended Intergoal Conflict and Facilitation Questionnaire shows that the frequency of situations in which goals are perceived as facilitative (i.e., positively influencing each other) tends to be independent of the frequency of situations in which goals are perceived as conflicting (i.e., hindering each other). This structure contradicts the assumption that intergoal conflict and facilitation represent opposite poles on a single dimension. Apart from theoretical implications, to which I will refer in the discussion part, this dimensionality of the goal conflict and facilitation questionnaire had implications for testing my hypotheses: Each of the reported goals, as well as the entire set of four goals, were characterized by the degree of both associated intergoal conflict and associated intergoal facilitation. Consequently, I investigated all hypotheses with respect to both characteristics.

Aggregation of intergoal conflict and facilitation composites. The aggregation of composites followed the following procedure: First, I recoded the modified Striving Instrumentality Matrix item (SIM) into two separate variables. As I described previously (see Table 7), the Modified Striving Instrumentality Matrix item asked the question "Overall, how does the pursuit of goal A influence the realization of goal B?" The response options read: "-2" (impairs very much), "-1" (impairs somewhat), "0" (neither helps nor impairs), "+1" (helps somewhat), "+2" (helps very much). I created a SIM-conflict variable that was assigned values of zero if the response reflected an overall evaluation of independence or facilitation (i.e., responses equal to or above zero). If the response reflected an overall evaluation of conflict (i.e., values below zero), the SIM-conflict variable was assigned the absolute value of the respective response (i.e., values of "+2" or "+1"). Similarly, I created a SIM-facilitation variable that was assigned values of zero if responses reflected an overall evaluation of independence or conflict, and values corresponding to the original response if it reflected evaluations of facilitation.

Averaging the newly created SIM-conflict variable and the four conflict items yielded the composite conflict score. Averaging the newly created SIM-facilitation variable and the two facilitation items yielded the composite facilitation score. Averaging across all pairs of goals yielded the conflict and facilitation composite score characterizing the entire set of four goals. Averaging across all pairs of goals involving a specific goal yielded the conflict and facilitation composite scores characterizing that particular goal. The composite scores theoretically ranged between 0.67 and 4.

Internal consistency of the intergoal conflict and facilitation composite scales. Cronbach's Alphas, obtained using SPSS RELIABILITY in the total sample and in the younger and older subsamples, consistently showed satisfactory internal consistencies of the composite conflict and facilitation scores (see Table 10).

Table 10. *Cronbach's Alpha for the Conflict and Facilitation Composite Scales*

Scale	*n* Items	Younger (*n*=98) [a]	Older (*n*=46)	Entire Sample (*N*=144) [a]
A. Conflict Composite				
Goal A	30	.87	.90	.89
Goal B	30	.89	.93	.91
Goal C	30	.89	.93	.91
Goal D (Exercise)	30	.85	.91	.88
Entire Set of Four Goals	60	.92	.95	.94
B. Facilitation Composite				
Goal A	18	.84	.92	88
Goal B	18	.83	.92	.83
Goal C	18	.88	.95	.92
Goal D (Exercise)	18	.86	.92	.90
Entire Set of Four Goals	36	.89	.95	.93

(a)   One participant in the younger age group reported only two (instead of three) personal goals besides the exercise goal. Reliability analyses in the younger subsample and the entire sample are therefore based on a minus one reduced sample size.

3.1.3.3.   *Hypothesized Antecedents of Intergoal Conflict*

Managing multiple goals. Because of a lack of published instruments assessing habitual strategies for coordinating multiple goals, I developed three items each to assess the following aspects of goal pursuit strategies: (a) setting priorities, (b) temporally sequencing the pursuit of multiple goals, (c) seeking and accepting compromises (i.e., lowering aspiration levels) when encountering difficulties in working on multiple goals, and (d) disengaging from some goal(s) upon becoming aware of difficulties in pursuing multiple goals (for item wordings, see Appendix A, Table A 3). Response options ranged from 1 "not at all true" to 5 "completely true." Participants responded to these items at T1. The items were distributed throughout the questionnaire, such that 10 to 13 intermediate items separated the items representing the same goal pursuit strategy.

I assigned items to subscales according to results of an exploratory factor analysis.[22] Generalized least squares extraction with oblimin, direct rotation, performed using

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[22] Data examination conducted prior to exploratory factor analysis revealed satisfactory symmetry in the distributions of the 12 items as indicated by absolute ratios of skewness and kurtosis to their respective standard errors being smaller or only slightly larger than 2 (see Appendix A, Table A 4).

SPSS FACTOR, yielded three factors with Eigenvalues greater than one. Table 11 shows factor loadings, communalities, percentages of explained variance, as well as factor correlations. Items are ordered by size of loading. The three factor solution fits the data satisfactorily ($\chi^2(33) = 35.59$, $p = .35$), accounting overall for 56.18% of the variance. Most communalities, representing the amount of variance of individual items accounted for by the extracted factors, were in the intermediate range.

Table 11. *Generalized Least Squares Extraction With Oblimin, Direct Rotation on the 12 Items Operationalizing Habitual Strategies for Coordinating Multiple Goals*

Intended Content Domain (Item) [a]		F1 (P/S) [b]	F2 (C)	F3 (D)	h^2 [c]
Sequencing (1)		**.88**	.09	-.05	.59
Prioritizing (3)		**.73**	.12	.12	.42
Sequencing (3)		**.68**	.04	-.23	.53
Sequencing (2)		.58	-.17	-.37	.55
Prioritizing (1)		**.40**	-.20	.11	.23
Prioritizing (2)		.25	-.05	-.20	.16
Distancing (3)		.14	**.81**	-.02	.38
Compromising (3)		.05	**.70**	-.04	.36
Compromising (1)		-.10	**.35**	-.03	.16
Compromising (2)		.01	.11	**-.81**	.45
Distancing (2)		-.01	-.07	**-.56**	.24
Distancing (1)		-.02	.14	**-.54**	.28
Percent explained variance		27.71	17.70	10.77	
Cumulative percent		27.71	45.41	56.18	
Factor correlations	F1	1.00			
	F2	-.18	1.00		
	F3	-.29	-.17	1.00	

Note. Bold font indicates assignment to subscales.
(a) For item wording, see Appendix A, Table A 3
(b) Factor labels: PS – Prioritizing/Sequencing, C – Compromising, D – Distancing
(c) Communalities

All items originally developed to assess prioritizing and sequencing had their highest loading on one single factor. This solution is theoretically plausible because setting priorities is a prerequisite for sequencing the pursuit of goals in time. Accordingly, this

factor represented a "prioritizing/sequencing" strategy. The second and third factors represented the strategies "compromising" and "distancing."[23]

I used factor loadings to assign items to subscales. Using a critical value of .30, ten items could be unequivocally assigned (bold font in Table 11). One item (originally developed to address the "sequencing" strategy) could have been assigned to more than one factor and another item (originally developed to address the "prioritization" aspect) could not be assigned at all. I excluded these two items from subscale aggregations. Averaging items assigned to each subscale yielded subscale scores. Internal consistencies as assessed by Cronbach's alpha were in an intermediate range, but, given the small numbers of items, acceptable (.74, .60, and .66 for prioritizing/sequencing, compromising, and distancing, respectively).

Resource intensity of goals. At T1, participants gave responses to three items that assessed the resource intensity of each of their four goals. The questions were: "How much time (money, strength and energy) would you have to invest to successfully realize this goal?"[24] Response options ranged from 1 "very little" to 5 "very much." Averaging across all 12 items (three items for each of the four goals) yielded a total score indicating the average resource intensity of the participant's reported goals ($M = 2.13$, $SD = .56$, Cronbach's $\alpha = .93$, for subscale correlations, see Appendix A, Table A 6).

3.1.3.4. *Subjective Well-Being*

At T1 and T2, participants completed several instruments assessing various aspects of psychological well-being, namely, (a) positive psychological functioning, (b) habitual emotional well-being, (c) general life satisfaction, and (d) goal-specific satisfaction.

Positive psychological functioning. The short version of the Ryff Scale (Ryff & Keyes, 1995) assesses six components of positive psychological functioning as conceptualized by Carol Ryff. A total of 18 items (three per subscale; German translation by Staudinger et al., 1999a) assess the degree of (a) self-acceptance (i.e., positively evaluating oneself and one's past), (b) personal growth (i.e., having a sense of continuous development as a per-

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[23] Patterns of loadings on the second and third factor reflected the during item development intended content domains with the exception of one item per factor. These exceptions, however, did not in my judgement affect the interpretation of the factors.

[24] German wording: "Um dieses Ziel zu verwirklichen, wie viel Zeit müssten Sie dafür aufwenden (wie viel Geld müssten Sie dafür investieren, wie viel Kraft und Energie müssten Sie dafür aufbringen)?"

son), (c) autonomy (i.e., having a sense of independence and regulation from "within"), (d) positive relations with others (i.e., having warm and trusting interpersonal relationships), (e) environmental mastery (i.e., having a sense of being capable of managing one's life and surrounding environment), and (f) purpose in life (i.e., believing that one's life is meaningful). Participants gave responses to these items on a five-point scale (1 "not at all true" to 5 "very true"). After recoding negatively formulated items, averaging across all 18 items yielded a total scale score that indicated the person's global level of positive psychological functioning. The scale (T1: $M = 3.77$, $SD = .37$; T2: $M = 3.80$, $SD = .40$) had internal consistencies of Cronbach's $\alpha = .69$ at T1 and $\alpha = .75$ at T2.

Habitual emotional well-being (retrospective in past months). The multidimensional affect rating scale (Multidimensionaler Befindlichkeitsfragebogen, Steyer et al., 1997) assesses positive and negative affect on three different dimensions. Four items (adjectives) each assess "positive mood," "ease," and "alertness" as dimensions with positive valence, and "negative mood," "restlessness," and "fatigue" as dimensions with negative valence. In the present study, a slightly modified version of this scale was used. The first modification was the time frame of instruction. Instead of evaluating their current affective states, participants indicated how often they had experienced each emotion during the past four months (at T2, in the interval since the first measurement point). Response options ranged from 1 "very seldom" to 5 "very often." The second modification was in the aggregation of subscales. Steyer et al. (1997) originally proposed three bipolar subscales (positive-negative mood, ease-restlessness, and alertness-fatigue). Predictions in the present study, however, specifically referred to the valence aspect of emotional well-being. Furthermore, examination of the data revealed that the dimensions with "positive" valence (i.e., positive mood, ease, and alertness) were highly correlated as were the dimensions with "negative" valence (i.e., negative mood, restlessness, and fatigue; see Appendix A, Table A 7). I therefore aggregated these into two subscales. Totaling the 12 items assessing positive mood, ease, and alertness yielded a "positive affect" scale, and totaling the 12 items assessing negative mood, restlessness, and fatigue yielded a "negative affect" scale. These subscales indicated the average frequency of positive and negative affect during the past months.[25] The positive affect scale (T1: $M = 41.45$, $SD = 7.80$; T2: $M = $

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[25] Both subscales were substantially correlated ($r_{T1} = -.67$, $p < .01$, $r_{T2} = -.72$, $p < .01$). Furthermore, exploratory factor analyses (generalized least squares extraction with oblimin, direct rotation) yielded one factor solutions (Eigenvalue greater than 1) accounting for 62.51% and 63.34% of the variance at T1 and T2, respectively. I did not

40.66, *SD* = 7.57) had internal consistencies of Cronbach's α =.92 at T1 and α =.92 at T2. The negative affect scale (T1: *M* = 32.60, *SD* = 8.25; T2: *M* = 31.74, *SD* = 8.16) had internal consistencies of Cronbach's α = .90 at T1 and α = .89 at T2.

Life satisfaction. Assessments of domain-general and domain-specific life satisfaction are likely to result from different judgement processes (Schwarz & Strack, 1985). Evaluations of "life in general" are typically based more strongly on current context and mood, whereas domain-specific evaluations are less context-specific and based more explicitly on comparisons of past experiences with individual standards. I therefore used two instruments to comprehensively assess the participant's life satisfaction as the cognitive component of subjective well-being. The life evaluation scale (Skala zur Lebensbewertung, Ferring et al., 1996) addresses satisfaction with "life in general" from different temporal perspectives (present, past, future). Six items assess current life satisfaction, four items, retrospective life satisfaction, and five items, prospective life satisfaction (i.e., being concerned or confident about the future). Participants responded to these items on a scale ranging from 1 "not at all true" to 5 "completely true." After negatively formulated items were recoded, averaging across all items yielded a total scale score that indicated a person's global satisfaction with life in general. This total scale score (T1: *M* = 3.68, *SD* = .56; T2: *M* = 3.71, *SD* = .56) had internal consistencies of Cronbach's α = .88 at T1 and α = .89 at T2.

The pressure-to-change scale (Veränderungsdruckskala, Filipp & Ferring, 1991) assesses (lack of) life satisfaction as the extent of change desired in each of several specific life domains. The scale was originally developed for research in the context of severe chronic illness. For the purposes of the present study, I modified the scale to cover 16 life domains often mentioned in the personal goals of healthy younger and older adults (e.g., Nurmi, 1992).[26] To evaluate the extent of change desired in these life domains, partici-

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compute a single scale score, despite these results, because the positive and negative subscales were differentially related to the intergoal conflict and facilitation aggregates (see 4.1.2). Furthermore, as I will describe in more detail below, the short version of this scale was also used to assess short-term mood in the diary phase. There, the correlation between the positive and negative affect scales was considerably lower (r = -.36, p < .01). Also, generalized least squares extraction yielded a clear two-factor solution (Eigenvalues greater than one) accounting for 73.82% of the variance. Using a critical factor loading of .30, all positive affect subscales (positive mood, alertness, and ease) could be unequivocally assigned to one, and all negative affect scales (negative mood, fatigue, and restlessness) could be unequivocally assigned to the other factor. To maintain consistency, I used this two-subscale solution in both parts of the study.

[26] I omitted life domains tailored to clinical populations (e.g., independence from help) and added others that, according to an investigation by Nurmi, 1992, are central to typical goals of healthy younger and older adults. The 16

pants used a seven-point scale with response options ranging from 1 "not at all" to 7 "fundamental." Averaging across all 16 items yielded a scale score for the person's average domain-specific (lack of) life satisfaction. This total scale (T1: $M = 3.70$, $SD = .88$; T2: $M = 3.67$, $SD = .87$) had internal consistencies of Cronbach's $\alpha = .86$ at T1 and $\alpha = .88$ at T2.

Scores of the life evaluation scale and the pressure-to-change scale were substantially correlated ($r_{T1} = -.44$, $p < .01$, $r_{T2} = -.54$, $p < .01$). Furthermore, subjecting the three subscales of the life evaluation scale and the pressure-to-change scale to exploratory factor analyses (generalized least squares extraction) yielded one factor solutions (Eigenvalue greater than one) accounting for 59.43% and 63.18% of variance at T1 and T2, respectively. I therefore averaged the z-scores of the life evaluation scale and of the reflected pressure-to-change scale. The resulting life satisfaction aggregate reflected the participants' global satisfaction with their lives.

Goal-specific satisfaction. At T1 and T2, participants were asked to assess their current satisfaction with each of the four goals ("With respect to that goal, how satisfied are you currently with yourself and your development?").[27] I changed the response format slightly in comparison to the original (Brandtstädter, 1984) to response options ranging from 1 "very dissatisfied" to 4 "partly satisfied, partly dissatisfied" to 7 "very satisfied." Averaging responses across all four goals indicated the participant's average goal-specific satisfaction (T1: $M = 4.71$, $SD = .83$, $\alpha = .44$; T2: $M = 4.69$, $SD = .86$, $\alpha = .42$).

3.1.3.5. Goal Progress

At T2, participants were asked to assess their subjective goal progress since the first measurement point. The item read: "Since our first session four months ago, have you moved toward that goal or have you moved away from it?"[28] I changed the response format slightly in comparison to the original (Brandtstädter, 1984) to response options

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items of the modified scale addressed desired change in the life domains "education," "leisure," "profession/work," "partnership," "health/physical well-being," "friends/acquaintances," "family/children," "financial situation," "personality," "material belongings," "enjoy life," "mental health," "physical capabilities," "plans/future prospects," "intellectual capabilities," and "appearance."

[27] German wording: "Inwieweit sind Sie im Hinblick auf dieses Ziel gegenwärtig mit sich und Ihrer Entwicklung zufrieden?"

[28] German wording: "Sind Sie in den vergangenen vier Monaten seit unserer ersten Befragung diesem Ziel näher gekommen oder haben Sie sich davon entfernt?"

ranging from 1 "moved very far away" to 4 "moved neither away nor toward" to 7 "moved very far toward that goal." Averaging responses across all four goals yielded a scale score indicating the participants' average subjective goal progress during the study interval (M = 4.87, SD = .81, α = .31).

3.1.3.6. Exercise Behavior in the Study Interval

Self-report. When making appointments for the second questionnaire session, research assistants informed participants that detailed reconstructions of their exercise behavior in the past months would be part of the questionnaire. They encouraged participants to bring materials (e.g., calendars) that might help them with this task. The printed instructions preceding the self-report of exercise behaviors were carefully phrased to encourage participants to report about their exercise behavior in as much detail and as openly and honestly as possible (see Appendix A, Box A 2). Possibilities such as having exercised with fluctuating intensity, having paused temporarily, or having completely abandoned exercising were mentioned to relieve inhibitions to report such behaviors. Self-reported reconstructions of the participant's exercise behavior were obtained separately for each of the five calendar months of the study interval.[29] Four aspects were assessed: (a) exercise frequency, (b) realization of the originally intended monthly exercise rate, (c) exercise regularity, and (d) exercise duration.

The *monthly exercise frequency* was assessed with the following item: "How often did you exercise in ... (calendar month)?" The (unnumbered) response options read: "not at all," "less than once a week," "once a week," and "several times a week." Participants choosing the response "less than once a week" further indicated how often they had exercised during the respective calendar month. Participants choosing the response option "several times a week" further indicated how many times per week they had exercised. From these responses, I computed the absolute exercise frequency in that month.[30] Averaging across all calendar months yielded the average self-reported exercise frequency during the study interval (M = 5.39, SD = 2.50).

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[29] The study interval typically included five calendar months, that is, a person who participated at the first measurement point in mid September, typically participated at the second measurement point in mid to late January.

[30] Participants who responded "not at all" were assigned a zero, participants who responded "less than once a week" were assigned the monthly exercise frequency they had reported in the additional question, participants who responded "once a week" were assigned a four, and participants who responded "several times a week" were assigned four times the weekly exercise frequency they reported in the additional question.

At T1, participants had responded to a single item "On the average, how often do you intend to exercise during the coming three to four months?" Response options and scoring were identical to the above, with the exception that the option "not at all" was not available (because only participants with exercise intentions had been recruited). I computed the *realization of the originally intended monthly exercise rate* for each calendar month as the ratio of the self-reported monthly exercise frequency (reported at T2) and the intended monthly exercise frequency (reported at T1). Averaging across all calendar months yielded the average realization of the intended monthly exercise rate during the study interval ($M = .73$, $SD = .30$).

The *monthly exercise regularity* was assessed by a single item: "How regularly did you exercise in ... (calendar month)?" Response options ranged from 1 "very irregularly" to 5 "very regularly." Participants who indicated that they had not exercised at all during the respective month were assigned a value of zero. Averaging across all five calendar months yielded a score indicating the participants' average monthly exercise regularity in the study interval ($M = 3.34$, $SD = 1.26$).

The *average monthly exercise duration* was assessed by a single item: "On the average, how long did you exercise each time in ... (calendar month)?" The (unnumbered) response options read: "Less than half an hour," "half an hour to one hour," "one to one-and-a-half hours," "one-and-a-half to two hours," "two to two-and-a-half hours," and "more than two-and-a-half hours." Response options were scored from one (less than half an hour) to 6 (more than two-and-a-half hours). Participants who indicated that they had not exercised at all in the respective month were assigned a value of zero. Averaging across all five calendar months yielded a score indicating the average exercise duration in the study interval ($M = 2.80$, $SD = 1.06$).

Objective data on exercise frequency. Objective information about the frequency of attending the cooperating sports facilities was available for $N = 107$ participants ($n_{younger} = 70$, $n_{older} = 37$).[31] For each of the five calendar months of the study interval, the atten-

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[31] In 22 cases, no objective information was available (e.g., because no attendance lists had been kept). In six cases, the cooperating sports facilities provided unprecise information. Additional nine participants were excluded because they had not become a member of the cooperating sports facilities (in these cases, fitness centers). Finally, one participant was excluded because she had not once attended the cooperating exercise facility during the study interval. Note that these 38 participants did not differ from those for whom objective attendance data were available with respect to their average self-reported monthly exercise frequency, duration, regularity, and the average realization of their intended monthly exercise rate ($F(4, 136) = 1.27$, $p = .29$, Box-M-Test: $F(10, 21539) = 1.25$, $p = .25$).

dance frequency was derived from attendance lists or electronic attendance registration data (in fitness centers). Averaging across all five calendar months yielded a score indicating the average objective exercise frequency of the participant ($M = 2.62$, $SD = 1.64$).

Correlation of self-reported and objective data. Pearson's correlation between the average self-reported and the objective monthly exercise frequencies showed that participants were relatively well able to reconstruct their exercise behavior in the past months: In the total sample ($N = 104$), the correlation was $r = .51$ ($p < .01$).[32] Of these participants, $n = 57$ indicated that they had exercised in (an)other context(s) in addition to attending the cooperating sports facility that had provided the objective attendance information. In the subsample of the $n = 47$ participants who had exclusively exercised in the cooperating exercise facility, the correlation between self-reported and objective exercise frequency increased to $r = .80$ ($p < .01$).

3.2. Study Part 2: Diary Phase

3.2.1. Participants

A subsample of $n = 52$ younger and $n = 29$ older participants agreed to participate in the diary phase. The socio-demographic characteristics of this subsample paralleled those of the parent sample. Younger and older participants were predominantly female. The majority of younger participants were students, and the majority of older participants retired. As compared to older participants, younger participants tended to have a higher educational status (for details, see Table 12).

Table 12. *Socio-Demographic Characteristics of the Younger and Older Participants in the Diary Phase*

	Younger $n = 52$	Older $n = 29$
Age (in years)		
Range	20.1 – 35.4	58.9 – 78.1
M	25.9	64.3
SD	4.1	4.7

(table continues)

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[32] The sample size reduced to $N = 104$ because objective attendance data were available for three participants who dropped out at T2 (i.e., for whom no self-reported attendance data were available).

Table 12. *(continued)*

	Younger $n = 52$		Older $n = 29$	
Gender				
Male	17	(32.7%)	5	(17.2%)
Female	35	(67.3%)	24	(82.8%)
Marital Status				
Unmarried	48	(92.3%)	1	(3.4%)
Married	4	(7.7%)	12	(41.5%)
Divorced	0	(0.0%)	9	(31.0%)
Widowed	0	(0.0%)	7	(24.1%)
Education				
Elementary/Junior high (8th grade) [a]	1	(1.9%)	7	(24.1%)
Secondary school level 1 (10th grade) [b]	5	(9.6%)	14	(48.3%)
High school (12th/13th grade) [c]	41	(78.9%)	4	(13.8%)
(Technical) College/University [d]	5	(9.6%)	4	(13.8%)
Current Occupation[e]				
Full-time/self employed	8	(15.4%)	2	(6.8%)
Part-time employed	8	(15.4%)	1	(3.4%)
Unemployed	1	(1.9%)	3	(10.3%)
Retired	0	(0.0%)	23	(79.3%)
Trainee	2	(3.8%)	0	(0.0%)
Student	39	(75.0%)	0	(0.0%)
Housewife/-man	0	(0.0%)	0	(0.0%)
Military/Civil service	1	(1.9%)	0	(0.0%)
Other	1	(2.2%)	1	(3.4%)

(a) Grund-/Hauptschule
(b) Mittlere Reife/Fachschule
(c) (Fach-) Abitur
(d) Fach-/ Hochschulstudium
(e) One person can belong to multiple categories (percentages do not add up to 100)

3.2.2. Procedure

The diary study started with an instruction session conducted by one of three trained persons. The instruction sessions took place shortly after T1 ($M = 8.67$ days, $SD = 7.75$).[33] For younger participants, the instruction sessions were typically conducted

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[33] For $n = 8$ older participants, participation in the diary phase started more than two weeks after T1 ($M = 32.50$ days, $SD = 11.98$) because the diary phase would otherwise have included the (potentially untypical) activities during Christmas time.

in groups of about three participants. Older participants were typically instructed in individual sessions.[34] The person conducting the session explained the procedure of the diary study and familiarized the participants with the necessary materials. Furthermore, diary completion was trained. After participants had completed a sample diary entry, they were given individual feedback and their questions were clarified. Participants received a completed sample diary, and a printed instruction describing the diary procedure and explaining the diary parts in detail. At the end of the instruction session, participants signed an informed consent form declaring that they voluntarily participated in the study and had been informed about its procedure and purpose. The person conducting the session kept in close telephone contact with the participants throughout the diary study. Participants were also encouraged to call in case they had questions.

Participants kept nine diaries during three diary periods. Each diary period consisted of three consecutive diary days. Intervals of six days separated the three diary periods (see Figure 5). The first diary period started on the day following the instruction session. Diary periods covered six weekdays (Monday through Friday) and three weekend days (Saturday or Sunday). The purpose of distributing the nine diary days throughout a longer time period of three weeks and across different days of the week was to cover different facets of people's everyday life. Study materials included a list of the diary dates. In addition, the contact persons reminded the participants per telephone of the start of a new diary period.
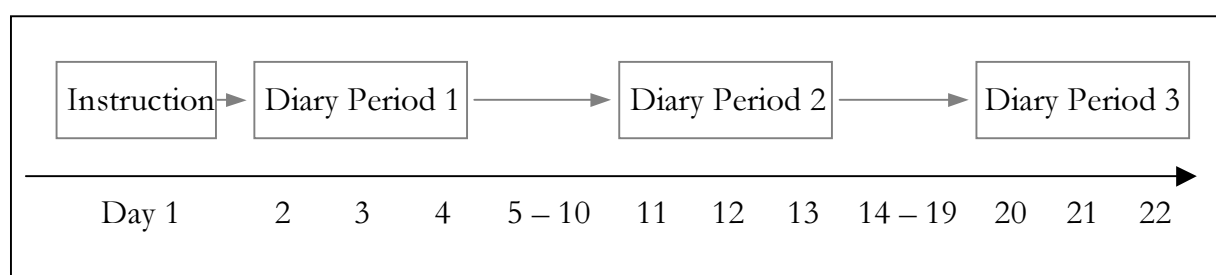

Figure 5. *Standard Procedure of the Diary Phase*

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[34] Pilot research had shown that individual instruction sessions were more suited for training the unfamiliar and complex diary procedure with older adults than were group sessions. They allowed thorough explanations of the procedure details and individualized training of diary completion. In contrast, group sessions were appropriate in the younger age group.

Participants received nine preprinted diaries, labeled with the date and the weekday during which they had to be kept. Each diary consisted of three diary entries to be completed at about noon, at about six p.m., and immediately before going to bed.[35] Participants also received an easy to use, portable alarm clock to ensure punctual completion of the diary entries. Participants themselves set the alarm for the next diary-entry time. Use of the alarm function was trained during the instruction session. Furthermore, the printed study materials included easily comprehensible directions for use of the alarm clock. Participants also received nine prestamped return envelopes and were asked to mail each diary on the day after its completion. Postmarks were controlled to check whether the diaries were mailed on time.

Each of the three diary entries per day consisted of three parts. In the first part, participants used the short version of the multidimensional affect rating scale (Mehrdimensionaler Befindlichkeitsfragebogen, Steyer et al., 1997) to rate their emotional well-being during the preceding hours (i.e., since waking up for the 1st, and since the last diary entry for the 2nd and 3rd diary entries). These affect ratings were taken first to reduce the possibility that they would be affected by completing the other parts. The second part requested a chronological report of the activities participants had engaged in during the preceding hours (for a sample activity report form, see Figure 6 on page 112). For each reported activity, participants indicated

1. starting and ending times,
2. with whom they had conducted the activity,
3. how they had enjoyed or disliked the activity,
4. how relevant the activity had been for each of the four goals they had reported at T1,[36]
5. whether they would have liked to do something else instead (and if so, if that would have been relevant for any of the four goals under study), and

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[35] If circumstances prevented diary reports at noon and six p.m. sharp, participants were instructed to keep the diaries at the time (earlier or later) with the shortest interval to the standard times.

[36] To facilitate the evaluation of goal relevance of activities, study materials included a copy of the goals participants had reported at T1. Furthermore, diaries were individualized and showed abbreviations of the participant's goals where the respective goal-relevance of activities had to be rated (see Figure 6). At T1, participants had described their personal goals in detail and chosen an abbreviation for each goal. These abbreviations were adopted to reference the goals in the diaries.

6. whether they ought to have done something else instead (and if so, if that would have been relevant for any of the four goals under study).

The third part of the diary entry was a single item evaluation of the current mood after having completed the diary entry.

Missing data is a common problem in diary studies (West & Hepworth, 1991). To minimize this problem, participants were informed in the instruction session that they would be asked to complete an additional diary for each incomplete diary they provided. Each incoming diary was screened for missing information and the date of the postmark was checked. Where deviations from standard requirements were detected, contact persons informed the participants per telephone and mailed them an additional diary. Where possible, participants kept the additional diary on the same day of week as the diary with the deviation. Overall, 22 participants kept additional diaries. Of these, 16 participants (five younger and 11 older) kept one, four participants (two younger and two older) kept two, and two younger participants kept three additional diaries. All participants were reimbursed with DM 145 (approximately $ 65) at the end of the study.

With the exception of one younger (male) participant who discontinued participation after completion of the first diary period, no participants dropped out during the diary phase. Table 13 on page 113 shows descriptions of the diaries completed by the total sample, and the subsamples of younger and older adults. There were no age-group differences with respect to the number of diary days (total, on weekdays, and on weekends), completed diary entries, reported activities, and the time interval between the first and the last diary.

From	To	What did you do? (use separate lines for separate activities)	With whom? (initials and relationship to person)	Enjoyment (a) (-3 to +3)	Goal relevance of activity (b) (-3 to +3)				Would have liked to do something else instead, namely ...	For goal? (d)	Should have done something else instead, namely ...	For goal? (d)
					Job (c) 1	*Fun* (c) 2	*Partner* (c) 3	*Exercise* (c) 4				
7:00	7:00	Woke up		-3								
7:00	7:30	Listened to radio		-1								
7:30	8:00	Had breakfast	N.R., partner	+2								
8:00	9:00	Needle work (present)		+3			+2					
9:00	9:30	Telephoned	H.S., boss	-3	+1				Needle work	3		
		...										

Note. Information used for testing of hypotheses are highlighted by shaded areas.

(a)   Enjoyment of activities; response options: –3 (disliked very much/very unpleasant activity) to 0 (neither enjoyed nor disliked the activity) to +3 (enjoyed very much/very pleasant activity)

(b)   Goal relevance of activities; response options: -3 (activity very much hindered that goal) to 0 (activity was irrelevant for that goal) to +3 (activity very much furthered that goal); to facilitate diary completion, goal irrelevance was indicated by leaving the column blank

(c)   Goals 1, 2, and 3: personal goals reported at T1 (referenced by an abbreviation chosen by the participant); goal 4: start regular physical exercise (shared by all participants)

(d)   Would that alternative activity have furthered any of the four goals under study? If yes, give the number of the respective goal.

Figure 6. *Activity Report Form With Sample Responses*

Table 13. *Description of Diary Characteristics in the Total Sample, the Subsamples of Younger and Older Adults, and Tests for Age-Group Differences*

	Sample	*Md*	*M*	*SD*	Range
Total Number of Diary Days	Total	9.0	9.23	.96	3 – 12
	Younger	9.0	9.14	1.10	3 – 12
	Older	9.0	9.39	.64	9 – 11
			t(79) = -1.12, p = .27		
Number of Weekday Diaries	Total	6.0	6.36	.88	2 – 9
	Younger	6.0	6.23	.92	2 – 9
	Older	6.0	6.59	.78	6 – 9
			t(79) = -1.76, p = .08		
Number of Weekend Diaries	Total	3	2.98	.35	1 – 4
	Younger	3	2.94	.42	1 – 4
	Older	3	3.03	.19	3 – 4
			t(79) = -1.13, p = .26		
Number of Diary Entries	Total	27.0	27.69	2.89	9 – 36
	Younger	27.0	27.42	3.30	9 – 36
	Older	27.0	28.17	1.93	25 – 33
			t(79) = -1.12, p = .27		
Number of Reported Activities	Total	251.0	251.10	39.71	71 – 357
	Younger	250.5	248.75	40.10	71 – 328
	Older	253.0	255.31	39.34	207 – 357
			t(79) = -.71, p = .48		
Days between first and last Diary	Total	20.0	21.98	5.84	2 – 57
	Younger	20.0	21.29	4.69	2 – 34
	Older	20.0	23.21	7.41	20 – 57
			t(79) = -1.43, p = .16		

3.2.3. Scale Aggregation

Below, I will describe the basic procedures for aggregating indicators of (a) emotional well-being, (b) the degrees of enjoying and disliking activities, and (c) the degree of involvement in activities furthering and hindering goal pursuit. I will describe indicators that were used in statistical analyses in more detail in the results part.

Emotional well-being. The short (i.e., 12 item) version of the multidimensional affect scale (Mehrdimensionaler Befindlichkeitsfragebogen, Steyer et al., 1997) was used to assess the average intensity of positive and negative affect during the past hours (i.e., since waking up for the 1st, and since the last diary entry for the 2nd and 3rd diary entry). For that purpose, I modified the instruction into "In general, how have you felt since waking

up (the last diary entry)?"[37] Two items (adjectives) each assessed "positive mood," "ease," and "alertness" as dimensions with positive valence, and "negative mood," "restlessness," and "fatigue" as dimensions with negative valence. Response options ranged from 1 "not at all" to 5 "very much." Averaging responses to the six items for positive and negative valence, respectively, yielded the positive and negative affect scale scores (for information on subscale correlations and factor structure, see footnote 25 on page 102).

Degree of enjoying and disliking everyday activities. Participants rated the degree to which they enjoyed or disliked each single activity. Response options ranged from −3 "disliked very much/very unpleasant activity" to 0 "neither enjoyed nor disliked the activity" to +3 "enjoyed very much/very pleasant activity." I recoded these responses into two separate variables. I created a variable reflecting the degree of "activity enjoyment" that was assigned values of zero when the response indicated that the participant either "disliked" or "neither enjoyed nor disliked the activity" (i.e., responses below or equal to zero). Otherwise (i.e., when the response reflected that the participant "enjoyed" the activity), the variable was assigned the values of the original response. I also created a variable indicating the degree of "disliking the activity" that was assigned values of zero when the response reflected that the participant either "enjoyed" or "neither enjoyed nor disliked" the activity (i.e., responses above or equal to zero). When the response reflected that participants "disliked" the activity (i.e., values below zero), this variable was assigned the absolute value of the respective response (i.e., values of "+1" to "+3"). Averaging both variables across all reported activities yielded indicators of the participant's tendency to enjoy or dislike what they were doing during the diary study.

Goal relevance of activities. Participants rated how relevant each reported activity was for each of their four goals under study. Response options ranged from -3 "activity very much hindered that goal" to 0 "activity was irrelevant for that goal" to +3 "activity very much furthered that goal." I recoded these responses into two separate variables following the procedure described above. A variable indicating the degree of "positive goal relevance" was assigned values of zero when the participant's response indicated "goal irrelevance" or "hindrance" (i.e., values equal to or below zero). Otherwise (i.e., when the response reflected "positive goal relevance"), the variable was assigned the value of the

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[37] Original German wording: "Wie haben Sie sich im Allgemeinen seit dem Aufwachen (dem letzten Tagebucheintrag) gefühlt?"

original response. A variable indicating the degree of goal "hindrance" was assigned values of zero when the response reflected the evaluation of goal "irrelevance" or of "positive goal relevance." When the response reflected evaluations of goal "hindrance," this variable was assigned the absolute value of the respective response (i.e., "+1" to "+3"). Averaging both variables across all activities and goals yielded indicators of the participant's tendency to engage in activities furthering or hindering the four goals under study.

3.3. Ruling Out a Methodological Concern: "Intervention Effects" of the Diary Phase?

Keeping diaries is a self-monitoring technique in behavioral therapy. Encouraging people to observe themselves and to record (desired or undesired) behaviors has been shown to facilitate behavior modifications (for an overview, see Wilz & Brähler, 1997). Keeping detailed activity diaries and evaluating activities with respect to their relevance for one's goals might have, at least short-term, effects on the intensity of goal pursuit, on goal progress, and goal-specific satisfaction. To counteract the possibility that intervention effects of the diary phase might still persist at T2 (and, thus, potentially distort the longitudinal results), the diary phase was designed to take place shortly after T1. To test whether potential intervention effects of the diary phase nevertheless existed at T2, I compared participants who took part in the diary phase with those who did not with respect to (a) self-reported goal progress at T2, (b) goal-specific satisfaction at T2, (c) self-reported goal involvement in the study interval (assessed at T2), the average (d) frequency, (e) duration, (f) regularity of self-reported monthly exercise, and the (g) mean objective monthly attendance in the cooperating sports facility.

Using SPSS GLM, I conducted multivariate analyses of variance on the self-reported variables (a) to (f) separately in the younger and older participants. These analyses yielded a nonsignificant multivariate mean difference between participants and non-participants in the diary phase (younger subsample: $F(7, 89) = 1.22$, $p = .30$ (Wilks' Lambda), Box-M-Test: $F(28, 30743) = 1.35$, $p = .10$; older subsample: $F(7, 36) = 1.41$, $p = .23$ (Wilks' Lambda), Box-M-Test: $F(28, 2905) = 1.18$, $p = .24$). Univariate mean comparisons (t tests, see Table 14), conducted for descriptive purposes, showed that there were no mean differences between diary phase participants and nonparticipants in the older subsample. In the younger subsample, three univariate comparisons reached significance at the .05 level. Younger participants who did *not* participate in the diary phase

tended to report a higher monthly exercise frequency and regularity, and to accomplish a higher percentage of their originally intended monthly exercise rate as compared to younger participants who took part in the diary phase. The interpretability of these results is limited because the multivariate mean difference was not significant. Note, however, that the direction of these mean differences speaks against an intervention effect of the diary phase. There were no significant differences between (younger and older) diary participants and nonparticipants with respect to (g) the objective exercise frequency in the cooperating sports facility (see Table 14). Overall, these results show that participation in the diary phase did not effect the participant's longer term goal-related behavior, progress, and satisfaction and, thus, did not distort the longitudinal results of the study.

Table 14. *Univariate Follow-Up Analyses of Potential Intervention Effects of the Diary Phase*

	Construct[a]	Younger Subsample Diary Phase			Older Subsample Diary Phase		
		No *M*(SE)	Yes *M*(SE)	*t* test *p*	No *M*(SE)	Yes *M*(SE)	*t* test *p*
T2	Goal progress	4.89 (.12)	4.76 (.10)	.41	4.98 (.21)	5.01 (.16)	.91
T2	Goal satisfaction	4.72 (.11)	4.47 (.10)	.11	4.77 (.26)	5.05 (.17)	.35
T2	Goal involvement	4.60 (.11)	4.50 (.12)	.55	4.77 (.27)	5.27 (.14)	.07
	Mean Monthly Exercise Behavior in Study Interval A) Self-Report						
T2	Frequency	5.82 (.34)	4.68 (.34)	.02	6.59 (.63)	5.29 (.46)	.10
T2	Duration	2.89 (.15)	2.58 (.14)	.14	3.08 (.35)	2.88 (.18)	.59
T2	Regularity	3.30 (.18)	2.80 (.17)	.04	3.80 (.32)	4.10 (.19)	.39
T2	Realization of intended rate	.75 (.04)	.62 (.04)	.02	.83 (.07)	.87 (.06)	.71
	B) Objective Attendance Data						
T2	Frequency	2.30 (.27)	2.23 (.26)	.83	3.25 (.59)	2.97 (.25)	.67

(a) Where appropriate, univariate outliers were adjusted to the closest nonoutlying value in the data distribution. See Appendix B, Table B 4, Table B 6, and Table B 9, for detailed descriptions of transformations, distributions, and age-group differences.

3.4.   General Statistical Procedures

3.4.1. Statistical Software Packages

Statistical analyses were conducted using SPSS for Windows 9.01 (SPSS Inc., 1999b) and SAS for Windows 6.12 (SAS Institute Inc., 1996).

3.4.2. Treatment of Missing Values

To treat missing values, I applied the following procedure: If the missing response was part of a subscale consisting of three or more items, and if at least 50% of the remaining items of that subscale were available, missing values were estimated using SPSS REGRESSION and age group, gender, and the responses to the other subscale items as predictors in linear multiple regression analyses (Tabachnick & Fidell, 1996). Subscale scores were computed using the estimated item response. If more than 50% of item responses pertaining to the same subscale were missing, this estimation procedure was not applied (due to a lack of reliable predictors), and the subscale score was set to missing. For the same reason, missing values were not estimated if they pertained to single item indicators. In study part 1, missing values rarely occurred because the person conducting the session screened every questionnaire and, if necessary, asked the participants to complete items with missing responses. Information obtained during the diary phase (study part 2) did not meet the requirements described above. Accordingly, no missing values were estimated for this part of the study.

3.4.3. Variable Transformations

Prior to statistical analyses, I checked the distribution of all variables for departures from normality and the existence of univariate outliers using SPSS EXPLORE. Satisfactory approximation of normal distribution is indicated by absolute ratios of skewness and kurtosis to their respective standard errors being smaller than two. In the case of departures from normality, I followed the recommendations by Tabachnick and Fidell (1996) and used logarithmic, square root, or inverse transformations to symmetrize the data distributions.

Univariate outliers are those values that are more than 1.5 box lengths larger than the 75th percentile, or more than 1.5 box lengths smaller than the 25th percentile of the distribution. The box length (or interquartile range) is the difference between the value of the 75th and the value of the 25th percentile. It represents the range of values of the central 50% of the distribution (SPSS Inc., 1999a). Where I detected univariate outliers, I adjusted them to the closest nonoutlying value in the data distribution (Tabachnick & Fidell, 1996).

Prior to analyses, I further checked for the existence of bi-, or multivariate outliers using SPSS REGRESSION. There were none at $p = .001$ (Mahalanobis distance, Tabachnick & Fidell, 1996).

Appendices B and E contain detailed descriptions of all variables and transformations.

3.4.4. Alpha-Level Adjustment in Multiple Testing

Where appropriate, I used multivariate analyses when multiple tests involving the same independent variable had to be conducted. If the multivariate test was significant at the .05 level, I conducted univariate follow-up analyses with alpha-level adjustment for multiple testing. In order to yield a family-wise alpha error at the .05 level, I typically adjusted the alpha level to the value obtained when dividing .05 by the number of repeated analyses (Bonferroni-adjustment). If, however, the analyses were separately conducted for intergoal conflict and facilitation, I adjusted the alpha level by the number of repeated analyses per scale. This is somewhat less conservative than Bonferroni adjustment, which would divide .05 by the number of *all* conducted analyses with both intergoal conflict and facilitation (Bortz, 1993).