

### 3 METHOD

#### 3.1 Participants

##### 3.1.1 Sample Size and Recruitment

The sample of the present study consisted of 168 women<sup>5</sup> aged 35 to 55 years. This age range was chosen to assess women before and after the biological deadline for childbearing (see Chapter 2.5.1). In order to investigate mechanisms and phenomena associated with chronological age, the sample was approximately stratified by age. Between 33 and 53 participants were recruited for each of four five-year age blocks (35 to 40, 41 to 45, 46 to 50, and 51 to 55, see Tables 2 and 3). Women in the youngest age groups were oversampled in order to have enough persons in the sample who were theoretically still able to have children.

Several strategies were used to recruit participants: (a) local newspaper advertisements in Berlin and Potsdam, (b) posting in an internet forum for involuntarily childless women ([www.klein-putz.net](http://www.klein-putz.net)), (c) postings and flyers in fertility treatment centers, fitness centers, and libraries in Berlin, (d) contacting persons who had participated in unrelated studies at the Max Planck Institute for Human Development and asking them whether they were interested in participation if they fulfilled the criteria of being childless, and (e) contacting persons who were informed about the study by other participating women. Since the goal was to investigate voluntarily and involuntarily childless women, two slightly different newspaper advertisement and flyer texts were used: a *neutral* text and a *child-wish-specific* text. Both texts were equal with respect to the description of the study but differed in one sentence. The wording of this specific sentence in both advertisements was the following:

#### Neutral text

*We are looking for childless women between 35 and 55 years who are currently not pregnant.*

#### Child-wish-specific text

*We are looking for childless women between 35 and 55 years who have or have had the wish for children and who are currently not pregnant.*

Of course it cannot be ruled out that women with a wish for children also responded to the neutral text. Table 2 gives an overview of recruited women by type of recruitment text.

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<sup>5</sup> Prior to recruitment, power analyses calculated with the program G-Power (Buchner, Faul, & Erdfelder, 1992) revealed that about 164 participants would be necessary for a comparison of at least four groups with a power of 0.90 and an expected medium effect size of  $f = .30$  ( $\alpha = .05$ ).

During recruitment, participants were informed that the study aimed at investigating similarities and differences in personal characteristics and attitudes in women with different marital status and that the wish for children would be one among several topics. Participants were not told that the study was primarily on the wish for children and life longing. In fact, the terms life longing and wish for children were never used in combination.

Table 2

*Number of Persons Responding to Different Newspaper Advertisement Texts or Other Recruitment Strategies*

	Neutral Text	Child-Wish-Specific Text	Other <sup>a</sup>	Total
<i>Age group</i>				
35 – 40 years	8	35	10	53
41 – 45 years	9	20	10	39
46 – 50 years	9	15	12	33
51 – 55 years	21	12	7	43
Total	47	82	39	168

*Note.*  $N = 168$ . <sup>a</sup> This category includes persons recruited through methods (b) to (e) described above.

### 3.1.2 Sample Characteristics

Table 3 gives an overview of basic sociodemographic characteristics of the total sample and separately for the four age groups. Age groups did not differ with respect to marital status,  $\chi^2(12, N = 168) = 17.33, p = .14$ ; education level,  $\chi^2(12, N = 168) = 11.27, p = .51$ ; years of education,  $F(3, 164) = 1.21, p = .31, \eta^2 = .02$ ; and current occupation,  $\chi^2(21, N = 168) = 22.20, p = .39$ . A relatively large proportion (43%) of the sample was single. The majority of the remaining participants (45%) were married or in a long-term relationship. Only 10% of the participants were divorced and less than 2% were widowed. The sample of the present study was highly educated. Overall, 55% of the women had a college or university degree; 21% had a high school degree (German: Abitur) and 21% had a lower secondary education degree (German: mittlere Reife). On average, participants spent 18 years in school, job training, and/or university. About 50% of all women were employed half- or full-time, 26% were unemployed, 13% were freelancers, and the remaining participants were students, homemakers, or retired.

Table 3  
*Sociodemographic Characteristics of the Total Sample and by Age Group*

	Total sample <i>N</i> = 168	35 – 40 years <i>n</i> = 53	41 – 45 years <i>n</i> = 39	46 – 50 years <i>n</i> = 33	51 – 55 years <i>n</i> = 43
<i>Age (in years)</i>					
Mean ( <i>SD</i> )	45.2 (6.6)	37.5 (2.1)	43.7 (1.5)	48.8 (1.6)	53.4 (2.3)
<i>Marital status</i>					
Single	72 42.9%	24 45.3%	16 41.0%	14 42.4%	18 41.9%
Married or long-term partnership	76 45.2%	28 52.8%	17 43.6%	15 45.5%	16 37.2%
Divorced	17 10.1%	1 1.9%	5 12.8%	3 9.1%	8 18.6%
Widowed	3 1.8%	0 0.0%	1 2.6%	1 3.0%	1 2.3%
<i>Education</i>					
Primary education <sup>a</sup>	1 0.6%	0 0.0%	0 0.0%	1 3.0%	0 0.0%
Lower secondary education <sup>b</sup>	35 20.8%	8 15.1%	7 17.9%	7 21.2%	13 30.2%
High school <sup>c</sup>	36 21.4%	11 20.8%	8 20.5%	9 27.3%	8 18.6%
College/University <sup>d</sup>	93 55.4%	32 60.4%	24 61.5%	16 48.5%	21 48.8%
<i>Years of education</i>					
Mean ( <i>SD</i> )	18.0 (3.9)	18.8 (3.6)	17.5 (3.9)	18.1 (4.0)	17.5 (4.1)
<i>Current occupation</i>					
Employed full-time	51 30.4%	20 37.7%	10 25.6%	9 27.3%	12 27.9%
Employed half-time	34 20.2%	11 20.8%	7 17.9%	6 18.2%	10 23.3%
Unemployed	44 26.2%	14 26.4%	11 28.2%	8 24.2%	11 25.6%
Retired	6 3.6%	0 0.0%	1 2.6%	2 6.1%	3 7.0%
Homemaker	4 2.4%	1 1.9%	0 0.0%	0 0.0%	3 7.0%
Student/Apprentice	8 4.7%	2 3.8%	4 10.1%	2 6.1%	0 0.0%
Freelancer/Other	21 12.5%	5 9.4%	6 15.4%	6 18.2%	4 9.2%

Note. Total *N* = 168. <sup>a</sup>German: Volks-/Hauptschule. <sup>b</sup>German: Mittlere Reife/Realschule. <sup>c</sup>German: (Fach-)Abitur. <sup>d</sup>German: Fach-/Hochschulstudium.

Age groups were compared with respect to current physical and mental health, indicators of cognitive functioning, and current mood (see Table 4). Participants rated their physical and mental health on a seven-point scale (1 = *very bad*, 7 = *very good*) with one item each (“How would you rate your physical health at present?” and “How would you rate your mental health at present?”). The Identical Pictures task (adapted from Lindenberger, Mayr, &

Kliegl, 1993) was used as a screening measure for perceptual speed, an ability from the broad fluid domain; a German vocabulary test, the Wortschatztest (WST, Schmidt & Metzler, 1992) measured crystallized intelligence. Current mood was assessed with an affect adjective list by Kunzmann, Stange, and Jordan (2005, for a more detailed description see Chapter 3.3.5), asking women how much ten positive and ten negative emotions applied to them at that moment (1 = *does not apply at all*; 6 = *applies very well*). Three longing-related adjectives were added to the list in order to ask for the current experience of such emotions. Current mood was measured four times: at the beginning of the first session and three times in the second session, namely at the beginning, after having completed all questionnaires related to the wish for children and at the very end. This was done to check for changes in current mood due to the confrontation with the possibly critical topic of the wish for children. The internal consistencies for all state measures of mood ranged from .72 to .89 (see Appendix A, Table A6). Here, only the scores for the baseline measure of the second testing session and the scores for affect after women had filled out the child-wish-related questionnaires are reported. Baseline measures at the first and second testing session were comparable.

Overall, all women reported relatively good physical and mental health. Participants in the four age groups differed in their self-rated physical health,  $F(3, 164) = 6.32, p < .05, \eta^2 = .10$ , but not in mental health,  $F(3, 164) = 1.06, p = .37, \eta^2 = .02$ . Women in the youngest age group rated their physical health as better than women in the other three age groups. With respect to cognitive functioning, age groups showed no differences in the vocabulary test,  $F(3, 164) = 0.22, p = .88, \eta^2 = .00$ , but they differed in perceptual speed,  $F(3, 163) = 11.37, p < .05, \eta^2 = .17$ . The older the participants were, the slower their reaction time in the Identical Pictures task. Age groups did not differ in level ( $F(3, 163) = 1.63, p = .18, \eta^2 = .03$ ) and change ( $F(3, 163) = 1.06, p = .37, \eta^2 = .02$ ) of positive affect. However, positive affect decreased over time,  $F(1, 163) = 58.22, p < .05, \eta^2 = .26$ . For negative affect no change over time ( $F(1, 163) = 0.48, p = .83, \eta^2 = .00$ ) and no time-by-age-group interaction ( $F(3, 163) = 0.03, p = .99, \eta^2 = .00$ ) was found but age groups differed in their mean level ( $F(3, 163) = 4.83, p < .05, \eta^2 = .08$ ). The youngest women reported the highest negative affect. Longing-related affect decreased over time ( $F(1, 163) = 8.12, p < .05, \eta^2 = .05$ ). Again, women differed in their mean level of longing-related affect ( $F(3, 163) = 6.14, p < .05, \eta^2 = .10$ ) but showed no differential change ( $F(3, 163) = 0.12, p = .95, \eta^2 = .00$ ). As for negative affect, women in the youngest age group reported the highest longing-related affect.

Table 4  
*Self-Rated Health, Cognitive Functioning, and Current Mood for the Total Sample and by Age Group*

	Total sample		35 – 40 years		41 – 45 years		46 – 50 years		51 – 55 years	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Self-Rated Health<sup>a</sup></i>										
Physical health	5.06	1.43	5.72	1.08	4.87	1.54	4.85	1.37	4.58	1.52
Mental health	4.91	1.52	5.19	1.52	4.67	1.44	4.95	1.42	4.77	1.67
<i>Cognitive Functioning</i>										
Perceptual Speed <sup>b</sup>	2.55	0.66	2.24	0.40	2.46	0.38	2.57	0.46	2.97	0.98
Vocabulary (WST) <sup>c</sup>	34.8	3.23	34.4	5.83	34.9	3.03	34.9	2.26	35.0	3.23
<i>Current Mood<sup>d</sup></i>										
Positive Affect T1 <sup>e</sup>	3.99	0.86	3.83	0.89	3.88	0.86	4.04	0.84	4.23	0.82
Positive Affect T2	3.58	0.96	3.55	0.99	3.45	1.00	3.49	1.02	3.81	0.80
Negative Affect T1	1.79	0.81	2.09	0.85	1.63	0.72	1.79	0.84	1.58	0.72
Negative Affect T2	1.80	0.82	2.11	0.94	1.65	0.72	1.78	0.87	1.59	0.60
Longing Affect T1	2.85	1.21	3.33	1.17	2.50	1.11	2.86	1.18	2.60	1.25
Longing Affect T2	2.62	1.30	3.16	1.29	2.21	1.06	2.59	1.36	2.36	1.26

Note. Total  $N = 168$ . <sup>a</sup> Rated on a seven-point scale ranging from 1 (*very bad*) to 7 (*very good*). <sup>b</sup> Mean reaction time in seconds. <sup>c</sup> Mean number of correctly recognized words. <sup>d</sup> Rated on a six-point scale ranging from 1 (*does not apply at all*) to 6 (*applies very well*). <sup>e</sup> T1 stands for baseline measure in the second testing session, T2 stands for the measurement of affect after women had filled out all child-wish-related questionnaires in the second testing session.

For the investigation of some research questions the sample of the present study was divided into groups according to their *current child-wish status*. As can be seen in Figure 5, a first distinction was made between those women who had never had a wish for children and those women who at least for some time in their life had had a wish for children. In the following, women who had never had a wish for children are referred to as *always voluntarily childless women*. Women with a wish for children were further categorized according to their current childlessness status, that is, whether they were currently voluntarily or involuntarily childless. One group included women who were voluntarily childless at the moment but had been involuntarily childless at an earlier point in their lives. This group will be called *currently voluntarily childless women*. The other group consisted of women who reported being involuntarily childless at present. This group will be called *currently involuntarily childless women*. Figure 5 displays the number of participants in each group.

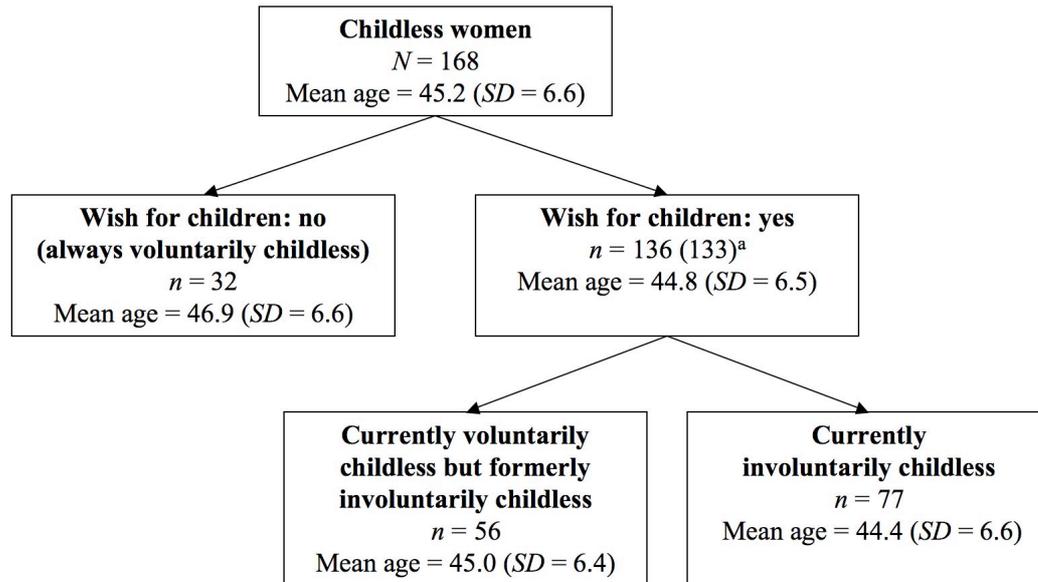


Figure 5. Distribution of women on groups according to their current child-wish status.

<sup>a</sup> From the 136 women with a wish for children, two women were excluded because they were identified as multivariate outliers (see chapter 3.4.3) and for one woman no information about her current childlessness status was available.

The three resulting groups (always voluntarily childless = AVC, currently voluntarily childless = CVC, and currently involuntarily childless = CIC) were compared to each other with respect to sociodemographic characteristics, current physical and mental health, indicators of cognitive functioning, and current mood (see Tables A1 and A2 in Appendix A for mean values and exact statistics for the following group comparisons). The three groups were comparable to each other with respect to age, marital status, education level, years of education, current occupation, physical health, mental health, perceptual speed, vocabulary, and current positive affect. Compared with the baseline of the second testing session, positive affect decreased after women filled out child-wish-related questionnaires. No time-by-group interaction occurred. Negative affect remained stable over time, but women with a wish for children scored higher than women without wish for children. A time-by-group interaction indicated that negative affect increased in involuntarily childless women whereas it decreased in currently voluntarily childless women and remained stable in always voluntarily childless women. Women with a wish for children reported higher longing-related affect than women without a wish for children. Longing-related affect remained stable over time in involuntarily childless women but decreased in both other groups.

### 3.2 Procedure

Women participated in two standardized testing sessions in a laboratory at the Max Planck Institute for Human Development. Only one woman decided not to participate further in the study after the first testing session for personal reasons. One to three participants took part in each testing session but each woman worked by herself. The first testing session lasted on average 87 minutes ( $SD = 23$ ). The second testing session, which was scheduled approximately one week after the first session, lasted on average 76 minutes ( $SD = 17$ ). Data collection was mostly computerized. After a short introduction to the topic and the procedure of the study by the experimenter, participants followed instructions given on a computer screen. Participants saw one item after the other on the computer screen and used the number keys on the keyboard for their responses. For some questionnaires, participants had to switch to paper and pencil.<sup>6</sup>

At the beginning of the first testing session, participants filled out questionnaires designed to assess sociodemographic characteristics and current mood. They were then asked to list and evaluate an important life goal that they had in former times but did not attain. This task was included as a validation check because, as indicated in the theoretical background chapter, it is suggested that life longings may develop out of unattainable goals. In order to control for possible position effects, half of the sample completed this task in the first testing session, whereas the other half of the sample did this at the very end of the second session. After filling out a questionnaire on personality characteristics, participants were asked to report their most important life longings (see Section 3.3.1 for instructions). Half of the sample completed Form A of this instruction (life-phase approach), whereas the other half completed Form B (life-domain approach). In the previous study by Scheibe et al. (2007), only the life-phase approach was used. Thus, one aim of the Life Longing Project (though not a major goal of this dissertation) was to investigate whether participants would list similar and as many life longings with another approach (in this case, the life-domain approach). Participants were randomly assigned to the two life longing instruction conditions (Form A or Form B) and to the two life goal conditions (listing an important life goal at the beginning of the first session or at the end of the second session). The listing of important life longings was

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<sup>6</sup> Note that in the following description only those questionnaires are listed and explained in more detail that were finally included in the present dissertation. For instance, questionnaires on personality characteristics, social support, and social relationships were assessed during data collection but the data were not analyzed in this thesis.

followed by several questionnaires designed to measure self-regulatory behavior and subjective well-being.

In the second session, participants filled out several questionnaires on the topic of the wish for children (for details see Section 3.3) and rated their wish for children on the Life Longing Questionnaire (Scheibe, 2005; Scheibe et al., 2007). Furthermore, they completed two tasks designed to measure cognitive functioning (the tasks were briefly described in Section 3.1.2). At three times during the second testing session, current mood was assessed to control for possible changes in mood as a result of being confronted with many questions on the possibly critical topic of the wish for children (see also Section 3.1.2). At the end of the second session participants were debriefed and received 27€ for their participation.

### 3.3 Measures

The following section describes the questionnaires that were used to assess relevant variables (for wording of newly developed items/questionnaires, see Appendix A, Table A3). Cronbach's  $\alpha$  was employed as a measure for internal consistency of the scales. Tables A5 to A8 in Appendix A give detailed overviews of the number of items, internal consistencies, and descriptive statistics for each scale (including mean, standard deviation, minimum, maximum, skewness, and kurtosis). Table A9 in Appendix A displays bivariate correlations between all measures.

#### 3.3.1 *Spontaneous Listing of the Life Longing to Have Children*

In order to assess whether participants mention the life longing to have children spontaneously, they were asked in the first testing session to list their most important life longings after reading an instruction of the Life Longing Questionnaire (Scheibe, 2005; Scheibe et al., 2007). In the introduction phase, participants read a one-page explanation of the lifespan-psychological conceptualization of life longings. After this explanation, participants read one of two instructions that should facilitate access to their life longings (for wording of both instructions, see Appendix A, Table A4). In Instruction A (life-phase approach), participants were asked to undertake a mental journey through different phases of their life, namely childhood, adolescence, young adulthood, middle adulthood, and old age. They were required to think briefly about each life phase and then to write down important life longings that might be related to these life phases. In Instruction B (life-domain approach), participants were asked to think about different domains of life (the domains provided in the instruction were: relationships with other persons, health and personal situation, view of oneself, and other important life domains) and to write down life longings

that are related to these domains. After participants had written down their life longings, they were asked to choose their two most important life longings and to record one key word and a short explanation for each. For the analyses of these data, two independent raters rated 15% of the reported life longings according to content and assigned each life longing to one of 15 different life domains. One of these domains was “family” with the specific subcategory founding a family/having children. Because of high inter-rater consistency (Cohen’s  $\kappa = .96$ ), the remaining 85% of reported life longings were coded by only one rater.

### 3.3.2 Expression of the Life Longing to Have Children

In the second testing session, participants completed the Life Longing Questionnaire (LLQ; Scheibe, 2005; Scheibe et al., 2007) with regard to their wish for children. In this context, the term “wish” instead of “life longing” was used in all items. The questionnaire was designed to investigate to what extent participants’ wish for children fulfilled the six structural criteria of life longings (incompleteness, symbolic meaning, reflection/evaluation, tritime focus, emotional ambivalence, personal utopia). In addition to the six structural characteristics of life longing, controllability of the realization and of the experience of life longing was assessed with the LLQ. Participants rated on a six-point scale how much the statement in each item applied to their wish for a child (1 = *does not apply at all*; 6 = *applies very well*). Low values revealed a low expression of life longing to have children, high values were indicative for high life longing expression to have children.

Table 5 gives one sample item, the number of items, internal consistency, mean, and standard deviation for each scale. Internal consistencies ranged from .76 to .95 and can thus be classified as acceptable to very good.

Before items were aggregated into six structural characteristic scales of life longing and before internal consistencies of these scales were calculated, a confirmatory factor analysis was conducted with all items of the six structural characteristic scales as manifest variables and six latent factors. The purpose of this analysis was to confirm the six-factorial structure of life longing that was found in previous studies (Scheibe et al., 2007; Wiest, 2006) but also to increase psychometric properties by excluding items with low factor loadings (standardized factor loading < .50). Full-information maximum likelihood estimation, which allows for incomplete data, was employed to estimate the model. The model fit was evaluated by the  $\chi^2$ -value (including its degrees of freedom and probability level), the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA) with its 90% confidence interval (e.g., Byrne, 2001). The resulting model (see Figure 6) included 22 manifest variables loading on six latent factors and had an acceptable fit,  $\chi^2 = 346.45$ ,  $df =$

194,  $p = .00$ , CFI = .93, RMSEA = .07 (.05-.08). All factor loadings were above .50. Estimated intercorrelations between the six latent factors were all significantly different from zero.

Table 5  
*Sample Items and Descriptives for Each Scale of the Life Longing Questionnaire*

Scale and sample item	# items	Cronbach's $\alpha$	$M$	$SD$
<b><i>Structural characteristics of life longing</i></b>				
<b>Incompleteness</b> <i>As long as my wish for a child is unfulfilled, something critical is missing for me.</i>	3	.91	3.17	1.71
<b>Symbolic meaning</b> <i>My wish for a child is heavily filled with meaning.</i>	4	.83	3.65	1.51
<b>Reflection/Evaluation</b> <i>My wish for a child often makes me think a lot about the meaning of my life.</i>	4	.88	3.59	1.58
<b>Emotional ambivalence</b> <i>Feeling my wish for a child is both painful and pleasurable.</i>	4	.81	3.27	1.49
<b>Tritime focus</b> <i>My wish for a child has to do with my past, present, and future.</i>	4	.82	3.24	1.53
<b>Personal utopia</b> <i>My wish for a child has an idealistic quality.</i>	3	.78	2.99	1.46
<b><i>Other characteristics of life longing</i></b>				
<b>Control over realization of wish for children</b> <i>I am sure that at some time, I will be able to fulfill my wish for a child.</i>	5	.81	3.52	1.44
<b>Control over experience of wish for children</b> <i>I can always control the feelings connected to my wish for a child very well.</i>	3	.76	3.88	1.45

Note.  $N = 168$ .

According to the theoretical conceptualization of life longing, all six structural characteristics of life longing together represent the general expression of a life longing. The results of the confirmatory factor analysis reported above as well as bivariate correlation analyses revealed that all six scales were significantly related to each other. Correlations between personal utopia and the other five scales were small to medium. All other scales showed high intercorrelations ranging from  $r = .59$  to  $r = .82$ . Thus, one score, called overall life longing expression, was calculated that included all 22 items of the six structural

characteristic scales. The internal consistency of this scale was very good with  $\alpha = .95$ .

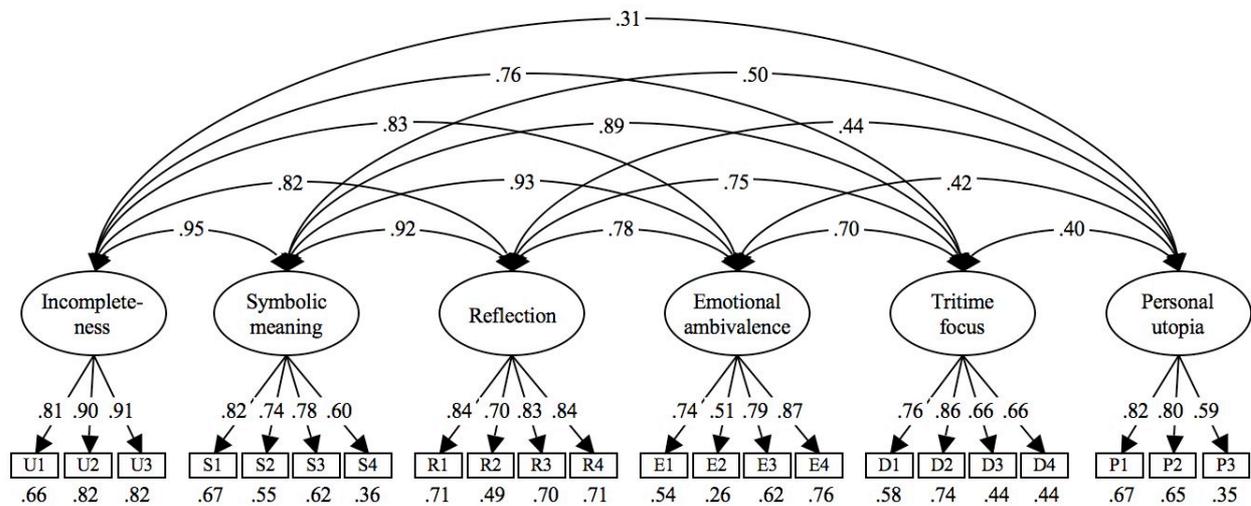


Figure 6. Six-factorial structure of expression of life longing to have children. Presented are communalities, standardized factor loadings, and intercorrelations between factors.  $N = 166$ . Two multivariate outliers were excluded from the original sample ( $N = 168$ ) prior to analysis. Model fit:  $\chi^2 = 346.45$ ,  $df = 194$ ,  $p = .00$ , CFI = .93, RMSEA = .07 (.05-.08).

In addition to the items of the Life Longing Questionnaire, participants read the following statement: “I would describe my wish for a child as a life longing.” and rated their agreement to this statement on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*).

### 3.3.3 Expression of the Goal to Have Children

Participants were not only asked to indicate to what extent their wish for children fulfilled the criteria of life longing, but also to what extent their wish for children met the characteristics of a goal. Therefore, women completed five items developed by the Life Longing Project to assess to what extent the wish for children is pursued as a goal (e.g., “I do everything for my wish for a child to come true.”). However, it has to be noted that these five items represent only one component of goal pursuit, namely effort, that is, how much a person tries and invests time and effort in order to realize a goal. How much a person is cognitively and emotionally committed to the goal (which is another important component of goal pursuit) was not assessed with this scale. As for life longing expression, items of the original scale were reformulated such that the term “my wish for children” rather than “my goal” was used in all items. All items were rated on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*). A low value on this scale revealed a low goal expression, a high value was

indicative for a high expression of the goal to have children. The internal consistency of this scale was  $\alpha = .88$ .

In addition, women were asked to rate their agreement with the statement “I would describe my wish for a child as a goal.” on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*).

### 3.3.4 Variables Related to the Wish for Children

*Current intensity of the wish for children.* As a measure for current intensity of the wish for children, a single item on intensity (“How strong is your wish for children currently?”) and a self-developed 11-item<sup>7</sup> questionnaire focusing on behavioral indicators for intensity and frequency of the wish for children were used. The single item on intensity of the wish for children was rated on a six-point scale ranging from *non-existing* (1) to *very strong* (6). The behavior-related items referred either to frequencies or agreement to statements and items were rated on a four-point scale ranging from *never* or *I totally disagree* (1) to *often* or *I fully agree* (4). The intercorrelation of the single item with the items of the behavior-related scale was high ( $r = .69, p < .05$ ) and so both measures were aggregated into one scale. For aggregation the single item was recoded so that responses lay in the range from 1 to 4 as well. The internal consistency for the resulting 12-item scale was  $\alpha = .88$ .

*Past and future intensity of the wish for children.* Almost the same items that were used to assess current intensity of the wish for children were also given for four additional time points in the past and future<sup>8</sup>. Participants indicated on a four-point scale ranging from *never* or *I totally disagree* (1) to *often* or *I fully agree* (4) how much each statement applied to them at ages 20 and 30 and how much they assume each statement will apply to them at ages 60 and 70. Internal consistencies were  $\alpha = .90$  for child-wish intensity at age 20,  $\alpha = .91$  at age 30,  $\alpha = .76$  at age 60, and  $\alpha = .78$  at age 70. Current intensity of the wish for children was weakly related to past child-wish intensity ( $r = .24, p < .05$  for age 20,  $r = .22, p < .05$  for age

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<sup>7</sup> Because of low factor loadings in a principal component analysis and low discriminatory power, two out of 13 original items were excluded from the scale, which resulted in a 11-item scale. All 13 items are displayed in Appendix A, Table A3.

<sup>8</sup> In contrast to the original 13-item questionnaire for current intensity of the wish for children, past intensity was originally assessed with 11 and future intensity with 10 behavior-related items because two/three items were inappropriate for retrospective and prospective ratings. Furthermore, because of low factor loadings in a principal component analysis and low discriminative power, the same two items as for current intensity were excluded from the scales assessing intensity at ages 20 and 30, and three items were excluded from scales on intensity at ages 60 and 70. All items are displayed in Appendix A, Table A3.

30) and highly correlated to future child-wish intensity ( $r = .67, p < .05$  for age 60,  $r = .59, p < .05$  for age 70). Intensity of the wish for children at ages 20 and 30 showed a correlation of  $r = .60, p < .05$ . Intensity of the wish for children at ages 60 and 70 were highly correlated with  $r = .94, p < .05$ . Because of the very high correlation between child-wish intensity at ages 60 and 70, both scales were aggregated into one score for future intensity of the wish for children.

*Duration of the wish for children.* In order to assess the overall duration of the wish for children, participants were asked to indicate at which age they first experienced the desire for children and when this wish ended (if applicable). The duration was calculated as the difference between age at beginning and end of the wish for children in years. For those participants who still had the wish for children (i.e., they had not given it up), overall duration was calculated as the difference between current chronological age and onset age of the wish for children.

*Attainability of the wish for children.* Several variables served as indicators for attainability of the wish for children. *Objective indicators* were (a) age, (b) sexual orientation, and (c) existence of a partnership. For each objective indicator a categorical variable (high attainability = 1 vs. low attainability = 0) was created as follows: age below or equals 45 years = 1, age above 45 years = 0; heterosexual orientation = 1, homosexual orientation = 0; partnership yes = 1, partnership no = 0. Finally, all three objective variables were aggregated into one composite score. Given that the probability of giving birth to a child after age 45 is extremely low (probability of getting pregnant per cycle = 0.2%, e.g., MedizInfo, 2007), the composite score for objective attainability was automatically zero for persons aged 46 years and older. If persons were younger than 46 years, the composite score was calculated as the mean of all three variables. Overall, this led to four possible values for the objective attainability: 0.0 for persons older than 45 years, 0.33 if one (namely age) of the three criteria equaled one and the other criteria equaled zero, 0.67 if two of the three criteria equaled one, and 1.0 if all three criteria equaled one. In the present sample, objective attainability of the wish for children was zero for 83 persons (50%), 0.33 for 7 persons (4.2%), 0.67 for 42 women (25.3%) and 1.0 for 34 women (20.5%).

In addition to objective indicators, the following *subjective indicators* were used: (a) the score on the scale control over life longing realization of the LLQ (five reformulated items, e.g., "I am sure I can fulfill my wish for a child sometime.", Scheibe, 2005) rated on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*) and (b) the self-rated likelihood to give birth to a child (single item: "How high do you rate the possibility of still getting pregnant?") rated on a four-point scale (1 = *very unlikely*; 4 = *very likely*). The single

item was significantly related to the scale control over life longing realization ( $r = .43$ ,  $p < .05$ ), thus, they were aggregated to one score for subjective attainability of the wish for children. For aggregation purposes the responses of the control over life longing realization items were recoded so that they lay in a range from 1 to 4 as well. The final scale consisted of six items and had a good internal consistency of  $\alpha = .81$ .

*Childlessness status.* A single item for each age period was used to assess participants' childlessness status, that is, whether they are/were/will be *voluntarily* or *involuntarily* childless at the moment/age 20/age 30/age 60/age 70.

*Reasons for childlessness.* In order to assess reasons for childlessness at the moment/age 20/age 30, a single item with several response categories was used ("At age 20/30/at the moment, I did/do not have children because of ... e.g., lack of partner, partner did not want to have children, I did not want to have children, lack of stable financial situation, lack of social support, job did not allow flexible time arrangements, would have prevented major promotion"). Figures A1 to A3 in Appendix A present the frequency distributions of the reasons for childlessness at present, age 20, and age 30.

### 3.3.5 Well-Being

Well-being was assessed by several indicators. The affective component of subjective well-being, that is, *positive trait affectivity and negative trait affectivity* were assessed with 10 items each of an affect adjective list by Kunzmann, Stange, and Jordan (2005). This list was developed with reference to the Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988) and an adjective list from Carstensen and colleagues (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). In addition to positive and negative affect, three items were included to measure life longing-related emotions during the session. These items were: *sehnsüchtig* (longing), *verträumt* (dreamy), and *sentimental* (sentimental). The 23 items were given once in a trait version<sup>9</sup> and four times in a state version (for the description of the state version see also Section 3.1.2). In the trait version women were asked how strongly they had experienced each affective state in the last year (1 = *not at all*; 6 = *very strongly*). Internal consistencies for trait mood were acceptable to good with  $\alpha = .80$  for positive affect,  $\alpha = .79$  for negative affect, and  $\alpha = .69$  for life longing-related emotions.

The cognitive component of subjective well-being, that is, *satisfaction with life* was assessed with the Temporal Satisfaction with Life Scale (Pavot, Diener, & Suh, 1998;

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<sup>9</sup> Note that the three longing-related items in the trait version were not used as a concrete measure of well-being.

Trautwein, 2004). This scale was developed from the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) and uses four identical items for past, present, and future evaluations of life satisfaction.<sup>10</sup> In this dissertation, only concurrent life satisfaction was used. Participants indicated on a six-point scale how much each given statement applied to them (1 = *does not apply at all*; 6 = *applies very well*). The scale showed a high internal consistency of  $\alpha = .89$ .

For reasons of parsimony, and consistent with the theoretical assumption that subjective well-being includes three components, namely positive and negative affect as well as life satisfaction (e.g., Andrews & Withey, 1976; Diener, 1984), positive affect, (absence of) negative affect, and current life satisfaction were aggregated into one index of subjective well-being (in the following this will be called *happiness* in order to avoid confusions with the term psychological well-being). Prior to analysis, all items for negative affect were reversed. Intercorrelations between the three scales were  $r = -.50$  for positive and negative affect,  $r = -.36$  for life satisfaction and negative affect, and  $r = .45$  for life satisfaction and positive affect (all  $ps < .05$ ). The internal consistency of the happiness scale was .88.

An alternative approach to the measurement of well-being is to assess positive psychological functioning instead of affect and life satisfaction. In the present study, a 54-item version of the Ryff Inventory (Ryff, 1989) was used to measure *psychological well-being*. This questionnaire comprises six dimensions of positive psychological functioning and assesses (1) how positively a person evaluates his- or herself (Self-Acceptance), (2) whether a person has good relations with others (Positive Social Relations), (3) the extent to what a person is self-determined (Autonomy), (4) how well a person can manage his or her life and environment (Environmental Mastery), (5) how strong a person believes that his or her life is meaningful (Purpose in Life), and (6) how strongly a person experiences a sense of personal growth and development (Personal Growth). Each domain is represented by nine items. Participants rated the given statements on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*). Internal consistencies were  $\alpha = .87$  for self-acceptance,  $\alpha = .79$  for positive social relations,  $\alpha = .76$  for autonomy,  $\alpha = .83$  for environmental mastery,  $\alpha = .74$  for purpose in life, and  $\alpha = .66$  for personal growth. Intercorrelations between the subscales were all significant and ranged from  $r = .19$  ( $p < .05$ ) for Autonomy and Purpose in Life to  $r = .71$  ( $p < .05$ ) for Environmental Mastery and Self-Acceptance. For reasons of parsimony, the six

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<sup>10</sup> For reasons not related to this dissertation, the *Temporal Satisfaction With Life Scale* was used in order to assess life satisfaction concurrently, retrospectively, and prospectively following a lifespan/life course approach.

subscales were combined into an index of positive psychological functioning. This scale had a high internal consistency of  $\alpha = .92$ .

As an additional indicator of well-being, the Center for Epidemiologic Studies Depression Scale (CES-D, Hautzinger, 1988; Radloff, 1977) was included to assess self-rated *depressivity*. Participants were given 20 statements and were asked to indicate how often they had experienced the feeling described in each item in the last week (1 = *less than one day*; 2 = *one to two days*; 3 = *three to four days*; 4 = *five to seven days*). The internal consistency of this scale was good:  $\alpha = .85$ .

### 3.3.6 Self-Regulation Strategies

*Dis-/Reengagement with respect to the wish for children.* A 10-item questionnaire adjusted from a scale by Wrosch (see Wrosch et al., 2003b) was employed to assess how childless women who formerly had a wish for children had reacted to the situation when they realized that they could not attain that goal. Also women who currently had the wish for children were asked to indicate how they would react if they could not fulfill their wish for children in the future. This questionnaire was given as a paper and pencil test and only those women who considered themselves to be or to have been involuntarily childless were asked to fill it out. Out of 133 women who had been involuntarily childless at least at one point in their life, 102 responded to the questionnaire. The questionnaire included two scales and participants rated all items on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*). The scale on goal disengagement consisted of four items and assessed to what extent participants reduced effort and relinquished commitment to the unattainable goal to have children (e.g., “I stay committed to the goal for a long time; I can’t let it go.”). The scale on goal reengagement included six items and measured to what extent persons reengaged in other goals (i.e., identify new goals, commit to new goals, and begin active pursuit of new goals) when they were confronted with the unattainable goal to have children (e.g., “I put effort toward other meaningful goals.”). Internal consistencies were good with  $\alpha = .84$  for goal disengagement and  $\alpha = .95$  for goal reengagement.

*Tenacious goal pursuit and flexible goal adjustment.* The Tenflex Questionnaire (Brandstädter & Renner, 1990) was used to assess two general (not child-wish-specific) self-regulatory strategies. The questionnaire includes two scales with 10 items each and measures how tenaciously a person pursues goals even under difficult circumstances (Tenacious Goal Pursuit) and how flexibly this person adjusts to aversive situations or unattainable goals (Flexible Goal Adjustment). Tenacious goal pursuit corresponds to an assimilative self-regulatory strategy whereas flexible goal adjustment is proposed to represent an

accommodative style of coping. Items were rated on a six-point scale (1 = *does not apply at all*; 6 = *applies very well*). Internal consistencies were acceptable with  $\alpha = .76$  for tenacious goal pursuit and  $\alpha = .85$  for flexible goal adjustment.

### 3.4 Data Preparation and Analyses

#### 3.4.1 Data Preparation

Most statistical analyses were conducted using SPSS 14.0 for Windows (SPSS Inc., 2005). Data collected on the computer were imported into SPSS. Data assessed by paper and pencil were entered into the same SPSS file. In order to control for entry errors, paper-and-pencil data were entered twice and checked for consistency using the SPSS Data Entry program. Logically inconsistent values (e.g., reporting only four years of school education) were replaced by missing values. Confirmatory factor analyses and path analyses were conducted in AMOS 5.0 (Arbuckle, 2003).

For hierarchical regression analyses in which interaction terms were tested, all predictor variables were centered to a mean of zero prior to analysis (see Aiken & West, 1991). For profile analysis it was necessary to z-standardize all dependent variables (see Tabachnick & Fidell, 2001). For all other analyses, raw data were used. Following recommendations by Cohen, Cohen, West, and Aiken (2003) unstandardized regression coefficients ( $B$ ) will be reported for regression analyses in which predictor variables were centered and standardized regression coefficients ( $\beta$ ) will be reported for analyses without centered predictor variables.

#### 3.4.2 Treatment of Missing Values

Prior to data analyses, SPSS Missing Value Analysis was used to check data for missing values. At the level of subscales, very few missing values occurred. Two out of all subscales had more than 5% missing values. These scales were childlessness status at age 60 (19.6% missings) and childlessness status at age 70 (20.8% missings). The number of missing values per scale is shown in Tables A5 to A8 in Appendix A.

In the present study, cases with missing values were not deleted and missing data were not replaced using methods of missing value estimation such as mean substitution, regression imputation, or expectation maximization as described for instance by Tabachnick and Fidell (2001). A substitution of missing values can lead to restrictions in variance of the data, inflations of covariance, or changes in frequency distributions (e.g., Byrne, 2001). For the two variables with more than 5% missings (childlessness status at age 60 and age 70), SPSS Missing Value Analysis was used to check whether participants with missing values differed

significantly from participants without missing values on other variables. This was true only for negative trait affect (persons with missing values on childlessness status at age 60 and 70 reported slightly higher negative trait affect).

### 3.4.3 Variable Distributions and Treatment of Outliers

At the level of subscales, all variables were checked for deviation from normality and the existence of outliers. Inspection of the absolute skewness and kurtosis values revealed that deviation from zero did not exceed the suggested cut-off values of 3.0 for skewness and 10.0 for kurtosis (Kline, 1998). Thus, variables were not transformed for analyses.

*Univariate outliers.* Outliers were inspected at the level of subscales. Cases with *z*-standardized scores in excess of 3.29 ( $p < .05$ , two-tailed test) were considered univariate outliers (see Tabachnick & Fidell, 2001, p. 67) and were replaced with the raw score corresponding to a *z*-score of  $\pm 3.29$  (e.g., Kline, 1998). In sum, 18 univariate outliers were identified (5 x intensity of the wish for children at age 20; 3 x intensity of the wish for children at age 70; 1 x tenacious goal pursuit (Tenflex Questionnaire); 4 x current negative mood; 3 x personal growth (Ryff Inventory); 1 x autonomy (Ryff Inventory); 1 x psychological well-being).

*Multivariate outliers.* Multivariate outliers were identified by calculating Mahalanobis distances. Cases were considered multivariate outliers if their Mahalanobis distance was significant at  $p < .05$  (Tabachnick & Fidell, 2001). Nineteen variables were used as predictors in a regression that was conducted to calculate Mahalanobis distances. These variables were: (1) intensity of the wish for children at age 20, (2) intensity of the wish for children at age 30, (3) current intensity of the wish for children, (4) duration of the wish for children, (5) subjective attainability of the wish for children, (6) objective attainability of the wish for children, (7) incompleteness, (8) symbolic meaning, (9) reflection/evaluation, (10) emotional ambivalence, (11) tritime focus, (12) personal utopia, (13) control over life longing experience, (14) goal expression, (15) depressivity, (16) psychological well-being, (17) happiness, (18) control over life longing realization, and (19) intensity of the wish for children in the future. Using these 19 variables, two cases were identified as multivariate outliers and were therefore excluded from all analyses. Both persons were in the third age group (i.e., between 46 and 50) and both persons had a wish for children.

### 3.4.4 Alpha Level Adjustment and Testing of Homogeneity of Variance-Covariance Matrices

Throughout the analyses reported in this dissertation, the alpha-level for rejecting the null hypothesis was set at .05, that is, results were considered to be significant when  $p < .05$ .

In several cases Bonferroni post-hoc tests were used to compare each group to each other. In this type of post-hoc test the overall error rate is divided by the number of comparisons in order to account for multiple testing.

When groups are compared to each other, it is necessary to check for homogeneity of variances (in the univariate case) and homogeneity of variance-covariance matrices (in the multivariate case) among these different groups (e.g., Tabachnick & Fidell, 2001). In the present study, Levene's test was used to examine homogeneity of variances and Box's *M* multivariate test was used to examine homogeneity of variance-covariance matrices. If not stated otherwise, the assumption of homogeneity was fulfilled in the analyses reported in the Results chapter.