

## 4 Results

Results are presented in the order of the five sets of hypotheses. The first part addresses the quality and the psychometric properties of the Longing Questionnaire. The second part deals with hypotheses about general characteristics of longing, and the third part describes age-related differences in longing. Subsequently, in the fourth part, regression analyses are presented that examine the potential regulatory role of longing in adult development. The fifth and final part explores the possibility of subgroups with distinct longing profiles and examines whether previously reported findings hold equally well for each of them.

### 4.1 Development of a Self-Report Measure for the Assessment of Longing

The first aim of the present study was to develop a measure for the assessment of longing based on the developmental conceptualization advanced. Towards this aim, the present section describes a series of confirmatory factor analyses (CFAs) that guided the optimization of subscales of the Longing Questionnaire. Item selection was based on ratings of each person's most important longing (subsequently labeled Longing 1). As described in the first subsection, the scale development process resulted in satisfactory measurement models. In the next subsections, latent multiple-group models show that the derived factor models were largely consistent across (1) the three longings of each person, (2) three age groups, and (3) baseline and retest assessments. Because longing characteristics were moderately to highly consistent across the three longings of each person, items and subscales were aggregated for further analyses.

#### 4.1.1 *Item Selection and Factor Structure of the Longing Subscales in Longing 1*

Except for the single items for the content domains of longing, the empirical measurement structure of the newly developed longing subscales (Incompleteness, Symbolic Nature, Personal Utopia, Ambivalent Emotions, Tritime Focus, Reflection, Salience, Control Over Longing Experience, Control Over Longing Realization, Directionality, and Managing Nonrealizability) was tested employing confirmatory factor analyses (CFA). In a first step, each subscale was optimized separately using only responses for Longing 1. Longing 1 was chosen because it was the most central longing of each person. A priori, it was an open question whether the factor structure was comparable across the three longings. Developing the initial models on the basis of Longing 1 allowed for testing their applicability to the remaining two longings in a subsequent step (see Section 4.1.2).

After the items were identified that best represented each theoretical construct (or subscale), items were entered into multiple-factor models in the second step. Separate CFAs were conducted for (1) the Structural Elaboration scales (six latent factors), (2) the Salience scale (one latent factor), (3) the Longing Control scales (two latent factors), and (4) the Longing Function scales (two latent factors). Item optimization was guided by a combined consideration of the obtained solution, modification indices provided by the AMOS 5 program<sup>11</sup>, and the constraint that any changes must be justifiable theoretically. Before presenting the scale optimization process in detail, however, characteristics of individual items are examined.

### *Item Characteristics*

Appendix D contains item characteristics for the 76 items rated in reference to Longing 1 and for the same 76 items when aggregated across the three longings of each person. For each item, the table contains mean and standard deviation, minimal and maximal values, skewness, kurtosis, and number of missing values. Overall, item characteristics were satisfactory. Participants used the full range of possible responses ranging from 0 to 5. Estimates of skewness and kurtosis indicated that there was reasonable normality for each item. No item had a skewness estimate with an absolute value greater than 1.4 or a kurtosis estimate with an absolute value greater than 1.7, and these are well within acceptable limits (Kline, 1998). On any given item, the number of missing values did not exceed 18. Item characteristics were comparable for ratings of Longings 2 and 3, and for the re-assessment of longings in the third session.

### *First Step of Item Selection: Separate CFAs for Each Longing Subscale*

In the first series of CFA analyses that was conducted separately for each proposed subscale (except for the Tritime Focus subscale, which consisted of only two indicators), one latent factor was proposed to account for item intercorrelations. Residual variances associated with each indicator were specified as uncorrelated, and factor variances were constrained to 1.0 for purposes of model identification. In a stepwise fashion, the items with the lowest factor loadings and/or highest modification indices were deleted until the overall model fit was satisfactory. Since one-factor models must have at least four indicators in order to be overidentified (Byrne, 2001), deletion of items was terminated at this point. Results are presented in Table 9.

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<sup>11</sup> Modification indices can only be computed for complete data sets. Thus, modification indices were based on the subsample with nonmissing data in the observed variables of a given model. Nevertheless, reported results (overall model fit and parameter estimates) always refer to the complete data set.

Table 9  
*Results From the First Optimization Step of Longing Subscales: Overall Fit Statistics*

Models	X <sup>2</sup>	df	p	RMSEA (90 % CI)	CFI
<i>Structural Elaboration</i>					
<i>Incompleteness</i>					
6 items	109.07	9	.001*	.19 (.16, .23)	.75
4 items	24.69	2	.001*	.20 (.13, .27)	.92
<i>Symbolic Nature</i>					
6 items	33.52	9	.001*	.10 (.06, .13)	.67
4 items	1.93	2	.38	.00 (.00, .11)	1.00
<i>Personal Utopia</i>					
6 items	66.51	9	.001*	.15 (.11, .18)	.61
4 items	6.91	2	.03*	.09 (.02, .17)	.94
<i>Ambivalent Emotions</i>					
6 items	23.37	9	.005*	.07 (.04, .11)	.94
4 items	2.12	2	.35	.01 (.00, .12)	1.00
<i>Tritime Focus<sup>a</sup></i>					
2 indicators	--	--	--	--	--
<i>Reflection</i>					
6 items	33.31	9	.001*	.10 (.06, .13)	.93
4 items	6.34	2	.04*	.09 (.01, .16)	.98
<i>Salience</i>					
<i>Salience</i>					
4 items	.76	2	.69	.00 (.00, .09)	1.00
<i>Longing Control</i>					
<i>Control Over Longing Experience</i>					
6 items	86.47	9	.001*	.17 (.14, .20)	.72
4 items	7.51	2	.02*	.10 (.03, .17)	.96
<i>Control Over Longing Realization</i>					
8 items	101.44	20	.001*	.12 (.10, .14)	.86
4 items	9.19	2	.01*	.11 (.05, .19)	.98
<i>Longing Function</i>					
<i>Directionality</i>					
6 items	117.61	9	.001*	.20 (.17, .23)	.80
4 items	1.70	2	.43	.00 (.00, .11)	1.00
<i>Managing Nonrealizability</i>					
6 items	59.36	9	.001*	.14 (.11, .17)	.86
4 items	1.31	2	.52	.00 (.00, .10)	1.00

Note. N = 299. CI = confidence interval.

<sup>a</sup>The tritime focus subscale was not optimized in the first series of CFAs given that it contained only two indicators and that a one-factor model needs at least four indicators in order to be overidentified.

\*  $p < .05$ .

Of the initial models, only the model of the Salience subscale obtained an almost perfect overall fit. Factor loadings were high (ranging from .63 to .71,  $M = .69$ ), associated standard errors were uniformly small (.06 to .08,  $M = .07$ ) and commonalities were satisfactory (.39 to .50,

$M = .47$ ). Therefore, this subscale was retained without further modifications. The final measurement model for Saliency is depicted in Panel B of Figure 3 (p. 81).

For the remaining subscales (i.e., the six structural characteristics, the two control dimensions, and the two proposed functions), the overall fit of the initial models was inadequate and thus, items loading poorly on their factor were eliminated. This procedure reduced the number of items per subscale to four and resulted in clearly improved, though still not fully acceptable, model fits (see Table 9).

#### *Second Step of Item Selection: CFAs Simultaneously Within Each Part of the Longing Questionnaire*

After the four items were identified that best represented each theoretical construct, subscales were further optimized in the second series of CFAs, which tested the factor structure of the subscales within each part of the questionnaire simultaneously. Because I was interested in the unbiased relationships between the different parts of the questionnaire (e.g., between structural elaboration and saliency, or between control and function), I did not optimize the four parts of the Longing Questionnaire in the same step. Otherwise, item deletion due to cross-loadings on other factors would have artificially reduced associations between longing dimensions of interest.

Three models were specified. Model 1a (representing the structural elaboration of longing) contained six latent factors; the Tritime Focus factor had two indicators, whereas the remaining five factors (Incompleteness, Personal Utopia, Ambivalent Emotions, Reflection, and Symbolic Nature) each had four indicators. In Model 2a (representing the controllability of longing), two latent factors (Control Over Longing Experience and Control Over Longing Realization) were each defined by four indicators. Model 3a (representing the functions of longing) also contained two latent factors (Directionality, Managing Nonrealizability) with four indicators each. In each of the three models, latent factors were specified as intercorrelated and factor variances were fixed at 1.0. To keep the factor structure conceptually clean, no cross-loadings were allowed. As can be seen in Table 10, the initial model fits were poor and several changes to the models were made.

*Structural Elaboration subscales.* Changes to Model 1a involved the exclusion of two items with low factor loadings, and the exclusion of one item with high cross-loadings. Three further items had factor loadings smaller than .50. In order to retain at least three indicators per factor, these items were not deleted. The final model (Model 1b) is depicted in Figure 3, Panel A (p. 81). In this model, Ambivalent Emotions and Reflection were each defined by four items; Incompleteness, Personal Utopia, and Symbolic Nature by three items, and Tritime Focus by two items (19 indicators in total). The model provided a satisfactory overall fit to the data (see

Table 10). Figure 3 (Panel A) shows that factor loadings and commonalities (i.e., the amount of explained variance of the items by their proposed factor) were reasonable with three exceptions. One indicator loading on Personal Utopia and two indicators loading on Symbolic Nature had standardized estimates below .50. Accordingly, the three indicators' commonalities were also rather low (.12 to .15). Apparently, these three items are not adequate representations of their proposed underlying factors and should be modified in future applications of the scale. The standard errors associated with the factor loadings ranged from .08 to .15 ( $M = .11$ ), which is acceptable.

Table 10  
Results From the Second Optimization Step of Longing Subscales: Overall Fit Statistics for Initial and Final Models

Models	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA (90 % CI)	CFI
<i>Structural Elaboration</i>					
Model 1a: 6 factors, 22 indicators	397.11	194	.001*	.06 (.05, .07)	.85
Model 1b: 6 factors, 19 indicators	237.46	137	.001*	.05 (.04, .06)	.92
<i>Longing Control</i>					
Model 2a: 2 factors, 8 indicators	63.18	19	.001*	.09 (.06, .11)	.92
Model 2b: 2 factors, 6 indicators	18.67	8	.02*	.07 (.03, .11)	.97
<i>Longing Function</i>					
Model 3a: 2 factors, 8 indicators	82.56	19	.001*	.11 (.08, .13)	.88
Model 3b: 2 factors, 6 indicators	7.60	8	.47	.00 (.00, .07)	1.00

Note.  $N = 299$ . CI = confidence interval.

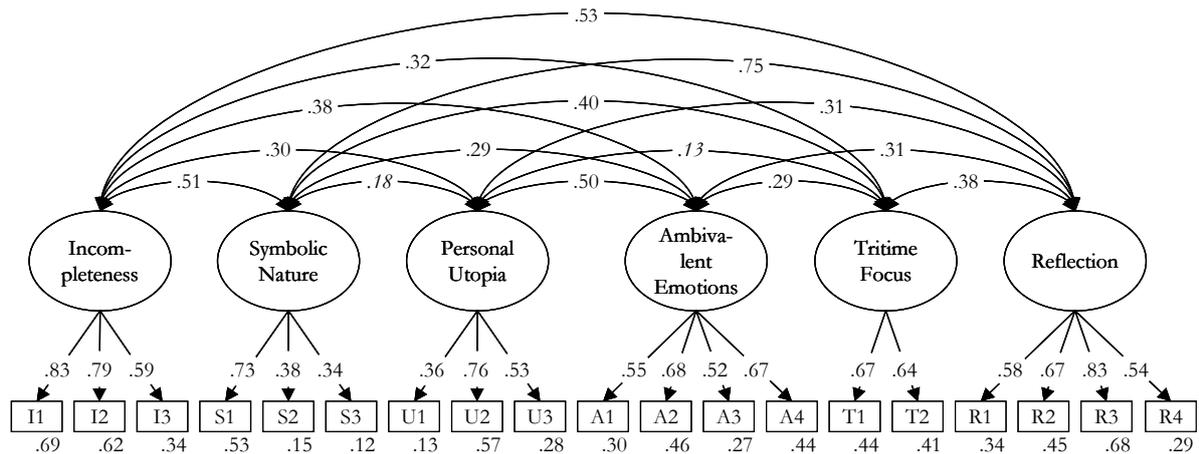
\*  $p < .05$ .

As hypothesized, almost all of the six structural factors were significantly intercorrelated (see Figure 3, Panel A, p. 81). Nonsignificant correlations were evident between Personal Utopia and Tritime Focus ( $r = .13$ ,  $SE = .09$ ,  $p = .16$ ) and between Symbolic Nature and Personal Utopia ( $r = .18$ ,  $SE = .09$ ,  $p = .06$ ). The remaining intercorrelations ranged from  $r = .29$  ( $SE = .09$ ,  $p = .001$ ) between Symbolic Nature and Ambivalent Emotions and between Tritime Focus and Ambivalent Emotions to  $r = .75$  ( $SE = .07$ ,  $p = .001$ ) between Symbolic Nature and Reflection (all  $ps < .01$ ).

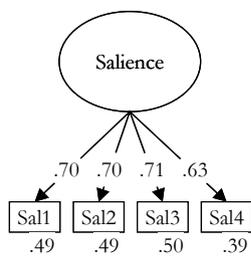
The strong association between Symbolic Nature and Reflection is notable. On the one hand, it suggests that the items defining the two factors may indeed measure a single factor and should therefore be combined. On the other hand, Reflection and Symbolic Nature are two

distinct aspects of longing from a theoretical point of view, and model development must be guided by theoretical considerations in addition to empirical findings. Furthermore, a merging of the two aspects would make it impossible to see potential differences in the two constructs' associations with other variables. Nevertheless, replications of this finding may justify the merging of Symbolic Nature and Reflection in future studies.

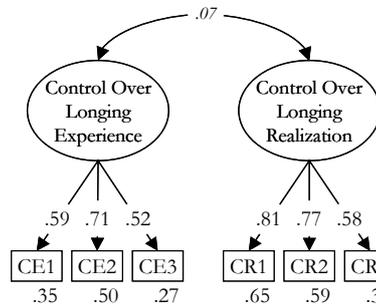
A. Structural Elaboration



B. Salience



C. Longing Control



D. Longing Function

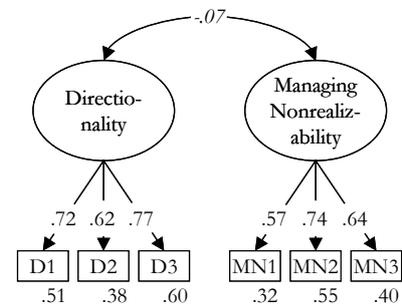


Figure 3. Measurement Models for the Four Parts of the Longing Questionnaire in Longing 1 Presented are standardized factor loadings, commonalities, and factor intercorrelations. Items are presented in Table 7 (Method section). Standard errors range from .06 to .15. Parameters in italics are not significantly different from zero at  $p < .05$ .

*Longing Control subscales.* Changes to Model 2a included the omission of two items with high cross-loadings. These changes resulted in a model with three indicators each for Control Over Longing Experience and Control Over Longing Realization (Model 2b). This model is depicted in Figure 3, Panel C. Overall fit was satisfactory (see Table 10). All standardized factor loadings were greater than .50 and ranged from .52 to .81 ( $M = .66$ ). Associated standard errors (between .10 and .12,  $M = .11$ ) and commonalities (between .27 and .65,  $M = .45$ ) indicated a well acceptable fit between the model and data. The two factors (Control Over Longing

Experience and Control Over Longing Realization) were uncorrelated ( $r = .07$ ,  $SE = .08$ ,  $p = .40$ ), which supports the position that longing-specific control is a two-dimensional construct.

*Longing Function subscales.* In Model 3a, two items were deleted because of high cross-loadings. In the resulting model (Model 3b), the two functions of longing were each defined by three items. The model fit was satisfactory (Table 10). All standardized factor loadings were greater than .50 and ranged from .57 to .77 ( $M = .68$ ). Associated standard errors (between .07 and .10,  $M = .09$ ) and communalities (between .32 and .60,  $M = .46$ ) indicated a well acceptable fit between the model and data (see Figure 3, Panel D). The correlation between Directionality and Managing Nonrealizability was nonsignificant ( $r = -.07$ ,  $SE = .08$ ,  $p = .39$ ), supporting the proposition that the function of longing is two-dimensional.

#### *Subscale Aggregation and Internal Consistency*

Subscales were computed to correspond to each of the latent factors by averaging the items loading on the particular factor. Internal consistencies (Cronbach's alpha-coefficients) were as follows: Incompleteness, .77; Symbolic Nature, .48; Personal Utopia, .54; Ambivalent Emotions, .71; Tritime Focus, .60; Reflection, .75; Saliency, .78; Control Over Longing Experience, .63; Control Over Longing Realization, .76; Directionality, .75; and Managing Nonrealizability, .68. Most of these coefficients were well in the desirable range. Internal consistencies were less satisfactory for Personal Utopia and Symbolic Nature. Post hoc screening of the items of these two scales suggested that they were formulated in a more abstract way than the remaining items. Participants were thus less restricted in their interpretation of these items and may have endorsed them more heterogeneously than less abstract items. Consequently, these subscales may be revised in future applications of the Longing Questionnaire (for a further discussion, see Section 5.1.4).

#### **4.1.2 Consistency of the Factor Structure Across the Three Longings of a Person**

So far, analyses were conducted on the data for Longing 1. The next series of CFAs tested the applicability of the derived factor models to Longings 2 and 3. If the factor structure proved consistent across the three longings, the relationships between the corresponding latent factors could be examined. Strong associations would suggest that person variables would influence longing characteristics more than the specific content of the longing. It would thus be adequate to aggregate items across the three longings of a person.

*Replication of the Factor Structure in Longings 2 and 3*

First, the models developed for Longing 1 were applied to the remaining two longings. Overall fit statistics attested a good fit between the models and the data, with CFI-values ranging from .87 to 1.00 and RMSEA-values ranging from .00 to .08 (Table 11). One exception was the Structural Elaboration model when applied to Longing 2, which resulted in a CFI-value below acceptance level (.87). In the interest of keeping the most generally applicable model, however, no use of modification techniques was made. Parameter estimates, standard errors, and communalities were comparable to the original models and thus, well acceptable. On the basis of these results, it was concluded that the factor models derived from Longing 1 largely replicated across the remaining two longings.

Table 11

*Replication of the Factor Structure for Longings 2 and 3: Overall Fit Statistics*

<b>Models</b>	<b>X<sup>2</sup></b>	<b>df</b>	<b>p</b>	<b>RMSEA (90 % CI)</b>	<b>CFI</b>
<i>Structural Elaboration</i>					
Longing 2	303.01	137	.001*	.06 (.05, .07)	.87
Longing 3	234.53	137	.001*	.05 (.04, .06)	.94
<i>Saliency</i>					
Longing 2	2.72	2	.26	.03 (.00, .13)	1.00
Longing 3	2.56	2	.28	.03 (.00, .12)	1.00
<i>Longing Control</i>					
Longing 2	7.55	8	.48	.00 (.00, .07)	1.00
Longing 3	7.87	8	.45	.00 (.00, .07)	1.00
<i>Longing Function</i>					
Longing 2	14.09	8	.08	.05 (.00, .09)	.98
Longing 3	21.45	8	.006*	.08 (.04, .11)	.97

Note. N = 299. CI = confidence interval.

\*  $p < .05$ .

*Parameter Invariance Across the Three Longings*

The previous analyses represented a configural replication of the factor models. No conclusions, however, can be made regarding the invariance of individual parameters. To address this requirement, the next set of models included the three longings simultaneously. Four models were specified. For the Structural Elaboration subscales, a model was specified with 57 indicators (19 indicators  $\times$  3 longings) and 8 latent factors (6 structural scales  $\times$  3 longings). The Saliency model contained 12 indicators (4 items  $\times$  3 longings) and 3 latent factors (1 Saliency factor  $\times$  3 longings). In the Longing Control model, 18 indicators (6 items  $\times$  3 longings) defined 6 factors (2 control subscales  $\times$  3 longings). Finally, the Longing Function model included 18 indicators (6

items  $\times$  3 longings) and 6 factors (2 control subscales  $\times$  3 longings). In each model, covariances were allowed between residual variances of corresponding indicators and between all latent factors.

Table 12

*Fit Statistics and Model Comparisons for Invariance Models Across the Three Longings of a Person*

Invariance models	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA (90 % CI)	CFI	$\Delta \chi^2$	$\Delta df$	<i>p</i>
<i>Structural Elaboration</i>								
<i>Measurement Level</i>								
Configural	1940.70	1329	.001*	.04 (.04, .04)	.89	--	--	--
Factor loadings	1983.73	1355	.001*	.04 (.04, .04)	.89	43.03	26	.02*
Intercepts	2039.78	1381	.001*	.04 (.04, .04)	.88	56.05	26	.001*
<i>Structural Level</i>								
Factor variances	2050.88	1393	.001*	.04 (.04, .04)	.88	11.10	8	.20
Factor covariances	2087.65	1423	.001*	.04 (.04, .04)	.88	36.77	30	.18
Factor means	2144.51	1435	.001*	.04 (.04, .04)	.87	56.86	12	.001*
<i>Salience</i>								
<i>Measurement Level</i>								
Configural	77.50	39	.001*	.06 (.04, .08)	.97	--	--	--
Factor loadings	87.63	45	.001*	.06 (.04, .07)	.96	10.13	6	.12
Intercepts	93.37	51	.001*	.05 (.04, .07)	.96	5.74	6	.45
<i>Structural Level</i>								
Factor variances	101.09	53	.001*	.06 (.04, .07)	.96	7.72	2	.02*
Factor means <sup>a</sup>	166.51	53	.001*	.08 (.07, .10)	.91	73.14	2	.001*
<i>Longing Control</i>								
<i>Measurement Level</i>								
Configural	123.94	102	.07	.03 (.00, .04)	.99	--	--	--
Factor loadings	132.35	110	.07	.03 (.00, .04)	.99	8.39	8	.40
Intercepts	136.91	118	.11	.02 (.00, .04)	.99	4.56	8	.80
<i>Structural Level</i>								
Factor variances	143.03	122	.09	.02 (.00, .04)	.99	6.12	4	.19
Factor covariances	144.23	124	.10	.02 (.00, .04)	.99	1.20	2	.55
Factor means	149.85	128	.09	.02 (.00, .04)	.99	5.63	4	.23
<i>Longing Function</i>								
<i>Measurement Level</i>								
Configural	123.06	102	.08	.03 (.00, .04)	.99	--	--	--
Factor loadings	126.28	110	.14	.02 (.00, .04)	.99	3.22	8	.92
Intercepts	138.15	118	.10	.02 (.00, .04)	.99	11.87	8	.16
<i>Structural Level</i>								
Factor variances	139.39	122	.13	.02 (.00, .04)	.99	1.24	4	.87
Factor covariances	140.77	124	.14	.02 (.00, .04)	.99	1.38	2	.50
Factor means	163.01	128	.02*	.03 (.01, .04)	.98	22.24	4	.001*

*Note.*  $N = 299$ . For each model comparison, the preceding model served as a reference except otherwise indicated. CI = confidence interval.

<sup>a</sup> Factor variances were not constrained to be equal in this model and the second-last model served as the reference in this case.

\*  $p < .05$ .

Successively, sets of parameters were constrained to be equal across the three longings, and change in model fit was evaluated. In the configural model, one indicator per factor was fixed to 1.0, and latent factor means were fixed to 0.0 for purposes of model identification. No other constraints were imposed. In the next model, factor loadings were set equal across longings. Equality constraints were added for intercepts of indicators in the third model. To test intercept invariance separately from factor means invariance, latent means of Longings 2 and 3 (but not of Longing 1) were freed in this model. The next models successively imposed equality constraints on factor variances, covariances, and means. Table 12 presents the overall model fit indices of the invariance models as well as the  $\Delta X^2$  tests for model comparisons.

In all models, when components of the measurement level (i.e., factor loadings and intercepts) were constrained to be equal across the three longings, overall model fit was still largely acceptable. For the Structural Elaboration model, the CFI-value (.88) was marginally below the acceptance level of .90. The RMSEA-value (.04), however, was clearly satisfactory. Based on a modeling rationale, it was therefore concluded that the measurement models were largely invariant across longings.

Differential results were obtained when placing equality constraints on the structural-level parameters. With the exception of the Longing Salience model, factor variances could be constrained to be equal across longings without losing model fit. Variance estimates of the Salience scales, however, differed between the three longings: Longing 1, .62 ( $SE = .08$ ); Longing 2, .69 ( $SE = .08$ ); Longing 3, .90 ( $SE = .11$ ). Critical ratio tests for differences between parameters showed that the variance of Longing 3 was significantly greater than that of Longing 1 (critical ratio = 2.58,  $p = .01$ ) and Longing 2 (critical ratio = 1.96;  $p = .05$ ), whereas no difference was evident between the first two longings. This finding may be explained by a ceiling effect in a way that the two most important longings were highly salient in nearly all participants, whereas the salience of the third most important longing varied more among participants. Factor covariances demonstrated invariance across longings in all parts of the questionnaire.

Factor means also differed across longings for all but the Longing Control scales. Whenever mean differences were detected, they were consistent with the ranking of longings. That is, means were always higher in more important longings, which can be taken as evidence that participants followed instructions. Specifically, among the Structural Elaboration scales, with the exception of Personal Utopia, mean estimates were significantly higher for Longing 1 as compared to Longings 2 and 3, whereas no mean differences were evident between Longings 2 and 3. The salience was higher for Longing 1 than for Longing 2, which in turn was higher than for Longing 3. Finally, the directionality function was higher for Longing 1 compared to Longings 2 and 3, while the latter two did not differ from each other, nor were there any

differences for the managing nonrealizability function. The means of all constructs are presented separately for the three longings in Table 13.

Table 13  
*Means and Standard Deviations of Longing Characteristics Across the Three Longings of a Person*

<b>Longing characteristics</b>	<b>Longing 1</b>	<b>Longing 2</b>	<b>Longing 3</b>
<i>Structural Elaboration</i>			
Incompleteness	3.13 (1.54) <sup>a</sup>	2.71 (1.42) <sup>b</sup>	2.61 (1.47) <sup>b</sup>
Personal Utopia	2.48 (1.37)	2.45 (1.35)	2.40 (1.39)
Ambivalent Emotions	2.20 (1.35) <sup>a</sup>	1.95 (1.31) <sup>b</sup>	1.87 (1.36) <sup>b</sup>
Reflection	3.36 (1.23) <sup>a</sup>	3.09 (1.30) <sup>b</sup>	2.95 (1.34) <sup>b</sup>
Tritime Focus	3.29 (.99) <sup>a</sup>	3.15 (1.04) <sup>b</sup>	3.09 (1.05) <sup>b</sup>
Symbolic Nature	3.38 (1.27) <sup>a</sup>	3.20 (1.24) <sup>b</sup>	3.02 (1.29) <sup>b</sup>
<i>Salience</i>			
Salience	3.92 (.88) <sup>a</sup>	3.58 (.94) <sup>b</sup>	3.36 (1.01) <sup>c</sup>
<i>Longing Control</i>			
Control Over Longing Experience	2.77 (1.23)	2.83 (1.32)	2.91 (1.27)
Control Over Longing Realization	2.68 (1.46)	2.69 (1.52)	2.71 (1.50)
<i>Longing Function</i>			
Directionality	2.92 (1.46) <sup>a</sup>	2.56 (1.47) <sup>b</sup>	2.54 (1.49) <sup>b</sup>
Managing Nonrealizability	1.98 (1.53)	2.11 (1.49)	2.02 (1.52)

*Note.*  $N = 299$ . Means (standard deviations shown in brackets) refer to the raw-data level. In contrast, differences between mean values were tested on the latent level by critical ratio tests in the models with all parameters constrained to be equal except means. Mean scores with no or the same superscript for any given construct are not significantly different at  $p < .01$ . CI = confidence interval.

#### *Rank-Order Stability of Longing Subscales Across the Three Longings*

Given the evidence of measurement invariance across the three longings, it was justified to interpret latent correlations between the three corresponding factors for each longing subscale. Latent correlations indicate the rank-order consistency of differences between persons across the three longings. For example, they are able to show whether persons who have a high Salience value for their first longing also have high Salience values for their remaining two longings. As can be seen in Table 14, corresponding latent factors correlated moderately to highly across the three longings. The Tritime Focus scale evinced the lowest consistency across longings (mean  $r = .41$ ) and the Symbolic Nature scale the highest (mean  $r = .75$ ). In conclusion, with regard to the characteristics measured, the three longings of a person were fairly similar to each other.

Table 14

*Latent Correlations Between Longing Factors Across the Three Longings of a Person*

Longing characteristics	Latent correlations			Mean
	Longing 1 – Longing 2	Longing 1 – Longing 3	Longing 2 – Longing 3	
<i>Structural Elaboration</i>				
Incompleteness	.46 (.18, .001)	.43 (.17, .001)	.51 (.18, .001)	.47
Personal Utopia	.44 (.17, .001)	.48 (.18, .001)	.51 (.18, .001)	.48
Ambivalent Emotions	.46 (.09, .001)	.55 (.10, .001)	.63 (.10, .001)	.55
Reflection	.60 (.09, .001)	.49 (.09, .001)	.63 (.10, .001)	.57
Tritime Focus	.41 (.07, .001)	.38 (.07, .001)	.44 (.07, .001)	.41
Symbolic Nature	.78 (.10, .001)	.66 (.09, .001)	.81 (.10, .001)	.75
<i>Salience</i>				
Salience	.41 (.05, .001)	.40 (.06, .001)	.54 (.07, .001)	.45
<i>Longing Control</i>				
Control Over Longing Experience	.73 (.10, .001)	.60 (.09, .001)	.60 (.09, .001)	.64
Control Over Longing Realization	.44 (.19, .001)	.49 (.19, .001)	.44 (.19, .001)	.46
<i>Longing Function</i>				
Directionality	.56 (.15, .001)	.43 (.14, .001)	.56 (.15, .001)	.52
Managing Nonrealizability	.78 (.15, .001)	.68 (.14, .001)	.57 (.13, .001)	.68

*Note.*  $N = 299$ . Correlation estimates (standard errors and  $p$ -values shown in brackets) are from the model with all parameters constrained to be equal across longings except means. An exception to this rule was the Salience model, in which variances were also freely estimated.

#### 4.1.3 Final Measurement Models of the Longing Subscales

##### *Model Fit of Aggregated Models*

Given measurement invariance and the substantial stability of the latent structural factors across the three longings, it appeared adequate to aggregate items across the three longings into item parcels for subsequent analyses. Descriptive statistics for item parcels (means, standard deviations, minimal and maximal values, skewness, kurtosis, and number of missing values) are listed in Appendix D. Skewness and kurtosis coefficients of item parcels were clearly superior when compared to individual items. Item parcels were essentially normally distributed. They were tested for univariate outliers; only a few outlying cases were detected for the Salience parcels.

Item parcels were now used as indicators in the four measurement models (one each representing the structural elaboration, salience, controllability, and function of longing), which

resulted in an acceptable overall fit between the models and the data (see fit statistics in Table 15).<sup>12</sup> The four models are depicted in Figure 4.

Table 15  
*Fit Statistics for the Final Measurement Models of the Longing Subscales (Indicators Aggregated Across Longings)*

Models	X <sup>2</sup>	df	p	RMSEA (90 % CI)	CFI
Structural Elaboration	329.42	137	.001*	.07 (.06, .08)	.91
Saliency	6.02	2	.05*	.08 (.00, .16)	.99
Longing Control	17.69	8	.02*	.06 (.02, .10)	.98
Longing Function	11.80	8	.16	.04 (.00, .08)	.99

Note.  $N = 299$ . CI = confidence interval.

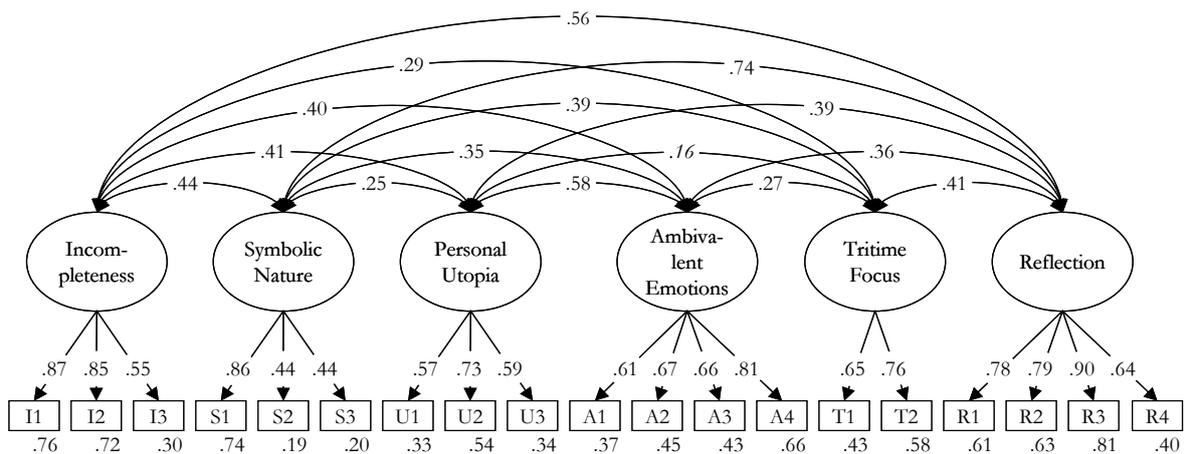
\*  $p < .05$ .

Factor loadings, standard errors, and communalities were comparable, or even superior, to the original models. Factor loadings were as follows: Structural Elaboration model, .44 to .90 ( $M = .69$ ; only two loadings of Symbolic Nature below .50); Saliency model, .63 to .83 ( $M = .75$ ); Longing Control model, .65 to .86 ( $M = .77$ ); and Longing Function model, .61 to .95 ( $M = .76$ ). In all models, associated standard errors were between .04 and .10 ( $M = .07$ ). Communalities were .19 to .81 ( $M = .50$ ) in the Structural Elaboration model; .40 to .69 ( $M = .57$ ) in the Saliency model; .42 and .75 ( $M = .60$ ) in the Longing Control model; and .43 to .90 ( $M = .59$ ) in the Longing Function model. All of these indices were well acceptable.

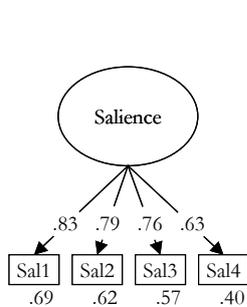
Factor intercorrelations were also similar to the original models. In the Structural Elaboration model, they ranged from .16 (Personal Utopia – Tritime Focus) to .74 (Symbolic Nature – Reflection). With the exception of the lowest correlation, all latent intercorrelations were statistically significant ( $p < .001$ ). In contrast to the Longing Control model for Longing 1, in the model with aggregated indicators, the two control factors were slightly correlated ( $r = .14$ ;  $SE = .07$ ;  $p = .05$ ). In the Longing Function model, the two factors were uncorrelated ( $r = .00$ ;  $SE = .07$ ,  $p = .96$ ). Taken together, it can be concluded that aggregation across the three longings of a person resulted in satisfactory measurement models to be used in subsequent analyses.

<sup>12</sup>In the Structural Elaboration model, there were five multivariate outliers. When these were deleted, the overall fit remained practically unchanged,  $X^2(137) = 323.59$ ,  $p = .001$ , RMSEA = .07 (.06, .08), CFI = .91. In the Saliency model, there were three multivariate outliers. Repeating the analysis without these cases ( $N = 296$ ) resulted in a comparable, or even slightly improved, overall fit,  $X^2(2) = 3.25$ ,  $p = .20$ , RMSEA = .05 (.00, .13), CFI = 1.00. When deleting three outlying cases in the Longing Control model ( $N = 293$ ), the fit was also comparable,  $X^2(8) = 12.37$ ,  $p = .14$ , RMSEA = .04 (.00, .09), CFI = .99. In the Longing Function model, one multivariate outlier was detected. Without this case ( $N = 298$ ), the fit was also unchanged,  $X^2(8) = 12.81$ ,  $p = .12$ , RMSEA = .05 (.06, .09), CFI = .99. Parameter estimates were all comparable to the analyses in the total sample.

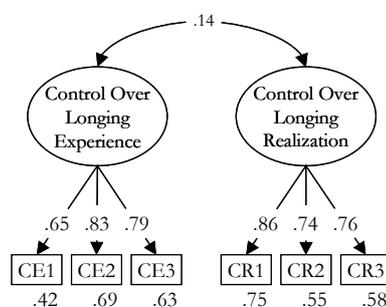
A. Structural Elaboration



B. Salience



C. Longing Control



D. Longing Function

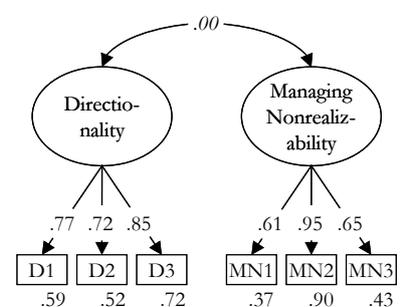


Figure 4. Measurement Models for the Four Parts of the Longing Questionnaire Aggregated Across the Three Longings.

Presented are standardized factor loadings, commonalities, and factor intercorrelations. Items are presented in Table 7 (Method section). Standard errors range between .04 and .10. Parameters in italics are not significantly different from zero at  $p < .05$ .

Subscale Aggregation and Internal Consistency

Subscales were computed for the composite of the three longings. First, single items responded to for each longing were aggregated into item parcels. Item parcels loading on a particular factor were then aggregated to form subscales. Internal consistencies (Cronbach's alpha-coefficients) were in an acceptable range: Incompleteness, .79; Symbolic Nature, .60; Personal Utopia, .65; Ambivalent Emotions, .78; Tritime Focus, .66; Reflection, .85; Salience, .83; Control Over Longing Experience, .81; Control Over Longing Realization, .83; Directionality, .88; and Managing Nonrealizability, .77. Thus, aggregation clearly improved internal consistencies to an acceptable level for all longing subscales.<sup>13</sup>

<sup>13</sup> It should be noted that internal consistencies were assessed in a conservative manner. Specifically, they were based on item parcels and thus underestimate the true number of items. If reliability estimates were based on the individual items contributing to each subscale, these estimates would be at or above .74 in every case.

#### 4.1.4 Consistency of the Factor Structure Across Three Age Groups

The next set of analyses tested the applicability of the final measurement models to different age groups. Ensuring that constructs were measured in a comparable manner across age groups was an important precondition for testing hypotheses about age-related differences. For these analyses, the sample was split in three groups of young (19 to 39 years), middle-aged (40 to 59 years), and old adults (60 to 81 years).

##### *Replication of the Factor Structure in Three Age Groups*

First, the models developed in the total sample were applied to the three subgroups of young, middle-aged, and old adults. Table 16 contains overall fit statistics, which in most cases attested a good fit between the models and the data. The fit was less than desirable for the Structural Elaboration model, particularly when it was applied to middle-aged adults (CFI = .84; RMSEA = .10). In the interest of keeping the most generally applicable model, however, no model modifications were made. A few factor loadings and commonalities were somewhat lower, and standard errors somewhat higher, than in the total sample, but still largely acceptable. Overall, results suggest that factor models applied well to different age groups.

Table 16

*Replication of the Factor Structure in Subsamples of Young, Middle-Aged, and Old Adults: Overall Fit Statistics*

<b>Models</b>	<b>X<sup>2</sup></b>	<b>df</b>	<b>p</b>	<b>RMSEA (90 % CI)</b>	<b>CFI</b>
<i>Structural Elaboration</i>					
Young <sup>a</sup>	188.26	138	.003*	.06 (.04, .08)	.93
Middle-aged	267.60	137	.001*	.10 (.08, .11)	.84
Old	219.21	137	.001*	.08 (.06, .10)	.87
<i>Salience</i>					
Young	1.30	2	.52	.00 (.00, .18)	1.00
Middle-aged	2.25	2	.33	.04 (.00, .20)	1.00
Old	4.52	2	.11	.11 (.00, .26)	1.00
<i>Longing Control</i>					
Young	7.84	8	.45	.00 (.00, .12)	1.00
Middle-aged	8.34	8	.40	.02 (.00, .12)	1.00
Old	12.38	8	.14	.08 (.00, .15)	.98
<i>Longing Function</i>					
Young	14.33	8	.07	.09 (.00, .17)	.97
Middle-aged	4.51	8	.81	.00 (.00, .07)	1.00
Old	9.12	8	.33	.04 (.00, .13)	.99

*Note.* Young adults:  $n = 98$ ; middle-aged adults:  $n = 102$ ; old adults:  $n = 99$ . CI = confidence interval.

<sup>a</sup> One degree of freedom was gained because the residual variance of Item S1 was set to 0.0 in young adults. This was done because in the original analysis this variance was negative, but not significantly different from zero (i.e., critical ratio = -.17). Thus, it was fixed to achieve an admissible solution.

\*  $p < .05$ .

*Parameter Invariance Across the Three Age Groups*

To test parameter invariance across age groups, a series of multiple-group models with increasing restrictions on parameters was tested for change in model fit in the same manner described in Section 4.1.2. Table 17 presents the overall model fit indices of the invariance models as well as the  $\Delta X^2$  tests for model comparisons.

When constraining factor loadings and intercepts to be invariant across age groups, the overall fit of the Longing Salience, Longing Control, and Longing Function models was still acceptable. Based on a modeling rationale, it was therefore concluded that the three measurement models were invariant across age groups. The measurement model for the Structural Elaboration scales was not fully invariant across age groups. The CFI-values (.86 – .88) were below acceptance level. The significant decrease in fit after constraining intercepts to be equal indicated mean differences between age groups in the unique (as compared to the shared) variance of single item parcels. Follow-up analyses therefore tested linear and quadratic age trends in individual item parcels.

A negative linear age trend was found for Item I1 (“My longing means that something essential is missing in my life,”  $r = -.23, p = .001$ ) and a positive linear age trend was found for Item S3 (“What I am longing for symbolizes something important to me,”  $r = .16, p = .16$ ). Quadratic age trends were evident in Item U2 (“Reality will never be the way I long for it to be,”  $b_0 = .15, p = .05; b_1 = -.26, p = .002$ ), which was highest in middle-aged adults and lower in both young and old adults; and in Item R4 (“When I am having this longing, I think about ways to better shape my life,”  $b_0 = -.27, p = .001; b_1 = -.20, p = .02$ ), which was high in young and middle-aged adults and lower in old adults. All remaining items did not show significant age associations (all  $|r|s < .11$ , all  $ps < .01$ ). The existing age trends in individual item parcels are not desirable because they indicate that constructs were not measured in a comparable manner in the three age groups (for a further discussion, see Section 5.1.3).

Regarding the structural level, factor variances and covariances could be constrained to be equal across age groups without losing model fit. Model fit decreased, however, when equality constraints were placed on factor means in the Structural Elaboration, Longing Control, and Longing Function models, whereas this was not the case in the Longing Salience model. Apparently, mean levels were not always equal across age groups. Except for the Structural Elaboration model, this finding is consistent with hypotheses of age-related differences in several longing characteristics. Further analyses regarding age-related mean level differences are described in Section 4.3.2.

Table 17  
*Fit Statistics and Model Comparisons for Invariance Models Across Three Age Groups*

Invariance models	X <sup>2</sup>	df	p	RMSEA (90 % CI)	CFI	Δ X <sup>2</sup>	Δ df	p
<i>Structural Elaboration</i>								
<i>Measurement Level</i>								
Configural <sup>a</sup>	675.06	412	.001*	.05 (.04, .05)	.88	--	--	--
Factor loadings	707.24	437	.001*	.05 (.04, .05)	.88	32.18	25	.15
Intercepts	775.22	463	.001*	.05 (.04, .05)	.86	67.98	26	.001*
<i>Structural Level</i>								
Factor variances	782.49	475	.001*	.05 (.04, .05)	.86	7.27	12	.84
Factor covariances	821.37	505	.001*	.05 (.04, .05)	.85	38.88	30	.13
Factor means	848.01	517	.001*	.05 (.04, .05)	.85	26.64	12	.009*
<i>Salience</i>								
<i>Measurement Level</i>								
Configural	8.06	6	.23	.03 (.00, .09)	1.00	--	--	--
Factor loadings	11.65	12	.47	.00 (.00, .06)	1.00	3.59	6	.73
Intercepts	25.42	18	.11	.04 (.00, .07)	.98	13.77	6	.03*
<i>Structural Level</i>								
Factor variances	26.17	20	.16	.03 (.00, .06)	.99	.75	2	.69
Factor means	26.43	22	.23	.03 (.00, .06)	.99	.36	2	.84
<i>Longing Control</i>								
<i>Measurement Level</i>								
Configural	28.57	24	.24	.03 (.00, .06)	.99	--	--	--
Factor loadings	36.44	32	.27	.02 (.00, .05)	.99	7.87	8	.45
Intercepts	66.73	40	.005*	.05 (.03, .07)	.96	30.29	8	.001*
<i>Structural Level</i>								
Factor variances	76.05	44	.002*	.05 (.03, .07)	.95	9.32	4	.05
Factor covariances	81.94	46	.001*	.05 (.03, .07)	.94	5.89	2	.05
Factor means	109.62	50	.001*	.06 (.05, .08)	.90	27.68	4	.001*
<i>Longing Function</i>								
<i>Measurement Level</i>								
Configural	27.97	24	.26	.02 (.00, .06)	.99	--	--	--
Factor loadings	34.22	32	.36	.02 (.00, .05)	1.00	10.51	8	.23
Intercepts	58.63	40	.03*	.04 (.01, .06)	.97	32.79	8	.001*
<i>Structural Level</i>								
Factor variances	61.49	44	.04*	.04 (.01, .06)	.97	3.91	4	.42
Factor covariances	61.72	46	.06	.03 (.00, .05)	.97	.15	2	.93
Factor means	72.55	50	.02*	.04 (.02, .06)	.96	9.81	4	.04*

Note.  $N = 299$ . For each model comparison, the preceding model served as a reference.

<sup>a</sup> One degree of freedom was gained because the residual variance of Item S1 was set to 0.0 in young adults. This was done because in the original analysis this variance was negative, but not significantly different from zero (i.e., critical ratio = -1.7). Thus, it was fixed to achieve an admissible solution.

\*  $p < .05$ .

#### 4.1.5 Retest Stability of the Longing Subscales

##### *Replication of the Factor Structure at Retest*

Before the retest-stability of the longing subscales over a 5-week period could be examined, it had to be demonstrated that factor models could be generalized to the retest assessment of longing. To this end, the final factor models developed with the baseline data (aggregated across longings) were applied to the retest data. Table 18 lists overall fit statistics for these models.

Table 18

*Fit Statistics for the Longing Subscales at Retest Assessment (Indicators Aggregated Across Longings)*

<b>Models</b>	<b>X<sup>2</sup></b>	<b>df</b>	<b>p</b>	<b>RMSEA (90 % CI)</b>	<b>CFI</b>
Structural Elaboration <sup>a</sup>	394.56	138	.001*	.08 (.07, .09)	.88
Salience	.73	2	.69	.00 (.00, .09)	1.00
Longing Control	19.88	8	.01*	.07 (.03, .11)	.98
Longing Function	21.27	8	.006*	.07 (.04, .11)	.97

*Note.*  $N = 283$ . CI = confidence interval.

<sup>a</sup> One degree of freedom was gained because the residual variance of Item Parcel T1 was set to 0.0. This was done because in the original analysis this variance was negative, but not significantly different from 0.0 (i.e., critical ratio = -.05). Thus, it was fixed to achieve an admissible solution.

\*  $p < .05$ .

As shown in the table, applying the Longing Salience, Control, and Function models to the retest data resulted in a satisfactory overall model fit. Overall fit for the Structural Elaboration model was marginally below acceptance level on one fit index (CFI = .88), but acceptable on the other (RMSEA = .08). Specific fit indices (factor loadings, associated standard errors, and communalities) were very similar to the baseline model and hence, well acceptable. It can thus be concluded that factor models applied well to the retest data. Parameter invariance was tested next.

##### *Parameter Invariance Across Baseline and Retest Assessments*

To test the invariance of individual parameters, four models were constructed. In the Structural Elaboration model, 38 indicators (19 indicators  $\times$  2 time points) defined 12 latent factors (6 structural scales  $\times$  2 time points). The Longing Salience model contained 8 indicators (4 items  $\times$  2 time points) and 2 latent factors (1 factor for each time point). The Longing Control and Longing Function models each included 12 indicators (6 items  $\times$  2 time points) and 4 latent factors (2 control factors  $\times$  2 time points). In each of these models, correlations were allowed between corresponding indicators and between all latent factors. In the Longing Function model,

the residual variances of Item MN2 both at baseline and retest were very low, and their covariance was not positive definite. Therefore, this error covariance was deleted from the model to achieve an admissible solution. Table 19 presents the overall model fit indices of the invariance models as well as the  $\Delta X^2$  tests for model comparisons.

When constraining components of the measurement level (factor loadings and intercepts of indicators) to be equal across baseline and retest assessments, overall model fit was still adequate for all four models. According to a modeling rationale, measurement invariance was thus established.

In two of the models, the Longing Function and Longing Control models, invariance was also found for all components of the structural level (i.e., factor variances, covariances, and means), indicating that none of these parameters changed across the 5-week period. In contrast, differences on the structural level became evident for the structural elaboration and salience of longings. First, the variance of the Salience subscale increased from .64 at baseline to .86 at retest, which represented a significant change (critical ratio = 2.47;  $p = .04$ ).

Second, the mean-level of salience decreased from baseline ( $M = 3.62$ ,  $SD = .73$ ) to retest ( $M = 3.54$ ,  $SD = .81$ ; critical ratio = -3.35,  $p = .001$ ). Both findings can be explained by a differential decrease of longing salience over time, with some persons changing more than others. At baseline, participants rated their three most important longings at that time. In contrast, at retest, participants re-assessed their three longings selected in the initial session. For some persons, these longings may have become less important (or less salient) in the meantime.

Third, mean invariance of the Structural Elaboration scales across measurement occasions was also rejected by the  $\Delta X^2$ -test. Factor means were significantly lower at retest for Personal Utopia (baseline:  $M = 2.44$ ,  $SD = 1.05$ ; retest:  $M = 2.36$ ,  $SD = 1.02$ ) and Reflection (baseline:  $M = 3.14$ ,  $SD = 1.07$ ; retest:  $M = 2.96$ ,  $SD = 1.07$ ). These mean changes may be a concomitant of a differential drop in salience over time, as the structural facets and the salience of longings are interrelated (see Section 4.2.3).

#### *Retest Stability of the Longing Subscales*

Correlations between corresponding subscales at baseline and retest provided evidence of a satisfactory retest-stability of longing characteristics. The following retest-correlations (on the raw-data level) were obtained: Incompleteness, .79; Symbolic Nature, .66; Personal Utopia, .67; Ambivalent Emotions, .71; Tritime Focus, .59; Reflection, .80; Salience, .71; Control Over Longing Experience, .71; Control Over Longing Realization, .85; Directionality, .83; and Managing Nonrealizability, .79 (all  $ps = .001$ ). These findings suggest that there are high and stable interindividual differences in the self-reported “structural expressions” of longing.

Table 19

*Fit Statistics and Model Comparisons for Invariance Models Across Baseline and Retest Assessments*

Invariance models	X <sup>2</sup>	df	p	RMSEA (90 % CI)	CFI	Δ X <sup>2</sup>	Δ df	p
<i>Structural Elaboration</i>								
<i>Measurement Level</i>								
Configural	1033.85	580	.001*	.05 (.05, .06)	.93	--	--	--
Factor loadings	1048.77	593	.001*	.05 (.05, .06)	.92	14.92	13	.31
Intercepts	1090.67	606	.001*	.05 (.05, .06)	.92	41.90	13	.001*
<i>Structural Level</i>								
Factor variances	1092.24	612	.001*	.05 (.05, .06)	.92	1.57	6	.96
Factor covariances	1109.60	627	.001*	.05 (.05, .06)	.92	17.36	15	.30
Factor means	1154.38	633	.001*	.05 (.05, .06)	.91	44.78	6	.001*
<i>Salience</i>								
<i>Measurement Level</i>								
Configural	9.85	15	.83	.00 (.00, .03)	1.00	--	--	--
Factor loadings	15.91	18	.60	.00 (.00, .05)	1.00	6.06	3	.11
Intercepts	17.04	21	.71	.00 (.00, .04)	1.00	1.13	3	.77
<i>Structural Level</i>								
Factor variances	23.38	22	.38	.01 (.00, .05)	1.00	6.34	1	.01*
Factor means <sup>a</sup>	27.98	22	.18	.03 (.00, .06)	.99	10.94	1	.001*
<i>Longing Control</i>								
<i>Measurement Level</i>								
Configural	67.86	42	.007*	.05 (.02, .06)	.99	--	--	--
Factor loadings	71.96	46	.009*	.04 (.02, .06)	.99	4.10	4	.39
Intercepts	76.61	50	.009*	.04 (.02, .06)	.99	4.65	4	.33
<i>Structural Level</i>								
Factor variances	77.04	52	.01*	.04 (.02, .06)	.99	.43	2	.81
Factor covariances	79.85	53	.01*	.04 (.02, .06)	.99	2.81	1	.09
Factor means	80.04	55	.02*	.04 (.02, .06)	.99	.19	2	.91
<i>Longing Function</i>								
<i>Measurement Level</i>								
Configural	55.53	43	.10	.03 (.00, .05)	.99	--	--	--
Factor loadings	55.98	47	.001*	.03 (.00, .05)	1.00	0.45	4	.98
Intercepts	58.63	51	.001*	.02 (.00, .05)	1.00	2.65	4	.62
<i>Structural Level</i>								
Factor variances	64.35	53	.14	.03 (.00, .05)	.99	5.72	2	.06
Factor covariances	64.35	54	.16	.03 (.00, .05)	.99	.00	1	1.00
Factor means	68.00	56	.13	.03 (.00, .05)	.99	3.65	2	.16

Note. N = 283. For each model, the preceding model served as comparison model unless otherwise indicated. CI = confidence interval.

<sup>a</sup> Factor variances were not constrained to be equal in this model and the second-last model served as the reference in this case.

\*  $p < .05$ .

#### 4.1.6 Additional Subscales and Items of the Longing Questionnaire

In addition to the scales measuring the structural elaboration, salience, controllability, and function of longing, the Longing Questionnaire also contained scales measuring the occurrence

of positive and negative emotions during longing and single items for the strength of three temporal foci (past, present, and future) and the attainability of longings. Participants also rated how much their longings were related to each of 13 life domains, which served as the basis for deriving an index of the number of life domains related to longings (see Section 3.3.1). To test their associations with the main longing dimensions, these additional scales and items were also aggregated across the three longings.

For positive and negative emotions, responses to each emotion word were first averaged across the three longings. Responses to the six positive emotion words and the six negative emotion words were then aggregated to form one index each for positive and negative longing-accompanying emotions. These scales had good internal consistencies: Positive Emotions, .94; Negative Emotions, .90.

Retest reliabilities were as follows: Positive Emotions, .77; Negative Emotions, .71; Past Focus, .63; Present Focus, .57; Future Focus, .59; Attainability, .70; and Number of Life Domains, .65. For individual life domains, retest reliabilities were: Health, .65; Physical Well-Being, .51; Personal Characteristics, .64; Religiosity, .77; Finances, .73; Work, .68; Leisure, .66; Living, .59; Partnership, .61; Family, .70; Friendships, .66; Societal Values, .64; and Politics, .73 (all  $ps = .001$ ). Some of these retest stabilities were somewhat lower than for the main longing subscales. This was to be expected, given that they were almost exclusively based on single items. For single-item measures, these retest stabilities across five weeks can be evaluated as substantial.

#### **4.1.7 Summary of Scale Development Results**

The goal of the present section was to establish a measure for the assessment of longing with satisfactory psychometric properties. The Longing Questionnaire contained subscales designed to measure the structural elaboration, salience, controllability, and function of longing. Scale optimization was done separately for the four parts of the questionnaire employing confirmatory factor analyses.

Items were selected using data for the most important longing (Longing 1), resulting in three to four items per subscale (an exception was the Tritime Focus subscale that consisted of only two indicators right from the beginning). The process of item selection resulted in satisfactory factor models for all parts of the Longing Questionnaire. These models were then successfully applied to the second and third most important longings (Longing 2 and 3). Using a modeling rationale, individual parameters of the measurement level (factor loadings and intercepts of indicators) were found to be invariant across the three longings of a person for all four parts of the Longing Questionnaire. It can thus be concluded that constructs were measured in a comparable manner across longings. Variances and covariances of latent factors were also

found to be invariant with one exception. For the Saliency scale, the factor variance was significantly greater in Longing 3, probably due to a restricted variance of scores associated with a ceiling effect in the two most important longings. There were a number of mean differences between latent factors in different parts of the questionnaire (particularly in the Structural Elaboration, Saliency, and Longing Function parts). Notwithstanding these differences on the structural level, moderate to high intercorrelations between corresponding subscales suggested that constructs were largely consistent across the three longings of a person. Thus, it seemed justified to aggregate across longings in subsequent analyses. Final (i.e., aggregated) factor models demonstrated acceptable fit and internal consistencies were reasonable. Descriptive statistics for the final subscales can be found in Appendix F.

Follow-up analyses tested the applicability of the derived factor models across three age groups. In the Saliency, Longing Control, and Longing Function models, parameters of the measurement level (i.e., factor loadings and intercepts) could be constrained to be equal across the three groups without significant reductions in overall model fit. Thus, these factor models could be applied equally well to young, middle-aged, and old adults. Several individual items of the Structural Elaboration part, however, evinced age group differences that reduced the generality of the measurement model across age groups. However, effects were only small.

For each part of the Longing Questionnaire, the retest stability across a period of five weeks was also tested. Fit remained acceptable when applying factor models to the retest data, and measurement equivalence of constructs across the two measurement occasions could be established. Retest correlations were substantial, indicating a high stability of individual differences over time.

Taken together, the present analyses constituted a notably strong test of the integrity and generality of the newly developed Longing Questionnaire. With minor exceptions, tests of the factor structure, internal consistencies, and retest-correlations all demonstrated that this instrument is a reliable and promising tool for the assessment of longing. Such data are not only evidence for the quality of the measurement instrument. Equally, if not more important is the interpretation that such results could be obtained because there exist elaborate interindividual differences in the construct of longing itself. Mental representations of longings and their structural composition are not a fleeting phenomenon. Longings are part of the ensemble of properties and processes that characterize individuals.

## 4.2 General Characteristics of Longing

The successful process of scale development and the evidence for stable structural characteristics of the underlying phenomenon made it possible to investigate theoretical

predictions regarding general characteristics of longing. These analyses are presented in the present section. The contents of longing are considered first, followed by analyses testing the higher-order factor structure of the six structural characteristics of longing. As detailed below, these latter analyses showed that the six structural characteristics could be subsumed under two higher-order factors, which were labeled Intensity/Scope and Utopia/Ambivalence. The third subsection addresses intercorrelations between all longing characteristics other than content. Given the small number of studies on longing, I also present descriptive results to provide basic information about the nature of people's longings and their associations with socio-demographic background characteristics and control variables.

#### 4.2.1 *The Nature of Longing Contents*

Although the concept of developmental tasks would suggest age-graded contents of longing, the lifespan developmental frame does not make predictions about the general, or age-independent prevalence of different content domains. Thus, the present section is more exploratory in nature. Results are presented for life domains of longing, the stability of longing contents across five weeks, and for additional longings endorsed under an anonymity instruction at the end of the study.

##### *Life Domains of Reported Longings*

To assess longing contents, participants rated on a six-point scale how much their three longings were related to each of 13 life domains (health, physical well-being, personal characteristics, religiosity, finances, work/education, leisure, living, partnership, family, friendships, societal values, and politics/world situation). For illustration, Table 20 lists examples of reported longings for each of the 13 life domains, one each for young, middle-aged, and old adults. Although the rating admitted participants to endorse multiple life domains for each of their longings, in most cases, one life domain appeared to be particularly salient in the longing descriptions. The examples in the table are based on an external coding by two independent raters (inter-rater agreement: Cohen's  $\kappa = .87$ ).

To assess the relative importance of life domains, a one-factor repeated-measures-ANOVA (factor: Domain with 13 measurements) was computed. Results indicated significant mean differences between the 13 life domains,  $F(12, 287) = 100.75, p = .001, \eta^2 = .81$ .

Table 20

*Longings in Different Life Domains: Examples From Young, Middle-Aged, and Old Adults*

<b>Life domains and age groups</b>	<b>Examples of longing</b>
<i>General Domain: Self</i>	
<i>1. Health</i>	
Young	To get rid of my colitis ulcerosa: No medication, no symptoms, no diet restrictions anymore
Middle-aged	Unrestricted coping ability/health: I suffer from the after-effects of a psychological illness. I wish I were able to cope with strains the way I was before the illness.
Old	Health and absence of pain so that I am able to do many things, such as long hikes
<i>2. Physical Well-Being</i>	
Young	To lose weight: I have been fat since I was a child. I wish I could go shopping for clothes and they would just fit.
Middle-aged	To be agile and flexible: Without it, I would be an unbearable person.
Old	To remain agile so that I can keep traveling, biking, and doing similar activities
<i>3. Personal Characteristics (Including Self-Image and Mental Well-Being)</i>	
Young	Self-acceptance: To be able to accept and love myself the way I am, including my shortcomings and weaknesses
Middle-aged	Freedom: To be independent and free from time restrictions as well as thoughts about progress, career, and success
Old	To feel other people still need me, not to be useless because of my age
<i>4. Religiosity<sup>a</sup></i>	
Young	To find God and myself. This is the most important thing in life.
Middle-aged	--
Old	To be able to believe as firmly as people in Andalusia do
<i>General Domain: Personal Context</i>	
<i>5. Finances (Including Financial Situation and Possessions)</i>	
Young	To have enough money to do whatever I want, without financial restrictions. For example, studying whatever and for as long as I like, seeing what I like, traveling and buying everything I like
Middle-aged	Money and financial independence: To stop having to think about work, earning money, etc.
Old	To maintain my standard of living until the end of my life
<i>6. Work/Education</i>	
Young	To get a Ph.D. title and become head of a company. To gain a high level of education, work very autonomously, and lead others
Middle-aged	To find a job: Without a job, there is no normal life, no social participation, no sense of self-worth
Old	To become an artist: I always wanted to be an artist, which was not possible due to circumstances of war and my "age"
<i>7. Leisure</i>	
Young	To travel the world for two years and just do what I like, only when I like it, instead of organizing everything with my calendar
Middle-aged	To write novels and earn my living from it
Old	Africa: I read many animal books about Africa and wanted to go there. I was there already, but the longing remains.

*(table continues)*

Table 20. (continued)

Life domains and age groups	Examples of longing
<i>8. Living (Including Living Situation and Location)</i>	
Young	Munich: It's a longing for the city where I was born, memories of friends, and the fact that I won't have the possibility to live there again in the near future
Middle-aged	The beach and nature: To live by the sea, feel the wind and fresh air, the silence, and the sound of the waves. This feels like home for me, like freedom and independence
Old	To go back to Italy. That's where I spent the best years of my life
<i>General Domain: Interpersonal Relationships</i>	
<i>9. Partnership</i>	
Young	A partner who will stay with me for the rest of my life, who makes me feel secure and sticks by me in good and in rough times
Middle-aged	Fulfilling sexuality: I want to have fun with my wife or other women I meet. I want to catch up on what I missed in my life in this regard.
Old	To get old together with my wife: Not to lose the partner I love, and not to have to leave her behind
<i>10. Family</i>	
Young	Having a child: My husband and I are partly infertile and are currently being treated in a fertility center
Middle-aged	A happy family: I lived in a divorced family during my youth. Am I able to live in a happy family?
Old	For my daughter who is ill, I just wish that she may have a healthy life
<i>11. Friendships</i>	
Young	Security: To live in a circle of people with whom I feel secure
Middle-aged	My friends with whom I have lost close contact after moving away
Old	A friend of mine who I always spent time with during college. Since then, we haven't seen each other because of her husband's jealousy.
<i>General Domain: Society</i>	
<i>12. Societal Values</i>	
Young	Perfection, final solutions, the luxury of quality, science, and art
Middle-aged	A just and sensible world of employment, no envy and malevolence between colleagues and superiors
Old	Social equality: From my childhood, I have been marked by social class differences and these have a revival today
<i>13. Politics/World Situation</i>	
Young	Peace: To stop injustice and destruction, poverty and hunger
Middle-aged	Peace: I fear that war (e.g., in Iraq) will affect my personal life
Old	Peace for everybody. I have experienced World War II with all its horror and I wish there would be no war anymore

*Note.* Examples are chosen to illustrate prototypical longings in the 13 life domains. Longing descriptions were assigned to their primary life domain by two independent raters.

<sup>a</sup>None of the middle-aged adults reported a longing in which religiosity was the primary theme.

Follow-up contrast analyses (Contrast type: Deviation) revealed above-average ratings for physical well-being,  $F(1, 298) = 280.13$ ,  $p = .001$ ,  $\eta^2 = .49$ ; health,  $F(1, 298) = 44.34$ ,  $p = .001$ ,  $\eta^2 = .13$ ; personal characteristics,  $F(1, 298) = 103.08$ ,  $p = .001$ ,  $\eta^2 = .22$ ; and the three social

domains of family,  $F(1, 298) = 113.17, p = .001, \eta^2 = .28$ ; partnership  $F(1, 298) = 50.74, p = .001, \eta^2 = .15$ , and friendship,  $F(1, 298) = 29.38, p = .001, \eta^2 = .09$ . Below-average ratings were obtained for work/education,  $F(1, 298) = 28.93, p = .001, \eta^2 = .09$ ; finances,  $F(1, 298) = 33.80, p = .001, \eta^2 = .10$ ; religiosity,  $F(1, 298) = 525.76, p = .001, \eta^2 = .64$ ; societal values;  $F(1, 298) = 8.98, p = .003, \eta^2 = .03$ ; and politics,  $F(1, 298) = 161.79, p = .001, \eta^2 = .35$ . Leisure and living-related longings did not significantly differ from the overall mean rating (both  $ps > .01$ ). Mean life domain ratings are shown in Figure 5.

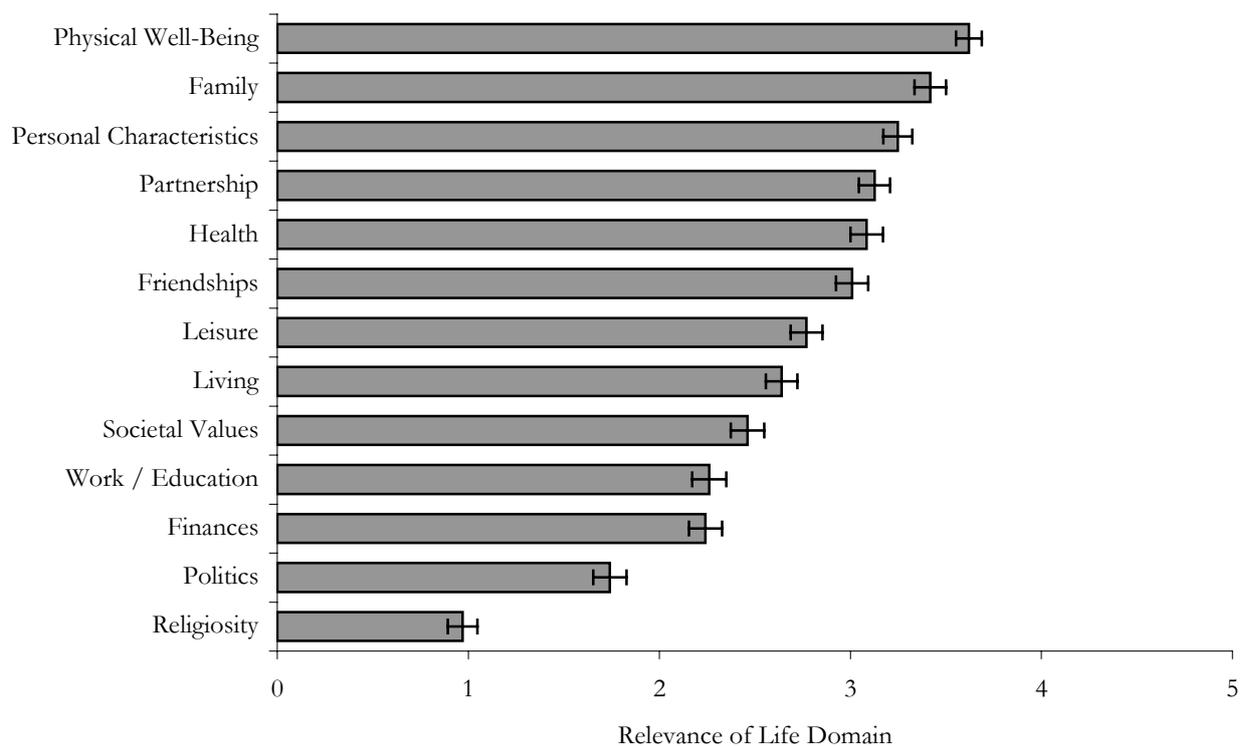


Figure 5. Life Domains of Longing Ordered According to Their Importance. Error bars represent standard errors. Life domains were rated independently of each other on a six-point scale (0 = *has nothing to do with it*; 5 = *has very much to do with it*).

*Sex and education differences.* Control analyses tested the relationship between the rating of life domains and background characteristics. According to a one-way multivariate ANOVA, no differences were evident in the life domains of longing between men and women ( $p > .01$ ). Life domains were also independent of education level (multivariate regression;  $p > .01$ ).

#### *Retest Stability of Longing Contents Over Five Weeks*

To assess the retest-stability of longing contents, participants were asked to generate their longings again after approximately five weeks. The newly generated longings were then compared with the initially generated longings. Longing contents were highly stable across five weeks.

Specifically, 85 % of participants re-generated their most important longing five weeks later, 75 % re-generated their second most important longing, and 72 % re-generated their third most important longing (see Table 21). All three longings were stable in 146 (51.6 %) participants, two out of three longings were stable in 89 (31.5 %) participants, one out of three longings was stable in 32 (11.3 %) participants, and none of the three longings were stable in only 15 (5.3 %) participants.

Table 21  
*Retest Stability of Freely Recalled Contents of Longing Across Five Weeks*

Ranking of Longing		Stable	Unstable	New Ranking				
				1	2	3	4-5	>5
Longing 1	<i>n</i>	240	42	134	43	27	10	11
	%	84.8	14.8	55.8	17.9	11.3	4.2	4.6
Longing 2	<i>n</i>	212	68	41	89	31	28	9
	%	75.4	24.2	19.3	42.0	14.6	13.2	4.2
Longing 3	<i>n</i>	196	74	31	47	61	26	17
	%	72.3	27.2	15.8	24.0	31.1	13.3	8.6

*Note.*  $N = 282$ . New rankings refer to the position that the original longings reported in Session 1 had in the list of longings reported in Session 3. Percentages of new rankings are based on the subsample of participants with stable longings.

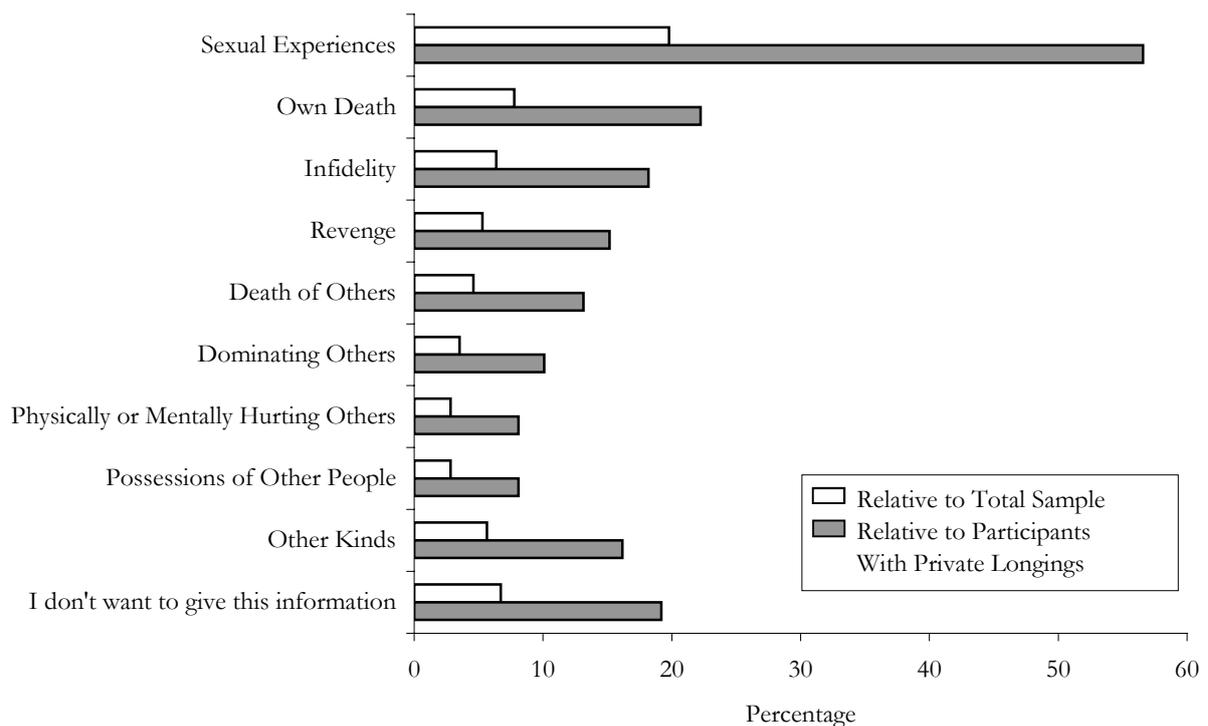
The retest procedure of this study also allowed for the assessment of the rank-order stability of longing contents within each participant's longing list (see right half of Table 21). Remember that the longing list contained all longings generated by a person, not only the three most important ones that had been rated on the questionnaire. Results indicated that out of the most important longings reported in the first session, 56 % were still on Rank 1 five weeks later, and 85 % were still among the three most important longings. The degree of rank-order stability declined somewhat for the second and third most important longings. Out of the second most important longings reported at the first session, 42 % were still on Rank 2, and 76 % were still among the three most important longings. Out of the third most important longings reported at the first session, 31 % kept their rank, and 71 % were still among the three most important longings. In sum, these findings indicate that the majority of longings were stable in content across five weeks and even remained among the top three longings of each participant.

According to a multivariate analysis of variance, stable and unstable longings did not differ with regard to longing characteristics including structural elaboration, salience, controllability, and function ( $p > .01$ ). There were also no sex differences, nor differences in age or education (all  $ps > .01$ ).

### *Frequency of More Private Longings*

The previous analyses pertained to the contents of longing that participants reported under normal instructions. Participants may have additional longings, however, that they were not willing to readily disclose, such as longings dealing with sexual or immoral experiences. These are called “more private”; they are likely to be associated with low social desirability and high personal intimacy.

To obtain a more comprehensive picture of the contents of persons’ longings, an anonymous follow-up checklist of more private longings was administered at the end of the final test session. One third (99 or 35 %) of participants indicated the presence of longings that they did not reveal during the course of the study because they found them too intimate. In comparison, 171 (60 %) participants answered in the negative, and 13 (5 %) participants left the checklist blank. The percentages of specific content categories are presented in Figure 6.



*Figure 6.* Longings Reported in Anonymous Follow-Up Checklist of More Private Longings

Percentages are shown for both the total sample and the subgroup of participants who indicated that they had private longings. Longings for sexual experiences were endorsed most frequently, followed by own death, infidelity, revenge, death of others, dominating others, possessions of others, and physically or mentally hurting others. Sixteen participants endorsed other kinds (e.g., winning the lottery or re-experiencing one’s childhood without sexual abuse),

and 19 participants did not want to reveal the nature of their more private longings. These findings suggest that a substantial number of participants had more longings than they disclosed under normal instructions.

#### 4.2.2 *Higher-Order Factor Structure of the Structural Characteristics of Longing*

According to the present conceptualization, longings have six structural characteristics. They combine a feeling of incompleteness, symbolic meanings, a personal utopia of life, ambivalent emotions, a tritime focus, and reflection. Empirically, this should be reflected in positive associations between the scales measuring these six characteristics. In addition, it was expected that the six characteristics load on one higher-order factor representing the structural elaboration of longings.

The analyses presented in the section on scale development (see Section 4.1.3) already showed that the six structural factors were positively intercorrelated, which supports the first prediction. Their higher-order structure was examined next. Although the hypothesis specified one second-order factor (Longing Elaboration), multiple second-order factors may be a better representation of the empirical data. Confirmatory factor analysis is limited in determining the appropriate number of second-order factors, because addition of second-order factors will naturally result in a higher amount of explained variance, which will be reflected in overall fit statistics.

As an additional piece of information, an exploratory factor analysis (principal-component-method) was conducted with the six structural scales (scale scores were built by unit-weighted aggregation of their defining items). Two factors exceeded the eigenvalue-criterion of 1.0, accounting for 44.4 % and 17.0 % of the variance. A promax rotation was performed, producing an oblique rotation with factors correlating .33. Incompleteness, Symbolic Nature, Tritime Focus, and Reflection loaded highly on Factor 1 (loadings ranged from .66 to .79), whereas Personal Utopia and Ambivalent Emotions loaded highly on Factor 2 (loadings were .89 and .79, respectively). Absolute cross-loadings on the other factor did not exceed .29.

Next, a series of confirmatory factor analyses was conducted to compare three alternative models representing the structural scales. Model 1, the *First-Order Factor Model*, contained six intercorrelated first-order factors (one factor for each of the six subscales) and served as the baseline model. In Model 2, the originally hypothesized model, one second-order factor was assumed to account for the variance of the six first-order factors (*General Second-Order Factor Model*). Model 3 included two second-order factors identified in the exploratory factor analysis (*Two Second-Order Factor Model*). The two factors were allowed to correlate. In Models 2 and 3, one loading was set to equal 1.0 for each first-order factor, as was the variance of the second-order

factor(s). In addition, residual factors were specified for each of the first-order factors. Fit statistics for the three models are presented in Table 22.

Table 22  
*Fit Statistics and Model Comparison for Three Alternative Models of the Structural Scales*

Models	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA (90 % CI)	CFI	$\Delta \chi^2$	$\Delta df$	<i>p</i>
Model 1: First-order factor model	329.42	137	.001*	.07 (.06, .08)	.91	--	--	--
Model 2: General second-order factor model	377.54	146	.001*	.07 (.06, .08)	.89	48.12	9	.001*
Model 3: Two second-order factor model	346.21	145	.001*	.07 (.06, .08)	.90	16.79	8	.03*

*Note.*  $N = 299$ . CI = confidence interval. Model 1 served as the reference model for model comparisons. \*  $p < .05$ .

For Models 1 and 3, fit indices were in the acceptable range, whereas in Model 2 the CFI (.89) was marginally below the acceptance threshold of .90. Both second-order factor models led to a significant reduction in fit compared to the first-order factor model, indicating that they are both poorer representations of the data than the baseline model. Nevertheless, the decrease in fit was clearly lower in Model 3 and only marginally exceeded the cut-off  $\Delta \chi^2$ -value of 15.51. It was thus concluded that two second-order factors best represent the interrelations between the six structural scales. This model is depicted in Figure 7 (for reasons of parsimony, residual variances for the first-order factors, as well as manifest indicators, are omitted). Second-order factor loadings were all significantly different from zero and ranged from .46 to .91 ( $M = .72$ ). Associated standard errors ranged from .06 to .09 ( $M = .08$ ) and communalities from .39 to .83 ( $M = .54$ ). The two factors were significantly correlated ( $r = .58$ ;  $SE = .07$ ;  $p = .001$ ) and accounted for 35 % and 20 % of the variance in the six first-order factors, respectively.

The first factor comprised the structural characteristics of incompleteness, reflection, tritime focus, and symbolic nature. Hence, longings high on this factor are characterized by intense feelings of a deficit and strong reflections about a large range of life domains, time periods, and symbolic meanings. Accordingly, this factor was labeled *Intensity and Scope* of longing. The second factor comprised the facets of personal utopia and ambivalent emotions. Longings high on this factor are perceived as utopian and unrealizable and are accompanied by bittersweet, ambivalent emotions. This factor was labeled *Utopia and Ambivalence*.

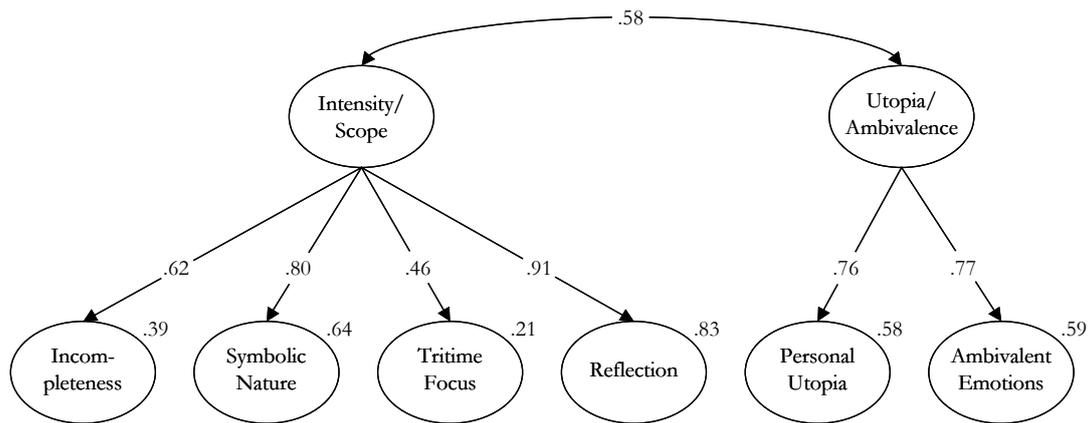


Figure 7. Higher-Order Structure of the Six Structural Characteristics of Longing  
Presented are second-order factor loadings and commonalities. For reasons of parsimony, indicators are omitted from the figure. For measurement models, see Figure 4. All parameter estimates are significantly different from zero at  $p < .05$

In brief, these findings suggest that the six proposed structural characteristics can be subsumed under two dimensions that describe two related, yet empirically distinct structural aspects of longing. In support of their empirical distinctness, the two structural dimensions (Intensity/Scope and Utopia/Ambivalence) had a differential pattern of correlations with the salience, control, and function of longing. Intercorrelations are presented in the next section.

#### 4.2.3 Intercorrelations Between Longing Characteristics Other Than Content

Figure 8 presents significant bivariate correlations between the different dimensions of longing. In these and all following analyses, the six structural characteristics of longing are represented by their two higher-order factors, Intensity/Scope and Utopia/Ambivalence (for individual correlations with the six structural characteristics, as well as nonsignificant correlations, see Appendix F).

##### *Correlations Within Each Part of the Longing Questionnaire*

The pattern of correlations within each part of the questionnaire mirrored the results of the confirmatory factor analyses (see Section 4.1.3). The two structural dimensions of longing, Intensity/Scope and Utopia/Ambivalence, were moderately positively related, indicating that if longings are intense and broad, they also tend to be utopian and emotionally ambivalent. The two dimensions of longing control were only slightly positively associated with each other, suggesting that the perceived ability to control the experience of longing is largely independent of the belief that longing can be fulfilled in real life. The two Longing Function scales were unrelated to each other, indicating that longing may fulfill two essentially independent functions: one of giving

direction for development and another one of compensating for lost or unrealizable developmental options on an imaginary level.

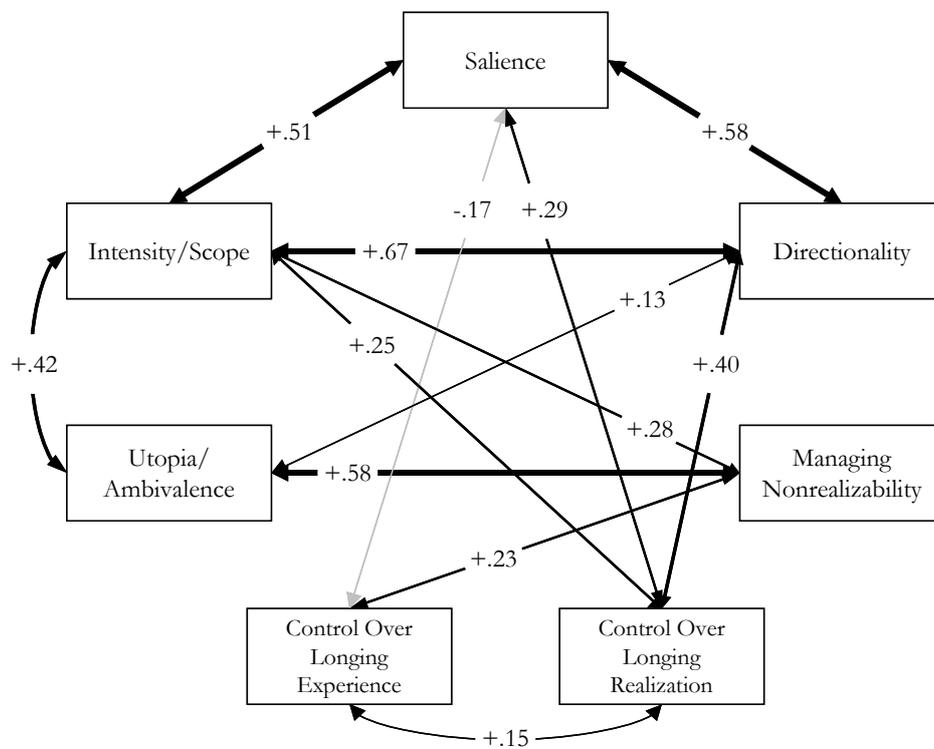


Figure 8. Bivariate Correlations Between Longing Characteristics

The six structural characteristics of longing are subsumed under their higher-order factors; Intensity/Scope: Incompleteness, Symbolic Nature, Tritime Focus, Reflection; Utopia/Ambivalence: Personal Utopia, Ambivalent Emotions. Black arrows indicate positive and grey arrows negative correlations. Nonsignificant correlations are omitted from the figure. The breadth of arrows designates the size of correlations. Correlations greater than  $\pm 0.15$  are significant at  $p < .01$ ; correlations greater than  $\pm 0.12$  are significant at  $p < .05$ .

#### Intercorrelations Between Parts of the Longing Questionnaire

The intercorrelations between the four parts of the Longing Questionnaire are also of importance. Because the structural facets of longing were proposed as central to the experience of longing, they were expected to relate positively to the salience (i.e., the frequency and ego-centrality) of longing. This hypothesis was only partly confirmed. As expected, highly salient longings were reported to be high in intensity and scope. Salience was, however, unrelated to the utopian and ambivalent quality of longings. This finding suggests that participants with highly salient longings did not necessarily perceive their longings as highly utopian and bittersweet, at least according to the current method of assessment.

The salience of longing was positively related to the perceived control over the realization of longing, suggesting that participants with frequent and central longings tend to feel more able

to actually fulfill them. In contrast, salience was negatively related to the perceived control over the experience of longing. That is, participants with more salient longings reported a lower ability to influence the beginning, course, and ending of their longing feelings. This negative correlation suggests that to some degree, a feeling of uncontrollability may be part of the experience of longing.

As a first support for the hypotheses regarding the regulatory role of longing, a number of positive associations were evident for the functions of longing with structural elaboration, salience, and control. Notably, the two functions of longing evinced differential patterns of association. A strong sense of directionality was reported for longings that were high in intensity and scope, highly salient, and coupled with a strong sense of control over their realization. In contrast, the regulation of losses and unattainable aims was rated higher when longings had a utopian and ambivalent quality and were coupled with a strong sense of control over their experience. A small association was also evident for the latter function and the intensity and scope of longing, but it was markedly lower than for the directionality function (Fisher's  $z = 5.96$ ,  $p = .001$ ). No relationships were found for the directionality function with Utopia/Ambivalence and control over the experience of longing. There were also no associations of the managing nonrealizability function with the salience and control over the realization of longing. All found associations were in line with predictions, although not all proposed associations were supported. Instead, it appears that the two functions of longing are differentially related to the structural elaboration, salience, and control of longing. Further analyses are presented below (see Section 4.4.1).

#### *Intercorrelations Between Longing Dimensions and Additional Longing Subscales and Items*

For a better understanding of the longing dimensions, this section describes intercorrelations between these subscales and additional subscales and items from the Longing Questionnaire (i.e., positive and negative longing-accompanying emotions, past, present, and future foci, attainability, and number of life domains). Associations were meaningful and supported the interpretation of the two higher-order structural factors, as well as their empirical distinctness (for a complete listing of correlations, see Appendix F).

The two structural facets (Intensity/Scope and Utopia/Ambivalence) were associated with more negative longing-accompanying emotions;  $r = .46$  and  $.41$ , respectively; both  $ps = .001$ , but they were independent of the degree of positive longing-accompanying emotions. The intensity/scope of longing was positively associated with thoughts about the present,  $r = .48$ ,  $p = .001$ ; and the future,  $r = .41$ ,  $p = .001$ ; and unrelated to thoughts about the past. In contrast, the utopian and ambivalent nature of longing was positively associated with thoughts about the

past,  $r = .22$ ,  $p = .001$ ; and unrelated to thoughts about the present and future. Highly utopian and emotionally ambivalent longings were described as less attainable,  $r = -.25$ ,  $p = .001$ ; which is consistent with the notion that utopian longings are unattainable in objective reality. Both structural facets, particularly Intensity/Scope, were positively associated with the number of life domains of longings,  $r = .43$  for Intensity/Scope;  $r = .17$  for Utopia/Ambivalence; both  $ps = .001$ . This supports the interpretation that Intensity/Scope represents the broadness of longings as indicated by their extension across multiple domains of life. The pattern of correlations for Salience was very similar to the one for Intensity/Scope, consistent with the earlier finding that the two characteristics are highly correlated (see Appendix F).

Participants with more controllable longings reported higher levels of positive longing-accompanying emotions,  $r = .28$  for Control Over Longing Experience;  $r = .40$  for Control Over Longing Realization; both  $ps = .001$ . Beliefs about one's ability to realize longings were positively associated with the perceived attainability of longings,  $r = .69$ ,  $p = .001$ . The two functions of longing were also positively correlated with positive longing-accompanying emotions,  $r = .22$  for Directionality;  $r = .17$  for Managing Nonrealizability; although Directionality was also positively related to negative longing-accompanying emotions,  $r = .19$ ; all  $ps \leq .004$ ; The two functions were differentially related to the three time foci. Thoughts about present and future were more pronounced in participants who reported a stronger sense of directionality,  $r = .46$  and  $.37$ ; both  $ps = .001$ . In contrast, thoughts about the past were more pronounced in participants who reported that their longings helped them to regulate lost or unrealizable life options,  $r = .32$ ; whereas thoughts about the present and future were less pronounced,  $r = -.16$  and  $-.26$ ; all  $ps \leq .008$ . In addition, the directionality function was higher in more attainable longings,  $r = .32$ ; whereas the managing nonrealizability function was higher in less attainable longings;  $r = -.26$ ; both  $ps = .001$ . Both functions were positively related to the number of life domains that were part of longings,  $r = .43$  for Directionality;  $r = .15$  for Managing Nonrealizability; both  $ps \leq .008$ .

#### ***4.2.4 Associations of Longing Characteristics Other Than Content With Socio-Demographic Background Characteristics and Control Variables***

For descriptive purposes, this section summarizes the associations of the main longing characteristics with socio-demographic background characteristics (except age which is presented in Section 4.3.2), socially desirable responding, as well as general emotion regulation and self-efficacy. A multivariate one-way ANOVA was computed to test the effect of sex, and multivariate regression analyses were computed to test the effects of the remaining variables.

On a multivariate level, men and women did not differ with regard to the main longing characteristics ( $p > .01$ ). Education was also independent of the seven longing characteristics

( $p > .01$ ). Therefore, no follow-up analyses were performed. Significant multivariate effects were obtained for socially desirable responding,  $F(7, 263) = 4.88, p = .001, \eta^2 = .12$ ; general emotion regulation,  $F(7, 277) = 16.07, p = .001, \eta^2 = .29$ ; and general self-efficacy,  $F(7, 277) = 6.84, p = .001, \eta^2 = .15$ . Follow-up correlational analyses revealed that socially desirable responding was positively related to a sense of control over the longing experience,  $r = .28, p = .001$ . General emotion regulation and general self-efficacy were both moderately positively related to the two longing control dimensions; general emotion regulation with control over longing experience,  $r = .46$ ; with control over longing realization,  $r = .17$ ; general self-efficacy with control over longing experience,  $r = .28$ ; with control over longing realization,  $r = .28$ ; all  $ps \leq .005$ . These positive associations were to be expected because all four scales measured control beliefs, either from a domain-general perspective, or for the specific domain of longing. Finally, a negative association emerged between general emotion regulation and the intensity and scope of longings,  $r = -.17, p = .001$ . This relation parallels the negative association found between Intensity/Scope and control over the longing experience (see Section 4.2.3) and suggests that a certain degree of uncontrollability may be part of the experience of longing.

#### 4.2.5 *Summary of Findings on General Characteristics of Longing*

The present section presented general, or age-independent, findings about the nature of longing in adulthood. It was shown that longing contents span manifold domains of life. Most frequently, adults reported longings pertaining to physical well-being and health, social relationships (e.g., family and partnership), and personal characteristics. For example, many participants in this study reported longings for a perfectly functioning body, ideal partnerships or conditions of family life, as well as longings for ideal ways of being and feeling about oneself and one's life. Longing also quite frequently targeted other life domains, including leisure activities (e.g., traveling the world) and living conditions (e.g., having the house of one's dreams). Work (e.g., pursuing a long-desired occupation), finances (e.g., a life without financial restrictions), politics and societal values (e.g., world peace), and religiosity (e.g. to firmly believe in god) were among the less frequent life domains of longing. The contents of longing were highly stable over a time interval of five weeks, thus ruling out the possibility that the longings assessed in this study were spontaneous, short-term desires.

An anonymous follow-up checklist of more private (i.e., more intimate and socially undesirable) longings indicated that one third of the sample had additional longings that they found too intimate to reveal under normal instructions. Most often, these longings targeted sexual experiences, infidelity, and one's own death.

Longing characteristics other than content were also investigated. Drawing on humanist and common-sense views, as well as lifespan theoretical notions, the present conceptualization specified a priori six structural characteristics of longing: a feeling of incompleteness, symbolic nature, personal utopia, ambivalent emotions, tritime focus, and reflection. These six characteristics could be identified as factor components that were positively interrelated. At a higher level of aggregation, they could be subsumed under two higher-order factors without a major loss in the variance accounted for (i.e., the difference in fit between the First-order Factor Model and the Two Second-order Factor Model was reasonably small). These two factors were labeled *Intensity/Scope* (comprising incompleteness, symbolic nature, tritime focus, and reflection) and *Utopia/Ambivalence* (comprising personal utopia and ambivalent emotions). *Intensity/Scope* represents the extent to which longing is accompanied by intense feelings of a deficit and strong reflections about a large range of life domains, time periods, and symbolic meanings. *Utopia/Ambivalence* represents the extent to which longing is perceived as utopian and unrealizable and is accompanied by ambivalent, bittersweet emotions.

The two structural factors (*Intensity/Scope* and *Utopia/Ambivalence*) were positively correlated, yet they had differential relationships with the remaining longing characteristics. Only *Intensity/Scope* was positively related to the salience of longing, control over the realization of longing, and the directionality function of longing. *Utopia/Ambivalence* was more strongly related to the managing nonrealizability function of longing. Correlations with additional scales and items of the Longing Questionnaire further supported the interpretation of the two structural factors: *Intensity/Scope* was associated with the number of life domains associated with longing, and *Utopia/Ambivalence* was associated with low attainability. Finally, the two structural factors were differentially related to the time foci of longings. Participants with highly intense and broad longings were more concerned with the present and future, whereas participants with highly unrealizable and ambivalent longings were more concerned with the past.

A low correlation between the two longing control dimensions suggested that the perceived ability to regulate the experience of longing is largely independent of the perceived ability to realize longing in actual life. Similarly, a nonsignificant correlation between the two functions of longing suggested that longing may fulfill two independent functions: one of giving direction for future development and one of helping manage lost and unrealizable developmental options. Both control dimensions and both functions of longing were associated with positive longing-accompanying emotions, indicating that these characteristics represent positive aspects of longing.

Finally, no associations were found between longing characteristics and background variables (sex and education level). Longing characteristics were also largely independent of the

tendency for socially desirable responding, with one exception. Persons who tended to respond in a socially desirable manner reported somewhat higher control over the experience of their longings. Moderate positive correlations were also obtained for the two dimensions of longing control with domain-general emotion regulation and self-efficacy. These correlations are consistent with the conceptual overlap between these four scales, as they all measure different aspects of control beliefs.

### 4.3 Age-Related Differences in Longing

This section addresses hypotheses about age-related differences in different longing characteristics. Results regarding contents of longing are described first, followed by results regarding the structural elaboration, salience, control, and function of longing. As described in the first subsection, longing contents differed considerably between age groups, mostly in accordance with hypotheses. As described in the second subsection, expected age-related differences were also found for longing-specific control beliefs and for the managing nonrealizability function of longing, but not for the directionality function of longing. The structural elaboration and salience of longing demonstrated stability across age groups.

#### 4.3.1 *Age-Related Differences in the Contents of Longing*

Across adulthood, individuals confront changing developmental tasks and themes. These should be reflected in the life domains of longing. Compared with other age groups, I had predicted that longings of young adults are more strongly related to partnership, self-development, and education/work, that longings of middle-aged adults are more strongly related to work, family, and partnership, and that longings of old adults are more strongly related to health, family, and politics/society. To test these predictions, linear and quadratic age trends were computed for each of the 13 life domain ratings. Figure 9 shows mean life domain ratings for young, middle-aged, and old adults.

Linear age trends were tested by correlational analyses. Consistent with predictions, significant age-related increases were obtained for health,  $r = .29$ ; family,  $r = .14$ ; and politics,  $r = .30$ ; all  $ps \leq .007$ . Significant age-related decreases were found for work/education,  $r = -.26$ ,  $p = .001$ ; and personal characteristics,  $r = -.12$ ,  $p = .02$ . No linear age trends were evident in the domains of physical well-being, finances, religiosity, leisure, living, partnership, friendships, and societal values.

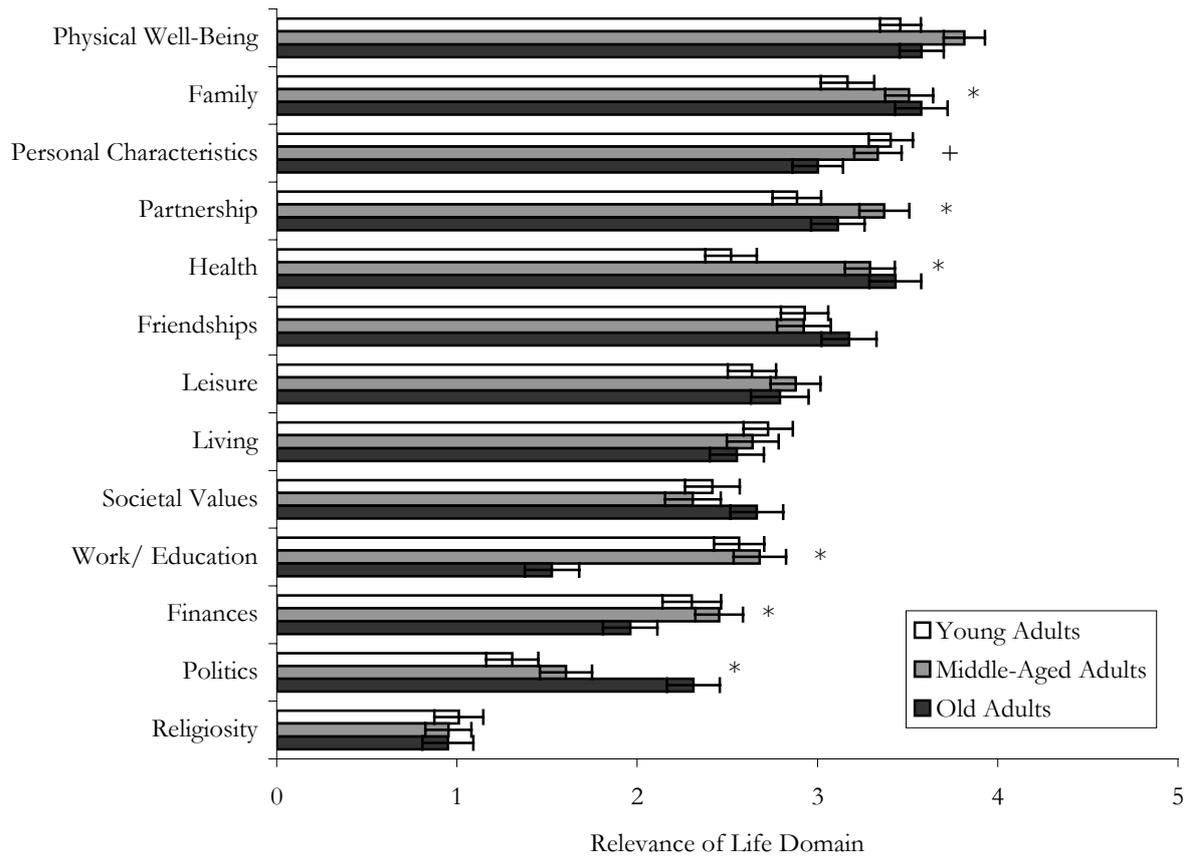


Figure 9. Life Domains of Longings Reported by Young, Middle-Aged, and Old Adults  
 Error bars represent standard errors. Life domains were rated independently of each other on a six-point scale (0 = *has nothing to do with it*; 5 = *has very much to do with it*).  
 \*  $p < .01$ , +  $p < .05$  (linear or quadratic age trends).

The next set of analyses tested the possibility of quadratic age trends. Each of the 13 life domains was regressed on age at Step 1, followed by the square of age at Step 2. The square-term of age significantly added predictive power for the partnership domain,  $b_0 = .05$ ,  $p = .37$ ;  $b_1 = -.20$ ,  $p = .001$ ;  $\Delta R^2 = .04$ ,  $\Delta F = 11.88$ ,  $p = .001$ . Longings were most strongly related to partnership in middle-aged adults, and less so in young and old adults. Additional quadratic age trends were obtained for the domains of finances,  $b_0 = -.08$ ,  $p = .16$ ;  $b_1 = -.19$ ,  $p = .001$ ;  $\Delta R^2 = .04$ ,  $\Delta F = 11.23$ ,  $p = .001$ ; and work/education,  $b_0 = -.27$ ,  $p = .001$ ;  $b_1 = -.23$ ,  $p = .001$ ;  $\Delta R^2 = .05$ ,  $\Delta F = 17.08$ ,  $p = .001$ . The beta-weights indicate that longings were most related to finances in middle-aged adults, and less so in young and old adults. Work/education was part of the longings of young and middle-aged adults and much less relevant in the longings of old adults. Almost all significant age effects remained stable (all  $F$ s  $> 11.42$ ; all  $p$ s  $< .01$ ) when controlling for sex and education. The age effects for the domains of family and personal

characteristics were slightly lowered, but still reached the level of statistical trends (both  $F_s > 5.09$ ; both  $p_s < .05$ ).

Most of these age trends were in accordance with hypotheses. In comparison to other age groups, health, family, and politics/world situation were more important for older adults, personal characteristics were more important for young adults, and work/education was more important for both young and middle-aged adults. Mixed results were obtained for partnership, which was highly relevant to middle-aged adults (as predicted), but not to young adults (contrary to hypotheses). In addition, there was a peak of finances-related longings in middle-aged adults.

#### ***4.3.2 Age-Related Differences in Longing Characteristics Other Than Content***

Longing characteristics likely reflect the changing developmental contexts and challenges individuals are confronted with as they grow older. Based on the lifespan psychological literature, positive age trends were predicted for the perceived ability to regulate the experience of longing and for the managing nonrealizability function. Negative age trends were expected for the perceived ability to realize longing in actual life and for the directionality function. Age-related stability was predicted for the structural elaboration and salience of longing. Correlational and regression analyses were performed to examine the age patterning of the various longing dimensions.

##### *Main Longing Characteristics*

Table 23 contains age correlations for the Structural Elaboration, Salience, Longing Control, and Longing Function scales. The two structural facets, Intensity/Scope and Utopia/Ambivalence, were both unrelated to age. Follow-up analyses with the lower-order structural factors indicated that Incompleteness was negatively correlated with age. In older adults, longings were less strongly associated with a feeling of incompleteness of life than in younger adults, although the effect was small. Overall, results confirmed the predicted mean-level stability of the structural elaboration of longing across adulthood. The salience of longing was also unrelated to chronological age, which supports the prediction. Young, middle-aged, and old adults described their longings as equally frequent, intense, enduring, and central to themselves.

Predictions were also confirmed for the two facets of longing control. Both control dimensions were correlated with age, although in a differential way. The perceived ability to control the experience of longing increased with age, whereas the perceived ability to fulfill longing decreased with age. Thus, compared to younger adults, older adults felt more able to regulate their experience of longing, but less able to actually fulfill their longings. Only one of the two proposed functions of longing was associated with age. As expected, older adults reported

somewhat more than younger adults that their longings helped them manage losses and unrealizable life goals. In contrast, the predicted negative association of directionality with age could not be confirmed. Thus, longings can give direction for future development in all age periods.

Table 23  
*Bivariate Correlations Between Longing Characteristics and Age*

Longing characteristics	Associations with age
	<i>r</i> ( <i>p</i> )
<i>Intensity/Scope</i>	-.09 (.14)
Incompleteness	-.17 (.003)*
Symbolic Nature	.01 (.91)
Tritime Focus	-.01 (.88)
Reflection	-.06 (.32)
<i>Utopia/Ambivalence</i>	.04 (.51)
Personal Utopia	.10 (.07)
Ambivalent Emotions	-.04 (.53)
<i>Saliency</i>	-.03 (.63)
<i>Control Over Longing Experience</i>	.22 (.001)*
<i>Control Over Longing Realization</i>	-.16 (.002)*
<i>Directionality</i>	-.02 (.37)
<i>Managing Nonrealizability</i>	.14 (.009)*

*Note.*  $N = 299$ . Significance tests were one-tailed for directed hypotheses and two-tailed for stability hypotheses.

\*  $p < .01$ ; +  $p < .05$ .

*Controlling for sex and education.* Most age associations remained stable after controlling for sex and education, all  $\Delta F$ s  $> 6.58$ ; all  $p$ s  $< .01$ . The only exception was Managing Nonrealizability, for which the age correlation was somewhat lowered,  $r = .14$ ;  $\Delta F = 5.21$ ;  $p = .01$ .

*Exploring quadratic trends.* To explore the possibility that middle-aged adults scored highest or lowest on any of the longing dimensions, follow-up analyses tested quadratic trends. Hierarchical regression analyses were performed for each of the longing subscales, with age entered at the first step and the square of age at the second step. No quadratic age trends were found, all  $\Delta F$ s  $< 6.10$ ; all  $p$ s  $> .01$ .

#### *Additional Scales and Items of the Longing Questionnaire*

To obtain a more detailed picture of age-related differences in the composition of emotions and temporal foci associated with longing, follow-up analyses considered the separate

ratings of positive and negative longing-accompanying emotions as well as past, present, and future foci. Correlational analyses indicated an increase in positive emotions,  $r = .24$ ; and a decrease in negative emotions with age,  $r = -.29$ ; both  $ps = .001$ . Thus, it appears that while longing is emotionally ambivalent in *all* age groups (no significant age correlation was found for Ambivalent Emotions), the composition of ambivalent emotions changes across adulthood towards a more favorable ratio of positive to negative emotions in older adults.

In addition, compared to younger adults, older adults reported a greater past focus,  $r = .23$ ; and a lesser future focus associated with longing,  $r = -.15$ ; both  $ps \leq .009$ ; whereas no age association was evident for the present focus. Correlations were also computed between age and the single item assessing the attainability of longings, and between age and the number of life domains of longings. No age differences were found, both  $ps > .01$ .

#### 4.3.3 *Summary of Findings on Age-Related Differences in Longing*

As detailed in the preceding section, longing appears to differ in several ways depending on the life phase of individuals. First, age-related differences were obtained for the content domains of longing, most of which were in accordance with hypotheses. As predicted, young adults reported that their longings concerned personal characteristics more than middle-aged and old adults, and work and education more than old adults. Unexpectedly, young adults did not report a higher relevance of the partnership domain than other age groups. Instead, partnership was rated as most relevant in the longings of middle-aged adults. In support of hypotheses, old adults' longings were more often related to health, family, and politics/world situation than longings of their younger counterparts. Longings pertaining to the financial situation peaked in middle-aged adults. Age explained 1 % to 9 % of the variance in life domain ratings.

Age-related changes were also evident in longing characteristics other than content. As predicted, older adults (compared to younger adults) felt better able to regulate the experience of their longing and less able to realize their longings in actual life. The positive age trend in the control over the experience of longing was mirrored by findings of more positive emotions and less negative emotions associated with longing in older age groups.

Only little evidence was found for the proposition that the self-regulation functions of longing would differ with age. The managing nonrealizability function of longing increased somewhat with age (as predicted), yet the directionality function remained stable across age groups (instead of the predicted age-associated decrease).

The structural elaboration of longing (represented by Intensity/Scope and Utopia/Ambivalence) and salience were stable across adulthood, which confirmed hypotheses. Follow-up analyses suggested that with increasing age, longings are less focused on the future and

more focused on the past. Finally, younger adults reported a stronger feeling of incompleteness of life associated with longing. Age effects, if present, amounted to 2 % to 8 % of the variance in longing characteristics.

#### 4.4 The Regulatory Function of Longing in Adult Development

The developmental model of longing outlined in Section 2.4.1 proposed that longing has a positive, regulatory function in adult development. The model distinguished proximal, specific and distal, general developmental consequences of longing. Proximally, longing may give direction for development and help manage losses and unattainable developmental options. Therefore, the first set of analyses examined whether the structural elaboration and control of longing would emerge as predictors for the two functions of longing. More distally, longing may contribute to subjective well-being as one possible indicator for successful development. The second set of analyses thus tested the predictive power of longing characteristics for subjective well-being.

Before presenting results, it is useful to highlight the limitations of the present data. The data are not only cross-sectional but also correlational in nature. Hence, they do not permit the kind of causal inferences that would permit conclusions about the role of longing in developmental regulation. The best one can do is to examine whether the correlational patterns obtained are consistent with theory-based predictions about causal linkages between longing characteristics and indicators of successful development.

##### 4.4.1 *Predicting the Function of Longing*

In the spirit of a first exploration, this section describes the analyses predicting the function of longing as a proximal, specific outcome of the structural elaboration and control of longing. I had hypothesized that if longing is highly elaborated, participants should perceive it as more functional in the sense that it helps them (re-)direct their lives and manage losses or unrealizable life paths. In addition, I had predicted that individuals with high control over their longing experience and/or its fulfillment should perceive their longings as more functional.

The pattern of correlations between longing characteristics presented in Section 4.2.3 suggested that the two functions of longing might be differentially related to the proposed predictors. This section follows up these findings to determine the magnitude and direction of simultaneous effects of the structural elaboration and control on the functionality of longing. Further, I tested the moderating effect of longing-specific control beliefs on the prediction of the directionality and managing nonrealizability functions of longing.

When interpreting the following analyses, it should be noted that during the process of scale development, a special effort had been made to avoid content overlap in the items of different scales (see Method section, Table 7). Therefore, the reported associations should not be due to artifacts in the measurement of constructs.

*Main Effects of the Structural Elaboration and Control of Longing on the Two Functions of Longing*

Multiple regression analyses were used to test the simultaneous (or main) effects of the structural elaboration of longing and a sense of control over longing on the two functions of longing. All four predictor variables were entered as a block. Separate regression analyses were performed for the two functions of longing. Table 24 contains results of regression analyses.

The magnitude and direction of effects closely mirrored the correlational findings. Directionality was most strongly predicted by the Intensity/Scope of longing. Thus, the more longings were accompanied by a feeling of incompleteness, reflection, as well as symbolic and temporal complexity, the more participants reported that their longings gave them direction for their lives. Directionality was also positively predicted by control beliefs regarding the realization of longing. The more participants felt able to work towards the fulfillment of their longings, the more they regarded them as a vision towards which they oriented their lives. Together, the predictors explained 53 % of the variance in Directionality.

Table 24

*Results of Multiple Regression Analyses Predicting the Two Functions of Longing: Main Effects*

Predictors	Directionality	Managing Nonrealizability
	$\beta$ ( $p$ )	$\beta$ ( $p$ )
Intensity/Scope	.66 (.001)*	.09 (.09)
Utopia/Ambivalence	-.12 (.01)+	.52 (.001)*
Control Over Longing Experience	-.07 (.09)	.20 (.001)*
Control Over Longing Realization	.23 (.001)*	-.07 (.17)
<i>Overall explained variance (R<sup>2</sup>)</i>	<i>.53 (.001)*</i>	<i>.38 (.001)*</i>

Note. \*  $p < .01$ ; +  $p < .05$ .

Differential predictive relationships were evident for the managing nonrealizability function. Here, Utopia/Ambivalence and Control Over Longing Experience were significant predictors. Participants, who reported that their longings were highly bittersweet and utopian and reported a strong sense of control over the experience of their longings, also regarded their longings more as an imaginary substitute for unattainable wishes. The positive bivariate correlation between Managing Nonrealizability and Intensity/Scope was no longer significant when the remaining longing characteristics were taken into account. The amount of explained

variance in Managing Nonrealizability was 38 %. Taken together, the structure and control of longing were found to be strong predictors of the two proposed functions of longing.

*Control analyses.* Control analyses tested the robustness of found associations after controlling for background characteristics (sex and education) and generalized control beliefs (general self-efficacy and general emotion regulation). In separate hierarchical regression analyses, each of the two sets of control variables was entered as a block, followed by the set of the four longing characteristics (see Appendix H for detailed results).

The net effect of background characteristics was nonsignificant, as was the net effect of general control beliefs (all  $R^2$ 's < .02; all  $p$ 's > .01). Controlling for background characteristics and general control beliefs did not change the effects (in terms of magnitude and direction) of the structural elaboration and control of longing on the two functions of longing in any substantial way.

#### *Interaction Effects of the Structural Elaboration and Control of Longing in Predicting the Two Functions of Longing*

The next hierarchical regression analyses tested whether the relationship between the structural elaboration and function of longing varied as a function of the sense of control over longing (interaction effects). I had expected that individuals who felt able to control their longing experience and to work towards the fulfillment of their longings would benefit more from the positive potential of highly elaborated longings. As a result, they should perceive their longings as more functional.

Separate analyses were performed for the two control dimensions. At the first step, the main effects of three predictors (Intensity/Scope, Utopia/Ambivalence, Control Over Longing Experience or Control Over Longing Realization) were entered as a block. At Step 2, the interactions of Intensity/Scope  $\times$  Control Over Longing Experience and Utopia/Ambivalence  $\times$  Control Over Longing Experience (first analysis) or Intensity/Scope  $\times$  Control Over Longing Realization and Utopia/Ambivalence  $\times$  Control Over Longing Realization (second analysis) were added. Following recommendations by Aiken and West (1991), scores for all variables were  $z$ -standardized prior to building interaction terms and conducting the analyses. This procedure reduces problems of multi-collinearity among predictor variables when computing interaction terms and allows the adequate interpretation of regression weights. Results are presented in Table 25.

Overall, addition of interactions with control over the longing experience added some prediction beyond main effects for Directionality (upper-left part of Table 25), and addition of interactions with control over longing realization added some prediction beyond main effects for Managing Nonrealizability (lower-right part of Table 25; both were statistical trends). Only one

individual interaction effect was in line with predictions, however, and is plotted in Figure 10. Specifically, control over the longing experience moderated the relationship between the Intensity/Scope and Directionality. As indicated by the slope, the relationship between these two variables was stronger in persons with higher control over their longing experience as compared to persons with lower control. There was another statistical trend for the Intensity/Scope × Control Over Longing Realization interaction effect on Managing Nonrealizability. Yet, this trend was contrary to hypotheses and is therefore not further considered.

Table 25

*Results of Multiple Regression Analyses Predicting the Two Functions of Longing: Moderating Effect of Longing Control*

Predictors	Directionality		Managing Nonrealizability	
	<i>B</i> ( <i>p</i> )	$\Delta R^2$ ( <i>p</i> )	<i>B</i> ( <i>p</i> )	$\Delta R^2$ ( <i>p</i> )
<i>Moderating Effect of Control Over Longing Experience</i>				
<i>Step 1</i>		.48 (.001)*		.38 (.001)*
Intensity/Scope (IS)	.75 (.001)*		.07 (.21)	
Utopia/Ambivalence (UA)	-.19 (.001)*		.54 (.001)*	
Control Over Longing Experience (CE)	-.03 (.55)		.19 (.001)*	
<i>Step 2</i>		.01 (.02)+		.00 (.88)
IS × CE	.14 (.005)*		.02 (.77)	
UA × CE	-.08 (.10)		.01 (.82)	
<i>Overall explained variance (R<sup>2</sup>)</i>		.49 (.001)*		.38 (.001)*
<i>Moderating Effect of Control Over Longing Realization</i>				
<i>Step 1</i>		.52 (.001)*		.34 (.001)*
Intensity/Scope (IS)	.68 (.001)*		.08 (.15)	
Utopia/Ambivalence (UA)	-.13 (.006)*		.55 (.001)*	
Control Over Longing Realization (CR)	.22 (.001)*		-.03 (.55)	
<i>Step 2</i>		.01 (.08)		.01 (.04)+
IS × CR	.05 (.20)		.09 (.04)+	
UA × CR	-.09 (.03)+		.03 (.49)	
<i>Overall explained variance (R<sup>2</sup>)</i>		.53 (.001)*		.36 (.001)*

*Note.* Three outliers were deleted prior to analysis. Following recommendations by Aiken & West (1991), unstandardized regression weights are reported.

\*  $p < .01$ ; +  $p < .05$ .

In sum, the present analyses provided initial support for the first part of the model linking longing with proximal, specific developmental consequences. Persons who reported highly intense and broad longings and felt able to work towards their realization reported a stronger sense of directionality deriving from their longings. Persons who reported more utopian and bittersweet longings and felt able to regulate their occurrence and experience reported that they

experienced their longings more as a compensatory mean to deal with lost or unrealizable developmental options.

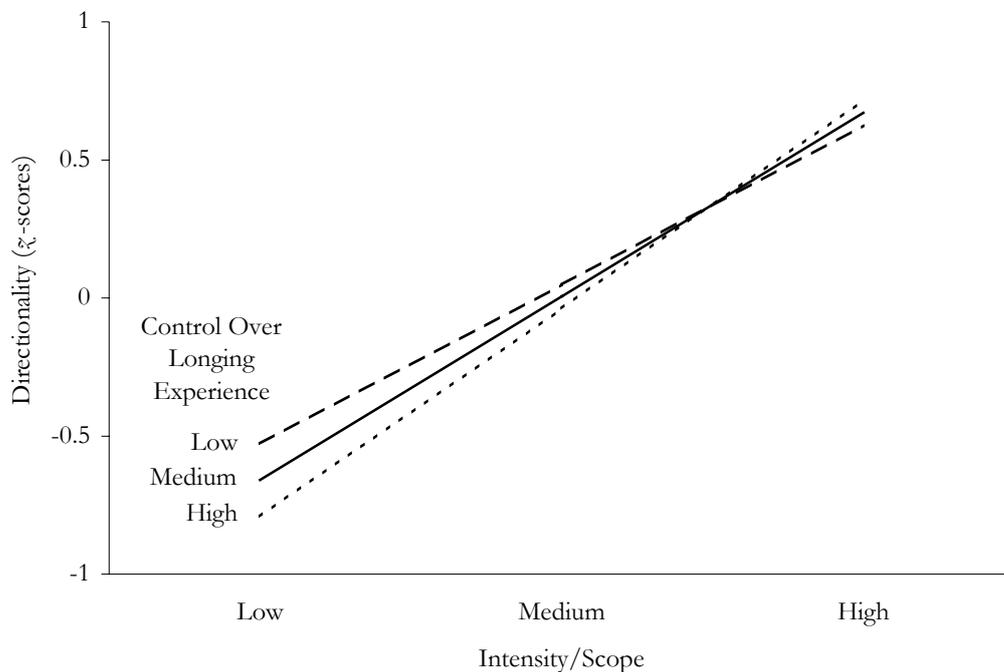


Figure 10. Moderating Effect of Control Over Longing Experience on the Relationship Between the Intensity/Scope of Longing and the Directionality Function of Longing

#### 4.4.2 Predicting Subjective Well-Being

Whereas the two functions of longing were conceptualized as proximal, specific criteria for the regulatory role of longing, overall subjective well-being served as a distal, general criterion. I had predicted that participants with more elaborated longings and with a stronger sense of control over longing would score higher on subjective well-being. In addition, a high functionality of longing should also contribute to overall subjective well-being (see Figure 2 in Section 2.4.1) for the theoretical model of the regulatory role of longing). Two facets of subjective well-being were included: an index of positive affect and life satisfaction (subsequently labeled Happiness) and an index of positive psychological functioning proposed by Ryff (1989), comprising autonomy of thought, environmental mastery, positive social relationships, self-acceptance, life purpose, and personal growth. The first analyses tested main effects of the six predictors, followed by hierarchical regression analyses examining moderating effects of longing-specific control beliefs and age.

### Main Effects of Longing Characteristics on Subjective Well-Being

*Bivariate associations.* Table 26 presents bivariate correlations between the six longing dimensions and the two indices of subjective well-being. Unexpectedly, the structural elaboration of longings (Intensity/Scope, Utopia/Ambivalence) was negatively associated with both measures of subjective well-being. Thus, highly elaborated longings were reported by people who tended to be dissatisfied with life, experienced little positive affect, and exhibited low levels of psychological functioning as defined by Ryff (1989). Correlations between the two dimensions of longing control and subjective well-being were positive and thus supported predictions. In persons who believe that they can regulate their experience of longing well and work successfully toward its fulfillment, subjective well-being is higher. Finally, the functionality of longing (Directionality and Managing Nonrealizability) was unrelated to happiness and positive psychological functioning, which is in contrast to hypotheses.

*Simultaneous effects.* Next, all six longing dimensions were entered into multiple regression equations separately predicting happiness and positive psychological functioning. Given that several longing subscales were substantially interrelated (see Section 4.2.3), the magnitude of their simultaneous effects on subjective well-being may be somewhat different than zero-order correlations would suggest.<sup>14</sup>

Table 26  
*Bivariate Correlations and Results of Multiple Regression Analyses Predicting Two Facets of Subjective Well-Being*

Longing Characteristics	Happiness		Positive Psychological Functioning	
	<i>r</i> ( <i>p</i> )	$\beta$ ( <i>p</i> )	<i>r</i> ( <i>p</i> )	$\beta$ ( <i>p</i> )
Intensity/Scope	-.29 (.001)*	-.46 (.001)*	-.18 (.002)*	-.20 (.02)+
Utopia/Ambivalence	-.18 (.002)*	-.12 (.10)	-.26 (.001)*	-.19 (.02)+
Control Over Longing Experience	.31 (.001)*	.26 (.001)*	.16 (.006)*	.15 (.01)+
Control Over Longing Realization	.14 (.02)+	.14 (.03)+	.22 (.001)*	.19 (.003)*
Directionality	-.05 (.37)	.22 (.006)*	.02 (.75)	.10 (.25)
Managing Nonrealizability	.02 (.71)	.15 (.03)+	-.12 (.04)+	-.01 (.95)
<i>Overall explained variance (R<sup>2</sup>)</i>		.24 (.001)*		.15 (.001)*

Note. *N* = 287 for bivariate correlations; *N* = 284 for regression analyses.

\* *p* < .01; + *p* < .05.

As seen in Table 26, the magnitude and direction of simultaneous effects mirrored bivariate correlations, with two exceptions. First, the negative associations between Intensity/Scope and the two indicators of well-being were somewhat stronger, and the negative

<sup>14</sup> In both analyses, three cases were identified through Mahalanobis distance as multivariate outliers with *p* < .001. In these and all following regression analyses in this section, these cases were deleted, leaving 284 cases for analyses.

associations between Utopia/Ambivalence and the two indicators of well-being were no longer significant. These findings suggest that overall subjective well-being was more strongly related to the intensity and scope of longings than to their utopian and ambivalent quality.

Second, whereas the bivariate correlations between the two functions of longing and happiness were nonsignificant, Directionality and Managing Nonrealizability emerged as positive predictors for happiness in the multiple regression analysis (although the regression weight for Managing Nonrealizability did not reach the strict significance criterion of  $p < .01$ ). To better understand this change in the direction of associations, I computed semipartial correlations of the two longing functions with happiness and positive psychological functioning while controlling for shared variance with only one other competing longing characteristic (see Table 27).

*Semipartial correlations between functions of longing and subjective well-being.* When partialling out the variance shared with the intensity and scope of longing, the *directionality* function of longing was positively associated with both facets of subjective well-being ( $sr = .19$ ,  $p = .001$  for both outcomes). Remember that the intensity and scope of longing emerged as a negative correlate of subjective well-being and that the directionality function was found to be highly associated with the Intensity/Scope factor. Hence, one could speculate that the directionality function has a positive direct effect on subjective well-being, but that this positive effect is confounded with the negative effect of the intensity and scope of longing on well-being. This would explain the nonsignificant zero-order correlation.

Table 27

*Semipartial Correlations of the Two Functions of Longing With Subjective Well-Being After Controlling for Shared Variance With Other Longing Characteristics*

Variables separately controlled for	Association with Happiness		Association with Positive Psychological Functioning	
	Directionality <i>sr</i> ( <i>p</i> )	Managing Nonrealizability <i>sr</i> ( <i>p</i> )	Directionality <i>sr</i> ( <i>p</i> )	Managing Nonrealizability <i>sr</i> ( <i>p</i> )
Intensity/Scope	.19 (.001)*	.11 (.05)	.19 (.001)*	-.08 (.20)
Utopia/Ambivalence	-.03 (.63)	.15 (.008)*	.06 (.33)	.03 (.57)
Control Over Longing Experience	-.03 (.59)	-.06 (.33)	.03 (.60)	-.17 (.004)*
Control Over Longing Realization	-.12 (.04)+	.03 (.60)	-.08 (.18)	-.11 (.06)

Note.  $N = 284$ .

\*  $p < .01$ ; +  $p < .05$ .

A similar pattern was found for the relationship of the *managing nonrealizability* function with happiness when considering its shared variance with the utopian and emotional ambivalent

nature of longings. When controlling for Utopia/Ambivalence (which is negatively associated with subjective well-being), the managing nonrealizability function positively predicted happiness ( $r = .15, p = .008$ ). A different picture emerged for positive psychological functioning (e.g., autonomy of thinking, positive social relationships, environmental mastery, and self-acceptance). No positive associations were found. This facet of overall well-being was even negatively associated with the managing nonrealizability function of longing when partialling out variance due to the perceived ability to control longing experiences ( $r = -.17, p = .004$ ). This result is inconsistent with the argument that using longing as compensation strategy for dealing with unrealizable life options contributes to psychological functioning.

In sum, these analyses suggest that certain characteristics of people's longings may explain interindividual differences in life satisfaction and psychological functioning. The set of longing characteristics accounted for 24 % and 15 % of the variance in happiness and positive psychological functioning, respectively.

*Exploring quadratic trends.* To explore the possibility that an intermediate level of longing elaboration, control, or function is most beneficial for subjective well-being, follow-up analyses tested quadratic trends. Regression analyses were performed with the six main effects entered first, followed by the square of the six predictors. Overall, the addition of quadratic terms did not add significant predictive power for happiness or positive psychological functioning (both  $ps > .05$ ), thereby ruling out the possibility of quadratic relationships between the longing dimensions and subjective well-being.

*Control analyses.* Control analyses tested the robustness of found associations after controlling for background characteristics (sex and education) and generalized control beliefs (general self-efficacy and general emotion regulation). In separate hierarchical regression analyses, each set of control variables was entered as a block, followed by the set of the six longing predictors (for detailed results, see Appendix H).

Background characteristics predicted neither happiness nor positive psychological functioning (both  $R^2 < .02$ ; both  $ps > .05$ ). Controlling for background characteristics did not change the direction and magnitude of associations between longing characteristics and the two subjective well-being indicators in any substantial way.

Generalized control beliefs emerged as strong predictor of happiness,  $R^2 = .40, p = .001$ ; and positive psychological functioning,  $R^2 = .41, p = .001$ . Specifically, general self-efficacy was positively linked with happiness,  $\beta = .48, p = .001$ ; and positive psychological functioning,  $\beta = .32, p = .001$ . General emotion regulation abilities were predictive of higher positive psychological functioning,  $\beta = .42, p = .001$ . These effects are well in line with the literature on generalized control and emotion regulation (Gross & Munoz, 1995; Lachman & Burack, 1993;

Skinner, 1996). Consideration of generalized control beliefs altered the magnitude of association between longing characteristics and subjective well-being. The regression weights of longing-specific control beliefs (Control Over Longing Experience, Control Over Longing Realization) and the two longing functions (Directionality, Managing Nonrealizability) were substantially decreased or no longer significant. These results suggest that the positive predictive power of longing-specific control beliefs and longing functions is mainly due to shared variance with generalized control beliefs. The negative relationships of the Intensity/Scope and Utopia/Ambivalence of longing with positive psychological functioning were also decreased. In contrast, the negative relationship of Intensity/Scope with happiness remained basically unchanged. Thus, intense and broad longing appears to be uniquely associated with low positive affect and life satisfaction.

#### *The Moderating Effect of Longing Control*

Next, I examined whether Control Over Longing Experience and Control Over Longing Realization moderated the relationships of the structural elaboration and functions of longing with subjective well-being. Originally, I had predicted that feeling in control of the experience of longing and its fulfillment would increase the beneficial effects of highly elaborated longings. Given the negative association of Intensity/Scope and Utopia/Ambivalence with subjective well-being, this hypothesis was reformulated. Thus, it was expected that high longing control would reduce the negative effect of highly elaborated longings.

Four hierarchical regression analyses were performed, two each for happiness and positive psychological functioning. The main effects of five longing characteristics (Intensity/Scope, Utopia/Ambivalence, Control Over Longing Experience *or* Control Over Longing Realization, Directionality, Managing Nonrealizability) were entered at Step 1. At Step 2, the interactions of the two dimensions of structural elaboration and the two functions of longing with Control Over Longing Experience (first analysis) or with Control Over Longing Realization (second analysis) were added (see Table 28).

*Moderating effect of Control Over Longing Experience.* Inclusion of interaction terms added predictive power for the prediction of happiness (statistical trend), but not for the prediction of positive psychological functioning. On the level of individual interaction terms, Intensity/Scope  $\times$  Control Over Longing Experience emerged as significant predictor for both facets of subjective well-being. These interactions are plotted in Figure 11.

As illustrated in the figure, persons with less intense and broad longing reported higher well-being, independent of their degree of control over their longing experience. The lack of well-being in persons with highly intense and broad longings, however, was more pronounced if

coupled with low control over the longing experience. Thus, in accordance with hypotheses, the negative associations of the intensity/scope of longing with happiness and positive psychological functioning were reduced in persons who reported higher control over their experience of longing.

Table 28

*Results of Multiple Regression Analyses Predicting Two Facets of Subjective Well-Being: Moderating Effect of Longing Control*

Predictors	Happiness		Positive Psychological Functioning	
	<i>B</i> ( <i>p</i> )	$\Delta R^2$ ( <i>p</i> )	<i>B</i> ( <i>p</i> )	$\Delta R^2$ ( <i>p</i> )
<i>Moderating Effect of Control Over Longing Experience</i>				
<i>Step 1</i>		.23 (.001)*		.12 (.001)*
Intensity/Scope (IS)	-.38 (.001)*		-.11 (.24)	
Utopia/Ambivalence (UA)	-.17 (.02)+		-.25 (.001)*	
Control Over Longing Experience (CE)	.28 (.001)*		.18 (.002)*	
Directionality (D)	.21 (.008)*		.11 (.20)	
Managing Nonrealizability (MN)	.14 (.05)+		-.02 (.84)	
<i>Step 2</i>		.03 (.04)+		.03 (.08)
IS × CE	.28 (.002)*		.26 (.007)*	
UA × CE	-.07 (.34)		-.01 (.89)	
D × CE	-.17 (.04)+		-.18 (.04)+	
MN × CE	.00 (.97)		-.07 (.32)	
<i>Overall explained variance (R<sup>2</sup>)</i>		.26 (.001)*		.15 (.001)*
<i>Moderating Effect of Control Over Longing Realization</i>				
<i>Step 1</i>		.18 (.001)*		.13 (.001)*
Intensity/Scope (IS)	-.51 (.001)*		-.23 (.01)+	
Utopia/Ambivalence (UA)	-.11 (.15)		-.17 (.03)+	
Control Over Longing Realization (CR)	.20 (.003)*		.24 (.001)*	
Directionality (D)	.21 (.01)+		.08 (.37)	
Managing Nonrealizability (MN)	.23 (.002)*		.05 (.54)	
<i>Step 2</i>		.01 (.74)		.02 (.23)
IS × CR	.05 (.60)		.05 (.60)	
UA × CR	-.06 (.32)		-.13 (.05)	
D × CR	.01 (.91)		-.05 (.60)	
MN × CR	.05 (.45)		-.02 (.82)	
<i>Overall explained variance (R<sup>2</sup>)</i>		.19 (.001)*		.15 (.001)*

*Note.* *N* = 284. Three outliers were deleted prior to analysis. Following recommendations by Aiken and West (1991), unstandardized regression weights are reported.

\* *p* > .01. + *p* > .05.

*Moderating effect of Control Over Longing Realization.* Regarding the moderating role of Control Over Longing Experience, no significant interaction effects emerged (Table 28, lower part). Thus, the perceived ability to realize longings neither enhanced nor reduced the associations of the longing characteristics with happiness and positive psychological functioning.

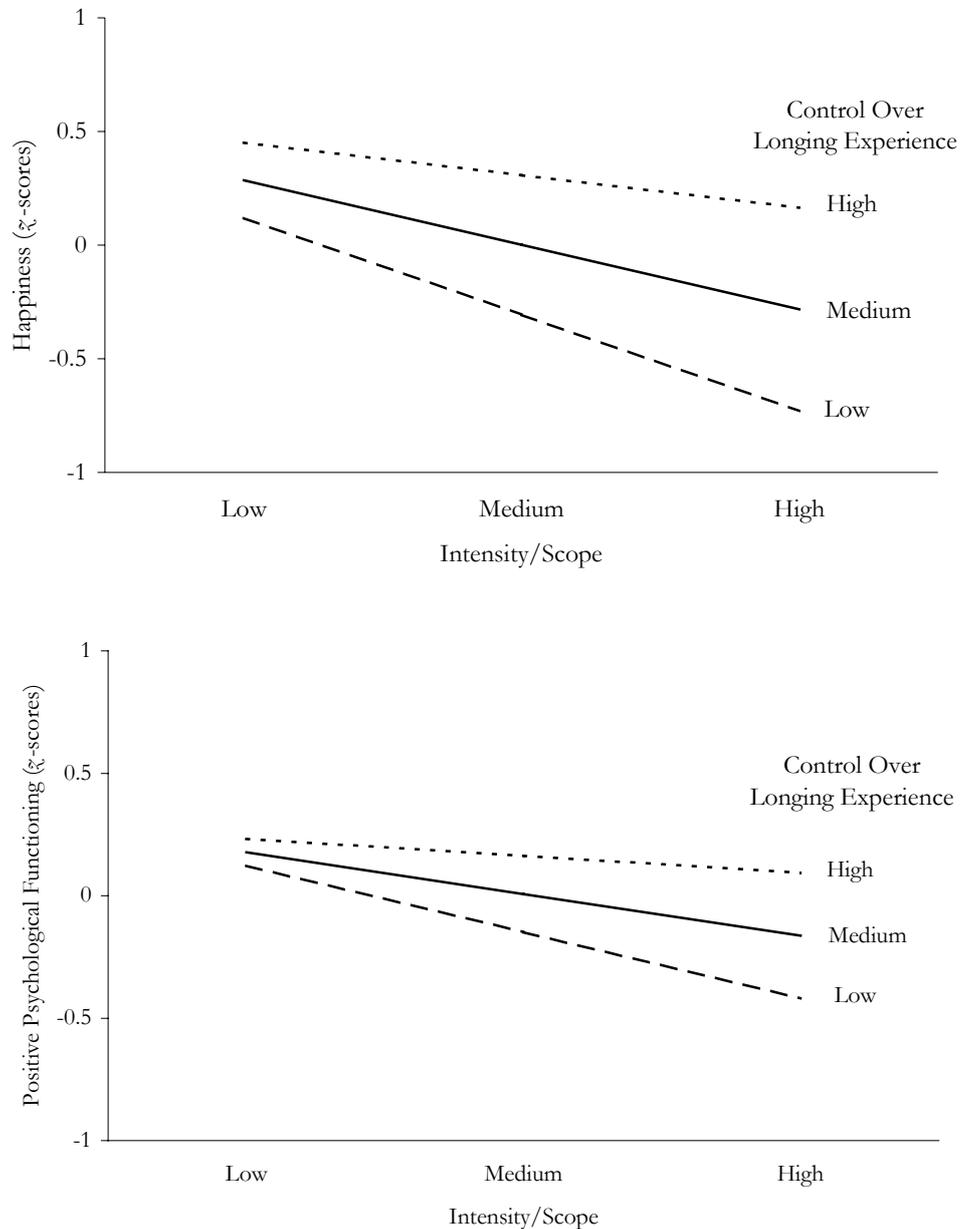


Figure 11. Moderating Effect of Control Over Longing Experience on the Relationship Between the Intensity/Scope of Longing and Subjective Well-Being

#### *The Moderating Effect of Age*

The next analyses tested the moderating effect of age on the relationship of the control and function of longing with subjective well-being. I had predicted that having control over the

realization of longing and the directionality function would be more strongly linked with subjective well-being in younger adults, whereas having control over the experience of longing and the managing nonrealizability function would be more strongly linked with subjective well-being in older adults.

Hierarchical regression analyses tested the interaction effects of each of four longing characteristics (Control Over Longing Experience, Control Over Longing Realization, Directionality, Managing Nonrealizability) with age (Step 3) over and above the main effects of age (Step 1) and longing characteristics (Step 2; see Table 29). Because the previous analyses showed that the two functions of longing were confounded with the Intensity/Scope and Utopia/Ambivalence of longing, these two variables were also included at Step 2.

Table 29  
*Results of Multiple Regression Analyses Predicting Two Facets of Subjective Well-Being: Moderating Effect of Age*

Predictors	Happiness		Positive Psychological Functioning	
	<i>B</i> ( <i>p</i> )	$\Delta R^2$ ( <i>p</i> )	<i>B</i> ( <i>p</i> )	$\Delta R^2$ ( <i>p</i> )
<i>Step 1</i>				
Age	.30 (.001)*	.13 (.001)*	.12 (.05)+	.02 (.04)+
<i>Step 2</i>		.19 (.001)*		.15 (.001)*
Intensity/Scope	-.41 (.001)*		-.18 (.04)+	
Utopia/Ambivalence	-.09 (.18)		-.17 (.03)+	
Control Over Longing Experience (CE)	.19 (.001)*		.11 (.07)	
Control Over Longing Realization (CR)	.22 (.001)*		.27 (.001)*	
Directionality (D)	.15 (.05)+		.03 (.69)	
Managing Nonrealizability (MN)	.11 (.10)		-.02 (.80)	
<i>Step 3</i>		.02 (.06)		.04 (.008)*
CE × Age	.01 (.89)		-.04 (.54)	
CR × Age	-.09 (.13)		-.20 (.002)*	
D × Age	-.01 (.94)		.06 (.39)	
MN × Age	-.14 (.01)+		-.11 (.06)	
<i>Overall explained variance (R<sup>2</sup>)</i>		.35 (.001)*		.21 (.001)*

*Note.* *N* = 284. Three outliers were deleted prior to analysis. Following recommendations by Aiken & West (1991), unstandardized regression weights are reported.

\*  $p < .01$ ; +  $p < .05$ .

At Step 1, age significantly predicted happiness, suggesting that older adults experienced higher life satisfaction and more positive affect than younger adults. Age was unrelated to positive psychological functioning (although there was a positive statistical trend). At Step 2, the six longing characteristics added significant predictive power for both facets of subjective well-being, with regression weights being comparable to previous analyses. That is, subjective well-

being was lower in persons who reported highly structurally elaborated longings and higher in persons who reported higher control over their longings (whereas the functions of longing had no significant effect on subjective well-being).

Most important for the present analyses was Step 3 that added interaction effects of the control and functions of longing with age. As a block, interaction terms added significant prediction beyond main effects for positive psychological functioning, but not for happiness. Specifically, the association between Control Over Longing Realization and positive psychological functioning varied as a function of age (see Figure 12). Adults of all ages reported higher positive psychological functioning if they felt able to realize their longings (high control). In contrast, in the group who reported that they felt unable to realize their longings (low control), young adults reported substantially lower psychological functioning than older adults. This finding is consistent with predictions. In sum, the present analyses confirmed one out of four predicted age-moderation effects for the relationship between longing characteristics and subjective well-being.

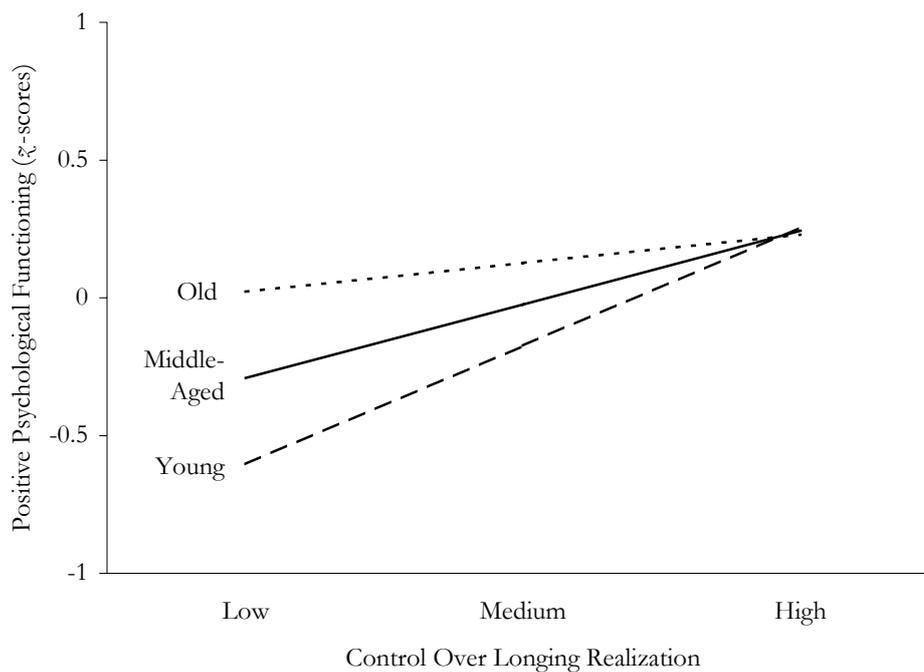


Figure 12. Moderating Effect of Age on the Relationship Between Control Over Longing Realization and Positive Psychological Functioning

#### 4.4.3 Summary of Findings on the Regulatory Function of Longing in Adult Development

This section explored the potential regulatory role of longing for adult development. Note at the outset that these explorations were tentative because they were based on cross-

sectional data. Nevertheless, they permit to test whether associations are consistent with the notion of possible causal mechanisms.

In testing the theoretical model of the developmental consequences of longing, two series of multiple regression analyses were performed. The first series predicted the two functions of longing (directionality, managing nonrealizability) as proximal, specific consequences of longing for development, and the second series predicted two facets of subjective well-being (happiness, positive psychological functioning) as distal, general consequences of longing for development. In addition to main effects of longing characteristics, the moderating effects of a sense of control over the experience and realization of longing, as well as age, were examined.

The two functions of longing were differentially predicted by the structural elaboration and control of longing. Persons who reported highly intense and broad longings (high Intensity/Scope) and a high ability to realize these in actual life (high Control Over Longing Realization) reported that these longings gave them strong direction for their future development. In contrast, persons who reported highly utopian and emotionally ambivalent longings (high Utopia/Ambivalence) and a high ability to control their occurrence and experience (high Control Over Longing Experience), reported that these longings helped them compensate for something they could not have in actual life (Managing Nonrealizability).

Associations remained unchanged when statistically controlling for background characteristics (sex, education) and generalized control beliefs (general self-efficacy, general emotion regulation). Moderation analyses further revealed that intense/broad longings gave even stronger directionality when the longing experience was perceived as controllable. These results are consistent with the first part of the theoretical model of the regulatory role of longings in showing that proximally, longings tend to give direction for development and help manage unrealizable developmental options. Effect sizes were substantial (with 53 % of the variance in Directionality and 38 % of the variance in Managing Nonrealizability accounted for).

More generally, longing characteristics were associated with subjective well-being. The direction of associations, however, was not uniformly consistent with predictions. Most importantly, Intensity/Scope and Utopia/Ambivalence were negatively related to happiness and psychological functioning. Reporting intense and broad longings of a utopian, emotionally ambivalent nature (high structural elaboration) was coupled with low rather than high well-being.

The two functions of longing were unrelated to subjective well-being on a bivariate level, but evinced positive relationships when statistically controlling for Intensity/Scope and Utopia/Ambivalence. Hence, in persons with comparably intense/broad and unrealizable/ambivalent longings, reporting that these give directionality for development and help compensate for unrealizable options was linked with higher levels of happiness and

adjustment. Results were also in agreement with the predicted beneficial effect of high control over longing on subjective well-being: Reporting a high ability to regulate the occurrence and experience of longing was coupled with higher well-being, as was reporting a high ability to work towards the realization of longings. Associations between longing characteristics and subjective well-being were robust after controlling for background characteristics, but mostly diminished when controlling for generalized control beliefs. One exception was the association between the Intensity/Scope of longing and happiness, which remained basically unchanged. Intense/broad longing thus seems to be a more unique correlate of low positive affect and life satisfaction.

In line with predictions, control over the longing experience moderated the relationship between the Intensity/Scope of longing and both indicators of subjective well-being. The negative association between intense/broad longing and well-being was stronger if coupled with low control over their experience. In contrast, control over the longing experience was largely independent of well-being for persons with little intense and broad longings. The second facet of longing control, control over longing realization, did not emerge as a significant moderator. Finally, age moderated the relationship between the sense of control over the realization of longing and positive psychological functioning. Reporting a higher ability to realize longings was more strongly linked to well-being in younger adults than it was in older adults. Overall, predictors accounted for 19 to 35 % of the variance in happiness and for 15 to 21 % of the variance in positive psychological functioning.

In essence, analyses in the present section provided partial support for hypotheses, in addition to unexpected findings. Whereas highly elaborated (i.e., intense/broad and utopian/ambivalent) longings may have an immediate function for development (i.e., they give direction and help compensate for nonrealizability), they were more often reported by persons with low happiness and poor psychological functioning. It remains an open question, however, whether such relationships apply to all participants equally well. Depending on the structural composition of their longings, participants may differ in the linkages between longing characteristics and subjective well-being. Exploring subgroups with different compositions of longing characteristics is the topic of the next set of analyses.

#### **4.5 Exploring Subgroups of Individuals With Different Longing Profiles**

The analyses presented thus far employed a variable-centered approach by investigating relationships between hypothetical dimensions of longing. Inherently, this approach assumes that individuals are continually distributed on these dimensions and differ only in the degree to which they “possess” the characteristics under study. It may be an over-simplification, however, that all persons have the same structural expression of longing. There may actually be different

subgroups of persons with distinct configurations of longing characteristics. Therefore, as a complement to the previous analyses, the present section presents an attempt to find distinguishable subgroups of persons with distinct longing profiles (as indicated by the six structural longing characteristics) that differ on other variables in a meaningful way. Cluster analysis was employed as a multivariate method to group individuals on the basis of the overall configuration of the six structural longing characteristics.

#### 4.5.1 *Cluster Analysis of the Six Structural Characteristics of Longing*

##### *Determining the Appropriate Number of Clusters*

A cluster analysis was performed on the six structural characteristics of longing (incompleteness, symbolic nature, personal utopia, ambivalent emotions, tritime focus, and reflection). The three criteria suggested for determining the appropriate number of clusters (Milligan & Cooper, 1985) uniformly indicated the presence of three clusters of individuals with different longing profiles. As a further support for the three-cluster solution, the median agreement (Cohen's  $\kappa$ ) for the 10 random splits of the sample was .78, with some variance between the random splits (ranging from .64 to .95). Given the usual cut-off  $\kappa$ -value of .60, the clusters proved to be highly replicable. All further analyses are based on the cluster solution derived in the total sample.

##### *Profiles of the Three Clusters*

Table 30 shows the means and standard deviations of the six structural scales for members of the three longing subgroups. For better comparability of the subgroups, scores were standardized (i.e., z-transformed). Standardized longing profiles of the three subgroups are depicted in Figure 13. A multivariate analysis of variance indicated that the three groups differed significantly in the set of the six structural characteristics; overall  $F(12, 582) = 82.76, p = .001, \eta^2 = .63$ ; and on each single one; Incompleteness,  $F(2, 296) = 140.43, p = .001, \eta^2 = .49$ ; Symbolic Nature,  $F(2, 296) = 65.83, p = .001, \eta^2 = .31$ ; Personal Utopia,  $F(2, 296) = 105.27, p = .001, \eta^2 = .42$ ; Ambivalent Emotions,  $F(2, 296) = 173.26, p = .001, \eta^2 = .54$ ; Tritime Focus,  $F(2, 296) = 27.44, p = .001, \eta^2 = .16$ ; and Reflection,  $F(2, 296) = 131.14, p = .001, \eta^2 = .47$ . It is notable that the amount of explained variance was lowest for the tritime focus, suggesting that the three longing subgroups differed least on this dimension. Post hoc Tukey tests revealed significant differences between all three clusters on each of the six variables with two exceptions: Clusters 1 and 3 did not differ significantly in ambivalent emotions, and Clusters 2 and 3 were comparable with regard to their tritime focus.

As can be seen in Figure 13, the first cluster (labeled “Low Profile”) was characterized by low scores in all of the six structural characteristics, suggesting that members of this cluster did not perceive their longings as representing an incomplete part of their lives. They also rated their longings as little idealized and little emotionally bittersweet, reflective, temporally extended, and symbolic. Cluster 2 (labeled “High Profile”) was uniformly high on all of the six structural characteristics. Thus, members of this cluster reported highly elaborated longings associated with a strong feeling of incompleteness. Cluster 3 (labeled “Mixed Profile”) was characterized by above-average scores on the four structural characteristics subsumed under Intensity/Scope, but low scores on the two characteristics representing Utopia/Ambivalence. This group rated their longings as temporally complex and symbolic, and as associated with high incompleteness and strong reflection. At the same time, participants did not perceive their longings as utopian (or unattainable), nor bittersweet. The three subgroups were roughly equally distributed across the sample, with a slight overrepresentation of Clusters 2 (34 %) and 3 (43 %) as opposed to Cluster 1 (23 %).

Table 30  
*Subgroup Differences in the Six Structural Characteristics of Longing*

Structural characteristics	Cluster 1 (“Low”) <i>n</i> = 68	Cluster 2 (“High”) <i>n</i> = 102	Cluster 3 (“Mixed”) <i>n</i> = 129
<i>Intensity/Scope</i>			
Incompleteness	1.36 (.79) <sup>a</sup>	3.46 (.80) <sup>b</sup>	3.11 (.89) <sup>c</sup>
Symbolic Nature	2.19 (.97) <sup>a</sup>	3.73 (.76) <sup>b</sup>	3.31 (.88) <sup>c</sup>
Tritime Focus	2.59 (.78) <sup>a</sup>	3.30 (.72) <sup>b</sup>	3.38 (.75) <sup>b</sup>
Reflection	1.83 (.86) <sup>a</sup>	3.75 (.69) <sup>b</sup>	3.35 (.81) <sup>c</sup>
<i>Utopia/Ambivalence</i>			
Personal Utopia	1.72 (.94) <sup>a</sup>	3.36 (.75) <sup>b</sup>	2.10 (.76) <sup>c</sup>
Ambivalent Emotions	1.34 (.82) <sup>a</sup>	3.09 (.68) <sup>b</sup>	1.50 (.70) <sup>a</sup>

*Note.* *N* = 299. Reported are means (standard deviations) on the level of raw scores. Means with no or the same superscript for a given variable are not significantly different according to Tukey tests ( $p < .01$ ).

The next analyses tested whether the three longing subgroups differed in central variables other than those included in the cluster analysis, and whether cluster membership moderated associations of longing characteristics with age and subjective well-being. These analyses were restricted to the 50 % most prototypical persons of each cluster. Prototypicality was indexed by each participant’s Euclidian distance to his or her cluster center. This was done because during the classification process, every person was assigned to a cluster, regardless of whether the person’s Euclidian distance to one of the other two cluster centers was only marginally greater. Hence, the assignment of persons who were in the middle between two cluster centers was more strongly influenced by measurement error and/or chance effects. These less prototypical persons

diminish the chance to find truly existing cluster differences. In addition, less prototypical persons were already sufficiently considered in the prior, variable-centered analyses. In the present analyses, the focus was on identifying and comparing persons who are clearly assignable to different longing profiles. Hence, non-prototypical cases were excluded from subsequent analyses.

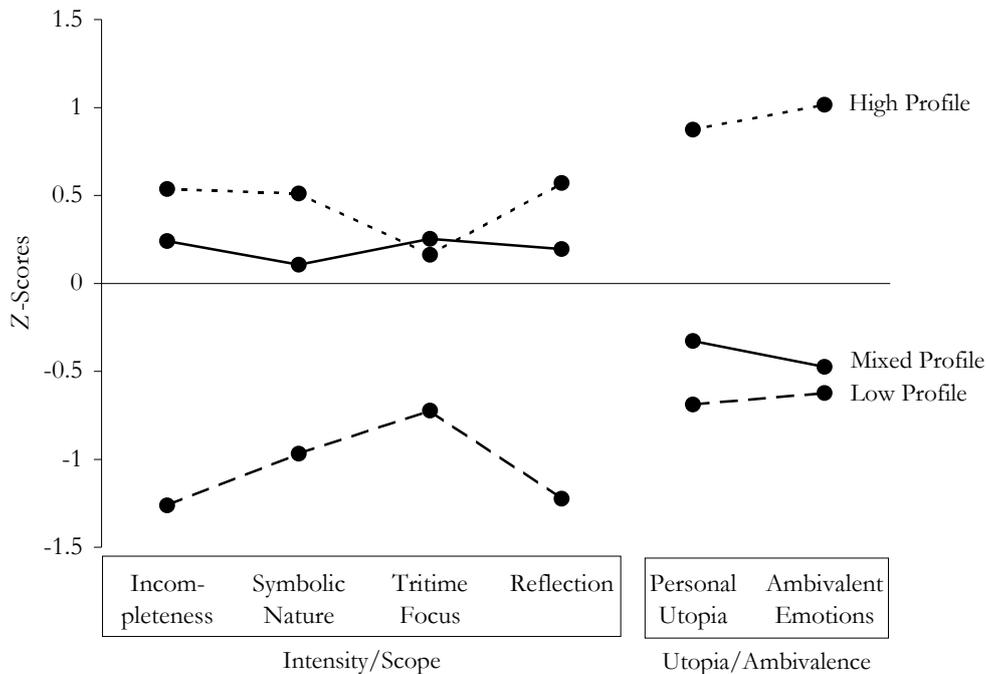


Figure 13. Z-Profiles of Structural Longing Characteristics, Separately for the Three Longing Subgroups

#### 4.5.2 Subgroup Differences in Socio-Demographic Variables, Longing Characteristics, and Subjective Well-Being

In order for the three subgroups to be meaningful, they should evince differences in longing characteristics other than the ones included in the cluster analysis (i.e., longing salience, control, function, and additional longing scales and items). This was tested in the next analysis. Background characteristics (age, sex, education) and subjective well-being indicators (happiness, positive psychological functioning) were also considered. Cluster differences in all of these variables are listed in Appendix I.

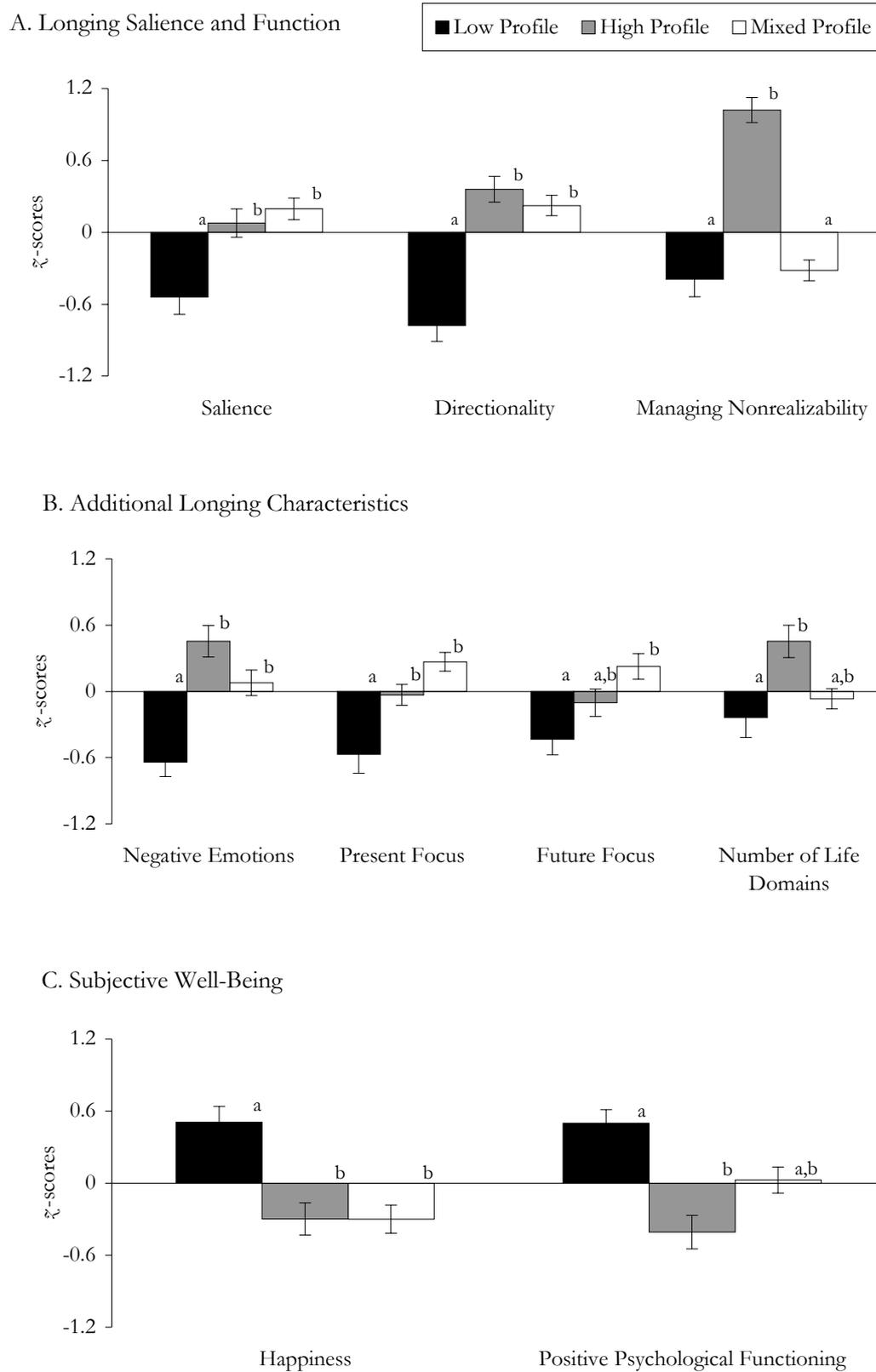


Figure 14. Subgroup Differences in Longing Characteristics (Other Than Structural Elaboration) and Subjective Well-Being  
 Only variables with significant cluster differences are shown. Bars with the same superscript for a given variable are not significantly different according to post hoc Tukey tests.

A multivariate analysis of variance with all variables (except sex, which was dichotomous and thus tested by a  $X^2$ -test) indicated significant cluster differences, overall  $F(32, 252) = 7.34$ ,  $p = .001$ ,  $\eta^2 = .48$ . Univariate follow-up analyses (see Appendix I) indicated that the three subgroups did not differ with regard to socio-demographic variables (age, sex, and education; all  $ps > .05$ ). There were, however, a number of differences in longing characteristics and subjective well-being, which are depicted in Figure 14 (in  $z$ -score metric).

According to post hoc Tukey tests, the groups with high and mixed longing profiles reported more salient (i.e., intense and central) longings than the group with the low longing profile (see Panel A of Figure 14). Whereas longing was reported to be equally controllable in all subgroups, there were differences in the two functions of longing. Members of the low profile group reported that their longings were least functional with regard to both dimensions (Directionality, Managing Nonrealizability). Members of the high and mixed profile groups reported that their longings gave them a high degree of direction for their lives. However, only members of the high profile group also reported that their longings helped them get over losses and unrealizable wishes by fantasizing about them.

Regarding the emotional composition of longings, the amount of positive emotions did not differ between subgroups. Longings in the low-profile group, however, were accompanied by less negative emotions than longings in the high- and mixed-profile groups (see Panel B of Figure 14). Differences were also evident in the time foci of longings. Members of the low-profile subgroup reported that their longings were less present- and future-oriented than members of the other two subgroups, and less past-oriented than members of the high-profile subgroup (statistical trend). Thus, longings in the low-profile group appear to be little temporally extended and complex. No subgroup differences were evident in the attainability of longings. The group with high-profile longings reported the greatest extension of longing across different life domains.

Regarding subjective well-being, individuals with a low longing profile were most happy and satisfied with their lives and reported the highest psychological functioning (see Panel C of Figure 14). Individuals with high and mixed longing profiles reported average levels of happiness. Individuals with high longing profiles reported the lowest psychological functioning.

In sum, the three subgroups with different longing profiles did not differ in socio-demographic characteristics. They differed, however, on a number of longing characteristics and subjective well-being, which supports the validity and meaningfulness of the derived subgroups.

#### 4.5.3 Subgroup Differences in Associations of Longing Characteristics With Age and Subjective Well-Being

This section examines whether previous findings on associations of the main longing characteristics (structural elaboration, salience, controllability, and function) with age and subjective well-being were consistent across the three subgroups with different longing profiles, or whether there were differential associations between variables in the three subgroups. Hierarchical regression analyses were performed that included cluster membership as a moderator variable. For this purpose, two dummy variables were created; the mixed-profile group was coded as the reference group. Age associations are considered first, followed by associations with subjective well-being. Bivariate associations of longing characteristics with age and subjective well-being, separately for the three subgroups, are listed in Appendix I.

##### *Differential Associations With Age*

For each of the seven main longing characteristics, a hierarchical regression analysis was computed to test whether cluster membership moderated its association with age. Age and cluster membership were entered at Step 1, followed by the interaction of Age  $\times$  Cluster Membership at Step 2. As previously, all continuous variables were  $z$ -transformed prior to analyses.

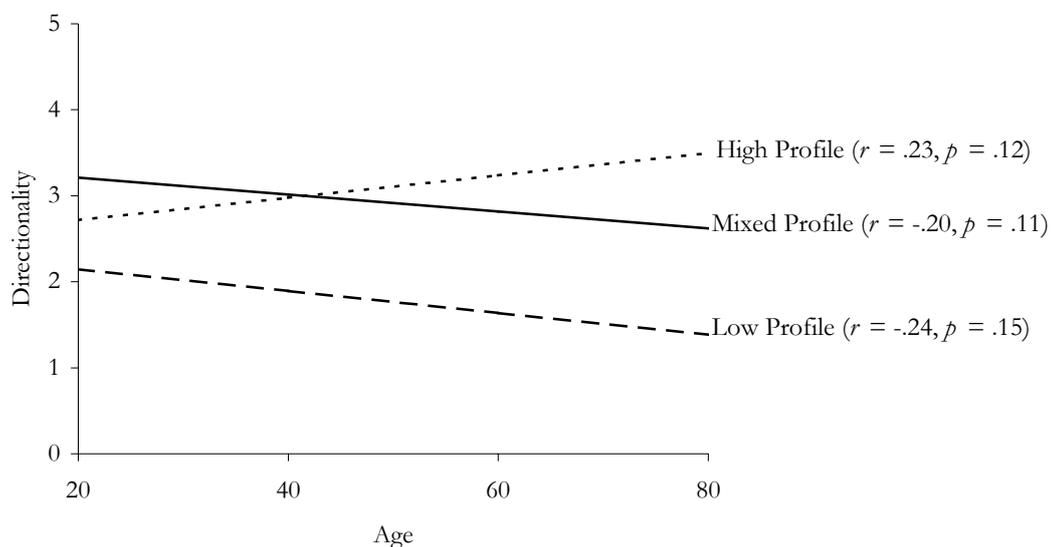


Figure 15. Age Gradients for the Directionality Function of Longing, Separately for the Three Subgroups With Different Longing Profiles

Cluster membership moderated the association between age Directionality,  $\Delta R^2 = .03$ ,  $\Delta F(2, 148) = 3.24$ ,  $p = .04$ . As depicted in Figure 15, Directionality decreased with age in the

groups with low and mixed longing profiles, whereas it increased with age in the group with a high longing profile. It should be noted that none of the three bivariate correlations reached significance, probably due to low power, as the sample was reduced to one sixth of its original size. The remaining age associations were not moderated by cluster membership (all  $\Delta F$ 's < 2.30, all  $p$ 's > .05).

#### *Differential Associations With Subjective Well-Being*

The next set of hierarchical regression analyses tested the moderating effect of cluster membership on associations with subjective well-being, separately for each of the main longing characteristics. Cluster membership and one of the seven longing characteristics were entered at Step 1, followed by the interaction of the respective longing characteristic with cluster membership at Step 2. Cluster membership moderated the association between Utopia/Ambivalence and positive psychological functioning,  $\Delta R^2 = .05$ ,  $\Delta F(2, 144) = 4.02$ ,  $p = .02$ ; and between Managing Nonrealizability and happiness,  $\Delta R^2 = .04$ ,  $\Delta F(2, 144) = 3.61$ ,  $p = .03$ . Differential regression lines are shown in Figure 16. The remaining subjective well-being associations were not moderated by cluster membership (all  $\Delta F$ 's < 2.44, all  $p$ 's > .05).

As shown in Figure 16, the previously found negative association of Utopia/Ambivalence with positive psychological functioning held only for the subgroup with the mixed longing profile ( $r = -.30$ ). It was absent in the groups with low and high longing profiles. Similarly, the previously found zero-correlation between managing nonrealizability and happiness held only for the group with a mixed longing profile. In contrast, managing nonrealizability was positively associated with happiness in the low- and high-profile subgroups. Thus, within the group of individuals with little intense and unrealizable longings, and within the group with highly intense and unrealizable longings, findings are compatible with the hypothesis that using longing as a compensatory mean for unrealizable projects is beneficial for well-being.

#### **4.5.4 Summary of Findings on Subgroups With Different Longing Profiles**

On the basis of the six structural characteristics of longing (incompleteness, symbolic nature, personal utopia, ambivalent emotions, tritime focus, and reflection), a cluster analysis identified three meaningful subgroups with different longing profiles. The subgroup with a "low profile" reported low scores on all six structural characteristics. In this group, longings were reported to be little intense and broad, and little utopian and ambivalent. Participants in this group reported that their longings comprised only few life domains and had little function for them; they neither gave strong directionality nor helped manage unrealizable developmental pathways. Longings in the low-profile subgroup were accompanied by only few negative

emotions, and this group scored highest on subjective well-being indicators. This subgroup was therefore called the group with “mild longings.”

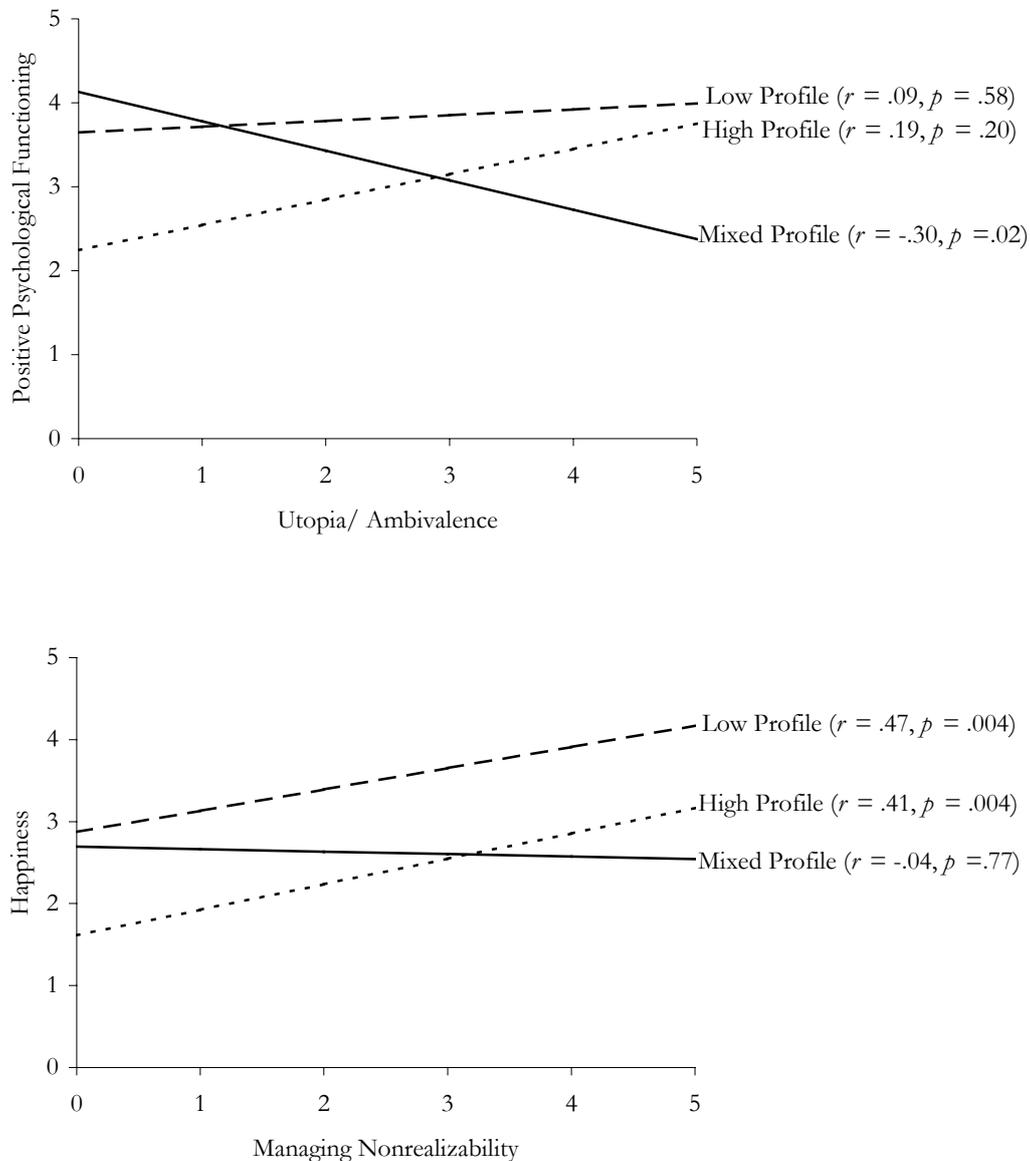


Figure 16. Regression Lines for the Association Between Utopia/Ambivalence and Positive Psychological Functioning (Upper Part) and Between Managing Nonrealizability and Happiness (Lower Part), Separately for the Three Longing Subgroups

The subgroup with a “high profile” was in many ways opposite to the low-profile group. In this group, longings were characterized by high scores on all six structural dimensions; they were rated as highly intense/broad and unrealizable/ambivalent. Accordingly, this group reported that their longings comprised many different life domains and were accompanied by strong negative emotions. Despite the high negativity, both functions of longing (directionality and managing nonrealizability) were rated high in this group. This group reported the lowest level of

psychological adjustment (as indicated by the Ryff-Inventory). Based on their utopian nature and negative emotionality, this subgroup was called the group with “melancholic-utopian longings.”

Finally, the subgroup with a “mixed profile” reported that their longings were high in intensity and scope (incompleteness, symbolic nature, tritime focus, and reflection were all high), but low in utopia and ambivalence. This group reported that their longings gave them strong directionality for future development, but helped little in managing unrealizable life options. Members of this group rated themselves as less happy than the low-profile group, but did not differ from the latter in psychological adjustment. Therefore, this subgroup was labeled the group with “visionary longings.”

Cluster membership moderated some associations of longing characteristics with age and subjective well-being. The directionality function of longing was negatively related to chronological age in the subgroups with low and mixed longing profiles, but positively in the subgroup with a high longing profile. Most notable were the subgroup-specific associations between the managing nonrealizability function of longing and happiness. In contrast to the total sample, this function of longing was positively linked with well-being in the low- and high-profile subgroups, but was unrelated to well-being in the mixed-profile subgroup. Together, these subgroup-specific findings suggest that there may be non-linear relationships between longing characteristics and outcome variables. Profile analyses thus provided an important supplement to the variable-centered analyses performed in the total sample.

#### 4.6 Summary of Major Hypotheses and Main Findings

Table 31  
*Summary of Major Hypotheses and Main Findings*

Hypotheses	Supported by results?
<i>General Characteristics of Longing</i>	
1. <i>The six structural characteristics of longing form a positive manifold. Together, they capture the essence of longing.</i>	<i>Yes, mostly</i>
a) The six structural characteristics are positively interrelated.	<i>Yes</i>
b) The six structural characteristics load on one higher-order factor representing the structural elaboration of longing.	<i>No</i> They load on two higher-order factors: Intensity/Scope and Utopia/Ambivalence
c) The six structural characteristics are positively related to the salience of longing.	<i>Partly</i> Only supported for the four characteristics belonging to Intensity/Scope

*(table continues)*

Table 31. (continued)

Hypotheses	Supported by results?
<i>Age-Related Differences in Longing</i>	
2. <i>Longing characteristics show different patterns of age-related differences, including patterns indicative of age-related increase, stability, and decline (multidirectionality).</i>	Yes
a) The <i>structural elaboration</i> and <i>salience</i> of longing are stable across adulthood.	Yes  However, there was an age-related decrease of the sense of incompleteness, the future focus, and negative emotions and an age-related increase in the past focus and positive emotions.
b) The <i>contents</i> of longing change across adulthood in reflection of changing developmental themes. Longings of young adults predominantly pertain to partnership, personality and self-development, and work and education. Longings of middle-aged adults focus primarily on work, family, and partnership. Longings of older adults focus more frequently on health, family, as well as on politics, society, and the situation of the world in general.	Yes, <i>mostly</i> The only exception was partnership, which was not important for young adults
c) The perceived <i>control</i> over the experience of longing increases, whereas the perceived control over the realization of longing decreases with age.	Yes
d) The directionality <i>function</i> of longing decreases, whereas the managing nonrealizability function of longing increases with age.	Partly Supported for Managing Nonrealizability, but not Directionality
<i>The Regulatory Role of Longing in Adult Development</i>	
3. <i>Longing has an immediate function for adult development, and this function is enhanced in the context of a strong sense of control over longing (proximal, specific developmental consequences).</i>	Yes, <i>mostly</i>
a) The structural elaboration of longing (indicated by high levels of the six structural characteristics) and the control over longing (in terms of experience and realization) are positively related to the two proposed functions of longing (directionality and managing nonrealizability).	Yes Differential predictive relationships: Intensity/Scope and Control Over Longing Realization are related to Directionality, Utopia/Ambivalence and Control Over Longing Experience are related to Managing Nonrealizability
b) The perceived control over longing moderates the positive relationships between the structural elaboration and the two functions of longing, that is, positive associations are higher at higher levels of control.	Partly Control Over Longing Experience moderates only the positive relationship between Intensity/Scope and Directionality in the expected direction
4. <i>Longing is positively associated with subjective well-being, and this relation is moderated by the perceived control over longing and age (distal, general developmental consequences).</i>	Direction of associations: No Moderator Effects: Partly

(table continues)

Table 31. (continued)

Hypotheses	Supported by results?
a) Longing characteristics (including the structural elaboration, control, and functions of longing) are positively related to subjective well-being.	<p><i>Partly</i></p> <p>Intensity/Scope and Utopia/Ambivalence are <i>negatively</i> related to subjective well-being</p> <p>Control Over Longing is <i>positively</i> related to subjective well-being</p> <p>For the longing functions, positive correlations emerge only after controlling for Intensity/Scope and Utopia/Ambivalence</p>
b) The perceived control over longing moderates the relationship between the structural elaboration of longing and subjective well-being, as well as the relationship between the two functions of longing and subjective well-being. Positive associations are higher at higher levels of control.	<p><i>Partly</i></p> <p>Control Over Longing Experience moderates the negative relationship between Intensity/Scope and subjective well-being; negative associations are reduced at higher levels of control</p>
c) Age moderates the relationship between the control over longing and subjective well-being as well as the relationship between the two functions of longing and subjective well-being. The directionality function and a sense of control over the realization of longing are more influential for the subjective well-being of younger adults. In contrast, the managing nonrealizability function and a sense of control over the experience of longing are more influential for the subjective well-being of older adults.	<p><i>Partly</i></p> <p>Age moderates only the relationship between Control Over Longing Realization and Positive Psychological Functioning in the expected direction</p>
<i>Exploring Subgroups of Individuals who Differ in Their Longing Profiles</i>	
5. <i>Subgroups of individuals with distinct longing profiles can be identified that differ on central variables in a meaningful way. Subgroup membership moderates associations of longing characteristics with age and subjective well-being.</i>	<i>Yes</i>