The Adolescent and Adult Time Inventory

Preliminary Technical Manual

Version 2.0

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Organizations

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Time Dimensions Assessed with the AATI

The Adolescent and Adult Time Inventory (AATI) consists of several components including time meaning, time frequency, time orientation, time relation, and time attitudes. Each component may be used separately or in combination with one another.

Time Meaning

Time meaning refers to individuals' definitions of the past, the present, and the future (Mello, Bhadare, Fearn, Galaviz, Hartmann, & Worrell, 2009). Time meaning is the first section of the AATI and is assessed with three open-ended questions

Time Frequency

Time frequency refers to the frequency with which adolescents report thinking about the past, the present, and the future (Mello, Worrell, & Andretta, 2009). Time frequency is the second section of the AATI and is assessed with three questions on the frequency with which individuals think about the past, the present, and the future.

Time Orientation

Time orientation refers to the relative emphasis adolescents place on the three time periods. It is the third section of the AATI and is assessed with sets of circle configurations, with circle size indicating importance or relative orientation among time periods.

Time Relation

Time relation refers to the degree that individuals perceive the past, the present, and the future to be related. It is the fourth section of the AATI and is also assessed with sets of circle configurations. The amount of overlap among the circles indicates how individuals perceive the relationship among time periods.

Time Attitudes

Time attitudes refer to positive and negatives attitudes toward the past, the present, and the future. The Adolescent and Adult Time Inventory–Time Attitude (AATI-TA) subscales consist of six 5-item subscales, including Past Positive, Past Negative, Present Positive, Present Negative, Future Positive, and Future Negative. Descriptive statistics and preliminary evidence for the psychometric properties of AATI-TA scores are presented below. The psychometric data are taken from Worrell et al. (2013).

Subscales

Means and standard deviations of AATI-TA scores are presented in Tables 1 and 2 for the U.S. and German samples, respectively. Subscale means fell between 2.0 and 4.0, with standard deviations in the 0.6 to 0.7 range. Subscale distributions were neither skewed nor

kurtotic and subscales intercorrelations were in keeping with theory (see Tables 3 & 4). For example, correlations between positive and negative subscales were negative, and correlations within valence grouping (i.e., negative/negative, positive/positive) were positive. Correlations were in the medium to high range, with the highest correlations occurring between items in the same time period (e.g., Past Positive & Past Negative). Correlations between proximal time periods (i.e., Past and Present scores and Present and Future scores) were generally higher than correlations between more distal periods (i.e., Past and Future scores).

Internal Consistency

Cronbach's alpha was used to examine the internal consistency estimates of scores on the six subscales. As can be seen in Tables 1 and 2, estimates ranged from .77 to .88 range (US *Mdn* = .80; German *Mdn* = .86). Confidence intervals around the reliability estimates ranged from .72 to .90. Examinations of the item/total correlations across the scales revealed that all of the items were contributing substantially to the reliability of the scores,.

Structural Validity

CFA results are presented in Table 5. The null models (Models 1 & 4) were rejected, with the highest chi-square to degrees of freedom ratio. The two- actor valence-based models (Models 2 & 6) with negative items making up one factor and the positive items making up the other factor did not fit the data well, with all of the fit indices falling well short of even a reasonable fit. Two of the fit indices (χ^2/df ratio and RMSEA) indicated reasonable fit for three- factor models (Models 3 & 7) based on time periods (Past, Present, Future), but the NNFI and CFI did not indicate good fit.

The 30-item six- actor structures (Models 4 & 85) had the best fit, with all of the indices within the recommended ranges. Standardized coefficients for the items ranged from .46 to .80 for the U.S. sample (see Table 6) and .54 to .83 for the German sample (see Table 7), with only two coefficients in the U.S. sample falling below .50. Intercorrelations among the factors ranged from -.84 (between Past Positive and Present Positive) to .28 (between Past Positive and Future Positive; *Mdn* = .48) in the U.S. sample, and from -.77 (between Present Positive and Present Negative) to -.31 (between Past Negative and Future Positive; Mdn = -.48) in the German sample. These results suggest that the ATI-TA is best described as a six- actor model of time attitudes with subscales of positive and negative valence representing the three time periods.

Convergent and Discriminant Validity

Time attitude scores in the American sample were not related to age (within the adolescent years), academic achievement, or academic self-concept (α = .87). However, time attitudes were related other constructs assessing time, including Hope (Snyder et al., 1997; α = .82), Optimism (Scheier & Carver, 1984: α = .74), and Perceived Life Chances (Jessor, Donovan, & Costa, 1990; α = .87). Time attitudes were also related to constructs assessing psychological well-being, including global self-esteem (Rosenberg, 1965; α = .83) and perceived stress (Cohen, Kamarck, & Mermelstein, 1983; α = .71). Moreover, the pattern of relationships those ATI-TA scores had with these variables are consistent with their theoretical underpinnings (see Worrell & Mello, 2009).

Table 1

Descriptive Statistics for Time Attitude Scores in American Adolescents

	M	*SD*	Skew	Kurtosis	α	95% C. I. (α)
Past Positive (5)	3.36	0.75	-0.04	0.16	.80	.76, .83
Past Negative (5)	2.48	0.82	0.25	-0.27	.79	.75, .83
Present Positive (5)	3.63	0.68	-0.68	1.12	.77	.73, .81
Present Negative (5)	2.49	0.79	0.40	-0.07	.77	.72, .81
Future Positive (5)	3.83	0.79	-0.48	0.02	.83	.79, .86
Future Negative (5)	2.07	0.79	0.67	-0.37	.81	.77, .84

Note. $N = 300$. C. I. = Confidence Interval. Number of items in parentheses. Confidence intervals for the reliability estimates were calculated with SPSS language from Fan and Thompson (2003).

Table 2

Descriptive Statistics for Time Attitude Scores in German Adolescents

	M	*SD*	Skew	Kurtosis	α	95% C. I. (α)
Past Positive (5)	3.60	0.90	-0.37	0.12	.88	.85, .90
Past Negative (5)	2.24	0.97	0.53	-0.19	.84	.81, .87
Present Positive (5)	3.79	0.81	-0.55	0.14	.87	.85, .90
Present Negative (5)	2.40	0.81	0.18	0.08	.77	.73, .81
Future Positive (5)	3.80	0.89	-0.38	-0.43	.87	.84, .89
Future Negative (5)	1.99	0.83	0.58	-0.13	.81	.77, .84

Note. $N = 316$. C. I. = Confidence Interval. Number of items in parentheses. Confidence intervals for the reliability estimates were calculated with SPSS language from Fan and Thompson (2003).

Table 3

Correlation Matrix of AATI-TA Scores in U.S.

Sample	1	2	3	4	5	6
1. Past Positive	1.00					
2. Past Negative	-.67	1.00				
3. Present Positive	.40	-.40	1.00			
4. Present Negative	-.27	.42	-.64	1.00		
5. Future Positive	.22	-.23	.39	-.30	1.00	
6. Future Negative	-.27	.47	-.33	.31	-.57	1.00

Note. N = 300. AATI-TA = Adolescent and Adult Time Inventory–Time Attitude Subscales.

Table 4

Correlation Matrix of AATI-TA Scores in German

Sample	1	2	3	4	5	6
1. Past Positive	1.00					
2. Past Negative	-.58	1.00				
3. Present Positive	.39	-.34	1.00			
4. Present Negative	-.31	.49	-.63	1.00		
5. Future Positive	.40	-.27	.48	-.35	1.00	
6. Future Negative	-.37	.60	-.40	.56	-.51	1.00

Note. N = 316. AATI-TA = Adolescent and Adult Time Inventory–Time Attitude Subscales.

Table 5

Fit Indices for AATI-TA Scores Derived From Confirmatory Factor Analyses (Maximum Likelihood Robust)

Model	χ^2 s-b	df	χ^2/df	*NNFI	*CFI	SRMR	*RMSEA	(90% C.I.)
United States (300)								
1. Null	8298.26*	1176	7.06					
2. 2-Factor (Valence)	3441.61*	1126	3.06	.564	.583	.114	.083	.080, .086
3. 3-Factor (Time Periods)	2086.92*	1124	1.86	.818	.826	.075	.054	.050, .057
4. 6-Factor (30)	546.00*	390	1.40	.937	.944	.059	.037	.029, .044
Germany (316)								
5. Null	8363.57*	1378	6.07					
6. 2-Factor (Valence)	3481.10*	1324	2.63	.679	.691	.094	.072	.069, .075
7. 3-Factor (Time Periods)	2547.32*	1322	11.93	.817	.825	.082	.054	.051, .057
8. 6-Factor	520.73*	390	1.34	.960	.965	.050	.033	.025, .040
Invariance								
9. Configural	1065.94*	780	1.37	.951	.956	.055	.035	.029, .040
10. Metric	1103.19*	804	1.37	.950	.954	.089	.035	.030, .040
11. Structural	1167.61*	825	1.42	.944	.947	.089	.037	.032, .041
12. Mean	1149.12*	810	1.42	.943	.949	.057	.037	.032, .042

Note. N = 300. AATI-TA = Adolescent and Adult Time Inventory–Time Attitude Subscales; s-b = Satorra-Bentler; *NNFI = Robust Nonnormed Fit Index; *CFI = Robust Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; *RMSEA = Robust Root Mean Square Error of Approximation; C.I. = Confidence Interval. Taken from Worrell et al. (2013).

*$p < .001$

Table 6

Standardized Coefficients from Confirmatory Factor Analysis of AATI-TA Scores in US

	Coeffs.	Error Terms	Effect Size		Coeffs	Error Terms	Effect Size
Past Positive				Past Negative			
Item 3	.62	.79	.38	Item 31	.61	.79	.37
Item 9	.63	.78	.40	Item 37	.71	.71	.50
Item 17	.70	.72	.49	Item 41	.59	.81	.35
Item 19	.69	.72	.48	Item 44	.69	.72	.48
Item 22	.70	.71	.49	Item 46	.68	.73	.46
α	.80				.79		
Present Positive				Present Negative			
Item 5	.54	.84	.29	Item 4	.58	.82	.34
Item 6	.69	.72	.48	Item 15	.54	.84	.29
Item 10	.78	.63	.61	Item 18	.70	.72	.49
Item 12	.63	.78	.40	Item 21	.73	.69	.53
Item 25	.58	.82	.34	Item 47	.60	.80	.36
α	.77				.77		
Future Positive				Future Negative			
Item 11	.74	.67	.55	Item 34	.46	.89	.21
Item 20	.80	.60	.64	Item 43	.67	.74	.45
Item 29	.77	.64	.59	Item 45	.76	.65	.60
Item 35	.80	.60	.64	Item 48	.70	.72	.49
Item 53	.47	.88	.22	Item 52	.79	.62	.62
α	.83				.81		

Note. N = 300. AATI-TA = Adolescent and Adult Time Inventory–Time Attitude Subscales; Coeffs. = Coefficients. Taken from Worrell et al. (2013).

Table 7

Standardized Coefficients from Confirmatory Factor Analysis of AATI-TA Scores in Germany

	Coeffs.	Error Terms	Effect Size		Coeffs	Error Terms	Effect Size
Past Positive				Past Negative			
Item 3	.72	.70	.52	Item 31	.70	.72	.49
Item 9	.74	.67	.55	Item 37	.80	.60	.64
Item 17	.78	.63	.61	Item 41	.68	.74	.46
Item 19	.81	.58	.66	Item 44	.68	.73	.46
Item 22	.79	.61	.63	Item 46	.72	.69	.52
α	.88				.84		
Present Positive				Present Negative			
Item 5	.83	.56	.69	Item 4	.57	.83	.32
Item 6	.76	.65	.58	Item 15	.60	.80	.36
Item 10	.74	.67	.55	Item 18	.56	.83	.31
Item 12	.76	.65	.58	Item 21	.82	.57	.67
Item 25	.67	.74	.45	Item 47	.75	.66	.56
α	.87				.77		
Future Positive				Future Negative			
Item 11	.77	.64	.59	Item 34	.54	.84	.29
Item 20	.82	.57	.67	Item 43	.65	.76	.42
Item 29	.76	.65	.58	Item 45	.68	.73	.46
Item 35	.71	.70	.50	Item 48	.77	.64	.59
Item 53	.69	.73	.48	Item 52	.72	.70	.52
α	.87				.84		

Note. N = 316. CFA = Confirmatory Factor Analysis; ATAS = Adolescent and Adult Time Inventory–Time Attitude Subscales; Coeffs. = Coefficients. Taken from Worrell et al. (2013).

Scoring the AATI

Time Meaning

Time meaning questions are open-ended and generate qualitative data.

Time Frequency

Time frequency is treated as an ordinal or interval variable with five values: *never*, *almost never*, *sometimes*, *fairly often*, and *often* for each of the three time periods.

Time Orientation

Time orientation is treated as a categorical variable with seven values that correspond to the item numbering: Figure 1 (*Past-Oriented*), Figure 2 (*Present-Oriented*), Figure 3 (*Future Oriented), Figure* 4 (*Past-Future Oriented*), Figure 5 (*Past-Present Oriented*), Figure 6 (*Present-Future Oriented*), and Figure 7 (*Balanced).* In past research, we used an older version of Time Orientation that did not include Figure 1 and Figure 5.

Time Relation

Time relation is treated as a categorical variable with four values that correspond to the item numbering: Figure 1 (*No Relationship*), Figure 2 (*Relationship between Present-Future*), Figure 3 (*Linear Relationship*), and Figure 4 (*Interrelated*).

Time Attitudes

Time attitudes include six 5-item subscales that correspond to the following listed items. Subscale scores are generated by calculating the average responses of the five items making up each subscale.

Given the high intercorrelations among subscales assessing the same time period, researchers should check for multicollinearity when conducting analyses using positive and negative subscales.

Past Positive: 3, 9, 21, 24, 30
Past Negative: 6, 12, 15, 18, 27
Present Positive: 5, 11, 14, 17, 26
Present Negative: 2, 8, 20, 23, 29
Future Positive: 1, 7, 13, 19, 28
Future Negative: 4, 10, 16, 22, 25

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Mello, Z. R., & Worrell, F. C. (2022). *The Adolescent Time Inventory: Preliminary Technical Manual (Version 2)*. San Francisco, CA: Author.

Check out the AATI website for additional versions of the scale: https://faculty.sfsu.edu/~zmello/content/adolescent-and-adult-time-inventory-aati

Appendix

The Adolescent and Adult Time Inventory (AATI)

The Adolescent and Adult Time Inventory

Write a response to each question below.

1. How do you define the past?

_____

_____

_____

2. How do you define the present?

_____

_____

_____

3. How do you define the future?

_____

_____

_____

Select one response for each question.

	Never	Almost Never	Some-times	Fairly Often	Often
1. How often do you think about the past?	**O**	**O**	**O**	**O**	**O**
2. How often do you think about the present?	**O**	**O**	**O**	**O**	**O**
3. How often do you think about the future?	**O**	**O**	**O**	**O**	**O**

Instructions: Select **one** figure below that shows how **important** the past, the present, and the future are to you, with larger circles being more important to you.

Figure 1. **O**

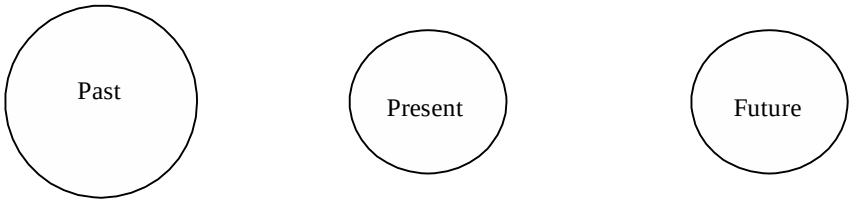


Figure 2. **O**

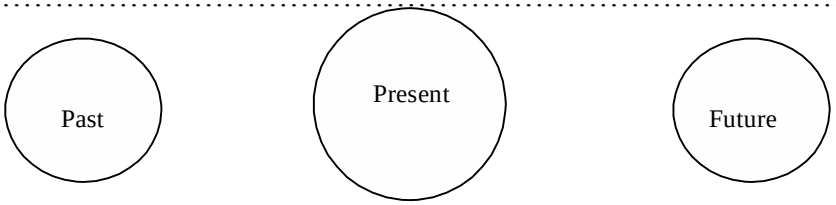


Figure 3. **O**

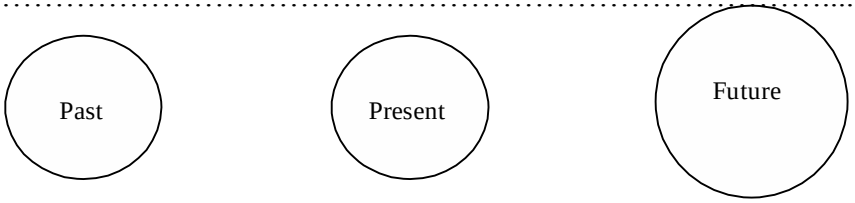


Figure 4. **O**

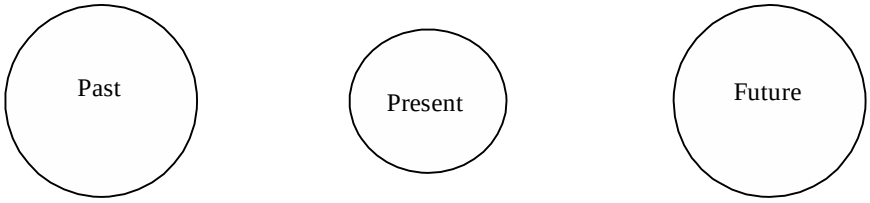


Figure 5. **O**

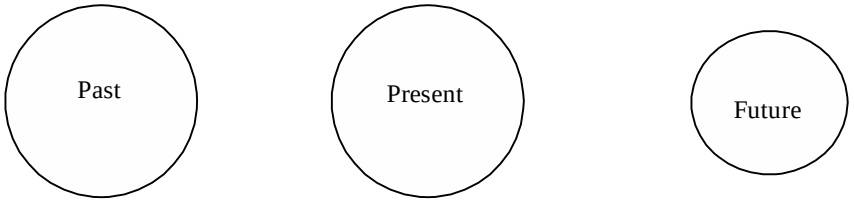


Figure 6. **O**

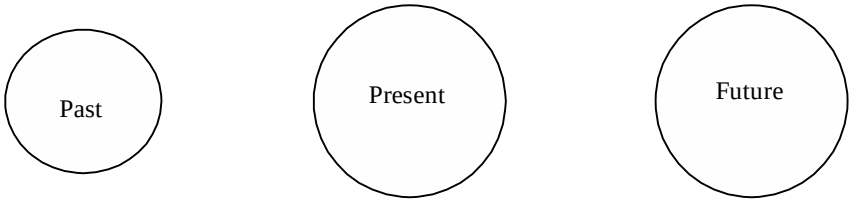
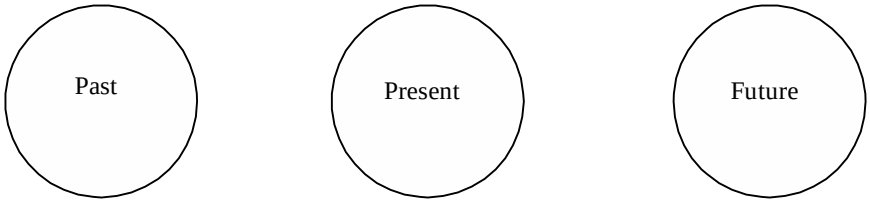


Figure 7. **O**



Instructions: Select **one** figure below that shows how you view the **relationship** among the past, the present, and the future.

……..

Figure 1. **O**

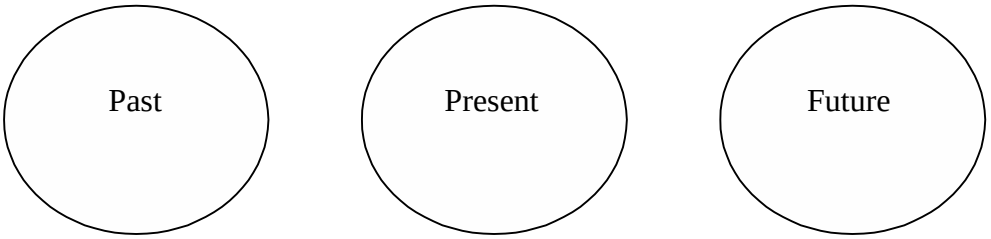


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Figure 2. **O**

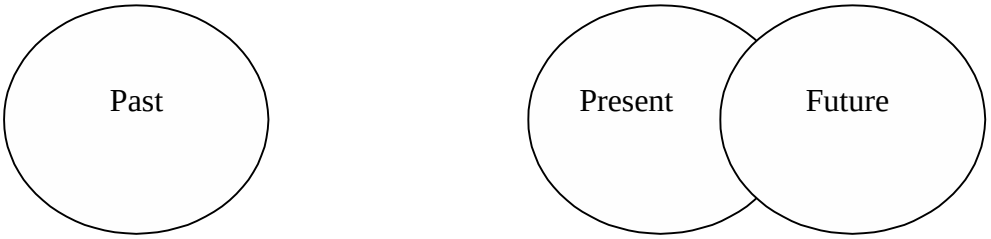

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Figure 3. **O**

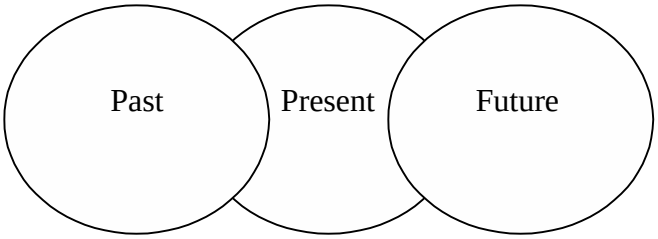

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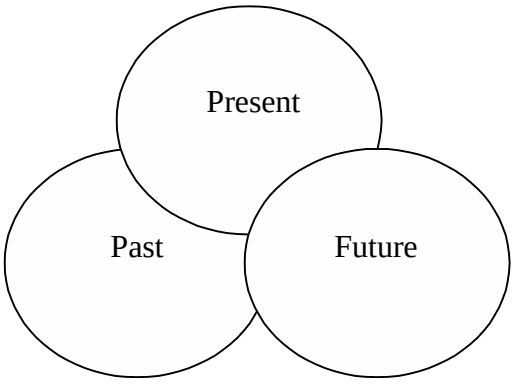
Figure 4. **O**



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Select one response for each question.

		Totally Disagree	Disagree	Neutral	Agree	Totally Agree
1.	I look forward to my future……	○	○	○	○	○
2.	I am not satisfied with my life right now……...	○	○	○	○	○
3.	I have very happy memories of my childhood…..	○	○	○	○	○
4.	I doubt I will make something of myself……...	○	○	○	○	○
5.	I am happy with my current life…….	○	○	○	○	○
6.	My past is a time in my life that I would like to forget……..	○	○	○	○	○
7.	My future makes me happy……	○	○	○	○	○
8.	I have negative feelings about my current situation……..	○	○	○	○	○
9.	I have good memories about growing up…….	○	○	○	○	○
10.	I don't think I'll amount to much when I grow up...	○	○	○	○	○
11.	I am pleased with the present……	○	○	○	○	○
12.	I am not satisfied with my past…….	○	○	○	○	○
13.	My future makes me smile……...	○	○	○	○	○
14.	I am content with the present……	○	○	○	○	○
15.	My past makes me sad……..	○	○	○	○	○
16.	Thinking about my future makes me sad……..	○	○	○	○	○
17.	Overall, I feel happy about what I am doing right now……...	○	○	○	○	○
18.	I wish that I did not have the past that I had……	○	○	○	○	○
19.	I am excited about my future……	○	○	○	○	○
20.	I am not satisfied with my present……	○	○	○	○	○
21.	I have happy thoughts about my past……	○	○	○	○	○
22.	I don't like to think about my future……	○	○	○	○	○
23.	I am not happy with my present life…….	○	○	○	○	○
24.	I like to think about my past because it was such a happy time for me…….	○	○	○	○	○
25.	Thinking ahead is pointless…….	○	○	○	○	○
26.	Overall, I feel happy with my life right now……	○	○	○	○	○
27.	I have unpleasant thoughts about my past……	○	○	○	○	○
28.	Thinking about my future excites me……..	○	○	○	○	○
29.	My current life worries me……...	○	○	○	○	○
30.	My past is full of happy memories……	○	○	○	○	○