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Factor Structure of Overall Autobiographical Memory Usage: The Directive, Self and Social
Functions Revisited

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Abstract

According to theory, autobiographical memory serves three broad functions of overall usage: Directive, self and social. However, there is evidence to suggest that the tripartite model may be better conceptualized in terms of a four-factor model with two social functions. In the present study, we examined the two models in Danish and German samples, using the Thinking About Life Experiences Questionnaire (TALE; Bluck, Alea, Habermas & Rubin, 2005), which measures the overall usage of the three functions generalized across concrete memories. Confirmatory factor analysis supported the four-factor model and rejected the theoretical three-factor model in both samples. The results are discussed in relation to cultural differences in overall autobiographical memory usage as well as sharing versus non-sharing aspects of social remembering.

Factor Structure of Overall Autobiographical Memory Usage: The Directive, Self and Social Functions Revisited

According to a prevailing theory, autobiographical memory serves three broad functions: Directive, self and social (e.g., Bluck, 2003; Cohen, 1998; Pillemer, 1992). The *directive function* involves the use of autobiographical memories in problem solving and planning, and in guiding present and future thinking and behavior (e.g., Baddeley, 1988; Pillemer, 2003). The *self-function* concerns the use of autobiographical memories in order to promote self-continuity, provide material for the self-concept, and basically tell us who we are (e.g., Baddeley, 1988; Conway, 1996; Fivush, 1988; Habermas & Bluck, 2000). The *social function* has often been described as the sharing of one's personal memories with others in order to facilitate social bonding, elicit empathy or intimacy, teach, communicate or inform (e.g., Alea & Bluck, 2003; Nelson, 1993; Pillemer, 1992), but may also involve memories about loved ones, which are not necessarily shared with others (e.g., Alea & Bluck, 2007; Kulkofsky, Wang & Hou, 2010). The three functions have been examined in relation to concrete memories (e.g., Alea & Bluck, 2007; Hyman & Faries, 1992; Kulkofsky et al., 2010; Mclean & Lilgendahl, 2008; Pasupathi, Lucas and Combs, 2002; Rasmussen & Berntsen, 2009a; b) as well as in survey studies addressing people's overall usage of the three functions generalized across concrete memories (e.g., Bluck, Alea, Habermas & Rubin, 2005, Cappeliez & O'Rourke, 2002; Cappeliez, O'Rourke & Chaudbury, 2005; Webster, 1993; 1997). Here, we focus on the latter. We examine the validity of the proposed tripartite factor structure of overall autobiographical memory usage in Danish and German samples.

For the present purpose, we use the Thinking About Life Experiences (TALE; Bluck et al., 2005; Bluck & Alea, 2009) questionnaire, which was developed in order to specifically assess the tripartite model of overall usage. Alternative instruments, such as the Reminiscence Function Scale

(RFS; Webster, 1993; 1997), which addresses eight functions of reminiscence (i.e., functions of thinking and talking about the past), are also available, but several researchers have argued that the eight functions measured on the RFS largely correspond to subcategories of the three functions as measured on the TALE (e.g., Bluck & Alea, 2002; Bluck et al., 2005; Cappeliez et al., 2005). In further support of this idea, Webster (2003) submitted the eight factors on the RFS to secondary factor analysis resulting in a circumplex model with two orthogonal dimensions and four function factors (i.e., Self versus Social and Proactive/Growth-oriented versus Reactive/Loss-oriented), which can be seen as overlapping with the directive, self and social functions of overall usage. Thus, the TALE covers most – but not all - of the RFS-functions in a more economic fashion.

In the initial construction of the TALE (Bluck et al., 2005), 28 items were submitted to exploratory factor analysis in an undergraduate sample. The items were generated from theoretical work and previous studies addressing the three functions, but the analysis supported a four-factor model with two social functions rather than the theoretical three-factor model and were based on only 24 of the original 28 items. Furthermore, the directive function was much broader than originally conceptualized, the self-function was much narrower, specifically addressing the self-continuity aspect of this function, and the social function was split into two factors addressing the nurturing of existing relationships versus the development of new relationships. Bluck et al. argued that the two social factors might reflect different phases of relationships across generations, and concluded that the results still supported the three-factor model, but that some refinement of the TALE was needed. Following up on this argument, Bluck and Alea (2009) constructed a revised version of the TALE, with three factors and 15 items, whereof most were derived from the original questionnaire. However, an equally possible explanation may be that the empirical four-factor model with two social functions (Bluck et al., 2005) offers a valid alternative to the theoretical

three-factor model (e.g., Bluck, 2003; Pillemer, 1992). This explanation is further supported by the Nurturing and Developing Relationships subscales being only marginally correlated in the original study ($r = .12$; see Bluck et al., 2005, Table 3).

In addition, there may be other theoretical interpretations of the two social factors than the ones reflected by the Developing and Nurturing Relationships subscales. For instance, previous work has conceptualized the social function in two ways (e.g., Alea & Bluck, 2003; Rasmussen & Berntsen, 2009a; Webster, 1993), which can be seen as reflected in the items of the Nurturing and Developing Relationships subscales respectively. One concerns the sharing of memories with others in order to facilitate social bonding, communicate, teach or inform (e.g., Alea & Bluck, 2003; Nelson, 1993; Pillemer, 1992), whereas the other concerns the thinking about memories of significant others, in order to increase intimacy with the person (e.g., Alea & Bluck, 2007; Webster, 1993). For the former, it is the actual sharing of a personal memory, which serves a social function, whereas for the latter, the memory might be shared, but it is the preceding thinking about the memory, which serves a social function. Consistent with this distinction, all items from the Nurturing Relationships subscale explicitly refer to memory sharing (e.g., “I think back over or talk about my life or certain periods of my life *when I want to make someone else feel better by talking to them about my similar past experiences*”; Bluck et al., 2005; Question 22), whereas the items from the Developing Relationships subscale describe social uses of memories, such as learning more about another person’s life, but without an explicit reference to memory sharing (e.g., “I think back over or talk about my life *when I hope to also learn more about the other person’s life*”; Bluck et al., 2005, Question 26). In further support of this idea, the correlation between overall talking about life, as also measured on the TALE, and the Nurturing Relationships subscale was of a larger magnitude (.42) than the corresponding correlation with overall thinking about the past (.16) in the

original study (see Bluck et al., 2005, Table 5), suggesting that the Nurturing Relationships subscale, compared to the Developing Relationships subscale deals more with the sharing of memories. In contrast, correlations between Developing Relationships and overall talking and thinking of the past were similar in magnitude (i.e., .25 and .24, respectively).

The two theoretical conceptualizations of the social function are indirectly supported by Webster's circumplex model (Webster, 2003). Three of the eight RFS-functions have been described as corresponding to the social function of overall autobiographical memory usage (e.g., Bluck & Alea, 2002). When submitting the RFS to secondary factor analysis, Webster (2003) found that these three functions (i.e., *Conversation*, *Teach/Inform* and *Intimacy Maintenance*) loaded on the same dimension, but different function factors (i.e., Social versus Self) according to whether they referred to sharing or thinking about memories for social reasons. Conversation and Teach/Inform, which both involve sharing memories, loaded on the Social factor of Webster's circumplex, whereas Intimacy Maintenance, which involves thinking about a loved one in order to maintain intimacy, loaded on the Self factor. Furthermore, in a recent study Kulkofsky et al. (2010) found that people report social functions for memories that are talked about as well as memories that are thought about in private. In this study, participants were asked to describe one event that a person would think about in private, and why they would think about it, as well as one event that a person would talk about at a party, and why they would talk about it. The memories were then coded for the three functions as well as for non-functional reasons for recollecting the event. The results showed that two thirds of the memories in the talk-about condition were reported as being talked about for social reasons, whereas one third of the memories in the think-about condition were reported as being thought about for social reasons, suggesting that both thinking and talking about an event can serve a social function.

The primary goal of the present study was to examine whether the tripartite model of overall autobiographical memory usage is better conceptualized as a four-factor model with two social functions, thereby replicating Bluck et al., (2005). The secondary goal was to examine whether the Nurturing Relationship factor would relate more to overall talking than thinking about the past, thereby supporting the sharing versus non-sharing distinction. Given that culture may play a role in overall autobiographical memory usage (e.g., Nelson & Fivush, 2004), a final goal of the study was to examine, whether the two social functions would also emerge in non-US samples. We therefore compared the two models in Danish and German samples.

The Study

We compared the theoretical three-factor model (Model 3T) and the empirical four-factor model (Model 4E). We also specified two alternative models: An empirical three-factor model (Model 3E), which is similar to Model 4E, except for the two social functions, Nurturing and Developing Relationships, being conceptualized as one factor, and a theoretical one-factor model (Model 1T). Model 3E was included in order to examine a three-factor model, which did not differ from Model 4E with respect to the directive and self-functions as well as with respect to number of items. Model 1T was included, because it is the most parsimonious model possible, and should therefore be ruled out. The two theoretical models (Models 3T and 1T) were based on all 28 items on the TALE, whereas the two empirical models (Models 4E and 3E) were based on the 24 items that came out in the study by Bluck et al., (2005). The four models are depicted in Table 1.

----Table 1----

Method

Participants

A total of 217 (157 females, mean age, 22.69 years, $SD = 4.62$, range 18-47 years) Danes and 229 Germans (148 females, mean age 22.18 years, $SD = 2.17$, range 19-30 years) participated in group sessions. The Danish data were collected by the first author as part of a larger study. This sample consisted of 136 folk high school students¹ and 81 psychology undergraduates, and the questionnaires were distributed as part of a lecture at the institutions. We found only minor effects of group differences in the Danish sample, for which reason the data were collapsed in our analyses. The German data were collected by the second author as part of a larger study. This sample consisted of medical undergraduates and the questionnaires were distributed during classes at the university. There was no significant difference between the Danish and German samples with regard to age and gender distribution.

The Thinking About Life Experiences Questionnaire

The TALE Questionnaire addresses people's self-reported reasons for thinking and talking about the past (Bluck et al., 2005). This 28-item scale is divided into subscales corresponding to the theoretical directive (10 items), self- (10) and social (8 items) functions of autobiographical memory. The empirical model consists of 24 of the original 28 items and assesses four factors: Directive (14 items), Self-Continuity (4 items), Nurturing Relationships (3 items) and Developing Relationships (3 items). Two introductory items address the frequency of overall thinking and talking about life. The instructions are: "Sometimes people think back over their life or talk to other people about their life – it may be about things that happened quite a long time ago or more recently. We are not so interested in the times that you think back over specific events as in when and how you bring together and connect the events and periods of your life" (Bluck et al., 2005, p. 97). This instruction is followed by a stem statement to the function-items: "I think back over or talk about my life or certain periods of my life..." All items, including the two introductory items,

are rated on 6-point scales (1 = never, 6 = very frequently) in the Danish version, whereas in the German version, items are rated on 9-point scales (0 = never; 8 = always). This difference in number of points on the rating scales should be minimal as long as correlations, and not means are compared. Both versions of the TALE had been translated from English through a standard translation and back-translation procedure.

Analysis

Four confirmatory factor models were specified and measured using LISREL 8.80 (Jöreskog & Sörbom, 2006). In order to account for non-normality, a covariance matrix and an asymptotic weight matrix were computed (Schumacker & Lomax, 1996) using PRELIS 2.80 (Jöreskog & Sörbom, 2006) based on all the relevant TALE-items (28 for Models 3T and 1T and 24 for Models 4E and 3E), excluding the two introductory items, and estimated using maximum likelihood. The percentage of missing values was very small for all variables (0-1.8 % for the Danish sample; 0-2.2 % for the German sample), and missing data were imputed using the EM-algorithm.

Due to recommendations from previous work (Bluck et al., 2005), all factors were allowed to correlate. Following Kline (2005), we assessed the goodness of fit for each model using a range of fit indices including the Satorra-Bentler scaled chi-square ($S-B\chi^2$; Satorra & Bentler, 2001), the Incremental-Fit Index (IFI; Bollen, 1989), and the Comparative Fit Index (CFI; Bentler, 1990). A non-significant chi-square reflects acceptable fit of the model. However, the chi-square is very sensitive to sample size, and may therefore sometimes lead to false rejection of a model. In such cases, values for the normative chi-square (i.e., the chi-square relative to the degrees of freedom) lower than 2 are generally accepted as indicators of good fit (e.g., Kline, 2005). Values above .95 for the IFI and CFI are considered to reflect acceptable fit of the model, whereas values greater than .90 indicate reasonable good fit. We also used the Root Mean Square of Approximation (RMSEA;

Steiger, 1990) with 90 % Confidence Intervals (90 % CI), which estimates the “badness of fit” of the model. Values less than .05 for the RMSEA indicate close fit, whereas values between .05 and .08 indicate reasonably acceptable fit. Values greater than .1 indicate poor fit. In addition, if the lower bound of the 90 % CI is less than .05, the model should not be rejected, whereas the model should be rejected, if the higher bound exceeds .1 (Kline, 2005). Kline also recommends the use of the Standardized Root-Mean-Square Residual (SRMR; Jöreskog & Sörbom, 1981) as well as the Expected Cross Validation Index (ECVI; Brown & Cudeck, 1989). Values less than .08 for the SRMR are generally considered favorable (Hu & Bentler, 1998). The ECVI assesses the comparative fit of the models with the smallest value indicating the best fitting model.

Results

Table 2 shows the fit indices for both the Danish and German sample. As shown by the table, all four models generally showed better fit for the Danish than for the German sample. At the same time, on the basis of all fit indices, the empirical four-factor model (Model 4E) showed the best fit in both samples, followed by the empirical three-factor model (Model 3E), the theoretical three-factor model (Model 3T), and the one-factor solution (Model 1T). Model 4E showed acceptable fit in the Danish sample and reasonably acceptable fit in the German sample. Model 3E showed reasonably acceptable to acceptable fit in the Danish sample, whereas it was rejected in the German sample. Models 1T and 3T were rejected in both samples. Although the chi-squares for model 4E were statistically significant, this should not lead to rejection of the model, since the normative chi-square was less than 2 in both samples. In addition, the other fit indices, which are less sensitive to sample size, all supported acceptable or reasonably acceptable model fit. Thus, the analysis suggested that the empirical four-factor model with two social functions (Model 4E) was

the best fitting model in both the Danish and German sample, consistent with previous work (Bluck et al., 2005).

----Table 2----

The standardized factor loadings for Model 3 in both samples are presented in Table 3. All loadings were positive and statistically significant ($p < .05$), ranging from .40-.82 in the Danish sample and .39-.85 in the German sample. There were only minor differences between the factor loadings across the two samples, and they were generally of the same magnitude as the factor loadings reported by Bluck et al. (2005, Table 2), although they cannot be seen as direct replications, since they were derived from confirmatory rather than exploratory factor analysis.

----Table 3----

The factor inter-correlations are shown in Table 4. All correlations were positive and statistically significant ($p < .05$), ranging from .32-.83 in the Danish sample and from .27-.69 in the German sample. Consistent with previous work (e.g., Bluck et al., 2005; Webster, 1993), the correlation between Directive and Self-Continuity was of a high magnitude in both samples. Interestingly, the correlations between the Developing and Nurturing Relationships subscales were not especially highly correlated in terms of rank order (i.e., the third out of the six inter-correlations in the Danish sample and the fourth in the German sample), and they were less than the average of the other five correlations (i.e., .56 in the Danish sample and .45 in the German sample). This further supports the empirical four-factor model, consistent with Bluck et al., (2005). As also shown by Table 4, the reliabilities, as measured by Cronbach's alpha, were all acceptable considering the low number of items in some of the subscales.

----Table 4----

The correlations between overall thinking and talking about life and the four factors from Model 4E are presented in Table 5. As shown by the table, the correlations between overall thinking about life and the Directive and Self-Continuity factors of the TALE were of a slightly higher magnitude than the corresponding correlations with overall talking about life, consistent with previous work (Bluck et al., 2005). However, contrary to our predictions, the correlations between overall talking and thinking about life and the Nurturing and Developing Relationships factors were of similar magnitudes in both samples. Thus, there was no support for a special relationship between overall talking about the past and the Nurturing Relationships factor in either of the present samples.

----Table 5----

Discussion

The present research tested the tripartite model of autobiographical memory function using the TALE-questionnaire (Bluck et al., 2005), which addresses individual differences in the overall usage of autobiographical memory. Four alternative models were specified and estimated using confirmatory factor analysis. Previous work suggested two competing models: A theoretical three-factor model consistent with the hypothesized directive, self- and social functions (e.g., Bluck & Alea, 2009; Cohen, 1998; Pillemer, 1992) and an empirical four-factor model with two social functions addressing the nurturing of existing relationships versus the development of new relationships (Bluck et al., 2005). In addition, we also tested the more parsimonious one-factor model as well as an empirical three-factor model, which was similar to the empirical four-factor model, except for the two social functions, Nurturing and Developing Relationships, being conceptualized as one factor. We tested these four alternative models in Danish and German samples. On the basis of all fit indices, and consistent with previous work, the four-factor model

showed the best fit in both samples, whereas there was only marginal support for the theoretical three-factor model. The empirical three-factor model was supported in the Danish sample, but not in the German sample, whereas the one-factor model was rejected in both samples. Thus, the empirical four-factor model with two social functions was considered the best model of overall autobiographical memory usage across both samples, suggesting that this model offers a valid alternative to the theoretical three-factor model (e.g., Bluck, 2003; Pillemer, 1992).

Contrary to Bluck et al. (2005), we did not find support for a special relationship between the Nurturing Relationships factor and overall talking about the past. In fact, the correlations between Nurturing Relationships and overall talking and thinking about the past were quite similar. Thus, our results were not consistent with the idea that the Nurturing and Developing Relationships subscales corresponds to the sharing versus non-sharing conceptualizations of the social function in both the Danish and German sample. It is possible that these deviations may reflect different attitudes towards memory sharing in Western European and US cultures.

We tested the four models in Danish and German samples and replicated the results from the original study (Bluck et al., 2005) with only minor deviations, suggesting that the four-factor model is valid across European and North American cultures. A logical next step for future research would therefore be to examine the factor structure of overall autobiographical memory usage in Asian cultures, which have been evidenced to differ markedly from European and North American cultures with respect to overall memory style, memory content and the extent to which they share their personal memories with others (e.g., Kulkofsky et al., 2010; Nelson & Fivush, 2005; Pillemer, 1998). Accordingly, they may also differ with respect to overall memory usage. For instance, when examining the self-reported functions of memory sharing in mother-child reminiscing practices, Kulkofsky, Wang and Koh (2009) found that European American mothers were more likely than

Chinese mothers to report conversational and social as well as teaching and problem solving functions. Furthermore, Kulkofsky et al. (2010) examined reasons for reminiscing in European American and Chinese samples and found that the European American sample reported more functional reasons for reminiscing (i.e., the directive, self and social functions), whereas the Chinese sample reported more non-functional reasons (i.e., recency, emotionality, aspects of the event etc.).

The four-factor model of overall autobiographical memory usage is largely overlapping with Webster's (2003) circumplex model with two orthogonal dimensions and four function factors (i.e., Self versus Social and Proactive/Growth-oriented versus Reactive/Loss-oriented). As mentioned previously, the Self and Social factors, as measured on the RFS, can be seen as corresponding to the Developing and Nurturing Relationships functions, as measured by the TALE, whereas the Proactive/Growth-oriented factor consists of the reminiscence functions *Problem Solving* and *Identity*, corresponding to the directive and self-functions of overall usage. However, the last factor in Webster's model - the Reactive/Loss-oriented factor - includes function categories that cannot easily be fitted onto the four-factor model of autobiographical memory usage. For example, it includes categories, which may be seen as dysfunctional (e.g., Bitterness Revival) or non-functional (e.g., Boredom Reduction), suggesting that the four-factor model as measured on the TALE is not exhaustive, and that other functions may also exist.

In conclusion, the present study supports a four-factor model of overall autobiographical memory usage with two social functions rather than the prevailing theoretical three-factor model, thereby replicating previous work (Bluck et al., 2005; Pillemer, 1992) in Danish and German samples. Future research needs to address possible interpretations of the two social functions as well as cultural differences in the functions of overall autobiographical memory usage.

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Footnotes

¹A folk high school [folkehøjskole] in Denmark is an institution of non-formal and continuing adult education often with a dominance of creative and artistic topics, such as music, drama and painting. A typical folk high school student is a young person, who has finished ordinary high school, and who wants to spend some time exploring a creative topic before beginning his or her college education.

Table 1

Alternative Models of Overall Autobiographical Memory Usage

	Model 1	Model 3T	Model 3E	Model 4E
TALE-items				
1.	AMF	DI	D	D
2.	AMF	DI		
3.	AMF	DI	D	D
4.	AMF	DI	D	D
5.	AMF	DI	D	D
6.	AMF	DI	D	D
7.	AMF	DI	D	D
8.	AMF	DI		
9.	AMF	DI	D	D
10.	AMF	DI	D	D
11.	AMF	SE	D	D
12.	AMF	SE		
13.	AMF	SE	SC	SC
14.	AMF	SE	SC	SC
15.	AMF	SE	D	D
16.	AMF	SE	SC	SC
17.	AMF	SE	SC	SC
18.	AMF	SE	D	D
19.	AMF	SE	D	D
20.	AMF	SE	D	D
21.	AMF	SO	D	D
22.	AMF	SO	NR_DR	NR
23.	AMF	SO		
24.	AMF	SO	NR_DR	DR
25.	AMF	SO	NR_DR	NR
26.	AMF	SO	NR_DR	DR
27.	AMF	SO	NR_DR	DR
28.	AMF	SO	NR_DR	NR

Note: AMF = Autobiographical Memory Function; DI = Directive Function; SE = Self Function; SO = Social Function; D = Directive; SC = Self-Continuity; NR = Nurturing Relationships; DR = Developing Relationships; NR_DR = Nurturing and Developing Relationships.

Table 2

Fit Indices for the Alternative Models of the Thinking About Life Experiences (TALE) Questionnaire

Fit Indices	Model 1T		Model 3T		Model 3E		Model 4E	
	Danish	German	Danish	German	Danish	German	Danish	German
S-B χ^2	904.35	1213.93	809.08	878.05	473.97	660.08	401.85	554.11
df (p)	350 (.00)	350 (.00)	347 (.00)	347 (.00)	249 (.00)	249 (.00)	246 (.00)	246 (.00)
RMSEA	.087	.11	.080	.084	.066	.087	.055	.076
90% CI	(.080-.094)	(.10-.11)	(.073-.087)	(.077-.091)	(.057-.075)	(.079-.095)	(.045-.065)	(.067-.084)
ECVI	4.89	6.14	4.46	4.61	2.77	3.50	2.45	3.07
90% CI	(4.48-5.33)	(5.67-6.65)	(4.08-4.87)	(4.22-5.03)	(2.49-3.08)	(3.16-3.96)	(2.21-2.73)	(2.74-3.37)
IFI	.91	.84	.92	.90	.95	.91	.97	.93
CFI	.91	.84	.92	.90	.95	.91	.97	.93
SRMR	.084	.100	.087	.097	.074	.091	.069	.085

Note: Bold faces illustrate acceptable or reasonably acceptable fit; S-B χ^2 = Satorra-Bentler scaled chi-square; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Intervals; ECVI = Expected Cross Validation Index; IFI = Incremental Fit Index; CFI Comparative Fit Index; SRMR = Standardized Root Mean Residual.

Table 3
Factor Loadings for Model 4E

[illegible]

Note: All factor loadings statistically significant ($p < .05$) D = Directive; SC = Self-Continuity; NR = Nurturing Relationships; DR = Developing Relationships.

Table 4

Factor Correlations and Reliability Estimates for Model4E

		D	SC	NR	DR
D	Danish	(.86)			
	German	(.85)			
SC	Danish	.64	(.82)		
	German	.71	(.79)		
NR	Danish	.50	.32	(.73)	
	German	.47	.28	(.71)	
DR	Danish	.83	.49	.58	(.60)
	German	.50	.29	.39	(.68)

Note: All correlations are significant ($p < .05$); Chronbach's α in parentheses; D = Directive; SC = Self-Continuity; NR = Nurturing Relationships; DR = Developing Relationships.

Table 5

Correlations between the TALE-subscales from Model 4E and Overall Thinking and Talking about Life

		D	SC	NR	DR
Thinking about Life	Danish	.54**	.42**	.29**	.38**
	German	.48**	.32**	.22*	.29**
Talking about Life	Danish	.32**	.34**	.22*	.39**
	German	.21*	.24**	.22*	.24**

Note: * $p < .001$; ** $p < .0005$; D = Directive; SC = Self-Continuity; NR = Nurturing Relationship; DR = Developing Relationships.