

Maternal attachment script representations: Longitudinal stability and associations with stylistic features of maternal narratives

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Abstract

To evaluate the temporal stability of maternal attachment representations obtained using a word-prompt task, a sample of mothers ($N = 55$) was assessed on two occasions, 12–15 months apart. Each mother responded to six word-prompt sets on each assessment occasion (4 word-prompt sets were designed to prime secure base themes, 2 word-prompt sets were designed to prime different themes), and the resulting stories were scored in terms of the presence and quality of the secure base scripts evident in each story. The story scriptedness scores (average across four stories) were internally consistent at each assessment (alphas $> .85$) and the mean difference in scores was not significant across assessments. The cross-time correlation for the composites (aggregates of scores at each age) was positive and significant, $r(53) = .54$. Other aspects of maternal stories were also stable (e.g., number of words used, number of sentences per story, use of words from the prompt list). Controlling for stable stylistic features of the stories did not reduce the magnitude of association for scriptedness scores across time. These results suggest that the presence and quality of secure base scripts is a stable aspect of maternal representations of attachment and that the word-prompt task is useful for prompting the script in narrative production.

Keywords: *Attachment script representations, longitudinal study*

Introduction

The notion that attachment behaviors and related interaction episodes gradually become represented as organized patterns in behavior and in mind is integral to the Bowlby/Ainsworth theory of attachment (e.g., Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982, 1988). During the early years of life, the child’s representation is at the sensorimotor level and is relatively easy to observe in both ordinary (e.g., home observations) and in emergency (e.g., separations, as in the Strange Situation; both examples described in Ainsworth et al., 1978). From 12 to 24 months old, organization is reflected in the child’s moment-to-moment use of the attachment figure as a secure base for exploration and as a haven of safety when a threat to safety is encountered (or she experiences a reduction in the

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level of stimulation necessary to support exploration). Although cycles of attachment and exploratory behavior indicative of the secure base phenomenon unfold over a longer temporal frame after 2 years of age, the sensorimotor representation is still evident across the years of early childhood (e.g., DeMulder, Denham, Schmidt, & Mitchell, 2000; Symons, Clark, Isaksen, & Marshall, 1998; Waters & Deane, 1985). As the child matures and acquires more sophisticated cognitive, linguistic, and motor skills, an internalized representation of the integrated pattern of behavior and emotion is co-constructed by the dyad members, but this mental representation cannot be observed directly and is inferred from responses to probes stimulating attachment relevant thoughts and associated feelings (e.g., drawing and projective tasks for 6-year-olds described by Main, Kaplan, & Cassidy, 1985; the Adult Attachment Interview [AAI], Main & Goldwyn, 1998; the Adult Attachment Projective, George & West, 2001).

Attachment representations at both sensorimotor and mental levels are presumed to reflect interaction histories relevant to both secure base use by the attached individual and secure base support from the attachment figure; consequently, it is expected that the organizational pattern characterizing the representation will be stable through time. That is to say, attachment theorists generally assume that a representational pattern indicative of security (or insecurity) at some "time 1" will also be apparent at some "time 2" in the future, at least when the situational context supporting the patterns of interaction does not change markedly over the period from time 1 to time 2 (e.g., Sroufe, 1979; Sroufe & Waters, 1977; Waters, 1978; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). When, however, the supporting situational context does change, the likelihood of change in the organization of the attachment representation also increases (e.g., Hamilton, 2000; Sroufe, Egeland, Carlson, & Collins, 2005; Vaughn, Egeland, Sroufe, & Waters, 1979; Weinfeld, Sroufe, & Egeland, 2000). Although both stability and change in the representation of attachment relationships can be assimilated by the Bowlby/Ainsworth theory, the demonstrations of stable patterns of attachment (and predictable instability) over periods ranging from a few months (e.g., Vaughn et al., 1979; Waters, 1978) to nearly two decades (e.g., Waters et al., 2000; Weinfeld et al., 2000) constitute some of the strongest empirical evidence supporting the utility of attachment theory as an explanatory framework for social/emotional development and relationship construction.

Although most reports of temporal stability for attachment security have focused on measures designed for infants and children, a number of investigators have tested the stability of adult classifications and scales from the AAI (Main & Goldwyn, 1998). When the time between assessments is relatively short (e.g., 2 months in Bakermans-Kranenburg & van IJzendoorn, 1993; 3 months in Sagi, van IJzendoorn, Scharf, Koren-Karie, Joels, & Maysel, 1994; 11 months in Benoit & Parker, 1994), the temporal stability of the three-category classifications from the AAI ranged from 78% to 90%. Over rather longer time periods (e.g., 21 months in Crowell, Treboux, & Waters, 2002; 48 months in Ammaniti, Speranza, & Candelori, 1996) the stability for three-category classifications ranged from 70% to 78%. Overall, these results suggest that adult "state of mind with respect to attachment" (the preferred interpretation of the classifications, Hesse, 1999) is temporally stable for adolescents and adults.

This study follows in the attachment research tradition of evaluating temporal stability of adult attachment representations. We tested the cross-time stability for mothers of preschool age children using a recently described word-prompt method (e.g., Waters & Waters, 2006; Waters, Rodrigues-Doolabh, Wais, Zevallos, & Apetroaia, 2006; Vaughn et al., 2006). Mothers and children were participating in a longitudinal study of the socialization of attachment beliefs and were seen on two occasions about 12–15 months apart. As described

by Waters and Waters (2006), the presence and quality of maternal secure-base scripts was scored from a set of four stories elicited in response to sets of word-prompts. We used the same word-prompt sets on both assessment occasions and were able to evaluate several structural features of the stories (e.g., number of words, number of sentences, the number of word-prompts used in the story) in addition to the “scriptedness” scores. Examining the correlations for other structural features of the stories provides additional information about the general narrative styles used by mothers to tell stories. Finally, we were curious to know whether respondents’ stories had a stylistic “signature” making them recognizable (as belonging to the same individual) in ways that might influence decoding. To test this possibility, we presented sets of time 1 and time 2 stories to naïve readers and asked them to group the stories from the same respondent together, solely on the basis of story content and structure.

Method

Participants

Data are available from 55 mothers who were participating in a larger collaborative study ($N=89$) of the socialization of children’s attachment beliefs. Families participating in the larger study came from two sites, one located in a Southeastern state ($N=50$) and the other in a Midwestern state ($N=39$). The families were predominantly middle class by the standards of their local communities and included a wide range of job titles. Reported family income levels ranged from <10 K to over 100 K US dollars annually, with over 40% of families at the highest income level. Maternal education levels ranged from high school or less to post-graduate (i.e., MA, PhD) and professional degrees (e.g., MBA, MD, JD). Over 88% of the mothers had a college degree and less than 4% of mothers had no education past high school (education level did not distinguish mothers from the two sites). Maternal age ranged from 22 to 46 years at enrollment into the study (mean = 34.7 years, maternal age did not distinguish site sub-samples). Approximately 25% of mothers were of minority ethnic status, but these mothers did not differ significantly from the remaining mothers in terms of age, education, or income level. Laboratory visits were scheduled annually and all time 2 visits occurred within 15 months of the time 1 visit.

Narrative data were available for 83 mothers at time 1 and for 59 mothers at time 2. Four mothers (two from each sub-sample) were not assessed with the attachment script representation measure at time 1 because they were unable to schedule a laboratory visit within 7 months after enrolment in the study. Equipment problems (e.g., microphone not attached correctly, mother spoke too softly to be recorded) made recordings for two mothers undecipherable in the time 1 data. Of the 83 mothers with time 1 data, 10 families relocated away from the study sites during the next year and were unavailable for follow-up, eight mothers were not able to schedule a laboratory session within the 15-month time window (four from each site), five families withdrew their children from the daycare centers where they had been recruited and discontinued participation in this project, and procedural or equipment malfunctions made it impossible to decipher and transcribe the maternal narratives (e.g., mother spoke too softly, tape broke during recording, microphone volume not set properly to record voice data) for five additional cases. Finally, four of the mothers with scored time 2 data were among those without data at time 1. The N for the longitudinal sample was 55. Tests on the demographic variables did not reveal any significant differences between mothers with complete data and those who only contributed data at one time point. For the analyses reported here, the samples from the two sites were combined.

Protocols and procedures

The word-prompt method has been presented by Waters and Waters (2006). The secure base scriptedness score derived from this protocol has been linked with other assessments of maternal attachment representation (e.g., Coppola et al., 2006; Dykas et al., 2006; Rodrigues-Doolabh & Waters, 2006). We used the six word-prompt sets she described and secure base scriptedness scores for the four attachment-relevant stories were derived using the scoring criteria and the 7-point scale suggested by Waters & Rodrigues-Doolabh (2004). Scriptedness scores reflect both the presence and quality of the secure base script for each story. Higher scores reflect a well-articulated secure base script for a story and low scores (i.e., <3 on the 7-point scale) reflect the absence of a secure base script. Different assistants collected stories at the two time periods and the scoring of time 2 stories was completed without knowledge of the scriptedness scores for time 1.

All stories were coded by multiple raters. Rater agreement (intra-class correlation) was established at both time periods and ranged (for two to four raters per story) between .68 and .85, with a median value of .76. One of the raters had collected the narrative data for half of the mothers in one of the two sub-samples. This coder's scores were in agreement with those of independent raters (intra-class correlations >.65 with all other raters for stories collected by the rater and for stories collected by other assistants) and we included this rater's scores in the calculation of story means. An aggregate score (i.e., average across all stories scored) was calculated for each mother. Cronbach's alpha for the aggregated score was .94 at time 1 and .88 at time 2. In addition, stories were scored for passage length (number of words used), number of idea units (complete sentences) per story, and the number of word prompts used in the story.

Finally, four teams of naïve raters were asked to evaluate transcripts of the time 1 and time 2 stories and to determine which stories were elicited from the same person. Each team evaluated stories elicited by a single word-prompt set (e.g., *Baby's Morning*). We included this scoring to determine whether there were features of maternal narratives that might uniquely identify a given storyteller and might influence scriptedness scores assigned across the time interval.

At both sites, the word-prompt task was administered during a laboratory visit. The initial segments of the visit included 15–25 minutes of more or less structured parent–child interaction (including toy play, book reading, and a memory for shared events task; see Bost et al., 2006). After completing the memory talk task, an assistant entered the testing room and asked the mother to accompany him to another room to complete the word-prompt task. The child remained in the testing room with another staff member. After being seated at a desk or table in the other room, the mother was told about the word-prompt procedure using instructions described by Waters and Waters (2006), with small modifications so as to make the procedure fit with the overall theme of the laboratory visit (e.g., mothers were told that one aspect of the study was to learn about how children construct their own autobiographies and this was the rationale for learning about how the mothers themselves told stories).

Word-prompt sets were given to the mother one at a time (in 1 of 6 predetermined orders) and she was asked to read through the prompts from the leftmost column to the rightmost before making up a complete story that used the story outline suggested by the prompts. Mothers were told to take a minute or two to compose their story and to let the assistant know when they were ready to start telling the stories. A handheld voice recorder was used to record the narratives, which were transcribed at a later time. Mothers were told that the stories were being recorded for later transcription and that they could re-start a story if they lost track of the story line or decided to use an altered story line in the middle of their

narrative. Approximately 5% of mothers (4 at time 1, 3 at time 2) elected to re-start their stories after an initial false start. In the Waters and Rodrigues-Doolabh scoring system, only the stories identified by mothers as their desired story are scores and false starts do not lower the score earned by a story. After producing stories for all word-prompt sets, the mother returned to the laboratory testing room where the interaction observations had taken place. As noted above, only the stories concerned with secure base themes (i.e., Baby's Morning, The Doctor's Office, Sue's Accident, Jane & Bob's Camping Trip) were scored for this report.

Results

Tests on the stability of the aggregate scriptedness score indicated that the average value did not change appreciably from time 1 to time 2, $t(54) = -0.30$, n.s.; means = 3.78 vs. 3.82 at times 1 and 2, respectively (descriptive statistics are found in Table I). Additional tests within the time 1 data compared those mothers with longitudinal data against those who did not complete the narrative protocol at time 2. Results did not reveal a group difference, $t(82) = 0.54$, n.s. Rank-order stability from time 1 to time 2 was moderately high, $r(53) = .54$, $p < .001$. Cross-time correlations for individual stories ranged from $r = .27$ to $r = .44$, all p -values $< .05$. These results are consistent with the hypothesis that adult attachment representations are stable. They also underscore the utility of aggregated measures/scales rather than individual items/scores in tests of stability.

Secondary analyses tested for the stability of stylistic aspects of the maternal storytelling (i.e., story length in words, number of sentences/idea units, see Table I) and for relations between stylistic variables and the scriptedness scores. Passage length tended to be shorter at time 2, $t(54) = 3.07$ $p < .01$ (means 266 and 223 words at time 1 and time 2, respectively); nevertheless, rank-order stability was moderately high, $r(53) = .65$, $p < .001$ (i.e., mothers using more words at time 1 tended to use more words at time 2). The average number of idea units (complete sentences) per story did not decline significantly across time, $t(54) = 0.21$, n.s. (means = 14.26 and 13.99 at time 1 vs. time 2, respectively). The cross-time correlation for number of sentences used was $r(53) = .55$, $p < .001$. As may be expected, these two stylistic indexes were themselves significantly related within time-period, $r_s = .80$ and $.55$, $p_s < .001$, at time 1 and time 2, respectively; longer passages tended to have more complete sentences. Use of the exact word prompts tended to increase from time 1 to time 2, $t(54) = -2.90$, $p < .01$, means = 9.57 and 10.46, respectively. The number of word prompts used varied from 4 to 12 across both administrations and the number of word prompts used showed moderate temporal stability, $r(53) = .41$, $p < .01$.

Naïve readers made correct matches approximately 12% of the time (i.e., correctly matched story 1 with story 2 for a given mother). Although the number of correct matches was modest, it is considerably greater than the ~2–5% of correct matches that could have

Table I. Summary statistics for attachment script representation variables at Time 1 and Time 2.

Variable	Time 1		Time 2	
	Mean	SD	Mean	SD
Scriptedness score	3.78	1.12	3.82	0.77
Number of words used	268	139	223	107
Number of idea units used	14.26	7.46	13.99	11.05
Number of word prompts used	9.57	2.62	10.46	1.23

been made by chance for any given story, suggesting that aspects of (at least some) mothers' styles of storytelling for a specific word list were consistent across administrations of the task. Of the 55 participants, only three produced recognizable (i.e., correctly identified by naïve readers) stories for two or more word-prompt sets. When asked to describe the clues they used to match stories, the naïve readers suggested a wide range of rationales for their choices including the length of stories, use of shorter vs. longer sentences, use of the same phrasing or words across stories, specific details mentioned (e.g., name of a campground for Jane and Bob's camping trip), and use of explicit dialogue between story protagonists.

We next evaluated relations between secure base scriptedness and narrative style features. Average passage length was a significant correlate of the aggregate scriptedness score at both time 1 and time 2, $r_s(53) = .37$ and $.58$, $p_s < .01$ and $.001$, respectively. The average number of sentences per story was also a significant correlate of scriptedness, but only at time 2, $r(53) = .29$, $p < .05$. The number of word prompts used also was significantly correlated with the aggregate scriptedness score, $r_s(53) = .45$ and $.28$, $p_s < .001$ and $.05$, at time 1 and time 2, respectively. Story recognizability (i.e., number of times a given mother's time 1 and time 2 stories were correctly matched by naïve readers) was not related to the scriptedness scores. This is most likely due to the fact that the modal recognizability score was "0."

Because narrative scriptedness was associated with some stylistic aspects of storytelling the cross-time association between the two attachment script representation scores was recomputed while controlling for stylistic correlates at both time periods. Cohen's set correlation technique, as implemented in the SYSTAT (2004, v. 11) statistical package, was used for this calculation. After controlling for the effects of passage length, sentences used, and word prompts used on the time 2 score and controlling for the effects of average passage length and word prompts used on the time 1 score, the canonical correlation between time 1 and time 2 scriptedness scores was $R_{RC} = .64$, $R^2 = .42$, $p < .001$. Thus, controlling for stylistic features of maternal story telling produced a modest increase in the cross-time association between scriptedness scores (compared to obtained zero-order correlation value).

Discussion

Bowlby believed that the mental representation, or internal working model, of the early attachment relationship was a critical influence on personality and self-representations from early childhood, when the model was first assembled, through adulthood (e.g., Bowlby, 1973, 1980). He also believed that this internal representation served as an implicit plan for the assembly and operation of future intimate relationships with mates and with offspring. Although Bowlby's construal of the internal working model left open the possibility for change when relevant interactional ecologies changed, attachment researchers tend to emphasize the continuity and coherence of attachment representations (rather than change and revision) over time (e.g., Bakermans-Kranenburg & van IJzendoorn, 1993; Sroufe et al., 2005; Waters, 1978; Waters et al., 2000). Indeed, it was the demonstrated stability of behavioral representations of attachment (e.g., Waters, 1978) that rebutted potentially devastating critiques of the conceptual and empirical bases of attachment theory (e.g., Masters & Wellman, 1974) and fueled interest in these conceptual bases and empirical consequences among developmental scientists who might otherwise have committed their efforts to different developmental themes and programs of research. As the community of attachment researchers began to design measures of cognitive/mental representations of attachment (e.g., Main et al., 1985), these too were examined with respect to their temporal stability (e.g., Bakermans-Kranenburg & van IJzendoorn, 1993). The findings to the effect

that mental representations show significant stability during adulthood have inspired confidence in both the measures themselves and the theory to which they relate.

Our goal was to explore the temporal stability of a recently described measure for assessing script-like representations of attachment (Waters & Waters, 2006). In addition, we sought to explore possibilities that a range of stylistic features of maternal storytelling might also be stable and to determine whether the stability of attachment script representations might be a function these non-attachment relevant features. As anticipated, scores for secure base scriptedness showed significant rank-order stability, even though passage length was reduced on the second telling. Both individual stories and aggregated “scriptedness” scores demonstrated stability, however, the degree of stability was greater for aggregate than for single item scores. This is an expectable consequence of aggregation (e.g., Rushton, Brainerd, & Pressley, 1983) and our data suggest that future studies using the attachment script representation task should use all four word-prompt lists when generating stories. We also found that stylistic features of the stories showed rank-order stability across time and that, for some of the mothers, the style of storytelling was sufficiently idiosyncratic that naïve readers could recognize that two stories told a year or more apart had been told by the same narrator. Some stylistic features (i.e., passage length, number of sentences used, number of word prompts used) were positively and significantly related to the scriptedness score, however, controlling for these variables in the set correlation analyses did not reduce the cross time relation between scriptedness scores. In fact, the cross-time correlation for the attachment script representation scores was somewhat greater after controls were included in the analysis.

Our results suggest that the majority of mothers had access to and were using a generalized secure base script as the template around which their relationship-relevant stories were formed and that this script shaped stories told by the same mothers a year or more apart. The results also imply that some mothers (approximately 26% at time 1 and 21% at time 2) did not access the secure base script when composing their stories. These participants had very low scores for scriptedness (means 2.5 and 2.8 at time 1 and time 2, respectively) and tended to tell either very brief, perfunctory stories without much relationship detail or emotional content, or their stories were longer but inconsistent with the secure base script (e.g., child cries self to sleep without finding lost toy; spouses argue and insult each other without making up in camping trip story). For these mothers, there is either no evidence of a script informing the stories (for the perfunctory narratives) or evidence points to insecurity rather than to a secure base script. On the other hand, a qualitative evaluation of the lowest scores suggests somewhat less stability at the lower end of the distribution than at intermediate or high positions in the distribution from time 1 to time 2. Of 14 mothers with the lowest scores at time 1, only seven were also in the lowest score group at time 2. By way of comparison, of 13 mothers who told the highest scoring stories at time 1, eight also were in the highest (i.e., above 75th percentile for the sample) group at time 2 and none were in the lowest score group (i.e., below 25th percentile). Our sample is not large enough to explore correlates of change with respect to the attachment script representations, but it will be of interest in future studies with more participants to identify the person and contextual correlates of such shifts.

Because this is the first study of temporal stability for this measure, it is appropriate that we report on a sample in which consistency of contextual variables (e.g., employment status, income level, marital status) tend to be relatively stable. However, even in this middle-class, economically stable sample, almost 10% of families relocated during the course of the study and were not available for follow-up and equipment problems invalidated several additional narrative protocols. Importantly, mothers who did not have data at one or the other time point did not differ from mothers with complete data on any demographic indicator and did

not differ on scriptedness scores. We do not view the reduced sample available for longitudinal testing as a threat to the validity of our findings. For samples with similar demographic and economic parameters, we anticipate that scriptedness scores will be stable indicators of adult attachment representations. In future studies, it will be useful to recruit from populations that vary in terms of demographic (e.g., age, ethnic status, education level) and economic (e.g., lower income, insecure employment, single-income families) indicators, or levels of life stress to determine whether secure base scripts are generally stable for adults or whether the temporal stability of scriptedness scores bears a critical relation to stability in the social and environmental context. Past research (e.g., Sroufe et al., 2005) with more stressed participants suggests that changes in secure base representations are not uncommon during childhood, however, it is not so clear that the representations of adults are as subject to change.

Finally, we found that passage length was associated with scriptedness in this sample (see also, Rodrigues-Doolabh & Waters, 2006). In part, this reflects the necessary relation between providing elaborative and evaluative detail in the narrative and attachment script representation scores. That is to say, the highest scriptedness scores require a sense that the relationship between dyad members is valued, that the caregiving member of the dyad is looking out for the welfare of the attached member, and that one or both members recognizes and responds to the affective state of the other. It is difficult to demonstrate this awareness/concern for the other in a story of less than 250 words. The shortest stories (i.e., <75 words) simply cannot provide such detail and only rarely do such short stories achieve scores as high as 4 (i.e., the lowest score indicating a use of the secure base script). However, simply telling a long story does not assure a high secure base scriptedness score; indeed, some of the longest stories receive low scores. We also note that higher scoring stories tended to use more of the word prompts from the list. Perhaps this is because mothers using the secure base script as their template for stories, as compared with mothers who did not use the secure base script, were able to recognize the script in the word lists and readily incorporated these words into their stories. Nevertheless, it is the secure base script content that accounts for longitudinal stability of scriptedness scores for this sample. When stylistic correlates were controlled for each time point, the time 1 to time 2 correlation for narrative scriptedness *increased* (i.e., from .54 to .64), suggesting that substance of secure base scripts was being assessed at both assessment periods. Taken together, the results of this study suggest that access to and use of a secure base script is a stable aspect of maternal attachment representations and that the word-prompt method is a reliable indicator of access to and use of this script.

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