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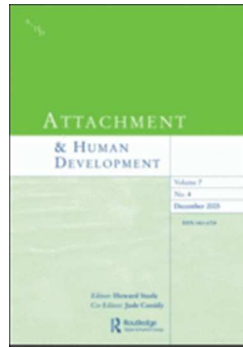
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The Relationship between Attachment Style and Placement of Parents in Adults' Attachment Networks over Time

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Manuscripts

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5 **The Relationship between Attachment Style and Placement of Parents in Adults'**

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7 **Attachment Networks over Time**

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45 **(8,030 words – excluding abstract, keywords, references, tables and figures, and authors' note)**

Abstract

Using a bull's-eye hierarchical mapping technique (HMT), the present study examined placement of parents in adults' attachment networks over time. We hypothesised that attachment style would predict distance at which network members (mother, father, romantic partner) would be placed from the core-self over time. Participants completed the HMT on two occasions, 12-months apart. Concurrently and over time, fathers were placed further from the core-self than mothers. Attachment style explained unique variance, beyond that accounted for by individual and relationship characteristics. Specifically, network members with whom participants reported greater attachment insecurity were placed further from the core-self concurrently. Mothers with whom participants reported greater attachment insecurity were placed further from the core-self over time. Unsatisfactory attachment relationships with father and partner and those marked by higher attachment insecurity were more likely to be excluded from attachment networks over time. Findings suggest that attachment style, relationship quality, romantic relationship status, and parents' marital status determine the placement of parents in adults' attachment networks.

Keywords: attachment; attachment networks; parents; attachment style; longitudinal

The Relationship between Attachment Style and Placement of Parents in Adults'

Attachment Networks over Time

Attachment is a life-long phenomenon (Bowlby, 1969) and parents remain attachment figures into adulthood (Ainsworth, 1985). Beginning in middle childhood, attachment functions gradually transfer from parents to peers beginning with proximity-seeking, then safe haven (providing care to reduce distress), and ending with the secure base (supporting exploration) (Seibert & Kerns, 2009; Zeifman & Hazan, 2010). The reorganization of attachment to parents is prompted by two psychosocial challenges in adolescence: establishing autonomy and achieving interdependence (Collins & Steinberg, 2006). One outcome of these normative developmental processes is that peers are included in the attachment network, the group of relationships in which the individual (seeks to) experiences comfort and security with attachment figures (Ainsworth, 1985).

Within the attachment network, attachment figures are organized in a hierarchical structure (e.g., Rowe & Carnelley, 2005; Trinke & Bartholomew, 1997). Studies indicate that attachment networks are fluid and dynamic in structure, changing over time (e.g., Friedlmeier & Granqvist, 2006; Mayseless, 2004; Zeifman & Hazan, 2010). The primary, or most important, attachment figure occupies the uppermost position above a number of subsidiary figures. For older adolescents and adults, mothers tend to occupy the first or second position, after romantic partners (e.g., Rosenthal & Kobak, 2010; Trinke & Bartholomew, 1997). In contrast, fathers are lower down in the hierarchy and are more likely than mothers to be relinquished as peer attachments are added to the network (Rosenthal & Kobak, 2010). Indeed, fathers - and mothers - do not feature in the attachment hierarchies of some adolescents and adults (e.g., Antonucci, Akiyama, & Takahashi, 2004; Freeman & Brown, 2001).

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5 In addition to age and romantic relationship status, theory (Ainsworth, 1985) and
6
7 empirical findings suggest that attachment style is a key factor in shaping the organization of
8
9 parental attachment bonds in the attachment network (Rowe & Carnelley, 2005) and the transfer
10
11 of attachment to peers (Friedlmeier & Granqvist, 2006; Mayseless, 2004;). Yet, because much
12
13 research to date on attachment hierarchies is cross-sectional in nature, little is known about the
14
15 extent to which attachment style explains parents' movement over time within the attachment
16
17 network relative to individual (i.e., age, sex) and other relationship characteristics (e.g.,
18
19 satisfaction with the parent-child relationship). Moreover, a question that remains unaddressed is
20
21 why some parents are jettisoned from the network: Are there differences between those parental
22
23 attachments that remain in the attachment network and those that are dropped? The present study
24
25 used a longitudinal method to address these theoretical questions.
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28
29

30 31 **Attachment Style and Organization of the Attachment Network** 32

33 Bowlby (1973) proposed that attachment experiences are internalized in mental
34
35 representations, named internal working models. These representations are used to organize and
36
37 shape affect, behavior and cognitions in close relationships (Collins, Guichard, Ford, & Feeney,
38
39 2004). Underlying these representations are attachment styles, which reflect individual
40
41 differences in cognitions, affect, and behavior. Attachment styles are commonly assessed along
42
43 two dimensions. Attachment anxiety reflects concern about abandonment, rejection, and not
44
45 being loved. Attachment avoidance reflects a desire for independence and discomfort with
46
47 closeness (Brennan, Clark, & Shaver 1998). Individuals who are high on one (or both)
48
49 dimensions are considered 'insecure' and those low on both 'secure'. Attachment styles are also
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51 assessed on different levels of specificity, reflecting the idea that working models vary in their
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53 level of abstraction (Collins & Read, 1994). General attachment styles reflect beliefs and
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5 expectations about attachment relationships in general whereas relationship-specific styles reflect
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7 cognitions about a given relationship partner.
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10 Attachments that provide comfort and security are preferred and sought out in times of
11
12 need (Trinke & Bartholomew, 1997). Similarly, Rowe and Carnelley (2005) found that network
13
14 members with whom participants had a secure (versus insecure) attachment style were placed
15
16 higher in the attachment hierarchy. Further, participants with a general secure attachment style
17
18 placed network members with whom they had a secure (versus dismissing-avoidant) style higher
19
20 in the hierarchy. It follows that attachment insecurity is likely to shape parents' placement in
21
22 attachment networks over time. Research has shown that attachment insecurity and less optimal
23
24 caregiving histories affect the transfer of attachment functions from parents to peers over time.
25
26
27
28 Anxious individuals hyperactivate proximity-seeking. In their close relationships, they seek to
29
30 minimize distance, cognitively and behaviorally, and desire a merger between the self and other
31
32 (Mikulincer & Shaver, 2007). Friedlmeier and Granqvist (2006) found that adolescents high in
33
34 general attachment anxiety and who reported more insecure attachment histories (more rejecting,
35
36 distant, and inconsistent parenting) with mother, but not father, experienced more and faster
37
38 transfer from parents to peers over 12-15 months. Thus, individuals high in anxiety with parents
39
40 should be more likely to move the parent or jettison them from the network over time. In
41
42 contrast, avoidant individuals inhibit the primary attachment strategy of proximity-seeking by
43
44 using deactivating strategies to maintain distance, control, and self-reliance in their relationships
45
46 (Mikulincer & Shaver, 2007). Friedlmeier and Granqvist (2006) found that adolescents high in
47
48 general attachment avoidance and who reported more insecure attachment histories with mother,
49
50 but not father, experienced less transfer from parents to peers over time. In a sample of Israeli
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52 men who had left home for military service, Mayseless (2004) found that men who were more
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5 avoidant sought parents less and peers more over 6-months. Although parents, in general, remain
6
7 central in the attachment network, individuals high in avoidance might be most likely to create
8
9 emotional distance from their parents or jettison parents from the attachment network over time.
10
11 In support of this, Gillath, Johnson, Selcuk and Teel (2011) found that attachment avoidance
12
13 positively predicted adults' tendency to terminate social ties.
14
15

16 17 **Other Predictors of the Organization of the Attachment Network**

18
19 Although we expect attachment style to be the most important factor, research suggests
20
21 individual and relationship characteristics should also shape the organization of attachment
22
23 networks over time. For example, Rosenthal and Kobak (2010) reported gender differences in
24
25 the hierarchy of college students: Women's mothers were placed higher in the hierarchy than
26
27 men's, and fathers were placed higher in the hierarchy of men than women (Rosenthal & Kobak,
28
29 2010). These findings may reflect differences in gender socialization or in perceptions of what
30
31 closeness entails (Feeney, 1999). Rosenthal and Kobak (2010) also found that adolescents from
32
33 intact (versus non-intact) families placed parents higher in the hierarchies. Similarly, Rowe and
34
35 Carnelley (2005) found that parents' placement within the network differed by parents' marital
36
37 status: divorced (versus married) parents were positioned at a greater distance from each other.
38
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41

42
43 Relationship characteristics that impede the ability to achieve comfort and security
44
45 should also influence organization of adults' attachment networks. Relationships marked by
46
47 dissatisfaction, conflict, and inadequate support might be more likely to be removed from the
48
49 network over time. For example, Carnelley, Julal, Hepper, and Rowe (2008) found that lower
50
51 perceived maternal responsive care was associated with mothers being placed lower in the
52
53 hierarchy. Yet, even unsatisfactory attachment bonds may remain in adults' networks.
54
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56
57 Milyavskaya and Lydon (2013) found that although attachment figures in insecure (compared to
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5 secure) relationships fulfilled fewer attachment functions, there were no differences in adults'
6
7 frequency of contact or communication across a week.
8

9 10 **Assessing Organization of the Attachment Network over Time**

11
12 Although parents might be less preferred as attachment figures with age (Markiewicz,
13
14 Lawford, Doyle, & Haggarty, 2006; Rosenthal & Kobak, 2010) and as compared to romantic
15
16 partners (Heffernan, Fraley, Vicary, & Brumbaugh, 2012; Trinke & Bartholomew, 1997),
17
18 research tells us little about the symbolic importance of adolescents' and adults' relationships
19
20 with their parents. Parents may continue to be psychologically available via internal working
21
22 models (Ainsworth, 1989; Cicirelli, 2010). Diagrammatic measures are good at capturing deeply-
23
24 rooted feelings of closeness (Aron, Aron, & Smollan, 1992). One such measure is the bull's-eye
25
26 hierarchical mapping technique (HMT; Kahn & Antonucci, 1979; as cited in Antonucci, 1986).
27
28
29

30
31 The HMT is a diagrammatic tool (see Figure 1 below), originally developed to assess
32

33
34 **INSERT FIGURE 1 ABOUT HERE**

35
36 adults' social support networks (Antonucci, 1986), that consists of three concentric circles. The
37
38 smallest most central circle represents the core-self and the other circles represent varying levels
39
40 of closeness. The inner circle represents people one feels closest to and is thought to represent
41
42 attachment relationships (Antonucci et al., 2004; Rowe & Carnelley, 2005). Participants position
43
44 their significant others on the bull's-eye in a way that is meaningful to them. Rowe and
45
46 Carnelley (2005) found that distances between the core-self and each significant other were
47
48 predicted by measures of subjective, but not objective, closeness and correlated with scores on
49
50 the Attachment Network Questionnaire (Trinke & Bartholomew, 1997), a measure of adults'
51
52 attachment hierarchies. Rowe and Carnelley (2005) did not find age or romantic relationship
53
54 status differences in the distances of mother and father, consistent with the view that adolescents
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5 do not relinquish their attachments to parents; rather parents remain central in attachment
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7 networks. The HMT successfully captures the hierarchical organization of attachment networks
8
9 and is sensitive to the psychological meaningfulness of parents. Yet, the extent to which the
10
11 HMT captures the dynamic nature of the attachment hierarchy over time remains to be tested.
12
13

14 **Present Study**

15
16
17 Extant longitudinal research has not comprehensively addressed the factors beyond
18
19 concurrent attachment style that are associated with parents' movement in the attachment
20
21 network over time. Herein we investigated the dynamic nature of attachment networks by
22
23 examining placement of parents within networks across two waves, 12-months apart. Movement
24
25 was assessed as the distance at which mother and father were placed from the core-self on the
26
27 HMT over time. We examined the relative ability of relationship-specific attachment style to
28
29 predict parents' placement concurrently and over time, after controlling for individual and other
30
31 relationship characteristics. For comparison, we also examined romantic partner's movement in
32
33 attachment networks over time.
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39 Given the age of our sample, we expected to observe differences in the distances of
40
41 mother and father from the core-self as a function of relationship status and for romantic partners
42
43 to be placed closer to the core-self than mother and father. In addition, we expected to replicate
44
45 findings of Rowe and Carnelley (2005). Firstly, married parents would be placed closer to the
46
47 core-self and to each other on the HMT than separated parents. Secondly, we expected
48
49 relationships marked by attachment insecurity (high avoidance, high anxiety) to be placed further
50
51 from the core-self. In addition, we made the following novel predictions:
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54

55 ***Hypothesis 1a and 1b***

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57 Relationship quality (i.e., negative affect, relationship satisfaction, use as an attachment
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5 figure, perceived responsive care, psychological presence of parent in one's daily life, frequency
6
7 of contact¹) should predict distance of network members from the core-self (a) concurrently and
8
9 (b) over time. Unsatisfactory attachment bonds will be placed further from the core-self and
10
11 moved further from the core-self over time, respectively.

14 *Hypothesis 2*

16
17 Relationship-specific attachment style should account for unique variance in distance
18
19 from the core-self, beyond that accounted for by relationship quality, age, gender, and romantic
20
21 relationship status.
22

24 *Hypothesis 3*

26
27 Relationship-specific attachment style should predict distance from the core-self over
28
29 time after accounting for individual and relationship characteristics. Relationships marked by
30
31 attachment insecurity at Wave 1 will be moved further from the core-self over time.
32

33
34 Some adults exclude mothers and fathers from their attachment networks (e.g., Doherty
35
36 & Feeney, 2004; Freeman & Brown, 2001; Trinke & Bartholomew, 1997). Yet the question of
37
38 why some parents are jettisoned from attachment networks over time has not been, to our
39
40 knowledge, addressed. We examined the differences in attachment style and relationship quality
41
42 between parents that were included in the attachment network over time (at both waves) and
43
44 those that were dropped (included in the first wave, only). In addition, we used a directed
45
46 approach to content analysis (Hsieh & Shannon, 2005) to explore reasons for keeping and
47
48 dropping parents from their attachment networks over time.
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51

52 **Method**

54 **Participants**

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Volunteers ($N = 403$) from three universities in England participated in Wave 1. Only data from participants who included their mother ($n = 348$), father ($n = 299$), or both parents ($n = 291$) on the HMT were analyzed. Across these subgroups, the majority of participants was female (77-78%), British (90-91%), and heterosexual (96%). Age ranged from 17 to 59 years ($M = 20$; $Median = 19$). When both parents were included, most were married (74%). Mean age at parental divorce was 10.1 years ($n = 66$; $SD = 6.06$). Two-hundred-and-five participants were currently in a romantic relationship (M length = 2.52 years; 8 were missing), with the majority dating one person seriously (69%).

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Approximately 12-months after Wave 1, 155 participants (39%) returned to participate in Wave 2. Women were 5.20 times more likely to return than men, $\chi^2(1) = 6.53, p = .011$. The majority was female (84%) and British (88%). Age ranged from 18 to 42 years ($M = 20$; $Median = 20$). Returning participants were 1.97 years younger than non-returners ($t(397) = 3.62, p < .001$; Levene's $F = 6.67, p = .010$). For distance over time analyses, only data from participants who included their mother ($n=138$), father ($n=119$), and partner ($n=68$) on the HMT at Wave 1 were used. Participants that included their mother and father on the HMT at Wave 1, but who did not return for Wave 2 were older than those that did return (mother: $M = 21.4$ vs. $M = 19.9$, $t(346) = 2.75, p = .006$; father: $M = 21.1$ vs. $19.6, t(297) = 2.96, p = .003$). Returning and non-returning participants did not differ significantly on any of the mother ($ps > .22$), father ($ps > .09$), or partner relationship variables ($ps > .09$).

50 51 52 53 54 55 56 57 58 59 60 **Wave 1 Materials**

Demographics Participants reported gender, age, nationality, sexual orientation, and parents' marital status.

Network Members

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5 Using the Modified Social Network Inventory (MSNI; Perl & Trickett, 1988),
6
7 participants listed up to 10 persons with whom they had a “close relationship, regardless of
8
9 whether this relationship is positive, negative or mixed.” For each person, participants provided
10
11 information about the relationship (relationship type, time known).
12
13

14 ***Attachment Networks***

15
16
17 The WHOTO (Fraley & Davis, 1997) is a 6-item measure that assesses use of a target
18
19 person as an attachment figure. Participants listed, in order of importance, whom they sought to
20
21 fulfil proximity-seeking, secure base, and safe haven needs. Each component was assessed with
22
23 two items. Following Fraley and Davis’s (1997) scoring system, scores ranged from 0 (person
24
25 was not listed for any items) to 3 (person was listed for one or both items for all three functions).
26
27 Higher scores indicated a greater propensity to use the person as an attachment figure.
28
29
30

31 ***Attachment Dimensions***

32
33 We used the Experiences in Close Relationships – Relationship Structures measure
34
35 (Fraley, Heffernan, Vicary, & Brumbaugh, 2011) to assess relationship-specific attachment
36
37 styles with mother, father, romantic partner, and best friend (not included in the current
38
39 analyses). Participants rated the extent to which they agreed (from 1 = *strongly disagree* to 7 =
40
41 *strongly agree*) with items assessing attachment avoidance (6-items) and anxiety (3-items) for
42
43 each figure. The ECR-RS is a reliable measure and shows convergent and divergent validity
44
45 (Fraley et al., 2011). Higher scores indicated greater attachment anxiety and avoidance.
46
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48
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50 ***Responsive Caregiving***

51
52 We selected 12-items from the Caregiving Questionnaire (Kunce & Shaver, 1994) to
53
54 assess perceptions of responsive care from each of the four relationship partners. Four items
55
56 were selected from the sensitivity-insensitivity, proximity-distance, and cooperation-control
57
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5 subscales (sample: “When I want or need a hug, this person is glad to provide it.”). Participants
6
7 responded on a 6-point scale (1 = *not at all descriptive* to 6 = *extremely descriptive*). Higher
8
9 scores indicate greater perceived responsive care.
10

11 ***Relationship Satisfaction***

12
13
14 Participants completed the 3-item relationship satisfaction subscale from the Perceived
15
16 Relationship Quality Components Inventory (Fletcher, Simpson, & Thompson, 2000) for each
17
18 relationship, using a 7-point scale (1 = *not at all* to 7 = *extremely*). Higher scores indicated
19
20 greater relationship satisfaction. This brief measure is reliable, shows high face validity, and is
21
22 useful for measuring evaluations in specific relationships (Fletcher et al., 2000).
23
24

25 ***Negative Affect***

26
27
28 We took two items from measures of parental conflict (Peterson & Zill, 1986) and
29
30 negative affect within the family (Moos & Moos, 1986) to assess anger and resentment and
31
32 frequency of arguments in each relationship. Responses were made on a 5-point scale (anchors
33
34 varied). Items were moderately correlated for each attachment figure ($r_s > .161$, $p_s < .001$).
35
36 Higher scores indicated more negative affect in the relationship.
37
38

39 ***Frequency of Parent-Child Contact***

40
41
42 Using 6 items from Sorokou and Weissbrod (2005), participants indicated the frequency
43
44 of self- and parent-initiated contact for need (e.g., “after you have expressed a problem to her”;
45
46 mother-initiated) and non-need (e.g., “when there is no particular reason other than simply to
47
48 touch base”) contact (1 = *never* to 5 = *frequently*). Higher scores indicated more frequent
49
50 initiated contact.
51
52

53 ***Psychological Presence***

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5 One item from the Nurturant Fathering (Finley & Schwartz, 2004) and Mothering
6
7 (Finley, Mira, & Schwartz, 2008) scale was used to assess parents' psychological presence: "As
8
9 you go through your day, how much of a *psychological presence* does your father (mother) have
10
11 in your daily thoughts and feelings?". Participants responded on a 5-point scale (1 = *always there*
12
13 to 5 = *never there*). Higher scores indicated *less* psychological presence.
14
15

16 17 ***Hierarchical Mapping Technique***

18
19 We used the HMT (Antonucci, 1986; Rowe & Carnelley, 2005) to assess distance from
20
21 the core-self (DCS) of network members. The central and smallest of the three concentric was
22
23 labeled, 'Me'. Participants were given stickers (18mm diameter) to represent each network
24
25 member and instructed to arrange the people in a way that was personal to them. Distances
26
27 between the core-self and network members were measured in millimetres. Higher values reflect
28
29 a greater distance, i.e., less closeness, between the participant and network member.
30
31
32

33 34 **Wave 2 Materials**

35 36 ***Distance from the Core-self***

37
38 Participants first completed the MSNI, generating a new list of people. Next, they
39
40 completed a computerised version of the HMT. Distances between the core-self and network
41
42 members were transformed into mm.
43
44

45 46 ***Change in Attachment Network Members***

47
48 Participants were presented with the MSNI list they had produced at Wave 1. Participants
49
50 indicated whether they had included each Wave 1 person on their Wave 2 list and briefly
51
52 described why they had or had not kept the person on the list. For the purposes of this study, we
53
54 focus only on responses regarding mother and father.
55
56

57 58 ***Reasons for Keeping and Dropping Parents from the Attachment Network***

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5 Based on discussions amongst experts in adult attachment research (see Footnote 1), we
6 identified 4 reasons for keeping and dropping a person from the attachment network (see Table
7 6). Participants indicated their agreement with each (1 = *strongly disagree* to 7 = *strongly agree*).
8
9 Only responses for mother and father are discussed here. Responses to “Hope to repair” and
10 “hope might be there for me someday” were positively correlated for each parent (mother: $r =$
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.856, $p < .001$; father: $r = .920, p < .001$).

Procedure

At each Wave, participants gave informed consent before completing the measures in individual cubicles. At Wave 1, all measures were counterbalanced. At Wave 2, the MSNI and HMT were completed first and the other measures were counterbalanced. At the end of each Wave, participants were debriefed and participants at two universities received participation credits.²

Content Analysis

We used a directed approach to content analysis (Hsieh & Shannon, 2005) to explore why parents are sometimes jettisoned from attachment networks over time. Directed content analysis uses formal theory as a basis for the coding scheme (Potter & Levine-Donnerstein, 1999). Thus, we referred to attachment theory, the Investment Model (Rusbult, Martz, & Agnew, 1998), and relationship maintenance and dissolution research to generate a list of potential themes.

We first generated a preliminary list of factors related to attachment figure use (e.g., safe haven support), descriptions of attachment relationships (e.g., caregiving, closeness, intimacy), and factors related to relationship maintenance and dissolution (e.g., anger, satisfaction). Next, we added to and refined the list following discussion and reading of the open-ended responses as

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2
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4
5 a team, including three research assistants who were blind to the study's hypotheses. Our focus
6
7 was on the manifest content in participants' responses (Potter & Levine-Donnerstein, 1999).
8
9 After five iterations, we finalized a taxonomy of 12 themes. Two themes (perceived closeness;
10
11 caregiving/social support) were for reasons for keeping a person in the attachment network and
12
13 10 themes (perceived rejection or resentment; trust; relationship dissatisfaction; change in
14
15 physical proximity or contact; change in psychological availability; change in similarity;
16
17 conflict; relationship dissolution; change in quality of caregiving; and, quality of alternatives) for
18
19 reasons for dropping a person from the network. Four trained research assistants (all were blind
20
21 to our hypotheses; two were involved in the initial coding process) coded for the presence or
22
23 absence of each theme. After reviewing the coding, eight themes had very low use in responses
24
25 for mother and father and were not considered further. Inter-rater reliability was acceptable
26
27 (Krippendorff's $\alpha > .700$, $M = .780$).
28
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33 Results

34 Data Preparation

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37
38 Outliers (z scores $\pm 3.29SDs$) and missing data were replaced.³ Analyses were repeated
39
40 with and without the missing data (Tabachnick & Fidell, 2013).⁴
41
42

43 Parents and Distances on the HMT

44
45 Mothers were placed closer to the core-self ($M=26.2$, $SD=16.2$) than fathers ($M=35.2$,
46
47 $SD=19.3$), $t(290)=-8.01$, $p < .001$. Consistent with our expectations, romantic partners were
48
49 placed significantly closer ($M = 20.6$ and $M = 20.7$, respectively, $SDs = 12.2$) to the core-self
50
51 than mother ($M = 27.0$, $SD = 15.9$), $t(179) = 4.52$, $p < .001$, and father ($M = 36.2$, $SD = 19.4$),
52
53 $t(149) = 8.60$, $p < .001$. Partially replicating Rowe and Carnelley's (2005) findings, there were
54
55 significant differences in distances of father as a function of parents' marital status. Separated
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5 fathers ($M = 42.5$, $SD = 23.0$) were placed further from the core-self than married fathers ($M =$
6
7 32.4 , $SD = 17.1$), $t(104) = -3.49$, $p < .001$. Distances of separated mothers ($M = 26.1$, $SD = 16.1$)
8
9 did not differ significantly from those of married mothers ($M = 25.9$, $SD = 15.9$), $t(104) = -0.096$,
10
11 $p = .924$. Further, participants with married parents positioned their parents closer together ($M =$
12
13 31.3 , $SD = 18.0$) than participants with separated parents ($M = 49.1$, $SD = 28.9$), $t(104) = -4.92$, p
14
15 $< .001$.
16
17

18 **Attachment Style as a Predictor of Distance from the Core-Self**

19
20 To test Hypotheses 1a and 2a we conducted hierarchical regression analyses to examine
21
22 whether relationship-specific attachment style predicted distance from the core-self, beyond
23
24 individual and relationship characteristics. DCS of mother, father, and partner were the criterion
25
26 variables. At Step 1, age, gender (1=female, 2=male), romantic relationship status (0=single;
27
28 1=in relationship; mother and father analyses, only) and university (mother analyses, only) were
29
30 entered.⁵ At Step 2 perceived responsive care, negative affect, relationship satisfaction, use as an
31
32 attachment figure, and self- and parent-initiated need- and non-need-based contact and
33
34 psychological presence of parent (mother and father analyses only), were entered. At Step 3,
35
36 relationship-specific anxiety and avoidance were entered. Descriptive statistics, reliability
37
38 coefficients, and correlations for mother, father, and partner variables are reported in Table 1
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40 below.
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47 INSERT TABLE 1 ABOUT HERE

48 ***Mother***

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50 Step 1 was significant as Table 2 shows below.

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52 INSERT TABLE 2 ABOUT HERE
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5 Older participants and men placed mother further from the core-self than did younger
6
7 participants and women, respectively. Notably, romantic relationship status was not a significant
8
9 predictor of mother's distance. Step 2 was significant. Participants who reported less
10
11 psychological presence, less frequent self-initiated non-need-based contact, lower propensity to
12
13 use mother as an attachment figure, lower perceived responsive care, lower relationship
14
15 satisfaction, and more frequent mother-initiated non-need-based contact placed their mother
16
17 further from the core-self. At Step 3 attachment style with mother explained additional variance
18
19 in mother's distance, beyond that explained by the individual and relationship characteristics. As
20
21 predicted, participants who reported higher avoidance and higher anxiety with mother placed
22
23 their mother further from the core-self.
24
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26
27

28 *Father*

29
30
31 Step 1 was not significant, but Step 2 was as Table 3 shows below.

32
33 INSERT TABLE 3 ABOUT HERE
34

35
36 Participants who reported lower relationship satisfaction, less psychological presence, lower
37
38 perceived responsive care, and lower propensity to use father as an attachment figure placed their
39
40 father further from the core-self. For Step 3, attachment style with father significantly predicted
41
42 father's distance beyond individual and relationship characteristics. Participants with higher
43
44 avoidance, but not anxiety, with father placed their father further from the core-self.
45
46

47 *Partner*

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49
50 Step 1 was significant as Table 4 shows below.

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52 INSERT TABLE 4 ABOUT HERE
53

54
55 Men placed their partner closer to the core-self than did women. Step 2 was significant.

56
57 Participants with lower relationship satisfaction, lower perceived responsive care, and lower
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propensity to use partner as an attachment figure scores placed their partner further from the core-self. Interestingly, participants who reported higher negative affect scores placed their partner *closer* to the core-self. At Step 3 attachment style with partner significantly predicted partner's distance beyond individual and relationship characteristics. Participants with higher avoidance, but not anxiety, with partner placed their partner further from the core-self.

Attachment Style as a Predictor of Distance from the Core-Self over Time

Table 5 displays the descriptive statistics and zero-order correlations of the Wave 1 relationship characteristics and distances from the core-self at Wave 2.

INSERT TABLE 5 ABOUT HERE

In general, each figure was placed closer to the core-self over time. Yet, mothers were again placed closer to the core-self ($M=20.6$, $SD=11.8$) than fathers ($M=27.1$, $SD=13.8$), $t(90)=-4.56$, $p < .001$. For mother and father, but not romantic partner, relationship quality variables were meaningfully correlated with DCS at Wave 2: Less satisfactory relationships and those marked by attachment insecurity at Wave 1 were placed further from the core-self over time. Only attachment avoidance with partner at Wave 1 was significantly correlated with Wave 2 DCS for partner.

To test Hypotheses 1b and 2b, we conducted hierarchical regression analyses with Wave 2 DCS for mother, father, and partner as the criterion variables. At Step 1, we entered Wave 1 DCS. At Step 2, we entered the individual and relationship characteristics and relationship-specific attachment style assessed at Wave 1.

Mother

After controlling for Wave 1 distance ($\Delta R^2 = .238$, F of change (1,103) = 32.2, $p < .001$), the Step 2 variables explained an additional 16.9% of the variance in mother's Wave 2 distance

($\Delta R^2 = .169$, F of change (13,90) = 1.97, $p = .032$). None of the Wave 1 individual (age, sex) and relationship characteristics were unique predictors of mother's distance over time ($ps > .128$).

Attachment anxiety ($\beta = .244$, $t = 2.32$, $p = .022$), but not avoidance ($\beta = .135$, $t = 0.917$, $p = .362$) predicted positioning mother further from the core-self over time (Total $R^2 = .407$, Adj. $R^2 = .315$, F of model (14, 90) = 4.41, $p < .001$).

Father

After controlling for Wave 1 distance ($\Delta R^2 = .343$, F of change (1,87) = 45.5, $p < .001$), additional variance in father's distance over time was explained by the Step 2 variables ($\Delta R^2 = .151$, F of change (11,76) = 1.97, $p = .034$); however, none of the variables, including attachment style, were unique predictors ($ps > .158$; Total $R^2 = .494$, Adj. $R^2 = .414$, F of model (12,76) = 6.19, $p < .001$).

Partner

After controlling for Wave 1 distance ($\Delta R^2 = .083$, F of change (1,42) = 3.78, $p = .059$), the Step 2 variables did not significantly explain additional variance in partner's distance at Wave 2 ($\Delta R^2 = .085$, F of change(7,35) = 0.507, $p = .823$; (Total $R^2 = .167$, Adj. $R^2 = .023$, F of model (8,35) = 0.878, $p = .544$).

Change in Network Membership over Time

In the following analyses, all participants had included the person on the HMT at Wave 1. Change in network membership over time was based on whether a person was included on the HMT at Wave 1 only (i.e., dropped from the network over time) or included at both waves. The majority of mothers (77%), fathers (75%), and partners (60%) were included at both waves.

Mother

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5 There were no significant differences in any Wave 1 variables between participants who
6 included mother at Wave 1 only ($n = 32$) and those who included mother at both waves ($n = 106$)
7 ($ps > .052$).
8
9

10 11 **Father**

12 Compared to participants who included father at Wave 1 only ($n = 30$), those that
13 included father at both waves ($n = 89$) reported lower avoidance ($M_{\text{both}} = 3.33$, $SD = 1.36$ vs. $M_{\text{Wave1, only}} = 4.06$, $SD = 1.61$, $t(117) = 2.39$, $p = .018$), higher relationship satisfaction ($M_{\text{both}} = 5.64$,
14 $SD = 1.21$ vs. $M_{\text{Wave1, only}} = 4.93$, $SD = 1.63$, $t(40) = -2.21$, $p = .033$; Levene's $F = 7.57$, $p =$
15 $.007$), and higher use of father as an attachment figure ($M_{\text{both}} = 2.63$, $SD = 0.82$ vs. $M_{\text{Wave1, only}} =$
16 2.13 , $SD = 1.22$, $t(38) = -2.07$, $p = .045$; Levene's $F = 13.9$, $p < .001$) at Wave 1.
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28 29 **Partner**

30 Compared to participants that were currently single or in a new relationship at Wave 2 (n
31 $= 27$), those in the same relationship ($n = 41$) reported lower avoidance ($M_{\text{same}} = 1.74$, $SD =$
32 0.734 vs. $M_{\text{different}} = 2.41$, $SD = 1.11$, $t(41) = 2.79$, $p = .008$; Levene's $F = 9.71$, $p = .003$); lower
33 negative affect ($M_{\text{same}} = 1.26$, $SD = 0.791$ vs. $M_{\text{different}} = 1.76$, $SD = 0.993$, $t(66) = 2.32$, $p =$
34 $.024$); and higher relationship satisfaction ($M_{\text{same}} = 6.01$, $SD = 1.08$ vs. $M_{\text{different}} = 5.32$, $SD =$
35 1.50 , $t(43) = -2.05$, $p = .046$; Levene's $F = 6.64$, $p = .012$) at Wave 1.
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45 46 **Reasons for Parents' Inclusion in Attachment Networks over Time**

47 Because few participants (1 for mother, 3 for father) who did not include the parent on
48 the Wave 2 HMT completed the reasons for dropping a parent questions, we could only examine
49 reasons for keeping parents in the attachment network.
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54 On average, participants disagreed that they had kept mother and father in their
55 attachment network because: despite the relationship being difficult, they hoped that they would
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5 repair the relationship ($M_{\text{mother}} = 1.76, SD = 1.53; M_{\text{father}} = 2.05, SD = 1.78$) and hoped the parent
6
7 might someday be there for them ($M_{\text{mother}} = 1.76, SD = 1.60; M_{\text{father}} = 1.86, SD = 1.60$). In
8
9 contrast, participants strongly agreed that they had kept their parent in their network because
10
11 they were satisfied with their relationship ($M_{\text{mother}} = 6.43, SD = 1.14; M_{\text{father}} = 6.19, SD = 1.12$)
12
13 and because the parent was a significant part of their life ($M_{\text{mother}} = 6.94, SD = 0.23; M_{\text{father}} =$
14
15 $6.79, SD = 0.64$).

16
17
18 Attachment anxiety at Wave 1 was positively correlated with “hope to repair” (r_{mother}
19
20 $(105) = .372, p < .001; r_{\text{father}} (86) = .539, p < .001$), “hope might be there for me” ($r_{\text{mother}} = .509, p$
21
22 $< .001; r_{\text{father}} = .565, p < .001$) and negatively correlated with “satisfied with our relationship”
23
24 ($r_{\text{mother}} = -.513, p < .001; r_{\text{father}} = -.534, p < .001$) and “significant part of my life” (for father only;
25
26 $r_{\text{mother}} = -.170, p = .083; r_{\text{father}} = -.333, p = .002$). Attachment avoidance at Wave 1 was positively
27
28 correlated with “hope to repair” (for father, only; $r_{\text{mother}} = .122, p = .215; r_{\text{father}} = .292, p = .006$),
29
30 “hope might be there for me” (for father, only; $r_{\text{mother}} = .187, p = .056; r_{\text{father}} = .236, p = .036$) and
31
32 negatively correlated with “satisfied with our relationship” ($r_{\text{mother}} = -.322, p < .001; r_{\text{father}} = -.435,$
33
34 $p < .001$) and “significant part of my life” ($r_{\text{mother}} = -.332, p < .001; r_{\text{father}} = -.321, p = .003$).

40 Qualitative Findings

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42 Of the 12 themes, four were present in participants’ descriptions of why they had or had
43
44 not kept their mother or father in their network. Each theme, its operational definition, and some
45
46 example extracts are shown in Table 6 below.

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49
50 INSERT TABLE 6 ABOUT HERE

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52 Three of these themes, perceived closeness, change in physical proximity or contact, and
53
54 change in psychological availability or intimacy codes, were classified into a meta-theme,
55
56 perceived closeness. The meta-theme reflected reasons for keeping or dropping parents and was
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5 present in 38% and 34% of responses for mother and father, respectively. Responses referred to
6
7 the closeness in the parental relationship and how it had changed over time and to aspects of
8
9 subjective (e.g., sharing confidences, intimacy) and objective closeness (e.g., changes in amount
10
11 of contact). The fourth theme, caregiving/social support, reflected reasons for keeping the parent
12
13 in the network and was present in 28% and 26% of responses for mother and father, respectively.
14
15 Responses referred to using the parent(s) as a secure base or safe haven, to turning to their
16
17 parents when experiencing positive and negative emotions, and to their parents “being there” and
18
19 providing different forms of support (e.g., emotional, financial).
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23 24 **Discussion**

25
26 The present study investigated the dynamic nature of adults’ attachment networks by
27
28 examining the extent to which attachment style, relative to individual and other relationship
29
30 characteristics, predicted distance from the core-self over time.
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32

33 **Predictors of the Organization of the Attachment Network**

34
35 Consistent with the hypotheses relationship-specific attachment style shaped the
36
37 organization of adults’ attachment networks. At Wave 1, after accounting for individual and
38
39 relationship characteristics, higher avoidance and anxiety with mother and higher avoidance with
40
41 father and partner were associated with these network members being placed further from the
42
43 core-self. At Wave 2, higher anxiety with mother assessed at Wave 1 was associated with
44
45 moving mother further from the core-self 12-months later. Attachment avoidance and anxiety
46
47 with father and avoidance with partner were only correlated with, but not predictors of, these
48
49 figures’ Wave 2 distance. Attachment avoidance reflects a discomfort with closeness and
50
51 emotional dependence, which, as our findings show, is captured in symbolically distancing
52
53 network members from the core-self. In contrast attachment anxiety reflects a greater desire for
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5 closeness and self-other merging (Mikulincer & Shaver, 2007), yet participants high in
6
7 attachment anxiety with mother demonstrated emotional distancing of the mother from the core-
8
9 self. Ainsworth (1989) proposed that where people have insecure attachment to parents they
10
11 might forge attachments with other more optimal caregivers. Friedlmeier and Granqvist (2006)
12
13 found that attachment anxiety and insecure maternal attachment history predicted a greater
14
15 tendency to use peers over parents. Consistent with Ainsworth's (1989) proposal, we speculate
16
17 that adults might have created psychological distance from a maternal relationship in which they
18
19 have not consistently found security and comfort as they pursue alternative attachment
20
21 relationships.
22
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24

25
26 Attachment style with mother significantly predicted distance over time, whereas
27
28 attachment style with father and with partner did not. The differential association between
29
30 attachment style with mother and father and distance over time is consistent with the pattern of
31
32 findings reported by Friedlmeier and Granqvist (2006). In their sample of adolescents, insecure
33
34 attachment histories with mother, but not father, was associated with the transfer of attachment
35
36 functions over time. Together these findings point to the significance of the maternal attachment
37
38 bond. That attachment style with romantic partner did not predict distances over time, whereas
39
40 attachment style with mother did, could be because attachment styles with parents are more
41
42 stable over time than those with romantic partners (Fraley, Vicary, Brumbaugh, & Roisman,
43
44 2011). According to the entrenchment hypothesis, young adults' working models of parents are
45
46 based on extensive experience whereas because romantic relationships are still developing the
47
48 partner attachment model is in a state of adjustment (Fraley et al., 2011). Although attachment
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50 style with partner at Wave 1 predicted partner's distance when both were assessed concurrently,
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5 it might not have accurately reflected the level of security 12-months later and, therefore, was
6
7 less likely to predict partner's distance at Wave 2.
8

9
10 Relationship characteristics also shaped the organization of the attachment network when
11 assessed concurrently. Consistent with extant research (Carnelley et al., 2008; Rowe &
12 Carnelley, 2005), less satisfactory attachment bonds, in terms of lower propensity to use for
13 attachment support and less perceived responsive care, were placed further from the core-self.
14
15 Of the frequency of contact variables, only those pertaining to mother were significant
16 predictors. More frequent self-initiated non-need contact with mother predicted placing mother
17 closer to the core-self. In contrast, and due to suppressor effects of self- and mother-initiated
18 need-based contact, more frequent mother-initiated non-need-based contact was associated with
19 placing mother further from the core-self. Mothers who excessively 'check-in' with their adult
20 child without a need-based reason might be perceived as intrusive and interfering with
21 autonomy, prompting emotional distancing. This might be particularly the case in a sample of
22 university students living away from home, developing adult relationships, and pursuing
23 academic or work-related goals. Partners with whom participants reported higher negative affect
24 were placed closer to the core-self, despite negative affect not being correlated with distances.
25
26 Given that this finding was not predicted and that negative affect was correlated meaningfully
27 with other relationship characteristics (e.g., relationship satisfaction), we do not discuss this
28 finding further.
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49 Parents' psychological presence in adults' daily lives could reflect the symbolic nature of
50 parental attachment in adulthood (that we argue a diagrammatic tool like the HMT is better
51 suited to capture than other measures of adults' attachment hierarchies). Indeed, participants who
52 reported more psychological presence of their mother and father in their daily lives placed the
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5 parent closer to the core-self. These participants also reported more frequent contact with
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7
8 parents, suggesting that mental representations of these parents might be highly accessible due to
9
10 frequent activation during contact as well as reactivation of memories.

11
12 Of the individual characteristics, age (mother only) and gender (mother and partner), but
13
14 not relationship status, explained differences in network organization. Older (versus younger)
15
16 participants placed their mother further from the core-self, consistent with past research
17
18 (Markiewicz et al., 2006; Rosenthal & Kobak, 2010). Men placed their mothers further from, and
19
20 their partners closer to, the core-self than women did, but there were no gender differences in
21
22 distance of father. Rosenthal and Kobak (2010) found that mothers were ranked higher in
23
24 women's hierarchies than men's. Thus, at this stage of development men may seek mother less
25
26 than women for attachment support, which is reflected in the greater distance observed on the
27
28 HMT. Behaviors that are perceived to signal closeness (e.g., tangible support, emotional
29
30 disclosure) may differ between men and women (Feeney, 1999), which might explain the
31
32 observed gender difference in partner's distance from the core-self. Romantic relationship status
33
34 was not a predictor of distance of parents at Wave 1, which may reflect the normative process of
35
36 establishing autonomy from parents. Partnered participants placed their partner closer to the
37
38 core-self than their parents. This finding is in line with extant findings that show adults rank
39
40 partners over parents as sources of attachment support (e.g., Trinke & Bartholomew, 1997).
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47 Parents' marital status also shaped the organization of the attachment network. If parents
48
49 were separated, fathers were placed further from the core-self than if parents were married.
50
51 Following the separation, fathers were rarely the primary caregiver (3% compared to 71% of
52
53 mothers), which might explain the greater emotional distance. Separated parents were also
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55 positioned further from each other on the HMT than married parents were. Consistent with Rowe
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5 and Carnelley (2005) this finding demonstrates that the HMT is useful in demonstrating
6
7 meaningful associations between network members as well as between network members and the
8
9 core-self.
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11
12 In sum, the present findings corroborate those of Rowe and Carnelley that secure
13
14 relationships are placed closer to the core-self and demonstrate that attachment style is an
15
16 important predictor of the organization of adults' attachment networks over time. That individual
17
18 and relationship factors also predicted distance of network members advances current
19
20 understanding of what shapes the organization of adults' attachment networks, beyond
21
22 attachment style, age, and romantic relationship status. Network members who were perceived to
23
24 be less optimal attachment figures were less likely to be central within the network. The over
25
26 time analyses provide some support to our claim that attachment styles predict attachment
27
28 network fluidity, as captured by the HMT: None of the individual and relationship characteristics
29
30 predicted distance over time but, attachment style with mother did. Future research could address
31
32 whether attachment style plays a causal role in shaping change in the organization of attachment
33
34 networks over time.
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40 **Network Membership over Time**

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43 Our findings were largely consistent with Ainsworth's (1989) premise that parental
44
45 attachment bonds continue into adulthood: The majority of participants kept their mother and
46
47 father in their attachment networks across both waves. Individual differences in attachment style
48
49 were linked to reasons for maintaining parental attachments: Participants who reported less
50
51 insecurity (i.e., lower anxiety and avoidance) in their parental attachments were more likely to
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53 endorse keeping their parents in the network because of their parents' significance in their life,
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55 relationship satisfaction and less likely because the relationships were difficult.
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5 Father and partner, but not mother, relationships marked by high attachment avoidance
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7 were less likely to be included on the HMT over time, which is consistent with research linking
8 attachment style to relationship termination (e.g., Gillath et al., 2012). Relative to partners and
9
10 mothers, fathers are used less as, and are less preferred, attachment figures (e.g., Rosenthal &
11
12 Kobak, 2010; Trinke & Bartholomew, 1997). Contributing to current understanding, our findings
13
14 showed that fathers, but not partners or mothers, who were sought for fewer attachment functions
15
16 were also more likely to be removed from the attachment network over time.
17
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20
21 Father and partner, but not mother, relationships marked by lower relationship
22 satisfaction at Wave 1 were more likely to be jettisoned from the network over time. These
23 findings are in line with the investment model's components (Rusbult, 1980). In this model,
24 satisfaction is a predictor of commitment and commitment, in turn, is linked to relationship
25 maintenance and persistence. Participants were also more likely to exclude partners with whom
26 they experienced more frequent anger, resentment, and conflict from their networks over time.
27
28 Nevertheless, whereas it might be easier to terminate a romantic relationship (e.g., if there are no
29 investments that require continued interaction), given the intricate ties some adults have with
30 their father (as part of the family system), it is likely more difficult to terminate a parental
31 attachment. Ending a relationship with a parent might be more likely – or easier to manage - if
32 parents are divorced or geographically separated from the adult child. In support of this idea,
33 participants with divorced parents showed greater emotional distance from their fathers.
34
35 We did not find any differences in the relationship characteristics for mothers kept and dropped
36 from the network over time; this could be due to the psychological importance of the mother-
37 child relationship. Although we included a range of relationship characteristics, our list was not
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exhaustive. The experiences required to significantly disrupt this bond might be difficult to capture using quantitative measures.

The quantitative analyses showed that parents were significant figures in the participants' lives and that participants were largely satisfied with these relationships. Indeed, participants' own explanations for including (or excluding) their parents from their networks highlighted the importance of continuing to use parents as attachment figures. The qualitative findings captured the adults' use of their parents as providers of proximity, a secure base, and a safe haven. Although participants might not have actively included parents on their lists of significant others at Wave 2, it was apparent from the qualitative analyses that parents remained important figures in the lives of these adults.

Study Evaluation and Future Research

The present study is one of a few to employ a longitudinal design to address important questions about change in attachment networks. Our findings confirm the predictive, discriminant, and convergent validity of the HMT as a measure of attachment networks. Despite these strengths, the study has limitations. To prevent participant fatigue we used a number of one- and two-item measures to assess relationship characteristics. Because the reliability of the negative affect measure was low ($\leq .700$) and internal consistency was not estimated for the single-item measures, we advise caution in drawing conclusions based on these measures. For the father and partner distance over time analyses, because the ratio of predictors-to-cases was low, we may not have had enough statistical power to adequately test the over time hypothesis for these figures. The attrition rate was high at ~60%, but was partly due to approximately 30% of participants graduating between waves. There were no systematic relationship differences between those

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5 participants that did or did not return, but returning participants were younger on average.
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7 Participants were university students and the majority was young adults (i.e., 18-20 years).
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9 Although this may be an important time for examining the reorganization of attachment
10 networks (Pitman & Scharfe, 2010), future research should examine factors that predict
11 reorganization over time at other developmental transitions. For example, over time,
12 parent-adult child attachments may become more symmetrical (Ainsworth, 1985) or adult
13 children might become caregivers for their own parents (e.g., Carpenter, 2001; Cicirelli,
14 1993). Several of the themes identified in the open-ended responses were not present in
15 participants' reasons for keeping or dropping their parents from their networks. This could
16 be because the coding scheme largely reflected themes of romantic/marital dissolution.
17 Finally, we advise caution in interpreting these analyses because although some
18 participants did not include their parents on the list at Wave 2, their responses suggested
19 they still considered the parent to be a member of their attachment network.
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36 It is noteworthy that whereas attachment style to father did not predict father's
37 distance from the core-self over time it was implicated in father's inclusion in the
38 attachment network over time. Moreover, in line with extant research (Freeman & Almond,
39 2010; Rosenthal & Kobak, 2010), fathers were placed further from the core-self than
40 mothers at both waves.. Our findings suggest the relationship characteristics associated
41 with mother and father's placement in the network differ. Indeed, the pattern of findings
42 for father showed several similarities with those found for partner (i.e., predictors of
43 distance over time; roles of attachment avoidance and relationship satisfaction in inclusion
44 in the attachment network over time). Together, these findings suggest that attachment to
45 fathers in adulthood has some qualitative differences to attachment to mothers. For
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5 example, young women viewed their fathers primarily as sources of instrumental, rather
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7 than emotional, support (Freeman & Brown, 2010). Differences in attachments to mother
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9 and father appear to emerge in adolescence (Kobak, Rosenthal, & Serwik, 2005; Kobak,
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11 Rosenthal, Zajac, & Madsen, 2007). What we have observed might be a consequence of
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13 cohort effects in which mothers were the primary caregivers, and in cases of divorce,
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15 children were placed with mothers over fathers. Future research might explore whether
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17 fathers who are the primary source of comfort and security are also demoted in the
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19 hierarchy. Future research might also explore the transition of a parent as an attachment
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21 figure to no longer serving as one for the adult child (e.g., whether there is role reversal
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23 whereby the adult child becomes the caregiver; whether the affectional bond transitions
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25 from attachment to affiliative).
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31 In conclusion, the present study found attachment style explains placement of parents and
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33 meaningful movement in mothers' placement in adults' attachment networks over time – both in
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35 terms of organization and content – as well as and beyond, age, romantic relationship status and
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37 relationship quality. Further our findings confirm the use of the HMT to capture attachment
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39 network fluidity. Together, these findings further our understanding of the fluid nature of adults'
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41 attachment networks over time and highlight areas for future research to better understand
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43 change in parental attachments across the lifespan.
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Footnotes

¹ The additional relationship characteristics were derived from the extant literature and through extensive discussion with members of the United Kingdom Attachment Network, a group of internationally-recognized experts in adult attachment theory, which took place in 2011-2012.

² We included additional measures to address other hypotheses about change in attachment networks over time: At Wave 1, the CES-D short form (Cole, Rabin, Smith, & Kaufman, 2004), State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) and a measure of significant others' psychological well-being, and at Wave 2, the ECR-short form (Wei, Russell, Mallinckrodt, & Vogel, 2007), psychological well-being measures, the ANQ (Trinke & Bartholomew, 1997), and the Wave 1 relationship characteristics measures for any new people on the Wave 2 list.

³ Outliers were winsorised (Tabachnick & Fidell, 2013) and missing values replaced with the mean. There was less than 5% missing for all variables except frequency of conflict with mother (8.25%) and father (8.12%). Missing conflict with mother scores were predicted from participants' age (Little's MCAR, $\chi^2(107) = 38, p = .024$). Participants that completed the measure were older ($M = 20.1$) than those who did not ($M = 19.1$ years), $t(51) = 4.2, p < .001$. Missing conflict with father scores were missing at random (Little's MCAR, $\chi^2(122) = 110, p = .77$). Participants that completed the measure were older ($M = 20.2$) than those who did not ($M = 19.0$), $t(45) = 4.40, p < .001$.

⁴ Findings were the same when based on non-mean replaced data, with the following exceptions. For mother's distance ($n = 308$) at Step 1 gender was not a significant predictor ($\beta =$

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5 .102, $p = .073$), but context was ($\beta = .124, p = .032$); at Step 2, relationship satisfaction was not
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7 significant ($\beta = -.118, p = .065$); and, at Step 3, attachment anxiety was not significant ($\beta = .073,$
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9 $p = .142$). For father's distance ($n = 261$), father-initiated non-need-based contact was a
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11 significant predictor ($\beta = .15, p = .046$) at Step 2. For partner's distance ($n=189$), the results were
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13 the same as those for the mean-replaced data.
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17 ⁵ Mother's distance differed by university, $F(2,345) = 4.06, p = .018$. Participants from
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19 University A placed mother closer ($M = 23.7$) to the core-self than did those from University B
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21 ($M = 29.8$), $p = .08$ and University C ($M = 28.1$), $p = .06$.
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Table 1

Descriptive Statistics and Zero-order Correlations with Distance from Core-Self at Wave 1

Variable	Mean	SD	<i>r</i>	Alpha
<i>Mother Analyses (n=348)</i>				
DCS Mother at Wave 1 (in mm)	26.0	16.1	--	--
Age	20.8	5.10	.15**	--
Use as an attachment figure	2.71	0.72	-.40***	--
Psychological presence	2.71	0.83	.45***	--
Self-initiated need-based contact	4.18	0.79	-.38***	.844
Self-initiated nonneed-based contact	4.00	1.01	-.48***	--
Mother-initiated need-based contact	4.38	0.69	-.40***	.788
Mother-initiated nonneed-based contact	4.15	0.97	-.25***	--
Negative affect	1.35	0.84	.23***	.648
Relationship satisfaction	5.97	1.15	-.49***	.955
Perceived responsive care	4.84	0.90	-.44***	.890
Attachment anxiety with mother at Wave 1	1.36	0.81	.36***	.830
Attachment avoidance with mother at Wave 1	2.52	1.34	.64***	.893
Romantic relationship status	--	--	.04	--
<i>Father Analyses (n=299)</i>				
DCS Father at Wave 1 (in mm)	35.1	19.3	--	--
Age	20.5	4.21	.08	--
Use as an attachment figure	2.38	0.99	-.40***	--
Psychological presence	3.05	0.86	.41***	--
Self-initiated need-based contact	3.73	1.05	-.46***	.903
Self-initiated nonneed-based contact	3.08	1.10	-.44***	--
Father-initiated need-based contact	3.64	0.98	-.42***	.831
Father-initiated nonneed-based contact	3.15	1.13	-.27***	--
Negative affect	1.25	0.94	.36***	.700
Relationship satisfaction	5.47	1.45	-.57***	.967
Perceived responsive care	4.29	0.96	-.51***	.886
Attachment anxiety with father at Wave 1	1.51	1.04	.36***	.878
Attachment avoidance with father at Wave 1	3.42	1.48	.62***	.906
Romantic relationship status			.06	
<i>Partner Analyses (n=205)</i>				
DCS Partner at Wave 1 (in mm)	20.0	12.4	--	--
Age	22.1	7.40	-.07	--
Use as an attachment figure	2.85	0.48	-.35***	--
Negative affect	1.31	0.85	.05	.690
Relationship satisfaction	5.91	1.17	-.37***	.949
Perceived responsive care	5.05	0.79	-.27***	.852
Attachment anxiety with partner at Wave 1	2.31	1.43	.20**	.909
Attachment avoidance with partner at Wave 1	1.98	0.96	.54***	.824

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5 Note: DCS = distance from the core-self. Romantic relationship status: Mother analyses - 43% (n
6 = 151) not currently in a relationship; 57% (n = 197) currently in a relationship; Father analyses -
7 Romantic relationship status: 45% (n = 134) not currently in a relationship; 55% (n = 165)
8 currently in a relationship
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11 * p < .05. ** p < .01. *** p < .001.
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For Peer Review Only

Table 2

Predictors of Distance of Mother from the Core-Self

Predictor	ΔR^2	<i>B</i>	SE <i>B</i>	<i>B</i>	<i>t</i>
Step 1	.045**				
Age		.393	1.72	.125	2.29*
Sex		4.27	2.08	.110	2.05*
Context		1.46	0.942	.085	1.55
Romantic relationship status		.791	1.73	.024	0.457
Step 2	.378***				
Use as an attachment figure		-4.00	1.06	-.180	-3.79***
Psychological presence		3.49	1.00	.181	3.49***
Self-initiated need based contact		.379	1.17	.019	0.324
Self-initiated nonneed-based contact		-3.89	.979	-.250	-3.97***
Mother-initiated need based contact		-2.59	1.35	-.111	-1.92
Mother-initiated nonneed-based contact		2.10	.944	.127	2.22*
Negative affect		-1.45	.995	-.076	-1.46
Relationship satisfaction		-2.47	.868	-.177	-2.85**
Perceived responsive care		-2.77	1.07	-.156	-2.59**
Step 3	.067***				
Attachment anxiety with mother		2.16	.966	.109	2.24*
Attachment avoidance with mother		4.75	.781	.397	6.08***
Total $R^2 = .491$ (Adj. $R^2 = .468$), F of model (15, 332) = 21.3***					

Step 1 F of change (3, 343) = 4.08, $p = .003$

Step 2 F of change (9, 334) = 24.4, $p < .001$

Step 3 F of change (2, 332) = 21.7, $p < .001$

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Predictors of Distance of Father from the Core-Self

Predictor	ΔR^2	<i>B</i>	SE <i>B</i>	β	<i>t</i>
Step 1	.019				
Age		.337	.267	.074	1.26
Sex		-4.69	2.65	-.102	-1.77
Romantic relationship status		1.77	2.26	.046	0.784
Step 2	.432***				
Use as an attachment figure		-2.45	1.02	-.125	-2.41*
Psychological presence		4.15	1.25	.185	3.33***
Self-initiated need based contact		-.930	1.16	-.051	-0.804
Self-initiated non-need-based contact		-2.07	1.37	-.118	-1.52
Father-initiated need based contact		-.523	1.33	-.027	-0.393
Father-initiated non-need-based contact		2.32	1.20	.136	1.93
Negative affect		1.31	1.12	.064	1.17
Relationship satisfaction		-3.65	.879	-.274	-4.15***
Perceived responsive care		-3.32	1.29	-.166	-2.58**
Step 3	.022**				
Attachment anxiety with father		.304	.996	.016	0.305
Attachment avoidance with father		3.40	1.01	.261	3.38***
Total $R^2 = .473$ (Adj. $R^2 = .447$), F of model (14, 284) = 18.2***					

Step 1 F of change (3, 295) = 1.87, $p = .134$

Step 2 F of change (9, 286) = 25.0, $p < .001$

Step 3 F of change (2, 284) = 5.95, $p = .003$

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4

Predictors of Distance from the Core-Self of Partner

Predictor	ΔR^2	<i>B</i>	SE <i>B</i>	β	<i>t</i>
Step 1	.042*				
Age		-.097	.123	-.055	-0.80
Sex		-6.08	2.19	-.192	-2.78**
Step 2	.253***				
Use as an attachment figure		-7.96	1.65	-.293	-4.83***
Negative affect		-3.30	1.14	-.213	-2.90**
Relationship satisfaction		-3.25	.816	-.289	-3.99***
Perceived responsive care		-3.78	1.32	-.227	2.87*
Step 3	.096***				
Attachment anxiety with partner		-.757	.592	-.082	-1.28
Attachment avoidance with partner		5.99	1.08	.437	5.56***
Total $R^2 = .391$ (Adj. $R^2 = .366$), F of model (8, 196) = 15.7***					

Step 1 F of change (2, 202) = 4.43, $p = .013$

Step 2 F of change (4, 198) = 17.8, $p < .001$

Step 3 F of change (2, 196) = 15.4, $p < .001$

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5

Descriptive Statistics and Zero-order Correlations with Distance from Core-Self at Wave 2

Variable	Mean	SD	<i>r</i>
<i>Mother Analyses (n=105)</i>			
DCS Mother at Wave 2 (in mm)	20.9	12.2	
DCS Mother at Wave 1 (in mm)	24.9	14.4	.491***
Use as an attachment figure	2.78	0.65	-.293**
Psychological presence	2.70	0.80	.355***
Self-initiated need-based contact	4.17	0.73	-.428***
Self-initiated nonneed-based contact	3.97	0.94	-.315***
Mother-initiated need-based contact	4.47	0.61	-.384***
Mother-initiated nonneed-based contact	4.17	0.90	-.261**
Negative affect	1.31	0.72	.277**
Relationship satisfaction	6.09	0.99	-.433***
Perceived responsive care	4.98	0.78	-.377***
Attachment anxiety with mother at Wave 1	1.35	0.78	.410***
Attachment avoidance with mother at Wave 1	2.33	1.17	.487***
<i>Father Analyses (n=89)</i>			
DCS Father at Wave 2 (in mm)	26.6	13.0	
DCS Father at Wave 1 (in mm)	32.0	17.5	.586***
Use as an attachment figure	2.63	0.82	-.422***
Psychological presence	3.11	0.86	.465***
Self-initiated need-based contact	3.76	0.93	-.375***
Self-initiated nonneed-based contact	3.20	0.99	-.456***
Father-initiated need-based contact	3.72	0.91	-.406***
Father-initiated nonneed-based contact	3.11	1.10	-.351***
Negative affect	1.20	0.86	.191
Relationship satisfaction	5.64	1.21	-.508***
Perceived responsive care	4.39	0.91	-.407***
Attachment anxiety with father at Wave 1	1.40	0.95	.261*
Attachment avoidance with father at Wave 1	3.33	1.36	.555***
<i>Partner Analyses (n=44)</i>			
DCS Partner at Wave 2 (in mm)	16.1	12.4	
DCS Partner at Wave 1 (in mm)	21.1	12.2	.287
Use as an attachment figure	2.98	0.15	-.080
Negative affect	1.39	0.86	.106
Relationship satisfaction	5.89	1.13	-.268
Perceived responsive care	5.08	0.69	-.185
Attachment anxiety with partner at Wave 1	2.08	1.12	-.037
Attachment avoidance with partner at Wave 1	1.89	0.87	.332*

Note: DCS = distance from the core-self on the bull's-eye diagram.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Themes and Operational Definitions for the Content Analysis

Meta-theme	Theme	Definition	Example extracts
Perceived closeness	Perceived closeness	Refers to the closeness in the relationship with the SO.	A: She's my mum, so I will always be close to her no matter how far away we are. [kept in Wave 2]
	Change in physical proximity / contact	Refers to a change in the amount or nature of physical (e.g., face-to-face) or verbal (e.g., telephone calls, Skype) contact with the SO. Reference may be made to seeing each other less, spending less time together, no longer sharing accommodation, moving to or being in different countries; a change in situation. Situational changes may involve the participant or SO starting work, changing universities, etc.. Proximity may be achieved physically or via modern forms of communication (e.g., Skype, email, etc.).	B: He is my dad and I feel much closer to him after his divorce. [kept in Wave 2] C: I have always been close to my dad and still continue remaining close to him [kept in Wave 2] D: Because she is my mother and is always there for me, also I feel closer to her more now than I did when I was a teenager. [kept in Wave 2]
	Change in psychological availability / intimacy	Refers to a change in the amount or nature of closeness in the relationship. Reference may be made to feeling less close to the SO, the participant or SO no longer sharing confidences (self-disclosure), or drifting apart, no longer being emotionally close.	E: I don't know why I included her last time, but I don't feel we've ever had a close relationship. I just don't get on with her [Wave 1, only] F: Being down in [City] I rarely keep in contact with him and don't feel I have a particularly close relationship with him. Just steadily grew apart, but obviously still have a relationship. [Wave 1, only] G: Just forgot really. Dad works away a lot so I always see more of mum than of him. Other than me being in uni and him working away it hasn't changed. He's still my dad and we're still close. [Wave 1, only]

Meta-theme	Theme	Definition	Example extracts
Caregiving		Refers to seeking emotional or tangible support from the SO; to depending on the SO. Uses SO for secure base (e.g., SO supports exploration) or safe haven (i.e. SO protects, comforts) functions. Sense of positive affect, enjoyment or encouragement from SO.	<p>H: I rely on this person for financial help. I visit my dad at least 4 times a month and therefore he still is influential in my life [kept in Wave 2]</p> <p>I: I am not as close to my dad but I can depend on him in times of need. [kept in Wave 2]</p> <p>J: I am my dad's little girl. Our relationship is even stronger now, I talk with him about everything – life, boys, emotions, work, friends, parties. I even talk with him at 3am after I have been out and for some reason I'm upset. He calms me down and he shows me and gives me great amount of love. [kept in Wave 2]</p> <p>K: They [mother] are very important to me. I would always go to this person in time of need. They understand me and love me unconditionally, I am there for them and they are there for me. I can always be myself around this person. [kept in Wave 2]</p> <p>L: She is still as important to me as ever and is very supportive whenever I need supporting. She does a lot for me, and I can tell her when I am feeling down and she will help me work out my problem. [kept in Wave 2]</p>

Note: SO = significant other

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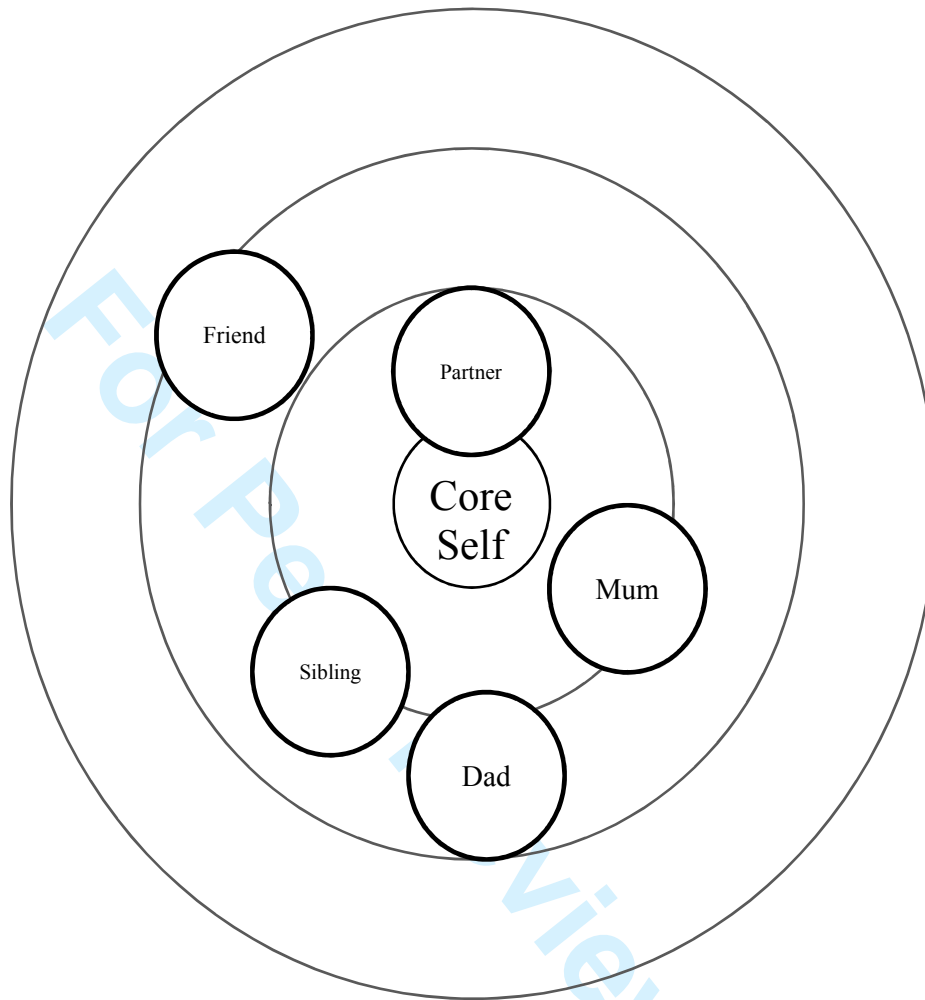


Figure 1. Distance of attachment figures from the core-self on the bull's-eye hierarchical mapping technique.