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Memory of Love Towards Parents Questionnaire: Development and Psychometric Evaluation

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Abstract

We document the development of the Memory of Love towards Parents Questionnaire—for use in multiple areas of psychology. It is designed to measure current feelings of and memory of love towards a specific parent during important time periods in childhood. In all samples (total $N = 1527$), we consistently found high internal reliability. We report the basic psychometrics of the 28-item subscale version in both undergraduate and US nonclinical adult samples and identified 10-item and 4-item subscale versions. The Memory of Love towards Parents Questionnaire has eight subscales: assessing mother and father separately during first, sixth, and ninth grade, as well as current feelings. We found a pattern of correlations that one would expect between existing attachment scales and the Memory of Love towards Parents Questionnaire. A factor analysis demonstrated that Memory of Love towards Parents Questionnaire items capture something different from the factors in established attachment measures. We found that the order of the subscales can be presented in a fixed order (mother-first and chronologically) without large order effects. The Memory of Love towards Parents Questionnaire demonstrated a single factor within subscales, reliability, and validity. The Memory of Love towards Parents

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Questionnaire can be used in clinical, social, developmental, and cognitive psychology.

Keywords
Memory, love, affection, emotion, mother, father

Introduction

For many, memories of love that they once felt towards their parents during childhood are an especially precious part of their autobiographical memory. For others, memory of a lack of love may be an equally important part of their life narrative. These memories help us assess the quality of our early life and, for some, inform our central narrative of our whole life. These narratives can be positive: for example, that one remembers feeling love in childhood and how that helped in later life. Or this narrative may be less positive: for example, that one remembers a lack of love and that required resilience and adaptation in later life—perhaps resulting in changing childrearing practices. In addition, memories of love may be related to a variety of important outcomes, a research line that might be worth pursuing with a reliable measure. Memory of love may be of interest in many areas of psychology, such as developmental, clinical, social, and cognitive psychology. Yet, no previous multi-item measure exists that assesses memory of love or current feelings of love towards parents (except our own research that utilized the scale in the current study: see Patihis, Jackson, Diaz, Stepanova, & Herrera, 2019). With a number of potential uses in mind, we set out to develop an instrument to measure the subjective self-report of current feelings of love, as well as memory of love towards parents during important time periods in childhood.

Defining the construct of interest

We must first explain exactly what we wish to measure in order to inform our search for past instruments, and if none exist, to aid in the creation of a new one. The first construct of interest is defined as an individual's subjective memory report of the frequency and strength of feelings of love and affection towards a specific parent during a specific period of time in the past. We are also interested in assessing the related construct of an individual's subjective report of the frequency and strength of *current* feelings of love and affection towards a specific parent. We will operationally define these constructs more precisely in the final section of the introduction, below. First, we investigate whether there are any previous measures available.

Search of the literature for past measures

An extensive search of the literature over a period of more than a year failed to find previous measures that assessed the aforementioned constructs. We searched multiple databases (e.g., Google Scholar, PsycINFO, Academic Search Premier, ScienceDirect, and PubMed). We used combinations of search terms, including but not limited to "love," "attachment," "affection," "parents," "mother, "father," "memory," "retrospective," and so forth. We found no previous instrument that used multiple items to measure current or past felt feelings of love towards a person, let alone towards a parent.

The need for a new measure and possible uses

For many readers, the importance of researching memory of love towards parents may be self-evident: both the emotion and the target may be considered to be central aspects of human life across cultures and across thousands of generations. We also argue that memory of love, and current feelings of love, could be important correlates with the behavior of the individual towards the target parent and the parental relationship. For example, frequency of visiting the parent, warmth shown towards the parent, depth of discussion when talking with the parent, how the parent is discussed with others, and support for the parent in old age (topics we are addressing in upcoming research). We speculate that memories of love towards parents may also effect behavioral choices about whether to raise the next generation similarly or differently to the way oneself was raised. Also of importance is the research question as to whether such memories of love will be malleable, and if so, whether that will in turn affect important behavioral outcomes in the relationship. We need a reliable measure with good face validity to investigate these research questions.

These important questions span several areas of psychology and there are an unlimited number of possible uses. For example, a scale measuring memory of love might be examined in relation to some of the aforementioned behavioral outcomes in relationships in social and developmental psychology. In developmental research, tracking changes in the memory of love and current feelings of love over a child's youth and adolescence could lead to results that change the way we all look at our memories of parents. In clinical psychology, a measure of memory of love towards parents in childhood could be given before and after psychotherapy treatments. This is especially of interest in psychotherapies that involve reappraisals of parents. As is emerging in affective neuroscience with other emotions (e.g., Dolcos, LaBar, & Cabeza, 2004; Phan, Wager, Taylor, & Liberzon, 2002), a measure of memory of love and current feelings of love could be used to investigate neural correlates. In social and cognitive psychology, research could investigate whether changing cognitive appraisals of a given parent would lead to changes in memories of love (cf. Levine, 1997;

Levine, Prohaska, Burgess, Rice, & Laulhere, 2001) and current feelings of love towards the parent (arguably predicted by the cognitive appraisal theory of emotions, see: Lazarus, 1982; Schachter & Singer, 1962; Scherer, Schorr, & Johnstone, 2001).

All of these applications would require a multi-item measure with sufficient internal consistency: single items attempting to measure such constructs would not be stable enough for experimental or multistage research. Imprecise and relatively unstable single-item measures could raise the possibility of Type II statistical errors: that is, finding no significant differences when an effect is present.

What do we mean by love?

Although we have defined earlier what we wish to measure, it is informative to briefly discuss the differing meanings of love, and what we are *not* seeking to measure. By doing so, our wording choices later on will be put in context—especially our use of specific synonyms of love that guide the participant towards the concept of interest. The term *love* has been used to mean a number of things and explaining what we mean by *love* in this study is paramount. In different contexts, it has been used to mean romantic love (Hatfield & Walster, 1978; Hazan & Shaver, 1987; Rubin, 1970; Sternberg, 1986, 1987), attachment (e.g., Ainsworth, 1967; Bowlby, Fry, Ainsworth, & World Health Organization, 1965; Harlow, 1958), or an emotion (Fehr & Russell, 1984; Shaver, Morgan, & Wu, 1996). In this article, we are interested in the latter: love as it is experienced as an emotion in the context of a parental relationship. Love has been listed as a *basic* emotion that is universally recognized across cultures by a number of psychologists, (see Fehr & Russell, 1984; Lazarus, 1991; Roseman, 1994; Shaver et al., 1996; Shaver, Schwartz, Kirson, & O'Connor, 1987; Shaver, Wu, & Schwartz, 1992; Wu & Shaver, 1993), though not by others (see Ekman, 1992; Izard, 1991; Oatley & Johnson-Laird, 1987). Regardless of whether love is a basic emotion, or not, we seek to measure subjective current feelings and memories of love similarly to the way emotions and memories of other emotions have been assessed previously (i.e., by strength/intensity and duration).

Questions of validity: What should our constructs be related to?

To our knowledge, the construct of interest has not been exactly measured before as defined here. Therefore, rather than assessing concurrent validity with existing scales that attempt to measure the same construct, we will instead examine how the measure we develop should be correlated with related past measures (convergent and discriminant validity).

The relationship between attachment and love. Shaver et al. (1996) proposed that love is one of several emotions that is generated by the attachment-behavioral system (Bowlby, 1969/1982), along with jealousy, anger, separation anxiety, loneliness, and grief. We would therefore expect those who report a good attachment to a given parent to report stronger and more frequent memories of love towards that same parent. This relationship, however, will depend upon what aspect of attachment is being measured.

Avoidant and anxious attachment. Attachment styles, such as secure, avoidant, or anxious attachment to a given parent, is a different measure than the central construct of memory of love towards that parent. The former assesses how one might react to separation and reunification, while the latter assesses a subjective memory of one's past feelings of love. Therefore, our new measure should not factor precisely on the same constructs assessed in instruments that measure aspects of attachment style, such as current attachment-related anxiety and avoidance towards a parent (e.g., as measured in Experiences in Close Relationships; ECR; Fraley, Heffernan, Vicary, & Brumbaugh, 2011). Nevertheless, we would expect those who report they are more securely attached to a parent are more likely to remember having a close relationship with that parent, and therefore be more likely to self-report higher subjective memories of love towards that parent (compared to those anxious or avoidant attachment). Therefore, we expect significant negative correlations between our new measure of memory of love towards a parent, and measures of both anxious and avoidant attachment, though the correlations should not account for so much variance that it indicates it is measuring the same construct.

More specifically, we expect differing relationships between memory of love and insecure and avoidant attachment. We propose that *anxious* insecure attachment with a parent does not necessarily mean the individual did not feel much love towards the parent—they may remember experiencing strong love towards the parent while simultaneously feeling anxious about maintaining that bond. In fact, that anxiety may be driven by strong past emotions. On the other hand, we propose *avoidant* attachment may be more predictive of differing feelings of love and affection. Those who currently feel they want to avoid a parent may have felt less love towards that parent compared to someone who does not avoid that parent. Therefore, memory of love could be a stronger correlate with avoidant attachment compared to anxious attachment.

We argue that this correlation should also vary by the time period under consideration. Because the ECR instrument measures *current* anxious and avoidant attachment with a given parent, it should correlate more strongly with *current* assessment of love towards that parent compared to *memory of* love towards that parent in childhood.

Parenting behavior during childhood: Care and protection. Caring and warm interactions from a parent towards a child will logically also increase positive emotions, such as love, towards that parent. Therefore, those who self-report that their parent exhibited behaviors during childhood indicative of caring and emotional warmth (as measured by the Parental Bonding Instrument (PBI); care subscale; Parker, Tupling, & Brown, 1979) will likely also report remembering more memory of love in childhood. When these positive caring interactions and past feelings of love from childhood are then remembered in adulthood, we should still find a strong correlation (despite some inaccuracies that memory inevitably produces).

In contrast to the care subscale of the PBI, some adults who had an overprotective parent (PBI subscale "protection") may retrospectively report relatively comparable ratings of love towards that parent compared to those with a less protective parent. Therefore, the relationship between memory and love and parental overprotective behaviors will likely be lower than the aforementioned parental care. Nevertheless, because those with overprotective parents may have encountered more restrictions in childhood, that may have caused the warmth in the relationship to decline, we expect a significant negative relationship with memory of love.

As before, this correlation should vary by the time period under consideration. Because the PBI construct measures *retrospective* assessment of parental behaviors during childhood, it should correlate more highly with *memory of* love towards that parent in childhood compared to *current* feelings of love towards that parent.

Current attachment and relationship quality towards parents. Some past instruments of attachment that assess the general quality of the relationship are composed of more than one factor. For example, the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) includes a number of differing items that assess a number of different feelings, interactions, and perceptions of a parent. These items sum to give a broad measure of relationship and attachment quality. In contrast, our measure, memory of love towards a parent, focuses on just one central concept within a specified time period. Therefore, we should find that our new measure of memory of love should have one factor and should not factor on the same factors as the IPPA measure (which we expect to be multifactorial).

Those with good relationships with a parent will likely lead to stronger and more frequent positive feelings, such as love. It is therefore reasonable to expect that a general measure of a positive relationship and attachment to a given parent will positively correlate with memory of love towards that same parent.

In addition, this correlation should vary according to the time period under consideration. Because the IPPA construct measures *current* attachment and

relationship quality with a given parent, it should correlate more strongly with *current* assessment of love towards that parent compared to *memory of* love towards that parent in childhood.

Other expected relationships. Our measure of current feelings of love should capture specific memory of love towards a parent, not *general* positive affect (or mood) that is not directed towards any specific target. Likewise, our measure should not assess the desire to present oneself favorably to researchers, so we do not expect social desirability to be a large correlate of current feelings of love or memory of love towards a parent. In addition, we would expect a concept such as memory of love towards parents in childhood to be affected by the quality of experiences during childhood. Negative experiences in childhood will likely detract from the parent–child relationship and therefore lead to moderately lower assessments of memory of love towards parents. Therefore, we predict that memory of love will negatively correlate with exposure to negative events during childhood.

The current study

Operational definition. The constructs of subjective memory of feelings of love and current feelings of love towards a specified parent are operationally defined as the averaged response on a seven-point Likert-type scale to the questions "how often on average [did/do] you feel [love] toward your [mother/father]? and "how strong on average [is/was] your [love] toward your [mother/father]?" for a specified time period. The word "love" in subsequent items is changed to synonyms that help capture the type of love specifically appropriate for parents (e.g., "affection").

Item wording construction. By asking several questions related to the central concept of parental love, we seek to steer the participant towards our desired constructs independent of their own definition of the word *love*. Therefore, as well as using the word "love" in some items, we also include other items assessing affection, caring, emotional warmth, respect, kindness, appreciation, attachment, bonding, and so on. We also include concepts with similar meaning to this type of love (parental), such as fondness, adoration, and devotion—in the wordings of our new measure. In addition, in keeping with other emotion research, we included questions that assess both frequency and strength.

Identifying and defining the time period subscales. We specifically chose time periods after the period of infantile amnesia (after ages 3–5 years), that spanned early to late childhood, involved common transitional school time periods (i.e., the first year of a new school), and gave a sufficiently detailed window into the patterns in a person's subjective memory of their love towards their parents. We chose

three time periods during childhood in order to observe patterns spanning early childhood, mid childhood, and a time period after puberty, but no more than three to prevent question fatigue, as well as the likelihood of redundancy and overlapping of subscale factors. In addition, we wanted reports of distant memory as well as more recent memory (hypothesizing that more distant memory might be more malleable). For these reasons, we chose the first year of each major school transition in the United States: the first years of elementary (first grade; ages 6–7 years), middle (sixth grade; ages 11–12 years), and high school (ninth grade; ages 14–15 years). These time periods were chosen because we anticipate that these will be remembered using those school transition cues many years later and be meaningful transitional periods for some people. The Memory of Love towards Parents Questionnaire (MLPQ) can simply be reworded for other countries that have different school transition year time periods (see Appendix). We decided to ask the participants specifically about the frequency and strength of their love throughout their school year, rather than a specific incident, to get a more rounded assessment as to the quality and the quantity of the feelings of love. By doing so, we think it is a more stable assessment of how much participants felt love towards their parent at that age. Nevertheless, the scale can be adapted to ask about different time periods and indeed about feelings of love at a specific event (and we have begun such research).

Mother and father subscales. The definition of the construct, given earlier, includes that we will ask about "a specific parent," and this means we will assess separate subscales for fathers and mothers. The reason for this is that individuals can have varying memories of feelings of love towards mothers compared to fathers. To ask about parents in general would be an ill-defined, imprecise, and likely multifactorial measure.

From the aforementioned introduction and from further discussion below, we generated some core research questions and predictions:

Research Question 1: Reliability. By design, the MLPQ should have good internal reliability within subscales, and we predict that within subscales there will also be good test–retest reliability.

Research Question 2: Convergent validity—Correlations with attachment measures. Relevant MLPQ subscales should be more correlated to some attachment measures than others.

2(a). As discussed earlier, we expect significant negative correlations between our MLPQ subscales, and measures of current anxious and avoidant attachment towards that parent—with a stronger correlation with avoidant attachment compared to anxious attachment. Anxious and avoidant attachment will be measured by the ECR–Relationships Structure (ECR-RS; Fraley et al., 2011). In addition, because the ECR assesses current attachment, the ECR-RS

subscales should correlate more strongly with *current* assessment of love compared to *memory of* love.

2(b). Utilizing the PBI, we expect a positive correlation between retrospective reports of parental care and the MLPQ subscales and a negative correlation between overprotection and the MLPQ subscales, though expecting relatively lower effect size. In addition, because the PBI is a *retrospective* assessment, it should correlate more highly with *memory of* love compared to *current* feelings of love.

2(c). We expect that the IPPA, a general measure of a positive relationship and attachment to a given parent, will positively correlate with MLPQ subscales towards that same parent. In addition, because the IPPA measures current attachment, it should correlate more strongly with MLPQ subscales assessing current love compared to memory of love.

Research Question 3: MLPQ and attachment item loadings and number of factors. In accordance with our purposeful single-facet design of the MLPQ items within each subscale—we predict a single factor within each of the MLPQ subscales (i.e., a single factor within the first grade MLPQ subscale, etc.). In contrast, we predict multiple factors within the general attachment construct. The MLPQ subscales should each load on one single factor, and this factor will be independent of any of the multiple factors we expect to see in attachment scales.

Research Question 4: Discriminant validity—Correlations with mood, social desirability, and negative childhood experiences. The MLPQ is intended as a measure of memory of love *specifically* towards a parent, and no subscale of the MLPQ should be too highly correlated with current *general* positive affect (as measured with the Positive and Negative Affect Schedule; PANAS; Watson, Clark, & Tellegen, 1988). Likewise, the MLPQ subscales should not measure the desire to present oneself favorably to researchers, so we expect the social desirability scale (as measured by SDS; Crowne & Marlowe, 1960) to not be a large correlate of any of the MLPQ subscales. In addition, the MLPQ should negatively correlate with exposure to negative events during childhood (as measured by the traumatic experiences checklist (TEC); Nijenhuis, Van der Hart, & Kruger, 2002) and that the effect size should not be higher than moderate.

Research Question 5: Subscale distinction. Each subscale of the MLPQ (i.e., first, sixth, ninth grade, and current) should be distinct from one another and should not load on the same factor as other subscales. We expect subscales assessing time periods that are the closest together in time (e.g., first and sixth grade) to be correlated more strongly than those further apart in time (e.g., first grade and current).

Research Question 6: Setting. Desirable psychometric properties would be that the MLPQ is stable across settings and independent of the surroundings in which the measure is administered. We test the prediction that there will be no

differences in the means of the MLPQ subscales between those who participated in the laboratory and those online.

Research Question 7: Order effects. Another desirable psychometric property would be that little or no order effects exist. This includes when questions about mothers are presented before fathers, or vice versa; or whether the target time periods are presented in random order or chronologically (e.g., Grades 1, 6, 9, and current). We test the prediction that there are no such order effects.

Method

Participants

During the development of the scale, seven different samples were collected (total $N = 1527$). One of the samples consisted of undergraduates participating for course credit (Sample 2), and other samples were adults in the United States (US) participating via Amazon Mechanical Turk (AMT) for monetary compensation (Samples 1, and 3–7; see Mason & Suri, 2012 for review of using AMT for behavioral research). Table 1 summarizes the gender, age, ethnicity, compensation, and sample-type statistics for all seven samples. All samples participated online, except 179 subjects in Sample 2 who participated in the laboratory. The research was approved for human subjects (USM IRB #16011902).

Materials

Not all the questionnaires listed below were presented to all nine samples. Nevertheless, for purposes of organization, we will list the materials used in the various samples together. For all samples, demographic questions were presented first, followed by background questions about the parents.

Memory of Love towards Parents Questionnaire. Participants then completed our MLPQ scale. All materials for full 28 items, 10 item, and 4 item subscale versions, as well as the recommended two-anchor version of the MLPQ are given in the Appendix (see Appendix S1 for fully anchored Likert-type version). Participants were instructed to think back and report the love they remember feeling—towards each parent separately—in the years that they were in first, sixth, ninth grade, and currently (the latter when addressed in isolation can be referred more accurately as the Love towards Parents Questionnaire [LPQ]). In the long-form version (28 items; used in Samples 1 and 2), half the items asked about the frequency of feelings of love, affection, warmth, and other words related to affective aspects of parental love. For example, one such item was "During the whole year when you were **in first grade**, *how often on average* did you feel **love** toward your **mother**?" (bold and italic as in original). The other half of the questions asked about the strength of love (affection, etc.) during the year

Table 1. Demographics of all samples used in the development of the memory of Love towards Parents Questionnaire.

Sample	*N*	Gender % Fem	Age *M* (*SD*)	Race/ethnicity (%)				SES (*SD*)	Sample Type	Comp[c]	Scale Type
				White	Black[a]	Asian	Hispanic[b]				
1	275	65.6	36.1 (11.0)	78.4	8.4	5.9	4.4	4.78 (1.79)	US adult	$2.00	F-anch 28-item
2	280	80.7	21.5 (5.6)	44.6	44.3	5.4	2.9	4.93 (1.59)	Student	Course credit	F-anch 28-item
3	148	71.6	37.6 (11.5)	77.0	6.8	7.4	5.4	—	US adult	$0.20	Two-anch 10-item
4	192	60.9	35.9 (11.6)	75.0	7.8	6.8	5.7	—	US adult	$2.00	Two-anch 10-item
5	275	72.4	37.3 (11.9)	86.5	6.2	3.6	7.7	—	US adult	$1.00	Two-anch 10-item
6	156	86.5	38.6 (10.7)	80.8	10.3	7.1	3.8	—	US adult	$0.25	Two-anch 10-item
7	201	55.2	41.9 (13.2)	85.6	6.5	6.5	4.0	—	US adult	$0.30	Two-anch 10-item

Note: Overall age ranges = 18–79 years (US adult), and 18–52 years (undergraduate sample). SES: mean self-reported socio-economic status on a scale from 1 (bottom rung: least money, education, worst jobs) to 10 (top rung: most money, education, and best jobs); US adult: samples recruited via AMT; F-anch: fully-anchored Likert scale; Two-anch: two-anchor Likert scale anchored at bottom and top; —: data not collected.

[a]Black or African American.

[b]Hispanic or Latino. Percentages of American Indian or Alaska Native participants ranged from 0.4% to 3.8%. Native Hawaiian and Pacific Islander ranged from 0.4% to 2.3%. Percentages of participants who chose "other (please specify)" as their ethnicity ranged from 1.9% to 2.9%. Ethnicity categories may sum to more than 100% due to participants choosing multiple categories.

[c]Compensation amount or credit type.

in question. For example, one question was: "During the whole year when you were **in first grade**, *how strong on average* was your **affection** toward your **mother**?" Participants in Samples 3 through 7 received the short-form 10-item version (items 1, 2, 3, 4, 5, 6, 9, 10, 27, and 28) with a revised Likert-type scale with anchors only at the top and bottom of the scale (two-anchor 10-item version).

PANAS. Participants in Sample 1 completed the PANAS 20-item short form (Watson et al., 1988). The PANAS consists of two 10-item scales representing negative and positive current mood or affect, and each has high internal reliability (Cronbach α's $> .84$), and the two subscales are not highly correlated (rs $< .23$ in magnitude). In Sample 1 of the current study, the mean positive affect score on the PANAS was 30.4 (standard deviation ($SD = 9.0$) and the mean negative affect score was 13.9 ($SD = 6.4$), which are comparable to Watson et al.'s (1988) averages ($M_{\text{positive}} = 33.3$, $SD = 7.2$; $M_{\text{negative}} = 17.4$, $SD = 6.2$).

Attachment-related scales. The following parental attachment and bonding scales were presented to participants in Sample 4 and not the other samples.

Experiences in Close Relationships–Relationships Structure. The ECR-RS is designed to capture attachment-related anxiety and avoidance in close relationships. The mother and father subscales of the nine-item ECR-RS (Fraley et al., 2011) were used. The first six of the nine items are part of an avoidance subscale (example item: "I don't feel comfortable opening up to this person"). The final three questions assess attachment-related anxiety (e.g., "I'm afraid that this person may abandon me"). Low scores on both the anxiety and avoidant subscales are indicative of secure attachment. This scale was found to be reliable (Cronbach's αs $\sim .90$) with the two expected factors—avoidance and anxiety—manifesting in a factor analysis (Fraley et al., 2011; Fraley, Waller, & Brennan, 2000; Sibley, Fischer, & Liu, 2005).

Inventory of Parent and Peer Attachment. We administered the mother and father subscales of the 25-item version of the IPPA (Armsden & Greenberg, 1987, 1989). The IPPA was developed to assess current attachment and relationship quality towards attachment figures. Examples of items from the mother subscale include "My mother respects my feelings" and "I feel my mother does a good job as my mother." Ten of the 25 items are reverse coded (e.g., "I wish I had a different mother"). Participants choose an answer on a five-point fully anchored scale, ranging from *1 = Almost Never or Never True* to *5 = Almost Always or Always True*. The internal reliability for the IPPA was reported as Cronbach's $\alpha = .87$ for mothers and .89 for fathers. Test–retest reliability for the IPPA subscale of parent attachment at three weeks was .93. In terms of validity, it is highly related to subscales on the Family Environment Scale (Moos &

Moos, 1974; Armsden & Greenberg, 1987) and the Parent Support Scale (Yazedjian & Toews, 2016). The IPPA is also related to depression (Vivona, 2000) and has good convergent validity with similar measures (Nada Raja, McGee, & Stanton, 1992; Paterson, Pryor, & Field, 1995).

Parental Bonding Instrument. The 25-item PBI (Parker et al., 1979) is a retrospective measure asking participants about their perceptions of their parent's previous parenting behavior during their childhood. Adult participants are asked to rate their mothers and fathers' (on separate subscales) relationship with the participant—in terms of care (emotional warmth) and overprotection—during the participants' first 16 years of life. For example, the participants are asked to remember their relationship with their mother to answer items such as "Spoke to me in a warm and friendly voice" (a *care* subscale item) or "Let me do those things I liked doing" (an *overprotection* subscale reverse-coded item). The PBI has been shown to have good internal consistency and retest reliability (Parker et al., 1979, 1988) and good convergent validity (Parker, 1983).

Other measures. Other measures included in two of our studies were the SDS (Crowne & Marlowe, 1960; Sample 2: undergraduates) and the TEC (Nijenhuis et al., 2002; Sample 5: AMT participants).

General procedure

In Samples 1 and 3 to 7, participants completed the study online. Study materials varied across samples, but generally involved this order of materials: Study information sheet, demographic questions, background questions about parents (e.g., biological parents or not, age of), MLPQ items, covariates of interest in that particular sample (e.g., PANAS, attachment questionnaires, traumatic experiences scales, etc.), and debriefing sheet, followed by automated compensation (see Table 1 for the various compensation rates). Study sessions ranged in time—depending on the number of variables under investigation—from 5 minutes (e.g., Sample 3) to 1 hour (e.g. Sample 1).

The procedure for Sample 2 was similar but differed in that some undergraduates ($n = 179$) participated in lab at a preordained appointment time, while other undergraduates participated online, also at set appointment times ($n = 101$). The procedure for Sample 2 also involved participating in a brief second session exactly one week after the first so that test–retest data for the MLPQ could be obtained. Session 1 for Sample 2 took about 1 hour, and Session 2 took less than an hour. At the end of Session 2, participants read a debriefing sheet and were compensated with course credit.

Results

In our results section, we first report the descriptive statistics for the MLPQ, followed by statistical analyses for reliability, validity, exploratory factor analyses, setting (laboratory vs. online), subscale discrimination, and order effects. This allows us to answer each research question in sequence while drawing evidence from multiple samples as we do so. Data analysis was performed in IBM SPSS 25. We use principal axis exploratory factor analyses with Promax rotation (Kaiser normalization) in this article. Principal axis factor analysis was chosen because it is one of the commonly used methods considered most appropriate for determining the underlying latent structure of a measure. We used Promax rotation because it allows the rotated factors to be somewhat correlated, which is consistent with what we expect within the subscales of the MLPQ.

Descriptive statistics

Table 2 shows the means and standard deviations of the MLPQ. These include statistics for US Adults and undergraduates, short form and long form, and fully anchored and two-anchored versions of the MLPQ. The 10-items were chosen by an iterative reliability analysis described in the next section. The two-anchored Likert-type scale version was developed to reduce means and skew and to increase spread, and we saw some evidence for that in AMT participants in Sample 3 (see Table S1 and S2; prefix S denotes Supplemental Materials). The Appendix contains the MLPQ items—including long-form, 10-item, and 4-item versions.

Research Question 1: Reliability

Internal and test–retest reliability. For each time period (Grade 1, 6, 9, and current) the MLPQ items were averaged into composite scores within each subscale. Table 3 displays internal reliability of each composite subscale in Samples 1 (AMT participants), 2 (undergraduates), and 4 (AMT), as well as test–retest correlations from Sample 2 (retest at one week; undergraduate sample). Within each subscale, the MLPQ subscale composite scores were consistently statistically higher for mothers than fathers (paired t-tests, all $ps < .001$). Skewness ranged from -1.26 (mothers Grade 1) to -0.35 (fathers Grade 9). Table S3 documents the mean, standard deviation, and skew for the MLPQ subscales for men and women separately. The high internal reliability results shown in Table 3 prompted us to investigate item reduction.

Using reliability to identify 10-item subscale. Using Sample 1 (AMT) data from the first grade MLPQ of the mother, we used an iterative reliability analysis and removed items in matching pairs that had the highest average Cronbach's α "if deleted." After nine such analyses, removing a matching pair of items per

Table 2. Descriptive statistics of the MLPQ for both US adult and undergraduate sample.

	Mother			Father		
	M	*SD*	Skew	*M*	*SD*	Skew
Sample 1: US adults 28-item fully anchored						
Grade 1 MLPQ	4.93	1.14	−1.26	4.29	1.73	−1.08
Grade 6 MLPQ	4.35	1.34	−0.75	3.84	1.77	−0.64
Grade 9 MLPQ	3.87	1.52	−0.42	3.55	1.80	−0.35
Current LPQ	4.29	1.86	−1.09	3.80	1.96	−0.88
Sample 1: US adults 10-item fully anchored						
Grade 1 MLPQ	5.06	1.07	−1.37	4.33	1.72	−1.13
Grade 6 MLPQ	4.53	1.30	−0.92	3.86	1.76	−0.66
Grade 9 MLPQ	4.04	1.52	−0.57	4.04	1.52	−0.57
Current LPQ	4.42	1.82	−1.21	3.89	1.98	−0.97
Sample 2: Undergraduates 28-item fully anchored						
Grade 1 MLPQ	5.17	1.04	−2.08	4.42	1.78	−1.11
Grade 6 MLPQ	4.71	1.32	−1.19	4.10	1.75	−0.81
Grade 9 MLPQ	4.44	1.48	−1.03	3.89	1.82	−0.55
Current LPQ	4.92	1.51	−1.79	4.29	1.95	−1.02
Sample 2: Undergraduates 10-item fully anchored						
Grade 1 MLPQ	5.25	1.04	−2.22	4.48	1.75	−1.18
Grade 6 MLPQ	4.79	1.29	−1.34	4.16	1.69	−0.85
Grade 9 MLPQ	4.55	1.47	−1.18	4.01	1.81	−0.56
Current LPQ	4.96	1.52	−1.86	4.34	1.95	−1.04
Sample 4: US adults 10-item two-anchor						
Grade 1 MLPQ	4.93	1.20	−1.46	4.41	1.54	−0.84
Grade 6 MLPQ	4.24	1.44	−0.77	3.75	1.65	−0.34
Grade 9 MLPQ	3.84	1.52	−0.46	3.49	1.75	−0.27
Current LPQ	4.57	1.61	−1.14	3.98	1.90	−0.77

Note: Sample included 28-item long form, 10-item short-form, fully anchored and two-anchored versions. Sample 1: $N = 268$ mothers, $N = 261$ fathers. Sample 2: $N = 273$ mothers, $N = 249$ fathers. Sample 4: $N = 191$ mothers, $N = 174$ fathers. Range for MLPQ and LPQ measures was minimum = 0 and maximum = 6. Likert scale on all items ranged from 0 to 6. Each MLPQ/LPQ score was calculated as the average score of the items. MLPQ: Memory of Love towards Parents Questionnaire.

iteration, we identified items 1, 2, 3, 4, 5, 6, 9, 10, 27, and 28 as the most internally reliable for our 10-item version of the scale. As with the 28-item long form, when comparing within each time period, the 10-item version (MLPQ-10) was statistically higher for mothers than fathers within each subscale (paired t tests, all $ps < .001$). Although the Cronbach's αs were slightly lower compared to the long-form version, the MLPQ-10 still had very high internal reliability (all α's $> .95$).

Reliability of a four-item Measure. We investigated the internal reliability scores for the first four items of each subscale. The first four items assess the strength and

Table 3. Internal and test–retest reliability statistics of the MLPQ for both US adult and undergraduate samples.

	Cronbach's α					Test–retest	
	Sample 1		Sample 2		Sam. 4	Sample 2	
	28-Item	10-Item	28-Item	10-Item	10-Item	28-Item	10-Item
Mother							
Grade 1 MLPQ	.989	.979	.989	.975	.979	—	—
Grade 6 MLPQ	.990	.979	.992	.980	.983	.865	.838
Grade 9 MLPQ	.991	.959	.992	.980	.980	—	—
Current LPQ	.995	.987	.994	.987	.983	—	—
Father							
Grade 1 MLPQ	.995	.954	.997	.991	.986	—	—
Grade 6 MLPQ	.994	.961	.995	.987	.986	.856	.852
Grade 9 MLPQ	.995	.962	.995	.987	.985	—	—
Current LPQ	.994	.976	.996	.989	.984	—	—

Note: Sample included 28-item long form, 10-item short-form, fully anchored and two-anchored versions. Sample 1: $N = 268$ mothers, $N = 261$ fathers; Sample 2 (undergraduates): $N = 273$ mothers, $N = 249$ fathers (fully anchored scales); Sample 4: $N = 191$ mothers, $N = 174$ fathers (two-anchor Likert-type). Test–retest reliability: Retest was one week after initial test.

frequency of memory of (or current feelings of) love and affection towards each parent. In Sample 1 (AMT participants), we found Cronbach α's for these four-item subscales ranged from .956 and .979 (see Table S4 for Cronbach α's, *M, SD,* and skew statistics).

Research Question 2: Convergent Validity—Correlations with attachment measures

Table 4 shows the correlations between the MLPQ subscales and various measures of parental attachment and bonding in Sample 4 (AMT).

2(a). As expected, we found significant negative correlations between our MLPQ subscales and measures of current anxious and avoidant attachment towards that parent (ECR-RS). Table 4 shows a stronger correlation with avoidant attachment compared to anxious attachment. As expected, the ECR subscales correlated more highly with *current* assessment of love compared to *memory of* love.

2(b). As expected, the *retrospective* PBI showed a general pattern of correlating most strongly with *retrospective* questions about childhood in the MLPQ (i.e. Grade 1, 6, and 9 subscales).

2(c). As shown in Table 4, and as expected, the IPPA measure was significantly and positively correlated with MLPQ subscales towards that same parent,

Table 4. Correlations between the MLPQ subscales and various validated scales measuring attachment and bonding to mother (top) and father (bottom): Sample 4.

	Retrospective			*Present*
	Grade 1	Grade 6	Grade 9	Now
Memory of love for mother				
Retrospective				
Care (mother; PBI)	.565	**.708**	.632	.544
Overprotection (mother; PBI)	−.238	−.364	−.380	−.299
Present				
Attachment to mother (IPPA)	.515	.595	.544	**.763**
Avoidant attachment mother (ECR)	−.485	−.532	−.499	−.742
Anxious attachment mother (ECR)	−.297	−.345	−.329	−.428
Memory of love for father				
Retrospective				
Care father (father; PBI)	.273	**.341**	.255	.310
Overprotection (father; PBI)	−.236	−.316	−.264	−.339
Present				
Attachment to father (IPPA)	.557	.639	.678	**.714**
Avoidant attachment father (ECR-RS)	−.498	−.599	−.655	−.633
Anxious attachment father (ECR-RS)	−.197	−.104	−.157	−.196

Note: Mother $N = 190$; Father $N = 173$. All r values above .15 were statistically significant ($p < .05$). Highest correlations in each of the mother and father matrices are **bolded**, and are examined further in the factorial validity section. IPPA: Inventory of Parent and Peer Attachment. ECR-RS: Experiences in Close Relationships. PBI: Parental Bonding Instrument.

and the IPPA correlated more strongly with MLPQ subscales assessing current love compared to memory of love.

In Table 4, we highlighted the largest correlations with boldface to be investigated further with a series of item-by-item factor analyses (see factorial validity section on MLPQ and attachment).

Research Question 3: MLPQ and attachment item loadings and number of factors

Establishing the MLPQ subscales each consist of a single factor. Using Sample 1 (AMT participants), we performed a principal axis factor analysis on the 28-item MLPQ for mothers at first grade. The first factor had an eigenvalue of 21.7, and second factor had an eigenvalue of 1.17. However, all item loadings on Factor 2 were below .4; therefore, we concluded that this subscale has one single factor. This is reinforced by observing in the scree plot (Figure 1), that after the first factor, all other factor loadings are clearly outside of the inflection

point. Table S5 presents the factor loadings on this factor for all 28 items on all subscales of the MLPQ. Table S6 shows the eigenvalues for the first two loading factors in all the MLPQ subscales for both mothers and fathers. The second factor in all other subscales yields eigenvalues below 1. The MLPQ subscales each have a predominant single factor. We performed a separate factor analysis on the 10-item version (MLPQ-10) and again found a single factor. We present the factor loadings on this single dominant factor in Table S7. Figure 1 shows two representative scree plots which illustrate the dominance of a single factor, as expected, on both the fully anchored 28-item MLPQ (top, Sample 1; AMT) and two-anchored 10-item MLPQ (bottom, Sample 3; AMT).

Table S8 presents the factor loadings (from Sample 3; AMT participants) for all 10 items in the revised short-form scale, as well as the eigenvalues for the first two factors. On all subscales (Grades 1, 6, 9, and current) the dominant factor had an eigenvalue above 8, and the second highest factor had eigenvalues less than 0.5.

MLPQ and attachment item factor analyses. A principal axis factor analysis with items from the MLPQ for mothers at Grade 6 and items from the retrospective PBI (Care subscale) for mothers revealed a two-factor solution (Sample 4; AMT participants). All the MLPQ items loaded on Factor 1 (eigenvalue 14.13), while PBI care items loaded on Factor 2 (eigenvalue 2.37; see Table S9 for the pattern matrix). Factor 1 correlated with Factor 2, $r = .673$. Other factors had eigenvalues below 1 (e.g., Factor 3 eigenvalue = .86). This confirmed that although the MLPQ and PBI-Care scales are strongly correlated, they load on different factors. Similarly, we found evidence that the retrospective MLPQ (father, Grade 6) is distinct from the retrospective PBI-Care father subscale (Table S10).

Table 5 shows, as expected, that the IPPA measure of current attachment (mother) has multiple factors (three factors), and the MLPQ items (mother current subscale) loaded on a different single factor (eigenvalue 20.9). Factor 1 correlated with Factors 2, 3, and 4, with rs = .690, .598, and .686, respectively. Other factors had eigenvalues below 1 (e.g. Factor 5 eigenvalue = .87). The three factors that the general attachment scale (IPPA) loaded on reaffirmed that conceptualization of attachment as multifactorial. The lack of loading of IPPA items on Factor 1 (which MLPQ items did load on) also reinforces our conceptualization that the memory of love construct lies partially outside the attachment construct. Similarly, MLPQ (father current) items loaded on a different single factor to the three factors the IPPA items loaded on (Table S11). We ran numerous other similar additional item factor analyses and all confirmed that no MLPQ subscale factor loaded on any attachment measure factor.

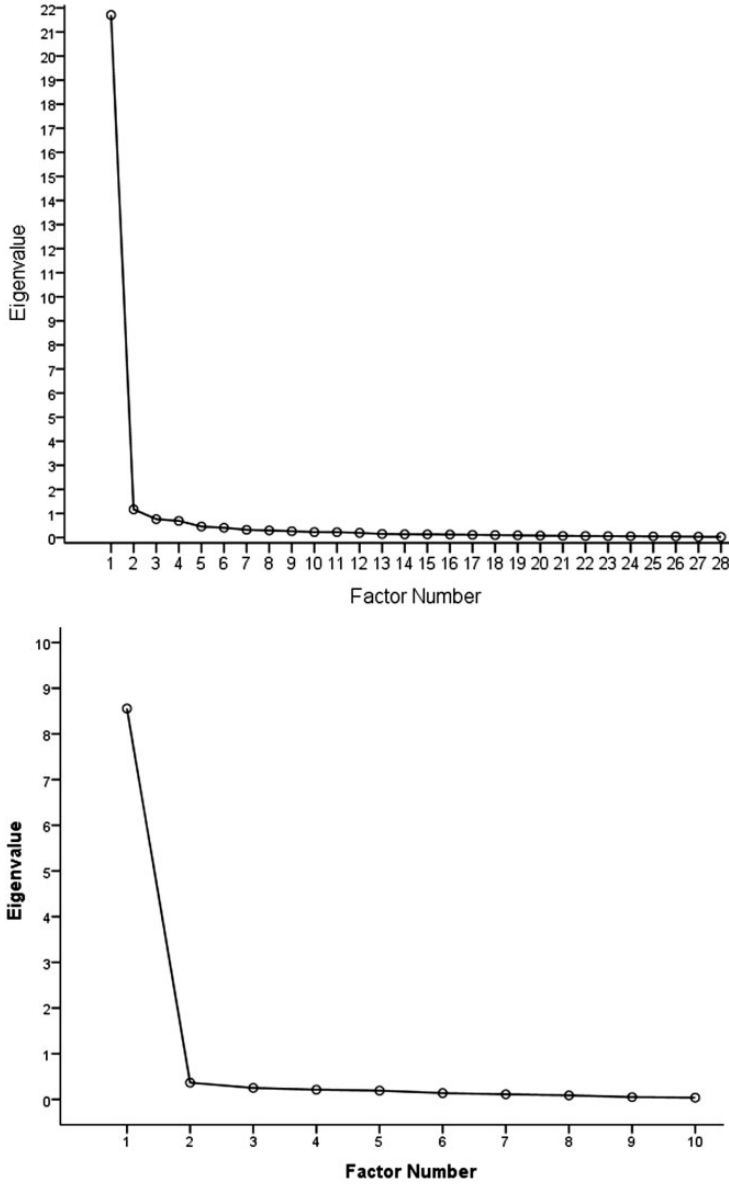

Figure 1. Top: Factor analysis scree plot for the 28-item MLPQ (mother, first grade; Sample 1) using the fully anchored Likert scale. Bottom: Factor analysis scree plot for the 10-item MLPQ-10 (mother, first grade; Sample 3) using the two-anchor Likert-type scale.

Table 5. Pattern matrix showing different loadings of MLPQ-10 mother current items and inventory of Parent and Peer Attachment (mother) items (Sample 4).

		Factors			
Pattern matrix		1	2	3	4
MLPQ mother current	1. Love (F)	.941	−.015	−.032	−.018
MLPQ mother current	2. Love (S)	.887	.021	−.057	.066
MLPQ mother current	3. Affection (F)	.877	.108	−.032	−.024
MLPQ mother current	4. Affection (S)	.888	.073	−.003	−.019
MLPQ mother current	5. Warmth (F)	.845	.093	.064	−.041
MLPQ mother current	6. Warmth (S)	.856	.152	.019	−.042
MLPQ mother current	9. Fondness (F)	.855	−.071	.026	.159
MLPQ mother current	10. Fondness (S)	.829	−.053	.048	.127
MLPQ mother current	27. Caring (F)	1.001	−.021	.001	−.092
MLPQ mother current	28. Caring (S)	.911	.057	−.131	.075
IPPA.1. My mother respects my feelings.		.012	.184	.058	.686
IPPA.2. I feel my mother does a good job as my mother.		.152	.041	.043	.698
IPPA.3. I wish I had a different mother. (R)		.260	−.245	.433	.355
IPPA.4. My mother accepts me as I am.		.019	.168	.069	.662
IPPA.5. I like to get my mother's point of view on things . . .		.115	.645	−.088	.239
IPPA.6. I feel it's no use letting my feelings show around mother. (R)		.033	.264	.643	.018
IPPA.7. My mother can tell when I'm upset about something.		.175	.519	−.015	.114
IPPA.8. Talking over my problems . . . makes me feel ashamed . . .(R)		−.030	.126	.667	−.116
IPPA.9. My mother expects too much from me. (R)		−.102	−.203	.692	.101
IPPA.10. I get upset easily around my mother. (R)		.118	−.125	.847	−.019
IPPA.11. I get upset a lot more than my mother knows about. (R)		−.173	.089	.636	.051
IPPA.12. When we discuss things, my mother cares about my. . .view		−.067	.387	−.015	.654
IPPA.13. My mother trusts my judgment.		−.009	.286	.028	.591
IPPA.14. My mother has her own problems, so I don't bother her. . .(R)		.147	.427	.487	−.407
IPPA.15. My mother helps me to understand myself better.		−.005	.833	.020	.039
IPPA.16. I tell my mother about my problems and troubles.		.073	.957	−.059	−.071
IPPA.17. I feel angry with my mother. (R)		.125	−.179	.695	.278
IPPA.18. I don't get much attention from my mother. (R)		−.044	.097	.609	.229
IPPA.19. My mother helps me to talk about my difficulties.		.004	.907	−.039	.021

(continued)

Table 5. Continued.

	Factors			
Pattern matrix	1	2	3	4
IPPA.20. My mother understands me.	.099	.573	.098	.212
IPPA.21. When I am angry.., my mother tries to be understanding	.022	.447	−.005	.453
IPPA.22. I trust my mother.	.125	.149	.004	.656
IPPA.23. . . .doesn't understand what I'm going through these days. (R)	−.045	.362	.613	−.033
IPPA.24. I can count on . . .when I need to get something off my chest	.067	.697	−.061	.242
IPPA.25. If my mother knows something is bothering me, she asks. . .	.005	.498	.071	.295
Eigenvalue of factor	*20.90*	*2.62*	*1.89*	*1.17*

Note: Extraction method: principal axis factoring. Rotation method: Promax with Kaiser normalization. Eigenvalues for Factor 5 was .87. Factor 1 correlated with Factors 2, 3, and 4, *rs* = .690, .598, and .686, respectively. Correlations between Factors 2, 3, and 4 ranged from .635 to .708. MLPQ: Memory of Love towards Parents Questionnaire; IPPA: Inventory of Parent and Peer Attachment; (F): frequency; (S): strength. (R): reverse coded.

Research Question 4: Discriminant validity—Mood, social desirability, and negative childhood experiences

Current affect (PANAS). Table S12 presents the correlations between the PANAS and the MLPQ subscales. The two PANAS subscales are only weakly correlated with the LPQ current love subscale towards mothers or father (*r*s = .17, .10, respectively).

Social desirability. In Sample 2 (undergraduates), social desirability (SDS) correlated with the 28-item MLPQ subscales with relatively small effect sizes. The largest correlation was between the 28-item MLPQ for mother during ninth grade ($r = .25$, $p < .001$), and the smallest correlation was between subscale for father current love ($r = .12$). A similar range of correlations was found between the short-form 10-item versions of the MLPQ and social desirability ($r = .06$ to .22).

Potentially traumatic experiences in childhood. Table S13 shows the correlations, from Sample 5 (AMT participants), between MLPQ subscales and traumatic experiences subscale composite scores (TEC). As expected, we found small negative correlations indicating a relationship (*r*s ranged from −.001 to −.32) and the absence of large negative correlations.

Table 6. Descriptive statistics and correlations between various subscales of the 28-item MLPQ for mothers in a sample of 268 US adults in Sample 1.

	M	*SD*	Grade 1 MLPQ	Grade 6 MLPQ	Grade 9 MLPQ	Current LPQ
Grade 1 MLPQ	4.93	1.14	1.000	.782	.648	.468
Grade 6 MLPQ	4.35	1.34		1.000	.871	.621
Grade 9 MLPQ	3.87	1.52			1.000	.648
Current LPQ	4.29	1.86				1.000

Note. All correlations: $p < .001$. $N = 268$.

Research Question 5: MLPQ subscale distinction

Table 6 presents the intercorrelations between the subscales of the MLPQ mother subscales (Sample 1, AMT). The closer the MLPQ reference time periods are together, the higher the correlation. As we expected, all the subscales are related, but the amount of variance explained between them varies. For example, current feelings of love subscale (LPQ) only account for 22% of the variance in the MLPQ Grade 1 subscale—indicating distinct measures. The MLPQ for Grade 1 accounts for 42% of the variance in the MLPQ Grade 9 subscale. Table S14 shows a similar pattern of correlations between MLPQ father subscales. Within-subject paired sample *t* tests found significant differences between the means of the 28-item MLPQ subscales for Grades 1, 6, and 9 ($ps < .001$; both mother and father subscales).

A factor analysis (principal axis; promax rotation) with all 28-items from the MLPQ Grade 1 (mother subscales) as well as all 28-items from the MLPQ Grade 6 showed that the Grade 1 items loaded on a different factor than Grade 6 items. Similarly, a series of factor analyses found Grade 1 items loaded on a different factor than Grade 9 items; and Grade 6 items loaded on a different factor than Grade 9. Moreover, the current love subscale loaded on a different factor than the Grade 1, 6, and 9 subscales. The same patterns found in the mother subscales replicated in a series of factor analyses comparing father MLPQ subscales.

Research Question 6: Setting: In laboratory versus online comparison

Table S15 documents the descriptive and *t*-test statistics comparing in-lab and online statistics for each subscale (Sample 2; undergraduates). We found no significant differences on the MLPQ subscales between those who participated in the laboratory and those who did so online.

Research Question 7: Order effects

Randomizing order of subscales. Table S16 compares the MLPQ statistics within each subscale for those who received the MLPQ subscales randomly

counterbalanced to those who received the scales in chronological order (Sample 6; AMT participants). Whether the participant received the materials in chronological order, or not, had no significant effect on any of the subscales of the MLPQ ($ps > .20$).

Mothers versus fathers first. Table S17 compares the means within each MLPQ subscales when the mother questions are presented first to when father questions are presented first (Sample 7; AMT participants). The order of presentation had no significant effect on the means of the MLPQ subscales.

General discussion

Using a number of nonclinical adult samples from the United States, we developed a measure to assess subjective current feelings of love and memory of past feelings of love towards parents: the MLPQ. It was developed with high internal reliability and good face validity for use in a variety of areas in psychology. There was a gap in the literature we begin to fill here: there appears to be no previous a multi-item measure of memory of feelings of love. The MLPQ asks participants to recall the strength and frequency of their feelings of love during Grades 1, 6, and 9 in childhood, as well as current feelings of love. In our 28-item subscale version, we found high internal reliability and test–retest reliability, and this enabled the identification of adequately internally reliable 10-item and 4-item subscale versions. We found that the MLPQ correlated with retrospective measures of general attachment in a pattern that is promising for validity—and loaded on a different factor than all factors associated with attachment measures. We showed that it made little difference whether the instrument is taken online or in a laboratory setting. We also found that the subscales of the MLPQ (Grade 1, 6, 9, and current) are sufficiently distinct from one another to justify the inclusion of each one. We demonstrated that order effects are negligible enough to justify using a mother-first chronological presentation order in most research. Given these properties, the scale can be used in research in areas such as cognitive, social, developmental, and clinical psychology, as well as in affective science and memory malleability research.

We found very high internal reliability within each subscale of the MLPQ, and this was by design. When formulating the 28-item scale, we first used the core concepts of the scale: *love* and *affection*, and then added related words. This was done to capture the specific type of feelings of love and affection that people feel towards their parents and to make the measure sufficiently stable for use in research to detect small changes across experimental conditions or timepoints. Because of the high internal reliability scores, for studies with time constraints the 10-item or the 4-item subscale version (which consists of 4 items $\times$ 4 subscales $\times$ 2 parents $=$ 32 items) is recommended for researchers to use. Although we had feared that participants' varying definitions of the word "love"

necessitated the addition of many synonyms, the very high internal reliability scores suggested that perhaps participants understood the meaning of "love" in the larger context of the items—and this means the four-item subscales versions (that use the words "love" and "affection") may be a good option that captures the most of the variance of the other items that use different words (e.g., adoration, caring, etc).

No previous questionnaires measure memory of past felt love towards parents, so we could not assess concurrent validity. To deal with this, we instead measured convergent validity with parental attachment measures and formulated hypotheses of what pattern of correlations we should find with various types of attachment measures. We found preliminary patterns indicating good promise for questions of validity—*retrospective* measures of overall quality of attachment in childhood correlated as expected with MLPQ childhood subscales (when the target was the same parent). Likewise, measures of current attachment to a given parent correlated relatively more strongly with the current love subscale for that same parent compared to retrospective measures. Even when considering the highest correlations that we found between attachment measures and a matching MLPQ subscale, attachment scales accounted for at most only 50% of the variance in any given MLPQ subscale. In addition, factor analyses revealed that MLPQ items and attachment items did not load on the same factors, suggesting that the MLPQ is measuring a different construct from the existing attachment scales we examined. In addition, examining the face validity of the questions asked in the memory of love scale and attachment scales reveal the intent to measure different constructs. For example, the memory of love items asks very specifically about memory of an emotion towards a person. In contrast, attachment items ask a variety of questions, including about specific behaviors. For example, the PBI care subscale has one item that asks the extent to which the parent "spoke to me in a friendly voice" before the age of 16 years. Compare that item wording to one of our MLPQ items: "during the whole year when you were in first grade, how often on average did you feel love toward your mother." Examining the face validity of the two wordings suggests a different, but related, construct. One would expect such items to correlate, but they do not have the same operational definition, nor do they attempt to capture the precisely the same construct. In an investigation into the MLPQ's discriminant validity, we found a promising pattern of correlations with current mood/affect, social desirability, and adverse childhood experiences.

We found that the MLPQ was not significantly affected by either setting (online or in the laboratory) or by the order in which the subscales are presented to participants. In most settings, therefore, presenting the MLPQ mother-first and chronologically (Grades 1, 6, 9, and current) will be both statistically justified and user-friendly for participants. Nevertheless, counterbalancing subscales will be advisable in some cases: for example, when the primary research question compares memory of love towards mothers with fathers.

There are numerous interesting potential implications of these findings, and we will choose just a few to discuss here. In terms of implications for science, because our new measure is distinct from attachment, this could open up new areas of research in developmental psychology and in other areas. The preciseness (high reliability and a single factor) of the MLPQ subscales has potentially important implications for their use in experimental research—where experimental effects might be expected to be small because the manipulations must be mild (by ethical necessity). In terms of practical implications, our results revealed that people feel more current love towards their mothers compared to their fathers, as well as remember more love towards their mothers. This raises the questions of whether this is fair to fathers or not—and whether this finding may be explained by differential parental investment (see Geary, 2000). In addition, the consistent marked reduction in memory of love from early childhood to late childhood might help prepare parents and offspring for the emotional pain that might cause. The finding that there appears to be an uptick in feelings of love towards parents when they get to adulthood (compared to late childhood) may provide some solace and hope for both parents and teenagers during the late-childhood period.

The current assessment has some limitations. We were able to assess validity with a number of measures, but that list is by no means complete. The current study has not established a relationship with some of the important behavioral outcomes we mentioned earlier, although we will have more to report on that in future publications. In addition, there are an unlimited number of other analyses that can be done on these subscales and potential other correlates, but we feel we have provided enough information for this single preliminary article. We acknowledge the effect of current cognitions in trying to remember the amount and strength of past felt love, and in many ways the measure is an assessment of memory traces. Nevertheless, this does have a direct parallel to how we remember past feelings of love in everyday life and assess those memories. Indeed the very effect of current cognitions is one of our central interests that we are investigating in current research (Patihis, Cruz, & Herrera, 2018) and was one of the motivations for the development of the scale. Interesting future research could assess clinical populations, which may demonstrate lower mean scores on the memory of love subscales and therefore less negative skew compared to nonclinical samples.

In summary, we created a reliable measure of subjective current feelings of love and memory of love towards parents that consists of one main core construct within each time period. It correlates in patterns consistent with good validity with previous attachment scales, affect, social desirability, and adverse childhood experiences. Memory of affective love is related to, but distinct from, attachment. The subscales of the MLPQ measure something distinct from each other; the measure can be used in different settings and has nonsignificant order

effects. The combination of high validity and reliability makes it a promising scale for use in many areas of psychology.

Appendix

Memory of Love towards Parents Questionnaire (MLPQ)

[First grade wording is given here in its entirety, as an example:]

Memory of Feelings of Child toward Mother

First year of elementary school

Remember back to how you felt about your mother during the year in which you were **in first grade** (how you felt toward her **at that time**).

First grade is typically experienced at ages 6 to 7 years in the United States and is the first year of **elementary school**.

Please be sure to answer all the questions if you knew your mother at all during first grade.

If you don't have a clear memory please give your best answer.

1*. During the whole year when you were **in first grade**, *how often on average* did you feel **love** toward your **mother**?

2*. During the whole year when you were **in first grade**, *how strong on average* was your **love** toward your **mother**?

3*. During the whole year when you were **in first grade**, *how often on average* did you feel **affection** toward your **mother**?

4*. During the whole year when you were **in first grade**, *how strong on average* was your **affection** toward your **mother**?

5*. During the whole year when you were **in first grade**, *how often on average* did you feel **warmth** toward your **mother**?

6*. During the whole year when you were **in first grade**, *how strong on average* was your **warmth** toward your **mother**?

7. During the whole year when you were **in first grade**, *how often on average* did you feel **appreciation** toward your **mother**?

8. During the whole year when you were **in first grade**, *how strong on average* was your **appreciation** toward your **mother**?

9*. During the whole year when you were **in first grade**, *how often on average* did you feel **fondness** toward your **mother**?

10*. During the whole year when you were **in first grade**, *how strong on average* was your **fondness** toward your **mother**?

11. During the whole year when you were **in first grade**, *how often on average* did you feel **adoration** toward your **mother**?

12. During the whole year when you were **in first grade**, *how strong on average* was your **adoration** toward your **mother**?

13. During the whole year when you were **in first grade**, *how often on average* did you feel a **good attachment** toward your **mother**?

14. During the whole year when you were **in first grade**, *how strong on average* was your **good attachment** toward your **mother**?
15. During the whole year when you were **in first grade**, *how often on average* did you feel **positively bonded** toward your **mother**?
16. During the whole year when you were **in first grade**, *how strong on average* was your **positive bonding** toward your **mother**?
17. During the whole year when you were **in first grade**, *how often on average* did you feel **admiration** toward your **mother**?
18. During the whole year when you were **in first grade**, *how strong on average* was your **admiration** toward your **mother**?
19. During the whole year when you were **in first grade**, *how often on average* did you feel **respect** toward your **mother**?
20. During the whole year when you were **in first grade**, *how strong on average* was your **respect** toward your **mother**?
21. During the whole year when you were **in first grade**, *how often on average* did you feel **kindness** toward your **mother**?
22. During the whole year when you were **in first grade**, *how strong on average* was your **kindness** toward your **mother**?
23. During the whole year when you were **in first grade**, *how often on average* did you feel **devotion** toward your **mother**?
24. During the whole year when you were **in first grade**, *how strong on average* was your **devotion** toward your **mother**?
25. During the whole year when you were **in first grade**, *how often on average* did you feel **liking** toward your **mother**?
26. During the whole year when you were **in first grade**, *how strong on average* was your **liking** toward your **mother**?
27*. During the whole year when you were **in first grade**, *how often on average* did you feel **caring** toward your **mother**?
28*. During the whole year when you were **in first grade**, *how strong on average* was your **caring** toward your **mother**?

[Long form = all 28 items.
*10-item version = these 10 items: 1, 2, 3, 4, 5, 6, 9, 10, 27, and 28.
4-item version = items 1, 2, 3, and 4.]

Likert-type scale and anchors

Frequency (for odd numbered questions above)

Two anchors (Samples 3–7)

[The anchor "*I never knew this parent at all*" is coded as missing data.]

Strength (for odd numbered questions above)
Two anchors (Samples 3–7)

[Note, the fully anchored Likert-type scales used in Sample 1 and 2 are given in Supplemental Appendix S1]

Instructions for the other time periods:

Memory of feelings of child toward mother

First year of middle school

Remember back to how you felt about your parents during the year in which you were **in sixth grade** (how you felt toward her **at that time**).

Sixth grade is typically experienced at ages 11 to 12 years in the United States and is the first year of **middle school**.

Please be sure to answer all the questions if you knew your mother at all during sixth grade.

If you don't have a clear memory please give your best answer.

Memory of Feelings of Child toward Mother

First year of high school

Remember back to how you felt about your parents during the year in which you were **in ninth grade** (how you felt toward her **at that time**).

Sixth grade is typically experienced at ages 14 to 15 years in the United States and is the first year of **high school**.

Please be sure to answer all the questions if you knew your mother at all during sixth grade.

If you don't have a clear memory, please give your best answer.

Current feelings of child toward mother

Now

Please report how you feel about your mother currently, (how you feel toward her now, today).

[Example item wording:]

1*. Currently *how often on average* do you feel **love** toward your **mother**?

[*Note:* For the four father subscales, substitute the word "Mother" with "Father," and "her" with "him."]

Recommendations. Our generic recommendation is for researchers to use the two-anchor Likert-type scale shown above—unless the research question requires a fully anchored scale (see Appendix S1). Whether the researcher chooses the subscales with 4-items, 10-items, or 28-items depends upon (1) the degree of precision they need, (2) whether they are interested in specific items that are

not present in the shorter versions, (3) question fatigue considerations, and (4) time constraints of a study.

For use in countries that do not have the same grade levels as the United States, the wordings of "first grade," "sixth grade," and "ninth grade" can be adapted according to the common terms used in that country or state.

For English-speaking countries, below is an approximate conversion table:

Age (years)[b]	England		Scotland		Ireland		United States		Australia[a]	New Zealand
	School	Year	School	Year	School	Year	School	Grade	Year	Year
6–7	Primary school (infants)	2	Primary school	P3	Primary school	First class	First-year elementary	1	1	2
11–12	Secondary school	7	Secondary school	S1	Secondary school	Sixth Class	First-year middle school[c]	6	6	7
14–15	Secondary school—GCSE	10	Secondary school	S4	Secondary school	Third year	High school—Freshman	9	9	10

[a]Year number can vary by area in Australia.
[b]Age ranges can vary: check this in your country.
[c]This can vary by US state.

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Supplementary Material

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