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Research report

The 10-item Remembered Relationship with Parents (RRP[10]) scale: Two-factor model and association with adult depressive symptoms ☆

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Abstract

Background: Dysfunctional parenting styles are associated with poor mental and physical health. The 10-item Remembered Relationship with Parents (RRP[10]) scale retrospectively assesses Alienation (dysfunctional communication and intimacy) and Control (overprotection by parents), with an emphasis on deficiencies in empathic parenting. We examined the 2-factor structure of the RRP[10] and its relationship with adult depression.
Methods: 664 respondents from the general population (48% men, mean age 54.6±14.2 years) completed the RRP[10], Parental Bonding Instrument (PBI), and Beck Depression Inventory.
Results: The Alienation and Control dimensions of the RRP[10] displayed a sound factor structure, good internal consistency (Cronbach's α=0.83–0.86), and convergent validity against the PBI scales. No significant gender differences were found on the RRP[10] scales. Stratifying by RRP[10] dimensions showed that respondents high in Alienation and Control, for both father (33.3% vs. 14.5%, $p<0.0001$) and mother (42% vs. 12.9%, $p<0.0001$) items, experienced the highest levels of depressive symptoms compared with respondents low in Alienation and Control. While scoring high on Alienation or Control alone was also significantly and independently associated with depressive symptoms, scoring high on both Alienation and Control was most strongly connected with depressive symptoms for both father (OR=2.48, $p<0.004$) and mother (OR=5.34, $p<0.0001$) items.
Limitations: Cross-sectional study design.
Conclusions: The RRP[10] is a reliable and valid measure of remembered parental Alienation and Control. High Alienation and Control were independently related to increased risk of depressive symptoms. Given the brevity of the RRP[10], it can easily be used in epidemiological/clinical research on the link between the remembered relationship with parents and mental/physical health.

Keywords: Remembered Relationship with Parents; Parenting; Assessment; Depressive symptoms

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1. Introduction

Evidence in human and animal studies has shown that child-rearing practices play a major role in individual development (Francis and Meaney, 1999; Lehmann et al., 2002; Bowlby, 1977; McKinney, 1974), with certain parenting styles being associated with the onset of adult psychopathology (Gilmer and McKinney, 2003). Lack of parental care from the father and mother has been related to increased vulnerability to lifetime depression (Parker et al., 1995; Duggan et al., 1998; Oakley-Browne et al., 1995). Perceived lack of maternal care, for example, has been linked with diagnosis of adolescent (Rey, 1995) and post-natal (Boyce et al., 1991; McMahon et al., 2005) depression. Although data on other parental factors are more mixed, there is evidence that overprotection is related to depression as well (Narita et al., 2000; Parker, 1981). Accordingly, some studies have examined exposure to 'affectionless control' by one or both parents (i.e., low care and high overprotection) as a determinant of adult depression (Parker, 1983; Plantes et al., 1988; Mackinnon et al., 1993).

Inadequate early caregiving may also have long-term consequences on health behavior, stress reactivity, and susceptibility to chronic illnesses in adulthood (Russek and Schwartz, 1997; Luecken et al., 2005; Weaver et al., 2006; Dong et al., 2004; Heim et al., 2000). Adverse childhood experiences, for example, have been shown to increase the risk of smoking (Anda et al., 1999) and onset of ischemic heart disease (Dong et al., 2004) in later life. These adverse experiences include sexual or physical abuse, neglect, and household dysfunction (Dong et al., 2004; Heim et al., 2000). People are also at risk for depression up to decades after they have been exposed to childhood emotional abuse (Chapman et al., 2004). Importantly, depressed individuals are at increased risk for coronary artery disease (Rumsfeld and Ho, 2005), and the relationship between adverse childhood experiences and heart disease may be mediated by depressed affect (Dong et al., 2004). Could these child-rearing practices be considered a developmental link between depression and heart disease? More research is warranted on this issue in the general population and in patients with coronary artery disease. Hence, there is a need for a short, easy to complete instrument assessing remembered parenting that can be used in epidemiological research and in non-psychiatric settings.

Parenting styles have been assessed by interview measures (Adam et al., 2004; Bifulco et al., 1997; Main et al., 1985) and self-report scales (Schaefer and Bell, 1958; Schaefer, 1965; Parker et al., 1979, 1997; Perris et al., 1980; George and Bloom, 1997), including the Children's Reports of Parental Behavior Inventory (Schaefer, 1965), the Parental Bonding Instrument (PBI) (Parker et al., 1979), and the EMBU (Egna Minnen Beträffende Uppfostran – My Memories of Upbringing) (Perris et al., 1980). The PBI is a frequently used measure of parenting styles (Parker et al., 1979), but it may pose a burden to the medically ill with its 25 items on rather sensitive topics like indifference, emotional coldness, and rejection by the parents.

In the current study, we therefore introduce a new 10-item measure, the Remembered Relationships with Parents (RRP^{10}) scale that was specifically developed to assess perceptions of parental care, with an emphasis on deficiencies in empathic relationships between parents and child, in non-psychiatric populations. The RRP^{10} comprises two dimensions; i.e., Alienation from parents and Control by parents. Alienation refers to the respondent's perception of the relationship with their parents to be ineffective in communication and lacking in mutuality and intimacy (Parker, 1983), while Control refers to the respondent's perception of an overprotective parenting style.

The RRP^{10} has a less pathological focus and is therefore more suitable to use in non-psychiatric populations than e.g. the PBI. The RRP^{10} also consists of fewer items, hence reducing the response burden. Taken together, this makes the instrument more easily applicable in epidemiological and clinical research. Therefore, the aim of this study was to evaluate the reliability and validity of the RRP^{10} in the general Dutch population. More specifically, we wanted to examine the factorial and construct validity of the RRP^{10} and the relation between its Alienation/Control scales and adult depressive symptoms.

2. Methods

2.1. Participants

The sample comprised 664 middle-aged adults from the general Dutch population (48% men; mean age 54.6 ± 14.2 years) (Table 1). Quota sampling was applied to ensure that different age and sex groups were equally represented in the sample. Initially, 709 respondents were included in the study, but 33 respondents provided descriptions of the father or mother only and another 12 respondents had missing scores on the PBI or depression scales. Research assistants were responsible for distributing the questionnaires. They approached the participants in person. After the purpose of the study was explained, the respondents gave written informed

Table 1
Characteristics of the sample stratified by sex (N=664)[a]

	Men (n=317)	Women (n=347)	P
Demographics			
Age	54.3 (14.0)	54.9 (14.4)	0.56
No partner, % (n)	10% (33)	18% (62)	0.004
Low educational level, % (n)	21% (65)	33% (115)	<0.0001
RRP subscales			
Alienation father	7.92 (5.1)	7.87 (5.3)	0.91
Alienation mother	6.22 (4.9)	6.74 (5.4)	0.20
Control father	5.06 (4.5)	5.65 (5.2)	0.11
Control mother	7.07 (5.2)	6.53 (5.1)	0.17
PBI subscales			
Care father	24.9 (7.5)	25.0 (8.4)	0.76
Care mother	26.8 (6.8)	26.3 (8.0)	0.45
Denial of autonomy father	4.4 (4.1)	4.8 (4.0)	0.19
Denial of autonomy mother	5.0 (4.2)	5.1 (4.2)	0.81
Behavioral freedom father	6.4 (4.2)	7.6 (4.6)	0.001
Behavioral freedom mother	6.3 (4.1)	7.6 (4.5)	<0.0001
Depressive symptoms			
BDI	5.2 (4.8)	7.1 (5.9)	<0.0001

[a] Data are presented as mean (S.D.), unless otherwise specified.

consent. Participants returned the questionnaires to the research assistants. Data were managed anonymously.

2.2. Alienation and control dimensions of the RRP[10]

The RRP[10] is a self-report scale that retrospectively assesses caregiving processes with the emphasis on empathic parenting. A preliminary list of 18 items was first devised to reflect the two-dimensional model of Alienation and Control that guided the development of the RRP[10]. This item pool was derived from the literature on perceptions of parental care (Schaefer and Bell, 1958; Schaefer, 1965; Parker et al., 1979, 1997; Perris et al., 1980; George and Bloom, 1997) and items that were specifically designed to reflect inhibited self-expression towards parents. These items were administered to a sample of 331 respondents from the general population and the following criteria were used to devise the final scale: items with high (1) factor loadings and (2) internal consistency were retained; items with a substantial loading on both parenting dimensions were deleted (data not shown). Accordingly, the final version of the RRP[10] comprises 10 statements that are commonly used by middle-aged adults to characterize their perceptions of less adequate parental care while growing up.

The five RRP[10] items of the Alienation scale reflect memories of the child's feelings of alienation from parents: "*I was very closed towards my father/mother*", "*I kept my troubles to myself*", "*My father/mother often made me feel insecure*", "*My father/mother often made me feel guilty*" and "*I often felt that my father/mother did not understand me*". The five RRP[10] items of the Control scale reflect memories of a controlling parenting style: "*I wished my father/mother would worry less about me*", "*My fathers/mothers anxiety that something might happen to me was exaggerated*", "*My father/mother worried that I couldn't take care of myself*", "*My father/mother sheltered me too much from difficulties*", and "*My father/mother was overprotective*". Hence, the Alienation scale has an internal focus (i.e., the child's feelings towards parents) and the Control scale an external focus (i.e., the child's perception of parental behavior) on the relationship with parents.

Respondents are asked to describe the relationship with their parents while growing up by rating the extent to which they agree with the RRP[10] items on a five-point Likert scale from 0 (false) to 4 (true). A high score on both scales is indicative of remembrance of poor parenting. The parental framework depends on the researcher's interest. If one wishes to assess a more detailed picture of remembered Alienation and Control, items are rated separately with reference to the father and mother. The latter version of the RRP[10] was used in this study and is presented in Appendix A. To reduce response burden in epidemiological research, items can be adapted by referring to an overall rating of the parents in general; e.g., "*I often felt that my parents did not understand me*". Scoring of the RRP[10] is presented in Appendix B.

2.3. Parental bonding

To assess the convergent validity of the RRP[10], we included the PBI. The PBI elicits memory-based responses to questions regarding parental rearing styles during the first 16 years of growing up, and contains 25 four-point Likert items that respondents have to complete for both parents (Parker et al., 1979). The psychometric properties of the scale are good, with Cronbach's α ranging from 0.74 to 0.95 (Parker, 1989). Originally, the PBI was developed to measure parental care and overprotection (Parker et al., 1979). Recent evidence showed that the overprotection component should be split into two factors; i.e., denial of psychological autonomy and encouragement of behavioral freedom, respectively (Murphy et al., 1997; Kendler, 1996; Heider et al., 2005). In the present study, Cronbach's α of the

Table 2
Sample pattern matrices of RRP[10] scale items as indicated by principal component analyses [a]

	Total (N=664)		Men (n=317)		Women (n=347)	
	Factor I	Factor II	Factor I	Factor II	Factor I	Factor II
Alienation						
F1 Very closed towards father	0.07	**0.74**	0.09	**0.79**	0.07	**0.70**
F2 Kept troubles to myself (towards father)	0.04	**0.72**	0.03	**0.79**	0.07	**0.67**
F8 Often felt that my father did not understand me	0.18	**0.69**	0.33	**0.60**	0.09	**0.74**
F4 Father often made me feel insecure	0.27	**0.60**	0.36	**0.58**	0.19	**0.64**
F7 Father often made me feel guilty	0.30	**0.61**	0.49	**0.52**	0.15	**0.64**
M8 Often felt that my mother did not understand me	0.15	**0.76**	0.26	**0.75**	0.10	**0.75**
M1 Very closed towards mother	0.07	**0.72**	0.08	**0.80**	0.09	**0.67**
M2 Kept troubles to myself (towards mother)	0.04	**0.68**	0.04	**0.77**	0.06	**0.61**
M7 Mother often made me feel guilty	0.25	**0.64**	0.36	**0.63**	0.19	**0.63**
M4 Mother often made me feel insecure	0.25	**0.62**	0.36	**0.58**	0.19	**0.64**
Control						
F10 Father was overprotective	**0.79**	0.09	**0.78**	0.11	**0.81**	0.08
F5 Father's anxiety was exaggerated	**0.79**	0.12	**0.79**	0.13	**0.78**	0.12
F9 Father sheltered me too much from difficulties	**0.77**	0.11	**0.74**	0.09	**0.79**	0.14
F3 Wished father would worry less about me	**0.64**	0.14	**0.66**	0.08	**0.64**	0.16
F6 Father worried that I couldn't take care of myself	**0.63**	0.36	**0.69**	0.35	**0.60**	0.35
M10 Mother was overprotective	**0.75**	0.12	**0.75**	0.18	**0.74**	0.05
M5 Mother's anxiety was exaggerated	**0.70**	0.13	**0.74**	0.17	**0.68**	0.06
M9 Mother sheltered me too much from difficulties	**0.73**	0.15	**0.67**	0.21	**0.77**	0.10
M3 Wished mother would worry less about me	**0.64**	0.14	**0.56**	0.14	**0.57**	0.12
M6 Mother worried that I couldn't take care of myself	**0.54**	0.43	**0.64**	0.42	**0.48**	0.41
Eigenvalues	7.34	2.89	8.28	3.17	6.67	3.17

[a] Varimax rotation; loadings of items assigned to a factor are presented in bold face.

care, denial of autonomy, and behavioral freedom scales were 0.94, 0.91, and 0.87, respectively.

2.4. Depressive symptoms

The Beck Depression Inventory (BDI) is a widely used self-report measure of the presence and severity of depressive symptomatology (Beck et al., 1961). The scale contains 21 items that are answered on a four-point scale from 0 to 3. A cut-off $\geq$10 indicates mild to moderate depressive symptomatology. The scale is often used in research of patients with somatic diseases, such as coronary artery disease (Frasure-Smith et al., 1995; Strik et al., 2001). The BDI is a reliable and valid measure of depression severity with Cronbach's α ranging from 0.81 for non-psychiatric subjects to 0.86 for psychiatric patients (Beck et al., 1988). In the present study, Cronbach's α of the BDI was 0.81.

2.5. Statistical analyses

Prior to factor analysis, the assumptions of the KMO-index and Bartlett's test of sphericity were checked. Principal components analysis (PCA) with varimax rotation was used to examine the factor structure of the RRP[10]. The scree plot was used to determine the number of factors to extract. Reliability analyses were performed to examine the internal consistency of the factors, using Cronbach's α. The subscales of the RRP[10] were also analyzed on the second-order level together with the PBI subscales. The convergent validity of the RRP[10] was evaluated by examining its correlation with the PBI. Finally, to provide evidence of construct validity, multiple logistic regression analyses (enter model) were performed, separately for the father and mother items, with the BDI depression scores as the dependent variable and demographics and the RRP[10] subscales as independent variables. SPSS for Windows, version 12.0.1, was used for all analyses.

3. Results

3.1. Alienation and control dimensions of the RRP[10]

Factor analyses (Table 2) were performed to investigate the factorial validity of the RRP[10] for the total sample (N=664) and separately for men (n=317) and women (n=347), respectively. The scree plot showed

a clear break between the second and third factor. The first two factors captured the greater part of the variance (51.2%) and were replicated in both men and women. Hence, for reasons of parsimony, these two factors were retained in the final model.

All of the five Alienation and five Control items had loadings ranging from 0.54 to 0.79 in the total sample and from 0.52 to 0.80 in men and from 0.48 to 0.81 in women, respectively. Although item M6 "*Mother worried that I couldn't take care of myself*" had double loadings, the item loaded consistently highest on the Control dimension across factor analyses and was accordingly treated as an item measuring Control. Cronbach's α for the Alienation factor was 0.85 for both the father and mother items. Likewise, Cronbach's α for the Control factor was 0.86 and 0.83 for the father and mother items, respectively. Mean inter-item correlations for the Alienation father and Alienation mother scales were 0.52 for both scales; mean inter-item correlations for Control father and Control mother scales were 0.57 and 0.50, respectively. Overall, these findings illustrate the internal consistency and factorial validity of the Alienation and Control scales of the RRP^{10}.

3.2. RRP^{10} scores stratified by sex

Men and women did not score differently on the Alienation (mean for men=14.14 vs. women=14.61, p=0.94) and Control (mean for men=12.13 vs. women=12.18, p=0.53) subscales. No significant gender differences were found on the Alienation subscale for the father and mother items, respectively (mean for men=7.92 vs. women=7.87, p=0.91; mean for men=6.22 vs. women=6.74, p=0.20) (Table 1). Likewise, men and women did not differ regarding remembered Control for father (mean for men=5.06 vs. women=5.65, p=0.11) and mother items (mean for men=7.07 vs. women=6.53, p=0.17).

3.3. Convergent validity of the RRP^{10}

In the total sample, correlations between the Alienation scale of the RRP^{10} and Care scale of the PBI was −.73 for the father and −.68 for the mother items, indicating shared variance of 50% (Table 3, left). The Control subscale of the RRP^{10} correlated 0.58 with the Denial of Autonomy scale of the PBI for both father and mother items, indicating 34% shared variance. The RRP^{10} Alienation and Control scales only shared 7% to 22% variance with the Behavioral Freedom subscale of the PBI (correlations ranging from 0.26 to 0.47). Hence, these parenting styles were related but not identical. The intercorrelation between the RRP^{10} Alienation subscales for the father and mother items was 0.64; the Control subscales for father and mother correlated 0.57. Alienation and Control subscales correlations ranged from 0.33 to 0.39 (Table 3, left). Second-order factor analysis of scale scores showed that on the one hand, Alienation for father (0.80) and mother (0.75), and on the other hand, Control for father (0.82) and mother (0.85) represented the parenting styles of the PBI, except for the behavioral freedom factor of the PBI (Table 3, right). These findings corroborated the convergent validity of the RRP^{10} and affirmed the duality of the original Control factor of the PBI.

Table 3
Correlation matrix and factor analysis of the RRP^{10} and PBI scales (N=664)

	Correlation matrix [a]				Factor analysis [b]		
	RRP^{10} AF	RRP^{10} AM	RRP^{10} CF	RRP^{10} CM	Factor I	Factor II	Factor III
RRP^{10} subscales							
Alienation father (AF)	–				**0.80**	0.32	0.13
Alienation mother (AM)	0.64	–			**0.75**	0.36	0.13
Control father (CF)	0.38	0.34	–		0.06	**0.82**	0.13
Control mother (CM)	0.33	0.39	0.57	–	0.10	**0.85**	0.02
PBI subscales							
Care father	−0.73	−0.50	−0.15	−0.14	**−0.87**	−0.03	−0.23
Care mother	−0.59	−0.68	−0.13	0.12	**−0.87**	−0.02	−0.28
Denial autonomy father	0.43	0.39	0.58	0.48	0.23	**0.73**	0.37
Denial autonomy mother	0.43	0.51	0.48	0.58	0.28	**0.75**	0.31
Behavioral freedom father	0.47	0.37	0.35	0.26	0.26	0.22	**0.90**
Behavioral freedom mother	0.39	0.47	0.32	0.32	0.26	0.23	**0.88**

[a] All correlations are significant at the 0.01 level.
[b] Principal components with varimax rotation; loadings of scales assigned to a factor are presented in bold face.

3.4. The RRP[10] subscales and depressive symptoms

Using cut-off scores (75th percentiles) on the RRP[10] subscales, 34.9% of the sample who scored high on Alienation experienced clinically significant levels of depressive symptoms (BDI score ≥10) compared with their non-alienated counterparts (15.7%) (Fig. 1). Likewise, subjects who scored high on Control reported more depressive symptoms than subjects who did not remember high Control parenting (32.3% high Control vs. 16% low Control, $p<0.0001$) (Fig. 1). The same tendencies were found for the percentages of subjects with depressive symptoms, when analyzing father and mother items separately (Fig. 2); subjects who scored high on either the Alienation father or Alienation mother scale experienced more depressive symptoms than subjects who scored low on these scales (30.8% high Alienation father vs. 17.3% low Alienation father, $p<0.0001$; 34.1% high Alienation mother vs. 15.8% low Alienation mother, $p<0.0001$). Clinically relevant depressive symptoms were also more prevalent in subjects who remembered more Control either by their father or mother than participants who did not (27.6% high Control father vs. 15.4% low Control father, $p<0.0001$; 27.5% high Control mother vs. 13.9% low Control mother, $p<0.0001$).

When looking at the interaction between parental Alienation and Control, the following results emerged: subjects who scored high on Alienation and Control experienced significantly more depressive symptoms than respondents who scored low on both parenting

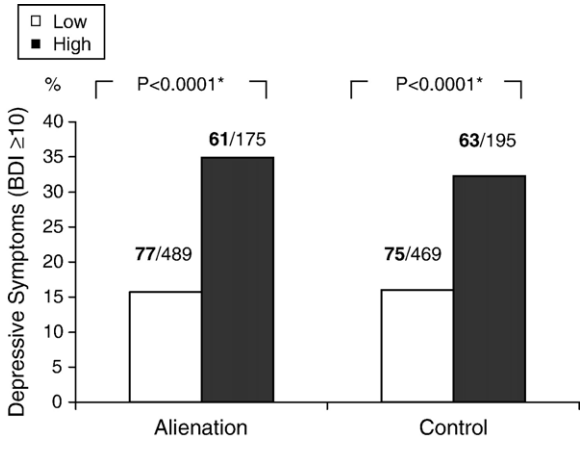

Fig. 1. Percentage of subjects with BDI depressive symptoms (≥10), stratified by high/low Alienation (cut-off score=21) and Control (cut-off score=18) scores.

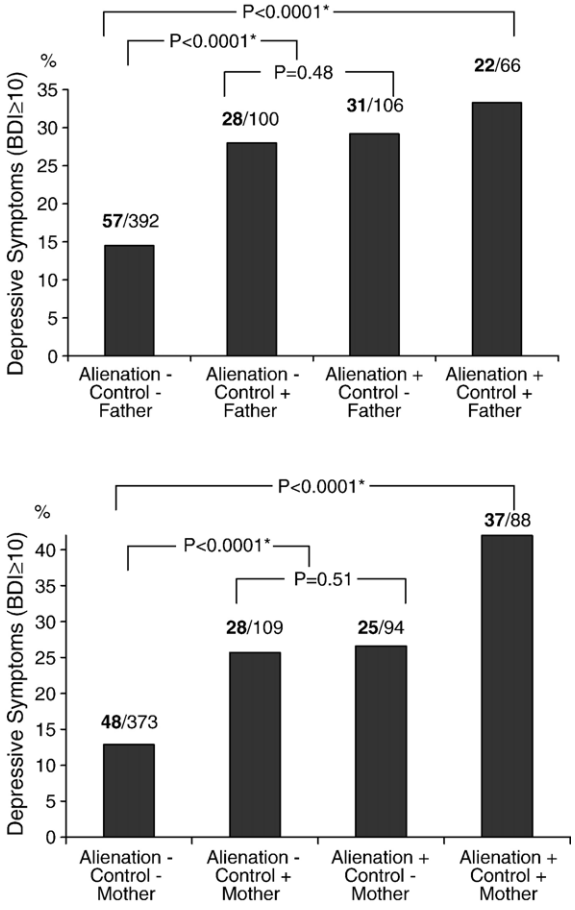

Fig. 2. Percentage of subjects with BDI depressive symptoms (≥10), separately stratified by Alienation and Control for father items (top) and mother items (below). Alienation−/Control−: subjects who score low on Alienation and Control; Alienation−/Control+: subjects who score low on Alienation but high on Control; Alienation+/Control−: subjects who score high on Alienation but low on Control; Alienation+/Control+: subjects who score high on Alienation and Control.

styles (Fig. 2). This was apparent for both father items (33.3% Alienation+/Control+ vs. 14.5% Alienation−/Control−, $p<0.0001$) and mother items (42% Alienation+/Control+ vs. 12.9% Alienation−/Control−, $p<0.0001$). In contrast, subjects who either scored high on Alienation or high on Control did not differ with regard to depressive symptoms (28% Alienation−/Control+ vs. 29.2% Alienation+/Control−, $p=0.48$ for father items; 25.7% Alienation+/Control+ vs. 26.6% Alienation−/Control−, $p=0.51$ for mother items). When pooling these two aforementioned groups (i.e. Alienation−/Control+ and Alienation+/Control−) and comparing them with subjects who neither scored high on Alienation nor on Control, significantly more

depressive symptoms occurred for both the father items (28.6% merged group vs. 14.5% Alienation−/Control−, $p<0.0001$) and mother items (26.1% merged group vs. 12.9% Alienation−/Control−, $p<0.0001$) in the former group (Fig. 2).

3.5. Construct validity: a multivariable model of depressive symptomatology

Logistic regression analyses were used to test a model of depressive symptoms, with combined RRP[10] scales, age, sex, marital status, and educational level as independent variables, separately organized for father and mother items and using the Alienation−/Control− as reference group (Table 4). All combinations of RRP[10] scales (Alienation−/Control+, Alienation+/Control−, and Alienation+/Control+) were independently associated with depressive symptoms for both father (odds ratio [OR], 1.70, 1.02, and 1.09, respectively) and mother items (OR, 1.16, 2.42, and 5.34, respectively).

Table 4
Multivariable predictors of BDI depressive symptoms (≥10), separately organized for father and mother items ($N=664$)

		Odds ratio	(95% CI)	P
RRP[10] Alienation/Control[a]				
Father Alienation	−	1.11	(0.99–1.24)	0.05
Father Control	+			
Father Alienation	+	2.34	(1.38–3.97)	0.002
Father Control	−			
Father Alienation	+	2.48	(1.34–4.56)	0.004
Father Control	+			
Demographics				
Age		1.02	(1.01–1.04)	0.01
Female sex		1.88	(1.25–2.85)	0.003
No partner		1.87	(1.11–3.14)	0.02
Low educational level		1.57	(1.11–2.46)	0.05
RRP[10] Alienation/Control[a]				
Mother Alienation	−	1.16	(1.04–1.30)	0.009
Mother Control	+			
Mother Alienation	+	2.42	(1.36–4.31)	0.003
Mother Control	−			
Mother Alienation	+	5.34	(3.08–9.26)	<0.0001
Mother Control	+			
Demographics				
Age		1.02	(1.00–1.04)	0.02
Female sex		2.10	(1.37–3.22)	0.001
No partner		1.84	(1.08–3.13)	0.02
Low educational level		1.73	(1.10–2.73)	0.02

[a] Subjects who scored low on Alienation and Control were used as reference group.

4. Discussion

The findings of this study confirmed the reliability and validity of the RRP[10] and its two-factor structure; i.e., Alienation from parents and Control by parents. Both dimensions had good internal consistency for both the father and mother items. The respondent's sex was not significantly related to RRP[10] total or subscale scores. Convergent validity was demonstrated by significant correlations of the RRP[10] dimensions with the subscales of the PBI. We also found a clear relation between RRP[10] measures of remembered relationship with parents and depressive symptoms, indicating the construct validity of the RRP[10]. Mean depression scores, as measured by the BDI, were rather low in our sample, although this is in accordance with the literature (Rabbit and Donlan, 1995) and may be due to the fact that we studied a healthy population. Approximately one-third of the subjects who remembered their parent(s) as being high in Alienation or Control experienced clinically significant levels of depressive symptoms. Stratifying by Alienation and Control showed that scoring high on Alienation or Control alone was already significantly and independently associated with depressive symptoms. However, significantly more subjects in the Alienation+/Control+ group experienced clinical levels of depression, as compared to the other three subgroups.

Our results showing that particular parenting styles may lead to increased levels of depressive symptoms are in line with previous studies. In particular, perceived parental rejection and control have been related to both anxiety and depression (Rapee, 1997), and childhood exposure to parental verbal aggression or domestic violence to dissociation, irritability, anger hostility, and also depression (Teicher et al., 2006). Several factors may influence the relationship between parenting styles and depressive symptoms in adulthood. For example, attachment style (Bifulco et al., 2006) or personality dimensions like neuroticism have been shown to mediate this relationship (Enns et al., 2000). The development of dysfunctional attitudes about the self, which are characteristic for depression, may also play an important role (Perris, 1988). According to Beck's cognitive model, the risk for depression in adults is due to acquired dysfunctional structures (or schemas), emanating from particular

types of negative experiences in childhood (Beck, 1988). Moreover, 'healthy' individual development may occur by going through each stage of the epigenetic process, i.e. attachment/caregiving, effective communication, effective joint problem solving, mutuality between family members, and capacity for intimacy (Parker, 1983). However, when these processes are distorted, psychopathological consequences during adolescence and adulthood may ensue (Wynne, 1984; Guttman, 2002). In sum, there is considerable evidence showing that particular parental rearing styles are related to depression, although the nature of this relationship is less clear (Gilmer and McKinney, 2003).

Caregiving processes are not only associated with individual development (Francis and Meaney, 1999; Lehmann et al., 2002; Bowlby, 1977; McKinney, 1974) and psychopathology (Gilmer and McKinney, 2003), but also with health behaviors, such as smoking (Anda et al., 1999), and susceptibility to chronic illnesses, including ischemic heart disease (Dong et al., 2004). Poor quality of caretaking and parental loss have been associated with long-term increases in blood pressure and increased levels of cortisol (Leucken, 1998; Luecken et al., 2005). Dong et al. (2004) have shown a relationship between diverse adverse childhood experiences, like emotional neglect and abuse, and risk for ischemic heart disease. There is also some evidence that early parental loss and distress are associated with breast cancer risk (Jacobs and Bovasso, 2000; Lokugamage et al., 2006). Given these preliminary findings, future studies that will further explore the link between remembered relationship with parents and somatic disease are warranted. The RRP^{10} could be used for this purpose, given its brevity and its non-pathological focus.

This study has some limitations. First, due to the cross-sectional design of the study it is not possible to infer causation. Because respondents completed questionnaires on remembered parenting and depressive symptoms at the same time, it is possible that the subject's perception of parenting styles was affected by current depressive symptoms, although previous research has refuted this notion (Gotlib et al., 1988; Brewin et al., 1993). Nevertheless, to replicate our findings, future longitudinal studies are warranted. Second, parenting styles were assessed retrospectively and assume some parental consistency over the lengthy period of infancy, childhood and early adolescence. Future studies on test–retest reliability of the RRP^{10} could demonstrate the stability of remembrance of parenting. However, previous research has shown that these retrospective reports on parenting styles are accurate (Brewin et al., 1993). Third, respondents who completed only father or mother items were excluded from further analyses. However, in total only 6% of the respondents were excluded due to missing values on questionnaires. Fourth, respondents were recruited from the general Dutch population, which may limit the generalizability to medical patients. Future studies are warranted to replicate the validity of the RRP^{10} in medical settings.

This study also has several strengths. First, the brief 10-item RRP^{10} was shown to be a valid and reliable measure for assessing remembered relationships with parents. Second, quota sampling was applied to ensure that different age and sex groups were equally represented in the sample, which provides us with extensive information about the RRP^{10} in the general population. This information can be used for reasons of comparability when studying diverse patient groups in medical settings. Third, even in this healthy sample, clear associations between remembered relationship with parents and depressive symptoms were observed.

Several clinical implications can be inferred from our study. Perceptions of Alienation from and Control by the parents were related to depressive symptoms, as previous studies have shown. Because the RRP^{10} is a brief and less pathological measure, it can be easily utilized in non-psychiatric populations and in epidemiological and clinical research. Moreover, since both Alienation and Control were associated with depressive symptoms, it is also important to focus on possible relationships with somatic outcomes. Depression and depressive symptoms are known to be important risk factors in cardiovascular disease (Whooley, 2006). By consequence, it is important to identify families who exhibit elevated levels of alienation and control, and monitor them in relation to mental and somatic health outcomes in future research.

In conclusion, the 10-item RRP^{10} was shown to be a valid and reliable measure of remembered caregiving processes with the emphasis on empathic relationships between parents and child. The two dimensions of the RRP^{10} (i.e. Alienation and Control) were significantly related to depressive symptoms, with their combined presence incurring the highest risk. The RRP^{10} is a brief instrument, which makes it suitable to use in non-psychiatric populations and in epidemiological and clinical research. Future studies are warranted to confirm the validity of the RRP^{10} in clinical samples, and to examine whether remembered parenting mediates the relationship between psychological distress and somatic disease.

Appendix A. 10-Item Remembered Relationship with Parents scale (RRP[10])

Below are a number of statements that people often use to describe their relationship with their parents while growing up. Read each statement and then **circle** the appropriate **number** next to that statement to indicate how you remember your relationship with your **father** and **mother** while growing up. There are no right or wrong answers; the only thing that matters is **your own impression**.

0 = FALSE 1 = MOSTLY FALSE 2 = NEUTRAL 3 = MOSTLY TRUE 4 = TRUE

Father	F1 I was very closed towards my father.	→	0 1 2 3 4
	F2 I kept my troubles to myself (towards father).	→	0 1 2 3 4
	F3 I wished my father would worry less about me	→	0 1 2 3 4
	F4 My father often made me feel insecure	→	0 1 2 3 4
	F5 My fathers anxiety that something might happen to me . . was exaggerated	→	0 1 2 3 4
	F6 My father worried that I couldn't take care of myself . .	→	0 1 2 3 4
	F7 My father often made me feel guilty	→	0 1 2 3 4
	F8 I often felt that my father did not understand me	→	0 1 2 3 4
	F9 My father sheltered me too much from difficulties . . .	→	0 1 2 3 4
	F10 My father was overprotective	→	0 1 2 3 4
Mother	M1 I was very closed towards my mother.	→	0 1 2 3 4
	M2 I kept my troubles to myself (towards mother).	→	0 1 2 3 4
	M3 I wished my mother would worry less about me	→	0 1 2 3 4
	M4 My mother often made me feel insecure	→	0 1 2 3 4
	M5 My mothers anxiety that something might happen to me. . was exaggerated	→	0 1 2 3 4
	M6 My mother worried that I couldn't take care of myself . .	→	0 1 2 3 4
	M7 My mother often made me feel guilty	→	0 1 2 3 4
	M8 I often felt that my mother did not understand me	→	0 1 2 3 4
	M9 My mother sheltered me too much from difficulties . . .	→	0 1 2 3 4
	M10 My mother was overprotective	→	0 1 2 3 4

Appendix B. RRP[10] scoring

1. Scoring of Alienation and Control

The Alienation and Control subscales can be used as continuous variables to assess each dimension of the remembered relationship with parents separately. Scores on both scales range from 0 to 40, and can be calculated as follows:

Alienation (F/M)* = sum of scores on items 1 + 2 + 4 + 7 + 8

Control (F/M)* = sum of scores on items 3 + 5 + 6 + 9 + 10

2. Interpretation of Raw Scores – General Dutch Population (N=664)

The following table can be used for the interpretation of raw scores on the Alienation and Control scales. A high score on both scales is indicative of recollections of a poor relationship with parents. The interpretation does not differ for men and women.

	Mean (S.D.)	Low	Below average	Average	Above average	High
Alienation	14.39 (9.50)	<5	5–11	12–17	18–23	>23
Father	7.90 (5.22)	<3	3–6	7–10	10–13	>13
Mother	6.49 (5.15)	<2	2–4	5–7	8–11	>11
Control	12.16 (9.03)	<3	3–8	9–14	15–20	>20
Father	5.37 (4.87)	0	1–3	4–6	7–10	>10
Mother	6.79 (5.11)	<2	2–5	6–8	9–11	>11

3. 75 Percentile cut-off scores

Alienation	**(≥21)**
Father	(≥12)
Mother	(≥10)
Control	**(≥18)**
Father	(≥9)
Mother	(≥10)

*According to the version that is used (overall rating of parents vs. father and mother separately).

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