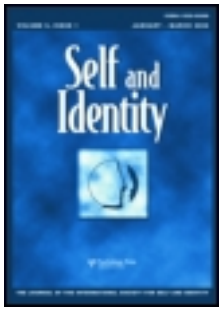

Self and Identity
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/psai20

A Longitudinal Cross-Lagged Study of the Role of Parental Self-Criticism, Dependency, Depression, and Parenting Stress in the Development of Child Negative Affectivity

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Published online: 08 Jan 2014.

To cite this article: Sara Casalin, Patrick Luyten, Avi Besser, Sofie Wouters & Nicole Vliegen , Self and Identity (2014): A Longitudinal Cross-Lagged Study of the Role of Parental Self-Criticism, Dependency, Depression, and Parenting Stress in the Development of Child Negative Affectivity, Self and Identity, DOI: 10.1080/15298868.2013.873076

To link to this article: http://dx.doi.org/10.1080/15298868.2013.873076

Self and Identity, 2014
http://dx.doi.org/10.1080/15298868.2013.873076

A Longitudinal Cross-Lagged Study of the Role of Parental Self-Criticism, Dependency, Depression, and Parenting Stress in the Development of Child Negative Affectivity

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Parental self-criticism and dependency, referring to maladaptive expressions of self-definition issues and relatedness, respectively, confer vulnerability to psychopathology in the transition to parenthood, in part through their association with stress generation. This prospective study is the first to study the intergenerational transmission of vulnerability to distress associated with these stress-generation effects from first-time parents to offspring. Mother- and father-reported data concerning parental self-criticism, dependency, depression, parenting stress and child negative affectivity ($N = 121$), measured when their child was in infancy and again 1 year later, were analysed using multilevel structural equation modelling. Results showed that parenting stress partially mediated the relation between parents' self-criticism and child negative affectivity over time. Dependency, in contrast, did not show direct or indirect effects on child negative affectivity, and was characterized by small stress-generation effects. No child-to-parent effects were found. These findings shed new light on the intergenerational transmission of vulnerability to distress associated with both personality dimensions, with self-criticism having greater negative effects than dependency on vulnerability to distress in offspring.

Keywords: Personality; Depression; Negative affectivity; Vulnerability; Stress.

Parenthood necessitates substantial redefinition of feelings regarding self and identity as well as of interpersonal relationships (e.g., Blatt, 2008; Slade, Cohen, Sadler, & Miller, 2009). Forming an attachment relationship with one's baby, reorganizing the relationship with one's partner and finding a new balance between work and family are just a few of the major challenges that accompany early parenthood. Blatt's two-polarities model of personality development (Blatt, 2004, 2008; Blatt & Blass, 1990; Blatt & Luyten, 2009, 2010; Luyten & Blatt, 2011) offers an integrative conceptual framework concerning normal and disrupted personality development that aids understanding of how the important changes associated with becoming a parent can impact on psychological functioning of both parent and child. More specifically, this framework conceptualizes

Received 28 January 2013; accepted 2 December 2013; first published online 7 January 2014.
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adaptive personality functioning as the result of a dialectical process between two developmental lines: (a) The *self-definition* line, referring to the development of an increasingly differentiated, integrated and essentially positive sense of self, and (b) the *relatedness* line, referring to the capacity to form mature and satisfying relationships (Blatt, 2004; Blatt & Luyten, 2009, 2010; Luyten & Blatt, 2011).

By contrast, disruptions in self-definition and relatedness in parents, expressed as high levels of self-criticism and dependency, respectively, are hypothesized to be associated with increased vulnerability to distress in offspring, a prediction that has been borne out by several studies (Beebe et al., 2007; Soenens et al., 2005; Soenens, Vansteenkiste, & Luyten, 2010; Thompson & Zuroff, 1998). Yet, to the best of our knowledge, these personality dimensions have not been well studied with regard to parenting and the early development of negative affectivity in offspring in particular. Therefore, this is the first study to investigate the influence of parental self-criticism and dependency on stress generation and the development of vulnerability to distress in offspring from infancy to toddlerhood.

In what follows, we discuss in more detail (a) changes in the self and relatedness during early parenthood, (b) the influence of parental self-criticism and dependency on the development of the child, and (c) stress-generation processes that might be implicated in these transactions.

Self-Criticism, Dependency and Early Parenthood

As noted earlier, normal personality development entails a balance between relatedness and self-definition. Disruptions of this dialectical interaction, however—that is, an emphasis on one developmental line to the neglect or defense of the other—have been shown to be associated with increased vulnerability to psychopathology (Blatt & Luyten, 2009; Blatt & Zuroff, 1992). In this regard, excessive preoccupation with self-worth, and achievement, characteristic of individuals with high levels of *self-criticism*, is expressed in a maladaptive emphasis on achievement and control, and a fearful or even dismissive attachment style (Blatt, 2008; Blatt, D'Afflitti, & Quinlan, 1976; Blatt & Zuroff, 1992). Maladaptive concerns with relatedness, characteristic of individuals with high levels of *dependency*, are typically expressed in exaggerated fears of losing the support and love of others and a preoccupied attachment style, evidenced by clinging behaviour towards others (Blatt, 2008; Blatt et al., 1976; Blatt & Zuroff, 1992).

Within this theoretical framework, as noted, early parenthood is conceptualized as a period of developmental transition that necessitates a reassessment of both self-definition and relatedness (Belsky, Rowine, & Fish, 1989; Priel & Besser, 1999). The confrontation with new issues and challenges characteristic of this transition accentuates ambiguity, priming individual vulnerabilities and thus increasing the risk for psychological problems (see also Caspi & Moffitt, 1993; Rutter & Rutter, 1993). Cross-sectional and longitudinal studies have consistently shown that individuals with high levels of self-criticism are more susceptible to depression in the peri- and postpartum period (for a review, see Besser, Vliegen, Luyten, & Blatt, 2008; Blatt & Luyten, 2009; Vliegen et al., 2010). In some studies, dependency seems to reduce the risk for postpartum depressive symptoms, probably due to the fact that dependency is also positively associated with higher levels of perceived social support (e.g., Besser et al., 2008) and with positive feelings of relatedness to the child (e.g., Priel & Besser, 1999, 2000).

Taken together, studies in this area thus generally found greater vulnerability to psychopathology in individuals with high levels of self-criticism compared to individuals with high levels of dependency (for a review see Besser et al., 2008; Blatt & Luyten, 2009;

see Blatt, Luyten, & Corveleyn, 2005). Dependency, in turn, seems to be a "double-edged sword", having both positive and negative effects.

Self-Criticism, Dependency and their Influence on Child Development

Despite the roles of dependency and self-criticism in explaining vulnerability to psychopathology in adults, little is known about how these dimensions of parental personality affect child development in early childhood (Blatt & Luyten, 2009). Most studies examining the impact of these dimensions on offspring have concentrated on effects in adolescence (Blatt & Homann, 1992; Soenens et al., 2005; Thompson & Zuroff, 1998), and suggest that mothers high on dependency interact with their children in ways that are likely to foster dependency by thwarting their children's strivings for autonomy through dependency-oriented psychological control, that is, overinvolving and autonomy-restricting behaviour. High self-criticism in parents, on the other hand, is likely to result in higher self-criticism in their children because of the use of achievement-oriented psychological control, with parents setting overly high standards for their children (Soenens et al., 2010).

The only study to have examined associations between self-criticism and dependency during early development (Beebe et al., 2007) found an association between self-criticism and dependency 6 weeks postpartum and mother–infant self- and interactive emotion regulation capacities when the children were 4 months old. More specifically, it was shown that infants of dependent mothers had greater difficulty with individuation because of the mother's excessive involvement in the child's emotions and behaviours. Indeed, dependent mothers are likely to show a clinging and consuming relational style and prefer symbiotic-like relationships (Blatt & Homann, 1992). Infants of self-critical mothers, by contrast, became more avoidant because their mothers were less attuned to the child's attentional and affective signals, and responded to them with a parenting style characterized by achievement-oriented psychological control and an avoidant interpersonal style. More specifically, self-criticism has been associated with the parent focusing on his or her own psychological concerns, using withdrawal of love and induction of guilt to coerce and control the child at the expense of the child's own feelings, and desires (Blatt & Homann, 1992; Soenens et al., 2005, 2010; Thompson & Zuroff, 1998). In addition, self-critical parents show less positive affect and more negative affect, as well as poor regulation of negative affect, such as venting and spending less time with others (Dunkley, Zuroff, & Blankstein, 2003; Fichman, Koestner, Zuroff, & Gordon, 1999; Mongrain & Zuroff, 1995).

Eventually, the effects associated with parental self-criticism and dependency are likely to increase vulnerability to distress in the child, pointing to one possible mechanism for the intergenerational transmission of self-criticism and dependency (Blatt & Homann, 1992; Soenens et al., 2005, 2010). However, studies have shown that parenthood is also associated with more positive feelings in mothers with high levels of dependency versus high self-criticism (e.g., Priel & Besser, 1999, 2000); this again points to the "double-edged sword" nature of dependency, which may lead to more adaptive outcomes in both parent and child, compared to self-criticism.

In the current study, we focus on child negative affectivity (Rothbart & Bates, 2006) as a prime candidate to explain increased vulnerability to psychopathology in offspring as a consequence of parental self-criticism and dependency. Negative affectivity in childhood has been related to broad personality dimensions such as neuroticism in later life (Clark, 2005; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006; Watson, 2005), as well as to more specific personality dimensions such as self-criticism and dependency

(see Luyten & Blatt, 2011). While several studies in this area have focused on the influence of parental neuroticism on child functioning (see for a review Kochanska, Clark, & Goldman, 1997; Kochanska, Friesenborg, Lange, & Martel, 2004; Komsi et al., 2008b; Prinzie, Stams, Dekovic, Reijntjes, & Belsky, 2009), we found only one study that focused on the influence of self-criticism and dependency on child negative affectivity (Pesonen, Raikkonen, Heinonen, Jarvenpaa, & Strandberg, 2006). This study reported that self-critical and dependent parents rated their child as exhibiting higher negative affectivity, largely independently of concurrent depressive symptoms. The dearth of research in this area points to an important gap in our knowledge, particularly as self-criticism and dependency have been shown to predict developmental outcomes over and above broader personality traits such as neuroticism (Luyten & Blatt, 2011). Indeed, these personality dimensions are thought to be rooted much more in developmental history than in basic personality factors, such as neuroticism or negative affect, that are strongly related to basic features of the temperament (Luyten & Blatt, 2011).

Self-Criticism, Dependency and Stress Generation

In line with recent dynamic interactionism models of personality that emphasize the active generation of stress (Blatt & Zuroff, 1992; Dunkley et al., 2003; Luyten, Blatt, Van Houdenhove, & Corveleyn, 2006; Luyten, Corveleyn, & Blatt, 2005; Priel & Shahar, 2000; Shahar, Blatt, Zuroff, Kuperminc, & Leadbeater, 2004), parenting stress could be a potential mediating or intervening variable[1] in the relation between parental self-criticism and dependency and child negative affectivity. More specifically, within stress-generation models, individuals are seen not as passive recipients of stress and adversity, but as active agents that may, unwittingly, generate in part their own stressful environment (see also Eberhart & Hammen, 2009; Hammen, 2005), which in turn may exacerbate personality-related vulnerability (Shahar, Blatt, et al., 2004).

Research has shown that self-criticism is strongly related to psychological distress both directly and indirectly through such stress generation effects (Dunkley et al., 2003; Priel & Besser, 1999; Priel & Shahar, 2000; Shahar, Blatt, et al., 2004; Shahar & Priel, 2003). Findings for dependency have been more mixed, with some studies suggesting stress-generation effects to be smaller (Mongrain & Zuroff, 1995; Shahar & Priel, 2003) or even absent (Eberhart & Hammen, 2009; Priel & Besser, 2000).

With regard to "child-to-parent" effects, only few studies have investigated the role of parenting stress in the context of early temperament development. Two studies (Bridgett et al., 2009; Gartstein et al., 2010) found that higher maternal stress in infancy was indeed associated with higher levels of child negative affectivity over time. Additionally, children with a "difficult temperament" have been shown to elicit high levels of parenting stress (e.g., Raikkonen et al., 2006). In this regard, dynamic interactionism models point to the importance of considering transactional relations between child temperamental features and parental personality. More specifically, as evidenced by research on person–environment transactions (e.g., Eisenberg et al., 2009; Komsi et al., 2008a; Luyten et al., 2006), both "parent-to-child" and "child-to-parent" effects may be important in this context. However, no study to date has investigated the potential mediating role of parenting stress in the transactional relations between dependency, self-criticism and child negative affectivity.

The Present Study

The main aim of this study was to investigate transactional relations between parental self-criticism and dependency, parenting stress and child negative affectivity. More specifically, using data from a 1-year prospective study from infancy to toddlerhood, parenting stress was examined as a possible mechanism involved in the intergenerational transmission of vulnerability associated with parental self-criticism and dependency. A multilevel structural equation modelling (SEM) approach was adopted to account for the interdependence between the mother's and father's ratings (because they reported on the same child). It is plausible that within-couple perception of infant temperament reflects a shared dynamic and, therefore, parental scores within a couple may not be entirely independent (e.g., Komsi et al., 2008b; Peugh, 2010). More specifically, child temperament development is not influenced by separate effects of mothers and fathers only, but is influenced by the "separate" as well as the "joint" effects of parents. Indeed, the child is inherently influenced by both parents separately as well as by their (couple-specific) interaction. In other words, the dynamics within parents may influence the development of temperamental features in their child. As a consequence, statistically, we need to model "main effects" of parental characteristics on child outcome, as well as "couple effects". By calculating the intraclass correlations (ICC), i.e. the average correlation of father and mother scores within a couple cluster, we have an indication of the presence of such couple effects (Peugh, 2010). Testing separate models for mothers and fathers, as is often done in research, is a data analytic strategy that fails to represent these interaction effects. In particular, as the ICC increases, the proportion of variance that occurs across couples increases, violating the assumption of independence, as well as underestimating standard errors and leading to an increased Type-1 error. This would indicate the need to use multilevel analyses to account for the interdependency between parents.

The theoretical model is presented in Figure 1. First, we expected parental self-criticism and dependency at T1 to predict changes in child negative affectivity over time, even when controlling for severity of depression, with self-criticism showing stronger associations than dependency. Second, we expected indirect effects from parental personality at T1 to child negative affectivity at T2 through parenting stress. In particular, we hypothesized that parenting stress would act as a mediating or intervening variable in these associations. Finally, we also expected child-to-parent effects, with child negative affectivity at T1 predicting parental self-criticism and dependency, and depression at T2, either directly or indirectly through parenting stress.

Method

Participants and Procedure

This study is part of a broader study concerning the role of personality in the intergenerational transmission of vulnerability to psychopathology. Details of the participants and procedures of this study are described in detail elsewhere (Casalin, Luyten, Vliegen, & Meurs, 2012). Briefly, participants were recruited by undergraduate students working in return for course credits. A total of 310 students worked in pairs; each pair of students was instructed to find one couple that met the study's inclusion criteria: Couples had to be Dutch-speaking first-time parents of a biological child, currently without serious health problems, between 8 and 13 months of age. At the first home visit, written informed consent was obtained from both parents and they were asked to complete

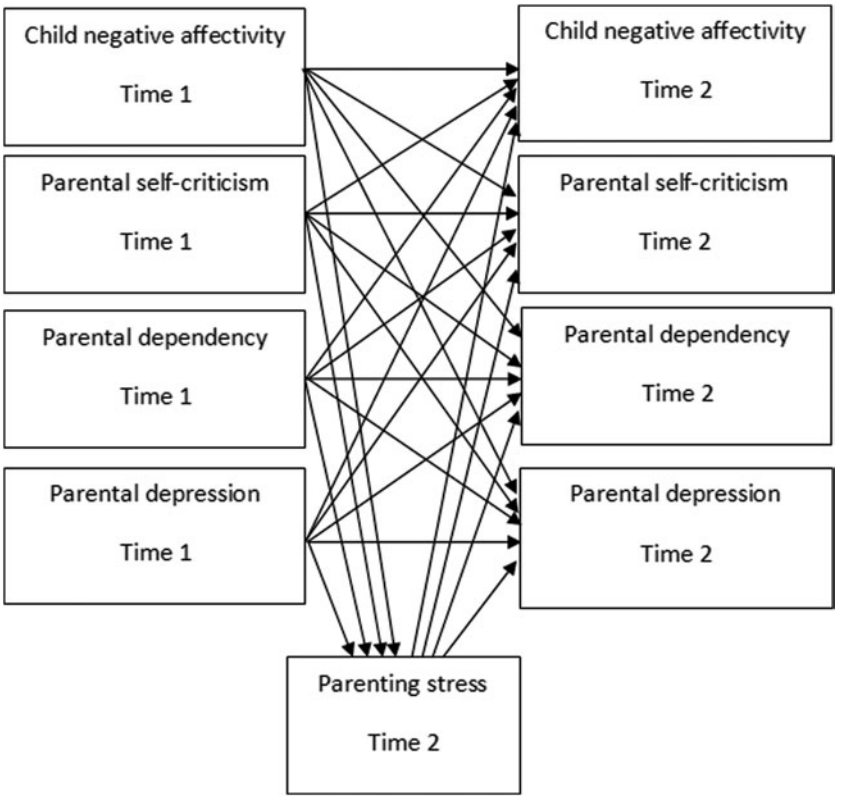

FIGURE 1 Changes in negative affectivity predicted by parental self-criticism, dependency, depression and parenting stress.

a series of questionnaires separately. During a second home visit, approximately 2 weeks later, parents returned the completed questionnaire booklets. Of the 310 consenting participants, 16 (eight couples) did not meet inclusion criteria. Of the remaining 294 participants who were eligible, 287 returned their questionnaires (response rate: 97.6%). Six parents were excluded because too many data were missing (more than half of the items were missing), so 281 parents (96%) of the original sample were included in the analyses. Consequently, at Time 1 (T1), the sample consisted of 141 mothers and 140 fathers. Women and men were on average 29 (SD = 3.12; range 21–39) and 31 (SD = 4.44; range 21–45) years old, respectively. Data were available for 86 infant boys (60%) and 57 girls (40%). The mean age of the infants was 9.89 months (SD = 1.43; range 8–13). Ninety-eight percent of the infants had Belgian nationality.

At 1-year follow-up (Time 2; T2), the sample consisted of 64 mothers (53%) and 57 fathers (47%) (response rate 44%). Comparisons of mothers and fathers who participated at both T1 and T2 with those who participated only at T1 revealed no significant differences in average maternal and paternal age ($t_{[262]} = 0.71$, n.s.), level of education ($\chi^2[3] = 5.87$, n.s.), self-criticism ($t_{[274]} = 1.03$, n.s.), dependency ($t_{[274]} = 1.19$, n.s.) or parenting stress ($t_{[265]} = 0.48$, n.s.).

We included children only if data on negative affectivity were available at both T1 and T2. At T2, mothers provided data for 64 children (45 boys and 19 girls) and fathers provided data for 57 children (43 boys and 14 girls). Consequently, for 54 children there were both mother- and father-reported data, for 10 children there were only mother-

reported data and for 3 children there were only father-reported data. Comparisons of children who did or did not participate at T2 showed a significant difference in child gender ($\chi^2(1) = 14.38$, $p < .001$), with parents of girls being significantly less likely to participate at T2. There were no observed differences between negative affectivity ratings for parents who did or did not participate at T2.

Measures

Negative Affectivity

To assess negative affectivity in infancy (T1) and toddlerhood (T2), abbreviated versions of the Infant Behaviour Questionnaire-Revised (IBQ-R; Gartstein & Rothbart, 2003) and the Early Childhood Behaviour Questionnaire (ECBQ; Putnam, Gartstein, & Rothbart, 2006) were, respectively, used. The full IBQ-R is a 191-item questionnaire, which was developed to assess three broad temperamental factors: Negative affectivity, surgency/extraversion and orienting/regulation in infancy (Casalin et al., 2012; Gartstein & Rothbart, 2003). The full ECBQ is a 201-item questionnaire, which assesses the same temperament dimensions in toddlerhood (Casalin et al., 2012; Putnam et al., 2006). The abbreviated versions of the IBQ-R and ECBQ contained 94 and 104 items, respectively (Casalin et al., 2012). In the current study, only the negative affectivity factor was used. Parents were asked to indicate on a seven-point Likert-type scale how often in the past week (*never, seldom, less than half of the time, half of the time, more than half of the time, almost always, always or not applicable*) responses indicative of negative affectivity occurred [e.g. "When your baby wanted something, how often did he/she have tantrums (crying, screaming, face red, etc.) when he/she did not get what he/she wanted?" (IBQ-R), "When he/she asked you for something and you answered with 'no' and how often did your child have a tantrum?" (ECBQ)]. These abbreviated versions of the IBQ-R and ECBQ show a similar factor structure to that of the original scales, and the three factors are relatively stable from infancy to toddlerhood (Casalin et al., 2012). In the current paper, we calculated scores for negative affectivity by averaging the scores on the item parcels that loaded on the negativity factor identified in earlier research (see Casalin et al., 2012). Cronbach's alpha for negative affectivity was .79 and .88 as rated by mothers, and .85 and .82 for fathers, in infancy and toddlerhood, respectively.

The ICC was .40 for negative affectivity, and a significant amount of the variance in negative affectivity was situated at the couple level ($p < .01$).

Parenting Stress

Parenting stress was assessed at follow-up (T2) using the Dutch version of the Parenting Stress Index (Abidin, 1995), the Nijmeegse Ouderlijke Stress Index (NOSI; de Brock, Vermulst, Gerris, & Abidin, 1992). The following subscales were included: *Competence* (13 items; e.g., "Parenting this child is much harder than I thought it would be"), *Role Restriction* (7 items; e.g., "Since I had this child, I notice that I can almost never do the things that I like to do"), *Social Isolation* (6 items; e.g., "I feel alone and without friends") and *Marital Relationship* (7 items; e.g., "Parenting this child has caused more problems in the relationship with my partner than I had expected"). Respondents were asked to rate each item on a six-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

Following recommendations by Abidin and colleagues (Abidin, 1995), most studies use the total parenting stress scale calculated as the mean of all subscales. The scree test in a principal component analysis provided clear evidence for a one-factor solution, with all items having high loadings on one factor (explaining 28.4% of the variance).

Consequently, to simplify data analyses, we used the total parenting stress score. In the current study, Cronbach's alpha for the total subscale was .77 and .79 for mothers and fathers, respectively.

Although less interdependency is expected when parents rate their levels of parenting stress, ratings of parenting stress may still be interrelated within couples. In this study, the ICC was .26 for parenting stress, and a marginally significant amount of the variance in parenting stress was situated at the couple level ($p < .10$).

Severity of Depression

The Beck Depression Inventory—Second Edition (BDI-II; Beck, Steer, & Brown, 1996) assesses 21 symptoms of depression. Psychometric characteristics of the Dutch version of the BDI are similar to the original version (Beck, Steer, Brown, & van der Does, 2002). In the current study, Cronbach's alpha was .79 and .82 at T1 and .85 and .84 at T2, for mothers and fathers, respectively.

For depression, the ICC was .15 and a small, non-significant amount of variance was situated at the couple level.

Parental Personality

Parental self-criticism and dependency were assessed using the *Depressive Experiences Questionnaire* (DEQ; Blatt et al., 1976), which consists of 66 items. Participants rated each item on a seven-point Likert-type scale ranging from 1 (*I don't agree*) to 7 (*I totally agree*). Sample items capturing self-criticism are "I set my personal goals and standards as high as possible" or "I often find that I fall short of what I expect of myself". Sample items for dependency are "I urgently need things that only other people can provide" or "I am very sensitive to signs of rejection from others". Studies have shown good internal consistency and test–retest reliability (see Luyten et al., 2005 for an overview). In studies with first-time mothers, internal consistencies typically range between $\alpha = .86$ and .90 (e.g., Priel & Besser, 1999, 2000). The Dutch version of the DEQ has similar psychometric characteristics to the original version (Luyten, Corveleyn, & Blatt, 1997). In this study, the DEQ was scored using the standard scoring system of the DEQ, using factor scores and weights as developed and recommended by Blatt and colleagues (see Blatt, Zohar, Quinlan, Zuroff, & Mongrain, 1995).

For dependency and self-criticism, ICCs were .04 and .36, respectively. Although only a small, non-significant amount of variance in dependency was situated at the couple level, a significant amount of variance in self-criticism was situated at the couple level ($p < .05$).

Analytic Strategy

First, zero-order correlations between the study variables were computed (see Tables 1 and 2). The ICCs showed a substantial part of the variance of the outcome variable to be situated at the "couple" level, indicating the use of a multilevel modelling approach to test the theoretical model summarized in Figure 1, based on current state-of-the-art recommendations for conducting multilevel SEM (Dupré et al., 2010; Hox, 2002; Komsi et al., 2008b; Peugh, 2010; Rowe, 2003). Data were hierarchically structured, with parents nested within dyads (i.e. treating the couple cluster as one level of the analysis) and a "random effect" was added to the model to account for this additional source of variation. All variables were standardized before analysis. The size of the effects between predictor variables and criterion variables were indicated by the path estimates (unstandardized and standardized regression coefficients) with their significance examined by a multivariate delta method (Bollen, 1987; Sobel, 1986).

TABLE 1 Zero-Order Correlations Among Study Variables for Mothers and Fathers Together

	1	2	3	4	5	6	7	8	9
1. NA1	–	.33**	.10	.10	.18	.12	.17°	.15	.24**
2. NA2		–	.33***	.12	.30**	.03	.25**	.10	.20*
3. SC1			–	.13	.69***	.19°	.41***	.36***	.42***
4. DEPEND1				–	.05	.80***	.27**	.33***	−.33***
5. SC2					–	.05	.49***	.23*	.41***
6. DEPEND2						–	.27**	.32***	.36***
7. NOSI2							–	.45***	.57***
8. BDI1								–	.62***
9. BDI2									–

Note: NA, negative affectivity; SC, self-criticism; DEPEND, dependency; NOSI, parenting stress; BDI, depressive symptoms. Correlations are for mothers and fathers together ($N = 121$), °$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$ (two tailed test).

To test for mediation or intervening effects through parenting stress (Baron & Kenny, 1986; Hayes, 2009), several multilevel SEM models were tested following contemporary guidelines for modelling indirect effects using SEM (Belsky, Fearon, & Bell, 2007; Besser & Zeigler-Hill, 2010; Cole & Maxwell, 2003; Soenens et al., 2010). This approach typically entails testing three models. (a) In a first step, a base model, which included all stability paths as well as cross-lagged paths, was tested. If the first criterion for mediation is not met, that is, if there is no direct association between the predictor and criterion variables (see criteria for mediation Baron & Kenny, 1986), potential intervening effects can be examined in a following step (Hayes, 2009), that is, whether there were significant indirect effects between parental personality and/or depression and child negative affectivity. (b) In a second step, a full mediation model, that is, a model with all stability paths and indirect (mediation) paths, but without any cross-lagged direct paths, was tested to examine indirect effects through parenting stress. (c) Next, in a third step, we tested whether a partial mediation model, that is, a model with direct cross-lagged paths added to the previous full mediation model, showed a better fit, suggesting partial mediation (Cole & Maxwell, 2003; Soenens et al., 2005).

Correlations between all exogenous variables and all residuals were allowed. We omitted non-significant paths by using a step-by-step approach to investigate whether removal of non-significant paths led to a significant reduction in model fit, but only if these were also theoretically justified.[2] To compare the fit of several nested models, we used

TABLE 2 Zero-Order Correlations among Study Variables for Mothers and Fathers Separately

	1	2	3	4	5	6	7	8	9
1. NA1	–	.28*	.01	.16	.07	.20	.18	.08	.23°
2. NA2	.40**	–	.29*	.22°	.25*	.08	.26*	.02	.20*
3. SC1	.20	.36**	–	.14	.70***	.16	.36**	.32*	.32*
4. DEPEND1	−.01	−.11	.27*	–	.07	.78***	.23°	.19	.27*
5. SC2	.28*	.32*	.67***	.14	–	.10	.44***	.20	.29*
6. DEPEND2	.09	.13	.40**	.76***	.14	–	.20	.22°	.27*
7. NOSI2	.17	.26*	.47***	.35**	.54***	.38**	–	.43***	.61***
8. BDI1	.24°	.28*	.48***	.42**	.33*	.31*	.47***	–	.56***
9. BDI2	.26°	.44**	.54***	.39**	.53***	.41**	.55***	.68***	–

Note: NA, negative affectivity; SC, self-criticism; DEPEND, dependency; NOSI, parenting stress; BDI, depressive symptoms. Correlations are for mothers ($N = 64$) are represented above the diagonal, correlations for fathers below the diagonal ($n = 57$), °$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$ (two tailed test).

χ^2-difference tests. To test whether the most parsimonious model showed a good or acceptable fit, several fit indices for real-world samples, with a reasonable sample size ranging from 5 to 15 cases per measured variable, were used (Kelloway, 1998; see also Zeigler-Hill & Besser, 2011). The comparative fit index (CFI) should be equal to or higher than .90 for an acceptable fit (Kline, 1998) and equal to or higher than .95 for a good fit (Hu & Bentler, 1999; Joreskog & Sorbom, 1993); a root mean squared error of approximation (RMSEA) equal to or lower than .08 indicates an acceptable fit (Byrne, 1998), whereas RMSEA values close to .06 indicate a good fit (Hu & Bentler, 1999). For all analyses, Mplus 4.1 statistical software (Muthén & Muthén, 1998–2010) with maximum likelihood estimations was used. Given the preponderance of boys in the study, the data did not allow for consideration of child gender effects.

Results

Mediation and Intervening Effects

Base Model

The base model without non-significant paths provided a good fit to the data, $\chi^2(23) = 23.74$, $p = .42$; RMSEA = .016; CFI = 1.00. In this model, all stability paths were significant as well as direct cross-lagged paths from T1 self-criticism to T2 negative affectivity ($B = .24$; $\beta = .30$; $p < .01$; SE = .09) and to BDI2 ($B = .21$; $\beta = .22$; $p < .01$; SE = .07) and from T1 dependency to T2 depression ($B = .15$; $\beta = .15$; $p < .05$; SE = .07) (see Figure 2). The direct cross-lagged effect of self-criticism on negative affectivity suggests that parenting stress could act as a mediator between self-criticism and negative affectivity. For dependency and depression, parenting stress cannot act as a mediator, as there is no direct association between predictor and outcome, but could still potentially be an intervening variable.

Comparison of Full and Partial Mediation Model

The full mediation model, that is, the model containing only stability and indirect effects, yielded a good fit, $\chi^2(22) = 33.01$, $p = .06$; RMSEA = .064; CFI = .97. In this model, the paths from T1 negative affectivity and from parenting stress to T2 dependency were

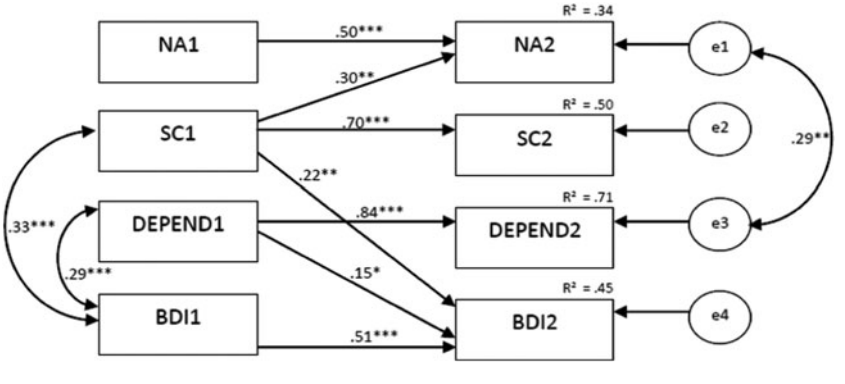

FIGURE 2 Base model with significant stability and cross-lagged paths. *Note*: NA, negative affectivity; SC, self-criticism; DEPEND, dependency; BDI, depressive symptoms. Standardized values are given for the path coefficients, $*p < .05$, $**p < .01$, $***p < .001$ (two tailed test).

not significant, and the path from T1 dependency to parenting stress was marginally significant ($B = .15$; $\beta = .17$; $p = .06$; SE = .09). Removing these non-significant paths from the model resulted in a model with an equally good fit, $\chi^2(34) = 46.41$; $p = .08$; RMSEA = .055; CFI = .97; $\Delta\chi^2 = 13.4$ (12), n.s. However, adding direct paths to this model (the partial mediation model) resulted in a model with a significantly better fit, $\chi^2(22) = 21.13$, $p = .51$, RMSEA = .000; CFI = 1.00; $\Delta\chi^2(12) = 25.28$, $p < .05$. Removing the non-significant paths in this model resulted in a model with an equally good fit, $\chi^2(32) = 37.18$; $p = .24$; RMSEA = .037; CFI = .99; $\Delta\chi^2 = 16.05$ (10), n.s., and this was thus retained as the final model (Figure 3). As can be seen in Figure 3, importantly, the direct, cross-lagged path from T1 self-criticism to T2 negative affectivity ($B = .18$; $\beta = .22$; $p < .05$; SE = .10), and from T1 dependency to T2 self-criticism ($B = -.13$; $\beta = -.14$; $p < .05$; SE = .07), was significant. The following indirect effects (i.e. via parenting stress) were significant: From T1 self-criticism to T2 self-criticism ($p < .01$; SE = .04) and to T2 depression ($p < .01$; SE = .04); from T1 depression to T2 depression ($p < .01$; SE = .04) and to T2 self-criticism ($p < .01$; SE = .04). The indirect effect from T1 self-criticism to T2 negative affectivity (via parenting stress) that was significant in the full mediational model ($p < .05$; SE = .04 and $p < .05$; SE = .04, respectively) became marginally significant after adding the direct paths ($p < .1$; SE = .04), pointing to partial mediation. Similarly, the indirect effect from T1 depression to T2 negative affectivity (via parenting stress) that was significant in the full mediational model ($p < .05$; SE = .04) became marginally significant after adding the direct paths ($p < .1$; SE = .04).

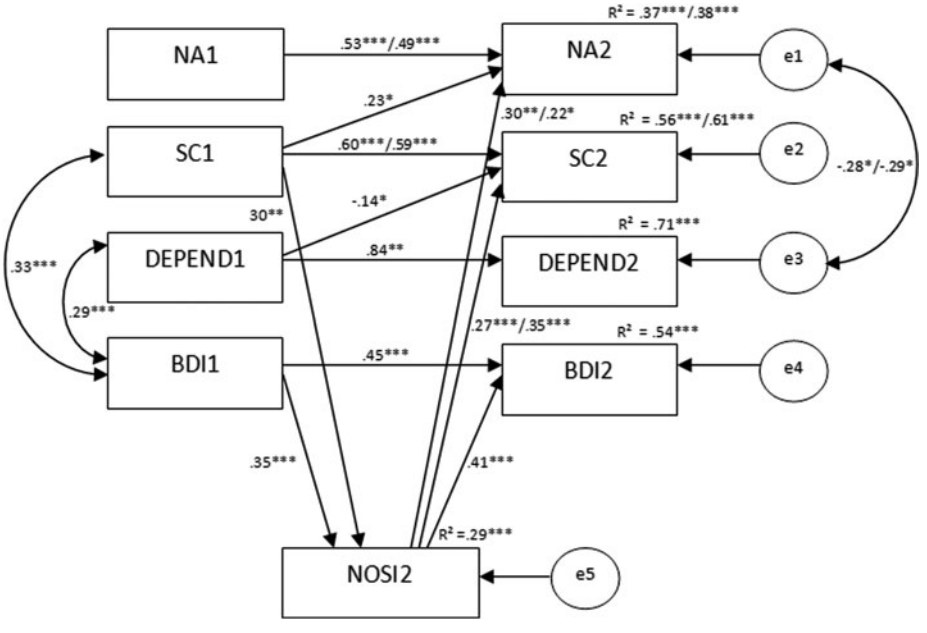

FIGURE 3 Final model with significant indirect and direct cross-lagged paths. *Note*: NA, negative affectivity; SC, self-criticism; DEPEND, dependency; NOSI, parenting stress; BDI, depressive symptoms. Standardized values are given for the path coefficients (if values changed after adding direct paths to the indirect model, values for the indirect model are presented before the forward slash, and for the direct model after the forward slash), °$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$ (two tailed test).

Taking these results together, parenting stress partially mediated the relation between self-criticism at T1 and child negative affectivity at T2: Higher levels of parental self-criticism resulted in higher levels of child negative affectivity over time, both directly and indirectly through heightened levels of parenting stress. Furthermore, parenting stress acted as an intervening variable in the relation between depression and child negative affectivity (however, this effect became marginally significant in the final model). For dependency, no direct or indirect effects were found (the stress-generation effect of dependency in the full mediational model was only marginally significant). Finally, there were no significant reciprocal child-to-parent effects: Child negative affectivity at T1 did not affect parental characteristics over time (see Figure 3).

Discussion

To the best of our knowledge, this is the first study to investigate the relations between impairments in parental self-definition and relatedness, as expressed in high levels of self-criticism and dependency, respectively, and the development of child negative affectivity from infancy to toddlerhood. Moreover, the study employed a longitudinal cross-lagged design, which enabled an examination of possible transactional relations, and a multilevel approach was adopted, taking into account the interdependency between mothers' and fathers' ratings. As hypothesized, parental self-criticism was associated with increases in child negative affectivity from infancy to toddlerhood, replicating the findings of Pesonen et al. (2006), who studied the effect of parental self-criticism on child temperament when the child was 5 years old. Further, our results extend these findings showing that this association was explained both directly and indirectly by stress-generation processes associated with self-criticism (parenting stress acted as a partial mediator). Confidence in these findings is amplified for two reasons. First, we found evidence for direct and indirect relations even when simultaneously modelling concurrent, stability and cross-lagged relations between the study variables. Second, effects of self-criticism were found when controlling for the effects of depression. This is important because previous research has consistently shown that parental depression is associated with increased infant negative affect (e.g., Gartstein et al., 2010) and stress generation (Hammen, 2005).

Also, as expected, self-criticism had a strong direct impact on the development of negative affectivity, consistent with previous research showing that self-criticism is associated with high standards with regard to both the self and others, including one's children, through the use of achievement-oriented psychological control (e.g., Blatt & Homann, 1992; Blatt & Zuroff, 1992; Soenens et al., 2010). Our results show that another route by which self-criticism could have an impact on child vulnerability is through increased parenting stress reinforcing this negative cycle. A possible explanation is that parents high on self-criticism may experience more parenting stress because of their feeling that the relationship with their child is not what they expected it to be. Given the interdependence between mothers' and fathers' self-criticism scores, high self-criticism in both parents may exacerbate these tendencies even further. Moreover, studies have shown that self-criticism is associated with the use of maladaptive coping strategies (Dunkley et al., 2003; Fichman et al., 1999; Mongrain & Zuroff, 1995) and a decreased likelihood to turn to others to share feelings and problems, particularly when under high levels of stress (Dunkley et al., 2003; Luyten et al., 2011), which may lead to further negative effects on their infants through modelling. Dependency, in contrast, had no direct or indirect effect on the development of child negative affectivity, and was associated with only a small stress-generation effect. Although contrary to our assumptions, this is congruent with evidence that dependency is related to levels of perceived social support (Besser et al., 2008)

and more positive feelings during parenthood (Priel & Besser, 1999, 2000), possibly reducing feelings of distress and the negative impact of dependency on child negative affectivity. However, there was a trend for dependency to correlate with child negative affectivity and parenting stress. It is possible that, congruent with other studies (for a review see Besser et al., 2008; Blatt & Luyten, 2009; see Blatt et al., 2005), in this community sample, the dependency subscale of the DEQ taps into more adaptive forms of dependency, which may explain in part why dependency did not have direct or indirect effects on child negativity in the SEM. Research in clinical samples could provide further insights into the "double-edged sword" nature of dependency, that is, its ability to confer both vulnerability and resilience. In clinical samples, more complex dynamics could be at stake. For instance, it has been suggested that more maladaptive levels of dependency are associated with intense needs for merger and union, and parenthood confronts these individuals with their own deep feelings of dependency as well as fears of loss and abandonment (Priel & Besser, 1999). Future research could also benefit from the investigation of different subdimensions of dependency. Bornstein and colleagues, for instance, have empirically identified three subtypes of dependency (Destructive Overdependence, Dysfunctional Detachment and Healthy Dependency) (Bornstein et al., 2003). The measure used in this study (the DEQ) does not allow assessment of different dimensions of dependency. Although a few studies have found evidence for a distinction between subscales assessing more adaptive versus more maladaptive dimensions of dependency (i.e. relatedness versus neediness) in the DEQ, more recent studies (e.g. Bacciochi, Bagby, Cristi, & Watson, 2003; Whiffen, Aubé, Thompson, & Campbell, 2000) found both dimensions to be related to psychopathology or did not find two separate latent factors using confirmatory factor analytic procedures (see McBride et al., 2006). Future research using measures that more clearly tap into this distinction is needed.

Although not the main focus of this study, it is also important to note that there was evidence for reciprocal relations between personality and depression ("intraparental" effects). More specifically, we found direct effects from T1 self-criticism and dependency to T2 self-criticism, as well as indirect effects from T1 self-criticism and depression to T2 depression and self-criticism, through their effects on parenting stress (see Figure 3). These findings are consistent with a "reciprocal causality model" (Shahar, Blatt, et al., 2004), which suggests a particularly maladaptive vicious cycle among these personality dimensions, and especially self-criticism, and depression over time. This probably further feeds into the detrimental effects of these parental characteristics on child negative affectivity over time. These findings are also consistent with research suggesting that adult personality is subject to changes during life changes and role transitions (Caspi et al., 2005; Helson, Kwan, John, & Jones, 2002), such as becoming a parent. Given the reciprocal effects between personality and depression, follow-up research should investigate long-term consequences, especially as depression has been associated with stress generation (Hammen, 2005) and decreased capacity of parents to regulate negative emotions in their children (Goodman & Gotlib, 1999; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). There may be a modelling or a "contagion" effect of negative mood involved (Field, 1986; Field, Healy, Goldstein, & Guthertz, 1990), for example, as evidenced by the finding that mothers and their infants reinforce each other's negative affective expressions (Cohn, Campbell, Matias, & Hopkins, 1990; Reck et al., 2004; Vliegen, 2005). Increased stress in the parent–child interaction could ultimately result in a vicious circle of negative emotions over time.

Finally, and importantly, we did not find child-to-parent effects, that is, infant negative affectivity did not influence parental personality and parenting stress over time. This may

perhaps be explained by the fact that studies in this early developmental period suggest that parent-to-child effects are often larger than child-to-parent effects (see Belsky, Rovine, & Taylor, 1984). Indeed, studies that did find child-to-parent effects were typically done in later developmental periods (e.g., Komsi et al., 2008b; Lengua, Bush, Long, Kovacs, & Trancik, 2008; Rothbart, Ellis, & Posner, 2004; van Zeijl et al., 2007). Research suggests that the main effects of parenting and temperament are stronger in early development, and processes grow more complex as development proceeds (Bronfenbrenner & Morris, 1998; Lengua & Kovacs, 2005).

Limitations and Suggestions for Future Research

The results of this study need to be interpreted in the context of a number of limitations. Because the parents in this study came from a relatively high socioeconomic background, results may not necessarily generalize to other samples. Also, at follow-up, there were significantly more boys (73%) than girls (27%). Furthermore, the sample size did not allow investigation of potential differences as a function of child gender. Clearly, therefore, replication of this study's findings in larger samples is needed. Although this was a prospective study using a cross-lagged panel design, the two-wave design limits the ability to draw strong conclusions with regard to causality (Cole & Maxwell, 2003). In addition, as parenting stress was measured at the same time as child negative affectivity, it is impossible to unequivocally rule out the possibility that parenting stress is a consequence, rather than a predictor, of parental personality and child negative affectivity at T2. Although this latter interpretation is to a certain extent plausible, extant research has clearly shown that the personality dimensions of dependency and self-criticism have considerable mean-level stability and are associated with active stress generation processes, and thus most likely are not merely the consequence of parenting stress (Luyten et al., 2011; Shahar, Joiner, Zuroff, & Blatt, 2004). Future research should, however, employ a multi-wave approach, enabling a more detailed examination of causality and processes (Belsky et al., 2007; Cole & Maxwell, 2003).

Further research is also needed to investigate the potential role of genetic effects, and gene–environment interactions and correlations in particular. Moreover, future research controlling for negative affectivity (neuroticism) in parents is needed. Although extant research suggests that the specific personality dimensions of self-criticism and dependency explain variance over and above negative affectivity (for a review, see Luyten & Blatt, 2011), high levels of negative affect in parents, reflecting a broad temperamental feature, may still influence these associations. Behavioural genetic studies in this context suggest that non-shared environmental factors in particular may play a key role in the intergenerational transmission of temperament and related features (e.g. Lipscomb et al., 2012; Saudino, 2005), and future research should investigate whether this is also the case in the context of relations between self-criticism, dependency, parenting stress and child negative affectivity. Finally, studies could also include observational measures of temperament, such as the Laboratory Temperament Assessment Battery (Goldsmith & Rothbart, 1991; Majdandžić & van den Boom, 2006). Although, congruent with most research on early child development (Pesonen et al., 2006), this study was based on parental reports of infant negative affectivity, one might argue that observer-rated temperament might yield a more "objective" measure of infant negative affectivity. However, parental assessments of infant temperament have been shown to be more valid predictors of child characteristics and parent–child interaction than observer-rated temperament (e.g. Pauli-Pott, Mertesacker, Bade, Haverkock, & Beckmann, 2003; Rubin, Nelson, Hastings, & Asendorpf, 1999). Nevertheless, results must be interpreted in the

light of the fact that this study is based on parent report, and future research using observational measures is needed.

Because we relied on both mother and father reports regarding the same child, we performed analyses that accounted for possible interdependency between data from the mother and father. Indeed, multilevel analyses showed that parental reports concerning child negativity in particular were interdependent, and thus the within-couple perception of infant temperament reflects in part a shared dynamic. Although interdependent to a lesser extent than for child temperament, certain parental characteristics were not entirely independent; a significant amount of the variance in self-criticism was situated at the couple level, and for parenting stress there was a trend in this respect. However, the sample size precluded investigating different models for mothers versus fathers. Consequently, no conclusions can be drawn with regard to potential differential effects of mothers and fathers on child development. In this regard, an Actor–Partner Interdependence Model (Cook & Kenny, 2005) approach, for instance, and by extension an Actor–Partner Interdependence Mediation Model (Ledermann, Macho, & Kenny, 2011) approach are needed to further investigate potential differences between effects of mothers versus fathers (Cummings, Merrilees, & George, 2010).

Finally, results of studies in clinical samples indicate that dependency may be related to depression in complex curvilinear ways (Besser Priel, Flett, & Wiznizer, 2007; Vliegen & Luyten, 2009). Although the bulk of research in this area has focused on linear effects, future research could focus on both linear and nonlinear dynamics involved in the relationship between parental personality and parenting.

Conclusion

This study is the first to address the role of self-criticism and dependency in the prediction of parenting stress and child negative affectivity. Overall, this study suggests that disruptions in the sense of self, as expressed in high levels of self-criticism, may play an important role in explaining the development of child negative affectivity during the earliest developmental stages, both directly and indirectly through effects on parenting stress. Dependency, in contrast, did not show direct or indirect effects on child negative affectivity, and the stress-generation effects associated with dependency were small. Infant negative affectivity did not influence parental personality, depression or parenting stress over time, suggesting that parent-to-child effects are more important than child-to-parent effects in this early developmental stage. These findings shed light on the intergenerational transmission of vulnerability to distress associated with both personality dimensions, with self-criticism having more negative effects than dependency in this community sample of parents and their young children. These results offer important avenues for further research and interventions in the area of parenthood and parenting.

Notes

1. A mediating variable refers to the situation when there is a direct effect from the predictor to the outcome as well as indirect effects through the mediator (see Baron & Kenny, 1986 criteria for mediation). An intervening variable (Hayes, 2009) refers to the situation when there are no direct effects from predictor to outcome, but only indirect effects through the intervening variable.
2. Moreover, we reran the analyses using various other strategies (e.g. first leaving out the theoretically most important paths, deleting paths randomly, etc.), and all options yielded similar results.

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