

Stability and Change in Levels of Depression and Personality

A Follow-up Study of Postpartum Depressed Mothers That Were Hospitalized in a Mother-Infant Unit

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Abstract: This prospective longitudinal study investigated the role of the personality dimensions of dependency and self-criticism in the course of depressive symptoms in a sample of inpatient severely postpartum depressed mothers ($n = 55$). Depressive symptoms and personality were measured during hospitalization and on average 3 1/2 years later. In line with previous research, a considerable subgroup of mothers (39%) reported moderate to severe symptoms of depression at time 2. In addition, although these mothers did not exhibit more depressive episodes during follow-up period compared with mothers with a less chronic course of depression, their depressive episodes were considerably longer, and they had higher levels of severity of depression as well as of dependency and self-criticism at Time 1. Finally, self-criticism, but not dependency, assessed at Time 1, predicted both depression diagnosis and levels of depression at follow-up, supporting a vulnerability model positing that self-criticism confers vulnerability for depression over time.

Key Words: Postpartum depression, follow up, dependency, self-criticism, personality

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Estimates of the prevalence of postpartum depression (PPD) in the general population range between 10% and 20% (Goodman, 2004; Halbreich, 2005; de Tychey et al., 2005). A meta-analysis of 59 studies estimated the average prevalence of PPD to be 13% (O'Hara et al., 1996). Hence, for a considerable number of mothers, the postpartum period is not a positive and happy experience, but a period of considerable mental pain and anguish. Moreover, in a considerable subgroup of mothers, PPD turns into a chronic disorder (McMahon et al., 2008).

One of the first follow-up studies of postpartum depressed mothers, that is relevant in this context, was conducted in a community sample of 114 primiparous mothers by Kumar and Robson 1984. This study not only reported that 14% of these mothers became depressed in the postpartum period, but that 43% of the PPD mothers continued to experience psychological problems 4 years after child birth, suggesting that PPD may have a chronic course in a considerable number of women. Subsequent studies have consistently replicated this finding, reporting that between 25% (Milgrom and Beatrice, 2003) and 31% (Horowitz and Goodman, 2004) of postpartum depressed mothers exhibit signs of chronic depression

up to 2 years after delivery. Ashman et al. (2008), for example, identified 3 classes of depressed mothers in a 7-year follow-up study of postpartum depressed mothers. The first and largest class consisted of 62% of mothers with relatively high levels of stability of mild depressive symptoms during the 7-year follow-up. The second class consisted of 8% of mothers who exhibited chronic and severe depressive symptoms over time. Only 30% of the postpartum depressed mothers demonstrated a decrease of depressive symptoms over time.

Yet, surprisingly, relatively little is known about the factors that predict the course of PPD. This is particularly surprising given the fact that there is increasing evidence for the intergenerational transmission of depression (e.g., Downey and Coyne, 1990; Goodman and Gotlib, 1999, 2002). Several studies suggest that the severity and chronicity of depression rather than a diagnosis of depression are related to children's negative outcomes (e.g., Ashman et al., 2008; Brennan et al., 2000; Sameroff et al., 1984; Teti et al., 1995). However, few studies explored which risk factors are associated with the persistence of depressive symptoms (McMahon et al., 2005).

The present study therefore sets out to investigate (a) the course of depressive symptoms in inpatient severely postpartum depressed mothers and (b) factors that determine the course of PPD in this sample. In particular, this study focuses on the potential role of the personality dimensions of dependency and self-criticism (Blatt et al., 1976; Blatt, 2004, 2006), 2 personality dimensions that have been associated with vulnerability to PPD (see below; for an overview Besser et al., 2008a, b), in explaining different trajectories of PPD over time in mothers who were hospitalized in a mother infant unit.

POSTPARTUM DEPRESSION AND THE PERSONALITY DIMENSIONS OF DEPENDENCY AND SELF-CRITICISM

Research has shown that the personality dimensions of self-criticism and dependency influence the onset and course of PPD (Besser and Priel, 2003; Besser et al., 2007; Priel and Besser, 1999, 2000a, b, 2001, 2002). Self-critical individuals are being described as overly preoccupied with self-definition, control and perfection, while dependent individuals are typically preoccupied with fears for abandonment and loss (Blatt, 1991; Blatt et al., 1976; Blatt, 2004, 2006). Both cross-sectional (Besser and Priel, 2005; Franche, 2001; Franche and Mikail, 1999; Vliegen and Luyten, 2008a, b, c; Vliegen et al., 2009) and longitudinal studies (Besser and Priel, 2003; Besser et al., 2007; Priel and Besser, 1999, 2000a, b, 2001, 2002) have provided consistent evidence for the assumption that self-criticism is strongly positively associated with postpartum depressive symptoms. With regard to dependency, studies suggest a curvilinear association between dependency and PPD (Besser et al., 2007), indicating that moderate levels of dependency protect against depressive symptomatology in the postpartum period, while high and

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low levels of dependency are associated with increased vulnerability to depression. In particular, mothers with low levels of dependency might be unable to enroll and maintain social support (Priel and Besser, 2001), and to relate to their baby (Priel and Besser, 1999), leading to feelings of inadequacy and subsequently depression. At high levels of dependency, in contrast, maladaptive enmeshment and symbiosis may occur, which might lead to feelings of fear of separation and depression. In contrast, moderate levels of dependency might reflect the ability to enroll and maintain social support, and to relate to the baby in adaptive ways, hence protecting against depressive feelings.

Yet, although these studies thus provide compelling evidence for the role of dependency and self-criticism in postpartum depression, none of these studies have investigated the effects of these personality dimensions on the long-term course of postpartum depression. Moreover, almost all of these studies have been done in mothers with relatively mild levels of depression.

Three models of the relationship between the personality dimensions of self-criticism and dependency and depressive symptoms have been proposed (Shahar et al., 2004). The vulnerability model posits that dependency and self-criticism confer increased vulnerability for depressive symptoms over time. A scar model, in contrast, assumes the opposite of the vulnerability model, and essentially proposes that depressive symptoms lead to higher levels of dependency and self-criticism, and thus that these personality dimensions serve as outcomes of depression, rather than predicting increased levels of depression over time. A reciprocal causality model, finally, holds that both personality variables and depressive symptomatology reciprocally influence each other over time. The only study to date that has compared these 3 models was conducted in a sample of adolescents (Shahar et al., 2004). In this study, support was found for the reciprocal causality model involving self-criticism (but not dependency) among girls (but not boys). In particular, self-criticism predicted increased levels of depression over time (vulnerability effect), which in turn led to higher levels of self-criticism (scar effect).

However, these results do not necessarily generalize to PPD mothers. In particular, studies have shown that mothers are characterized by increased psychological flexibility in the postpartum period (Cohen and Slade, 2000; Hopkins et al., 1984; Menos and Wilson, 1998; Stern, 1995), which enables them to reorganize aspects of self and of their interpersonal relatedness with others, to cope with the new developmental tasks of parenthood. Hence, this general flexibility may also lead to greater flexibility, and thus fluctuations, in personality features, and thus the question remains to which extent personality features such as dependency and self-criticism are stable over time in mothers, and whether they influence the course of depression.

In this context, it is important to note that studies in samples other than PPD have found considerable stability of dependency and self-criticism over periods ranging from weeks to up to 3 years in both clinical and nonclinical samples (for a review, see Luyten et al., 2005). Furthermore, follow-up studies of depressed patients have shown that levels of both dependency and self-criticism remain elevated in remitted depressed patients compared with normal controls, even after brief pharmacological and/or psychotherapeutic treatment (Bagby et al., 1994; Frank et al., 1997; Moore and Blackburn, 1997; Zuroff et al., 1999). Hence, together these studies suggest that both dependency and self-criticism are relatively stable personality dimensions that thus may be important predictors of the course of PPD.

From a theoretical point of view, one would expect that a reciprocal causality model might provide the best model to conceptualize the relationship between dependency, self-criticism and the

course of PPD symptoms (Besser et al., 2008a, b). In particular, one would expect that on the one hand, both higher levels of dependency and self-criticism predict increases in depressive symptoms over time in the postpartum period. Mothers who are highly self-critical or dependent are expected to have difficulties in dealing with the experiences of uncertainty, failure and incompetence that are inherent in the early transition to parenthood. Mothers who are highly dependent are expected to have difficulties with being confronted with issues of dependency and separation. On the other hand, however, the experience of depression may also lead to increased levels of dependency and self-criticism. In particular, being depressed may not only serve to increase dependent mother's feelings of helplessness and dependence on others, it may also confirm feelings of being a failure in self-critical mothers.

STUDY AIMS AND HYPOTHESES

Based on the above considerations, the aims of this study are to investigate: (a) the absolute and relatively stability of PPD symptoms as well as the personality dimensions of dependency and self-criticism in inpatient PPD mothers, (b) heterogeneity within the group of inpatient PPD mothers, and (c) to study the relationship between dependency and self-criticism and PPD symptoms over time.

The hypotheses of this study can be summarized as follows:

1. In line with previous studies, in the total sample, we expect a decrease in mean levels of depressive symptoms after the postpartum period, but high relatively stability of depressive symptoms over time. In addition, we expect both dependency and self-criticism to exhibit high relative as well as absolute stability over time.
2. Yet, we expect considerable heterogeneity within the total sample. In particular, we hypothesize that only a small subgroup of mothers shows a more benign course of depression, the majority of mothers are expected to show a more chronic course of depression as expressed in more depressive episodes of longer duration. Moreover, we expect the subgroup of mothers with a more chronic course of depression to be characterized by higher levels of depression and dependency and self-criticism as Time 1.
3. Finally, we expect that a reciprocal causality model provides the best fit in explaining the relationship between dependency, self-criticism and depressive symptoms over time.

METHOD

Participants

Participants were 55 mothers, meeting DSM-IV criteria for major depressive disorder with postpartum onset, who were hospitalized in 2 mother-infant units (Bethaniënhus Zoersel, Belgium, and St Camillus Gent, Belgium). Exclusion criteria for the PPD group were schizophrenia or other psychotic disorders, bipolar disorders or post traumatic stress disorders, severe somatic pathology, and acute suicidal risk. All DSM-IV diagnoses were given by 2 ward psychiatrists of the units, both having more than 20 years of experience with postpartum psychopathology. Response rate for the second wave of the study was 74% ($n = 41$). Of the fourteen mothers who did not participate in the second wave of the study, 6 could not be contacted again, and 8 other mothers refused further participation. Reasons for refusal included wanting to leave the difficult period of hospitalization behind them ($n = 3$), being no longer interested in the study ($n = 3$), too busy ($n = 1$) or their husband did not agree ($n = 1$). The mean maternal age was not significantly different in mothers who participated in the follow-up versus those mothers who did not want to participate further in the follow-up study ($M = 30.71$ years of age, $SD = 5.46$, and $M = 29.39$ years, $SD = 4.40$, respectively; $t = 0.91$, ns). However,

mothers who did not participate in the second wave were less educated than participating mothers ($M = 13.68, SD = 2.69$ and $M = 11.14, SD = 2.98$, respectively; $t = -2.97, p < 0.01$). There was no significant difference between both groups of mothers in child gender ($\chi^2 = 0.15, ns$), and levels of depression ($M = 26.25, SD = 10.85$ and $M = 24.06, SD = 13.30$ respectively; $t = 0.55, ns$), dependency ($M = 0.70, SD = 0.82$ and $M = 0.19, SD = 1.04$, respectively; $t = 1.65, ns$) and self-criticism ($M = 0.25, SD = 1.07$ and $M = 0.28, SD = 1.29$, respectively; $t = -0.08, ns$).

The mean maternal age of the 41 mothers who participated in the follow-up was 29.39 years ($SD = 4.40$) at Time 1 and 32.95 ($SD = 4.51$) years at follow-up. The mean age of their infants was 4.17 months ($SD = 2.30$) at Time 1 and 46.95 months ($SD = 9.24$) at Time 2.

Measurement Instruments

The Depressive Experiences Questionnaire (DEQ; Blatt et al., 1976) consists of 66 items that are based on phenomenological experiences of depressed patients. Subjects have to rate each item on a 7-point Likert-type scale. Initial principal components analyses with VARIMAX rotation in a sample of 660 students yielded 3 factors, i.e., dependency, self-criticism, and efficacy (Blatt et al., 1976). The Dutch version of the DEQ which was used in this study has similar psychometric characteristics as the original DEQ (Luyten et al., 1997). In this study only the Dependency and self-criticism subscales were used, and scores were calculated using the factor scores and loadings of the original DEQ (Blatt et al., 1976). According to Blatt et al. (1976), each of the standardized scores of the 66 items should be multiplied by the factor weight coefficient obtained in the normed sample for the loadings on self-criticism and dependency. In this unit weight scoring system, all 66 items, relative to their factor weight coefficients, contribute to form the final scores of each factor. Thus, internal consistency reliability coefficient is reported only for the entire DEQ questionnaire.

The Beck depression inventory–Second Edition (BDI-II; Beck et al., 1996) measures 21 symptoms of depression. Psychometric characteristics of the Dutch version of the BDI are similar to the original version (Beck et al., 2002). Estimate of internal consistency (Cronbach’s alpha) in this study was 0.94.

A life history calendar (Caspi et al., 1996; Axinn et al., 1999) method was used to collect data with regard to the course of depression. A life history calendar method is designed to collect detailed individual-level event timing and sequencing data within an interview framework. The method encourages recall at both thematic and temporal levels, and increases the accuracy of autobiographical memory (Belli, 1998). In this study, data concerning mother’s reports of depressive episodes using DSM-IV criteria, their timing, and duration during the follow-up period were used, closely following instructions used in the Structured Clinical Interview for Mental Disorders mood disorders section (First et al., 1997). All interviews were conducted by the first author and 3 research assistants with considerable clinical experience.

Procedure

This study was part of a broader naturalistic study of the course of PPD of mothers who were hospitalized for PPD in a mother-infant unit. Mothers were contacted again on average 3 1/2 years (range, 32–57 months) after Time 1 assessment by phone or by mail, and an appointment was scheduled for those mothers who agreed to participate. After written informed consent, all participants received a booklet containing questionnaires including the DEQ and the BDI. The initial study was carried out between April 2003 and April 2005, the follow-up study between May and August 2007, and both studies were approved by the Ethics Committee of the

University of Leuven (Belgium). Participation was voluntarily and full anonymity was guaranteed.

Data Analytic Strategy

Relative and absolute stability of depressive symptomatology and dependency and self-criticism were estimated using Pearson product moment correlations and paired *t*-tests. Repeated measures analysis of variance (ANOVA) was used to investigate group differences in demographical and personality variables, and *t*-tests were used to explore differences in mean levels of dependency and self-criticism at Time 1 and Time 2. Next, we divided the total sample at Time 2 into a depressed versus nondepressed subsample, based on the clinical cut-off score of 13 for depressive symptoms at Time 2 (Beck et al., 1996). Then, *t*-tests were used to compare mean levels of depressive symptoms, dependency and self-criticism between both groups. Hypotheses with regard to the relationship between level of depressive symptoms and personality dimensions over time were examined using odds ratios for categorical variables and Structural Equation Modeling for the dimensional variables (SEM, Hoyle and Smith, 1994). All analyses were conducted using SAS 9.1 (SAS Institute Inc. 2004), except SEM which was conducted using the AMOS 4.01 program (Arbuckle, 1999).

RESULTS

Relative and Absolute Stability of Depression and Personality Variables

As seen in Table 1, highly significant correlations over time indicated considerable relative stability for both depressive symptomatology and personality variables.

In the total sample, levels of depression as well as personality decreased during the follow-up period (Table 2). While this was in line with our expectations with regard to depressive symptomatology, the finding that levels of both dependency and self-criticism decreased during the follow-up period was against expectations.

TABLE 1. Pearson Product Moment Correlations Between Severity of Depression and Personality at Time 1 and Time 2

	Depend Time 2	SC Time 2	BDI Time 2
DEQ-Dep Time 1	0.54*	0.15 <i>ns</i>	0.13 <i>ns</i>
DEQ SC Time 1	0.08 <i>ns</i>	0.65*	0.46**
BDI Time 1	0.39***	0.36***	0.42**

**p* < 0.001.
 ***p* < 0.01.
 ****p* < 0.05.

TABLE 2. Means and Standard Deviations for Severity of Depression and Personality at Time 1 and Time 2

	Time 1 (<i>n</i> = 41)		Time 2 (<i>n</i> = 41)		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
DEQ-Dep	0.19	1.04	−0.35	0.99	3.52*
DEQ SC	0.28	1.29	−0.21	1.45	2.74**
BDI	24.06	13.30	14.28	13.75	4.63*

**p* < 0.001.
 ***p* < 0.01.

Group Differences in Personality and Depressive Symptoms

Next, we divided the sample into mothers who met cut-off criteria for depression at follow-up ($n = 16$) versus mothers with scores below the clinical cut-off at Time 2 ($n = 25$). As expected, mothers who were depressed at Time 2, were not only significantly more depressed at Time 1, but were also more self-critical and more dependent at Time 1 than mothers who did not meet criteria for depression at Time 2 (Table 3).

A repeated measures ANOVA revealed a significant main effect of group ($F(1, 39) = 26.55, p < 0.001$; effect size [partial eta squared]: 0.41, observed power: 0.99) and of time with regard to depressive symptomatology ($F(1, 39) = 16.61, p < 0.001$; effect size: 0.30, observed power: 0.98), as well as an interaction effect between group and time ($F(1, 39) = 7.09, p < 0.01$; effect size = 0.15, observed power: 0.74) (Fig. 1). Although all mothers were depressed at Time 1 ($M = 24.06, SD: 13.30$), the mothers who were depressed at Time 2 had significantly higher levels of depression at Time 1 compared with mothers who were nondepressed at Time 2 ($M = 29.76, SD: 23.64$ and $M = 20.77, SD: 23.64$ for depressed and nondepressed mothers at Time 2 respectively, $t = -2.18, p < 0.05$). In addition, there was a significant higher decrease in depressive symptomatology from Time 1 to follow-up, but only in mothers who were nondepressed at Time 2.

Furthermore, repeated measure ANOVAs revealed a significant main effect of group ($F(1, 39) = 19.09, p < 0.001$; effect size:

0.33, observed power: 0.99) and of time with regard to self-criticism ($F(1, 39) = 5.04, p < 0.05$; effect size: 0.11, observed power: 0.59). For dependency, there was no significant main effect of group ($F(1, 39) = 2.50, ns$; effect size: 0.06, observed power: 0.34) nor of time ($F(1, 39) = 9.63, p < 0.01$; effect size: 0.20, observed power: 0.86). The interaction effects for group and time for dependency and self-criticism did not reach statistical significance. Mothers who were depressed at Time 2 were significantly more self-critical at Time 1 compared with mothers who were depressed at Time 2 ($M = 1.02, SD: 1.22$ and $M = -0.14, SD: 1.14$ for depressed and nondepressed mothers at Time 2 respectively, $t = -3.00, p < 0.01$), while this effect was not found with regard to dependency ($M = 0.36, SD: 1.83$ and $M = 0.08, SD: 1.35$ for depressed and nondepressed mothers at Time 2, respectively, $t = -0.82, ns$).

The number of depressive episodes between Time 1 and Time 2 did not differ between mothers with versus without current depression at Time 2 ($M = 1.88, SD: 1.07$ vs. $M = 2.00, SD: 1.22$ respectively; $t = -0.30, ns$); but the currently depressed mothers had significantly longer episodes ($M = 90$ weeks, $SD: 80$) compared with the mothers without current depression ($M = 42$ weeks, $SD: 45$, $t = -2.39, p < 0.05$).

Moreover, mothers with higher levels of self-criticism at Time 1 were more likely to be depressed at Time 2 (odds ratio: 2.65, 95% confidence interval: 1.29–5.45), while levels of dependency did not predict depression status at Time 2 (odds ratio: 0.93, 95% confidence interval: 0.43–2.02).

For Means and Standard Deviations for Severity of Depression and Personality at Time 1 and Time 2 (see Table 4); and for the Pearson Product Moment Correlations between Severity of Depression and Personality at Time 1 and Time 2 in Mothers in Remission and Mothers with Current Depression at Time 2 (see Table 5).

TABLE 3. Means and Standard Deviations for Severity of Depression and Personality in the Depressed and the Nondepressed Samples at Time 2

	Nondepressed Mothers ($n = 25$)		Depressed Mothers ($n = 16$)		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
DEQ-Dep	-0.63	1.07	0.09	0.68	-2.65*
DEQ SC	-0.97	1.20	0.97	0.93	-5.78**
BDI	5.60	4.43	28.81	11.43	-7.76**

* $p < 0.01$.
** $p < 0.001$.

Structural Equation Model of the Relationship Between Personality and Depressive Symptoms

As seen in Table 1, self-criticism, but not dependency, at Time 1 correlated with depressive symptoms at Time 2. Consequently, only self-criticism was included in the SEM model. We used a crossed-lagged model to explore the causal relationships between self-criticism and severity of depression at Time 1 and self-criticism and depression at Time 2. To explore whether self-criticism at Time 1 predicted depression symptoms at Time 2, while assessing measurement errors in the dependent variables and con-

FIGURE 1. Mean differences for group and time.

Means of depressive symptomatology

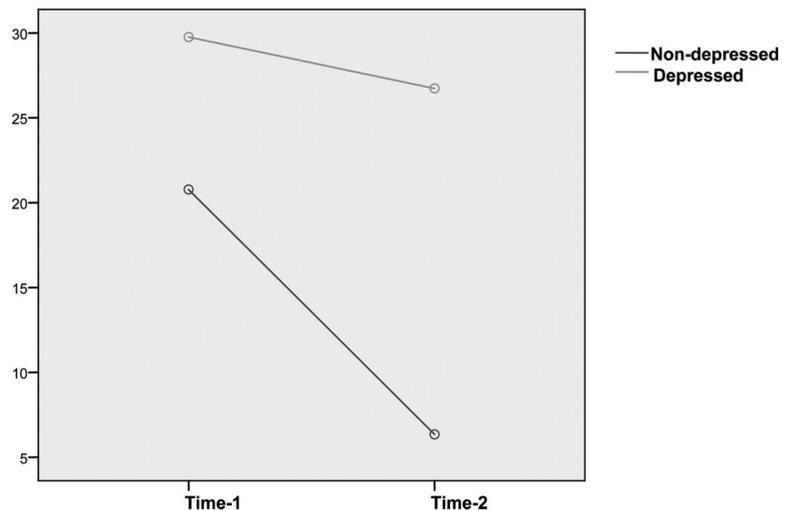


TABLE 4. Pearson Product Moment Correlations Between Severity of Depression and Personality at Time 1 and Time 2 in Mothers in Remission and Mothers With Current Depression at Time 2

	Depend Time 2	SC Time 2	BDI Time 2
Mothers in remission at Time 2 (n = 25)			
DEQ-Dep Time 1	0.68*	0.06 ns	-0.10 ns
DEQ SC Time 1	-0.08 ns	0.47**	0.18 ns
BDI Time 1	0.28 ns	0.20 ns	0.21 ns
Mothers with current depression at Time 2 (n = 16)			
DEQ-Dep Time 1	0.32 ns	0.20 ns	0.18 ns
DEQ SC Time 1	-0.18 ns	0.62**	0.16 ns
BDI Time 1	0.37 ns	0.16 ns	0.30 ns

*p < 0.001.
**p < 0.01.

TABLE 5. Means and Standard Deviations for Severity of Depression and Personality at Time 1 and Time 2

	Time 1		Time 2		t
	M	SD	M	SD	
Mothers in remission at Time 2 (n = 25)					
DEQ-Dep	0.08	1.35	-0.63	1.07	6.82*
DEQ SC	-0.14	1.14	-0.97	1.20	4.40*
BDI	20.77	15.54	5.60	4.43	3.21*
Mothers with current depression at Time 2 (n = 16)					
DEQ-Dep	0.36	1.83	0.09	0.68	0.69 ns
DEQ SC	1.02	1.22	0.97	0.93	0.81 ns
BDI	29.76	23.64	28.81	11.43	0.25 ns

*p < 0.001.

trolling for the association between the self-criticism and depression at both times, 2 path models were constructed using structural equation modeling (SEM; Holey and Smith, 1994). In these 2 models, both self-criticism and depression at Time 1 were the predictors, and self-criticism and depression at Time 2 were the criteria. In addition, we controlled for the association between self-criticism and depression at Time 1, and for their shared measurement error terms at Time 2 (Fig. 2).

We first examined the full model, delineating the direct effects (i.e., the effect of self-criticism at Time 1 on self-criticism at Time 2, and the effect of depressive symptoms at Time 1 on depressive symptoms at Time 2) and the cross-lagged effects (i.e., the effects of the depressive symptoms at Time 1 on self-criticism at Time 2 and the effects of self-criticism at Time 1 on depressive symptoms at Time 2), and controlling for the predictors' associations and outcome error terms (Fig. 2). This model showed significant stability for self-criticism and for severity of depression. Moreover, at each time point, severity of depression and self-criticism were highly correlated. Finally, beyond these significant effects, self-criticism at Time 1 significantly predicted severity of depression at Time 2. Yet, the path from severity of depression at Time 1 to self-criticism at Time 2, assessing possible scar effects, was not significant. This model explained 43% and 26% of the variance in postpartum personality and depression respectively (Fig. 2). As this model had zero degrees of freedom, it had a perfect fit.

To obtain the most parsimonious model and to allow the evaluation of the overall goodness-of-fit of the path model, we calculated a final model in which we removed the nonsignificant paths found in the full model. This model fitted the data very well: *chi square* = 0.02, *df* = 1, *p* = 0.90, *chi square/df* = 0.02, *GFI* = 1.0, *AGFI* = 0.99, *CFI* = 1.0, *RMSEA* = 0.000. In this model, self-criticism at Time 1 predicted increases in depressive symptoms over time, while depression levels measured at Time 1 did not predict changes in self-criticism over time.

DISCUSSION AND CONCLUSIONS

PPD often is considered to be confined to the phase of early motherhood. Consequently, most research concerning PPD focuses only on the postpartum period. Yet, in line with earlier research (Milgrom and Beatrice, 2003; Horowitz and Goodman, 2004; Ashman et al., 2008), results of this study confirm that a considerable subgroup of mothers continue to suffer from depression. In this study, 39% of mothers who were hospitalized because of PPD in a mother-infant unit, report moderate to severe symptoms of depression on average 3 years after they were admitted. Moreover, these mothers had been depressed during on average 90 weeks, which was more than twice as much as in the sample of mothers who were in remission at follow-up.

Further analyses suggested that high levels of self-criticism at Time 1 were related to both depression diagnoses and higher levels of severity of depression at follow-up, supporting a vulnerability model of self-criticism as a personality factor that confers vulnerability for depression as conceptualized by Shahar et al. (2004). Hence, taken together, these findings are in line with previous studies showing that high levels of self-criticism are particularly maladaptive. Yet, to the best of our knowledge, this is the first study to show that self-criticism is related to increased levels of depression

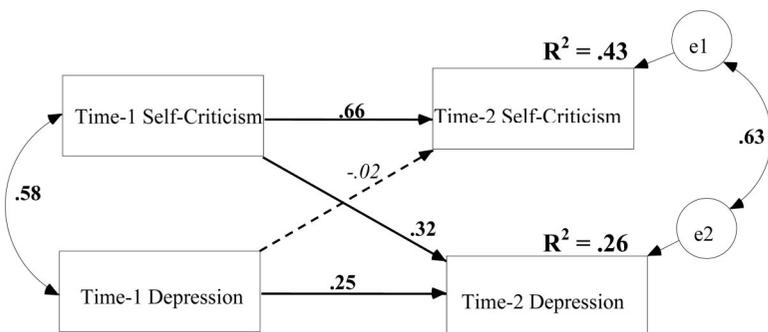


FIGURE 2. The Crossed-Lagged Model. Rectangles indicate measured variables, and small circles (e) reflect residuals. Bidirectional arrows depict associations/correlations and unidirectional arrows depict hypothesized directional, or "causal," links. Standardized maximum likelihood parameters are used. Bold estimate is statistically significant.

diagnosis as well as severity of depression after the postpartum period in a sample of severely postpartum depressed mothers who were hospitalized. Dependency, in contrast, did not predict higher levels of depression over time. These findings are in line with previous studies suggesting that PPD is associated with having high standards and excessive self-criticism, but less with feelings of dependency, which might actually in part protect against feelings of depression in the postpartum period (Besser and Priel, 2003; Franche, 2001; Franche and Mikail, 1999; Priel and Besser, 1999, 2000a).

From a clinical perspective, these findings suggest that clinicians should particularly attend to those mothers who are highly self-critical, and should address not only their depressive symptoms, but their self-critical attitudes as well. Moreover, the clinical importance of these findings lies not only in the fact that they show that PPD may become recurrent and even chronic for many mothers, but also that this may jeopardize the development of their children. Elevated levels of depression are likely to have a strong influence on the relationship between mother and her baby (Edhborg et al., 2001; Goodman and Gotlib, 1999). It has been shown that children of depressed parents are 3 times more likely to experience an episode of depression than children of nondepressed parents (Beardslee et al., 1998; Goodman and Gotlib, 1999, 2002), and estimates of psychiatric disorders more generally range from 41% to 77% among children of depressed parents (Goodman and Gotlib, 2002). In addition, the younger the child is when faced with parental mood disorders, the higher the risk of developing depressive symptoms and other psychiatric disorders later in childhood or in adult life (Garber and Flynn, 2001; for a review, see Vliegen et al., 2005). Moreover, congruent with results found in this study, studies on the intergenerational transmission of depression in adolescents have shown that highly self-critical attitudes in parents explain not only higher levels of self-criticism, but also predict higher levels of depression in their offspring (Soenens et al., 2008) as well as insecure models of attachment in the next generations (Besser and Priel, 2005). Consequently, future studies should further address the potential role of high parental self-criticism in the intergenerational transmission of depression.

In this study, depressive symptoms were measured on average 3 years after hospitalization due to PPD. To map the course of PPD in more detailed, disentangling chronicity and recurrence, further multi-wave studies are needed. A second limitation of this study is that it was conducted in an inpatient sample, and thus results may not generalize to other samples. Finally, as this was a naturalistic setting, results of this study may have been influenced by the treatments these mothers received during and after admission.

Yet, despite these limitations, the present study is the first to show that self-criticism is related to increased levels of depression diagnosis as well as severity of depression after the postpartum period in a sample of severely postpartum depressed mothers who were hospitalized in a mother-infant unit.

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