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**Exploring the paths between dysfunctional attitudes towards motherhood and postpartum depressive symptoms: The moderating role of self-compassion**

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**Abstract**

Better understanding how cognitive processes operate to influence women's depressive symptoms during the postpartum period is crucial for informing preventive and treatment approaches. The present study aimed to examine the relationship between women's dysfunctional attitudes towards motherhood and depressive symptoms, considering the mediating role of negative automatic thoughts and the moderating role of self-compassion. A sample of 387 women in the postpartum period cross-sectionally answered a set of questionnaires to assess dysfunctional attitudes towards motherhood, negative automatic thoughts (general and postpartum-specific), depressive symptoms and self-compassion. Women with clinically significant depressive symptoms presented more dysfunctional attitudes towards motherhood, more frequent negative thoughts and lower self-compassion. More dysfunctional beliefs about others' judgments and about maternal responsibility were associated with higher depressive symptoms, and this effect occurred through both general and postpartum-specific thoughts related to the metacognitive appraisal of the thought content. Moreover, these relationships occurred only when women presented low or moderate levels of self-compassion. These results highlight the need to comprehensively assess women's cognitive variables during the postpartum period with appropriate measures, for the early identification of women with more dysfunctional beliefs about motherhood, who may be at higher risk of depression. Moreover, preventive/treatment approaches should aim not only to challenge women's pre-existing dysfunctional beliefs but also to promote a more self-compassionate attitude towards themselves.

**Key Practitioner Messages**

- Women's more dysfunctional attitudes towards motherhood (particularly related with others' judgments and with maternal responsibility) may lead to more frequent negative automatic thoughts, and these negative thoughts may go beyond the postpartum specific context;
- The relationship between women's more dysfunctional attitudes towards motherhood and depressive symptoms seem to occur via negative automatic thoughts, particularly related with the metacognitive appraisal of the thoughts' content;
- Higher self-compassion levels buffers the relationship between women's attitudes towards motherhood and postpartum depressive symptoms;
- Preventive and treatment approaches for postpartum depression should address the reappraisal of women's beliefs about motherhood and the promotion of a more self-compassionate attitude;

### **Introduction**

Postpartum depression (PPD) is one of the most common clinical conditions during the postpartum period, with prevalence rates of 13-20% (Gavin et al., 2005; Gaynes et al., 2005). The pervasive nature of postpartum depressive symptoms (Horowitz & Goodman, 2004) may impair maternal health and well-being (Muzik & Borovska, 2010) but also compromise the infant's development (Grace, Evindar, & Stewart, 2003; Kingston, Tough, & Whitfield, 2012) and mother-child interactions (Field, 2010; Tronick & Reck, 2009).

PPD is not qualitatively different from depressive episodes occurring in other periods of life in terms of its main symptoms, evolution and prevalence. However, it has several specificities, such as a well-defined precipitating event (the infant's birth and the associated childcare demands) or specific care needs that justify the use of this diagnostic term (Riecher-Rossler & Hofecker, 2003). Moreover, the occurrence of PPD may have underlying mechanisms that are different from the ones explaining depression in other periods of life. For example, Cooper and Murray (1995) identified a group of women who present depressive symptoms only during the postpartum period (i.e., without prior non-postpartum mood disorder), and found that they were at a greater risk for subsequent PPD, but not for subsequent non-postpartum depression, which highlight

the specificities of PPD. Therefore, despite the extensive body of theoretical and empirical knowledge that emphasizes the important role of cognitive processes in the development and maintenance of depressive symptoms in general depression (Beck, 1987; Beck, Rush, Shaw, & Emery, 1979), it is important to better understand how they operate to influence women's depressive symptoms during the postpartum period.

Beck's Cognitive Theory of Depression (Beck, 1987; Beck et al., 1979) proposes that two levels of cognitions – dysfunctional attitudes or beliefs and negative automatic thoughts – contribute to the development and maintenance of depression. Dysfunctional attitudes may be understood as predisposing or vulnerability factors for the occurrence of depression (Beck, 1987; Beck et al., 1979), with depressive symptoms resulting from an interaction between specific types of dysfunctional attitudes or beliefs and stress-inducing events that are congruent with the important components of these beliefs (Coyne & Whiffen, 1995). When activated by stress-inducing events, dysfunctional beliefs may influence the way individuals interpret the events, leading to the occurrence of negative automatic thoughts (Beck, 1987; Beck et al., 1979), which have an important role in the exacerbation and maintenance of depressive symptoms. Specifically, some studies have found evidence of the mediating role of negative automatic thoughts in the relationship between general dysfunctional attitudes and depression in the general population (David, Ghinea, Macavei, & Kallay, 2005; Kwon & Oei, 1992; Palmer, 2015).

Furthermore, more recent theoretical models have added to the understanding of the occurrence of depressive symptomatology in the general population by highlighting the relevant role of other constructs, such as self-compassion. Self-compassion may be understood as an individual capacity to have a kind and caring attitude towards oneself in the face of personal suffering, to recognize that all individuals share a common human condition (in which feelings of pain, failure and inadequacy are included), and to acknowledge and desire to alleviate the individual's suffering in a non-judgmental way (Neff, 2003a, 2009, 2012). As described by Neff (2003a), self-compassion entails three dimensions: Selfkindness (i.e., the tendency to face difficulties, failures and pain with a caring and understanding attitude, rather than being self-critical and judgmental), Common Humanity (i.e., the tendency to acknowledge that ones' painful experiences are part of a common human condition, rather than feeling isolated, ashamed, or different), and Mindfulness (i.e., the tendency of being aware of painful emotions and experiences in a balanced manner, instead of ignoring, avoiding, or over-identifying

with one's negative experiences). When facing stress-inducing events, self-compassionate individuals tend not to avoid or suppress negative experiences and feelings or to perpetuate them with self-critical evaluations; rather, they tend to non-judgmentally accept them as part of a common shared experience, which allows proactive and effective behaviors (Neff, 2003a, 2009, 2012).

Several studies have demonstrated that self-compassion is an indicator of psychological health, with higher self-compassion being associated with greater psychological well-being (Akin & Akin, 2015; Neff, Rude, & Kirkpatrick, 2007) and less depression, anxiety and stress (Krieger, Altenstein, Baettig, Doerig, & Holtforth, 2013; MacBeth & Gumley, 2012; Neff, 2003a). More recently, some studies have sought to understand the relationship between self-compassion and cognitive processes. Specifically, studies conducted in the general population have shown that higher levels of self-compassion were associated with a lower frequency of negative automatic thoughts (Akin, 2012; Mantzios & Wilson, 2014; Mantzios, Wilson, Linnell, & Morris, 2015). Moreover, two studies with the general population have found that self-compassion could have a buffer effect in the relationship between dysfunctional beliefs and depressive symptoms. First, Wong and Mak (2013) found that self-compassion moderated the relationship between cognitive-personality vulnerability styles (e.g., autonomy, self-criticism) and depression and that this relationship was weaker in individuals with high levels of self-compassion. Second, Podina, Jucan and David (2015) showed a positive and significant association between dysfunctional beliefs and depression only when individuals presented low or moderate levels of self-compassion, and this relationship was non-significant in the presence of high self-compassion levels. These results suggest that self-compassion may help individuals better manage their dysfunctional attitudes or beliefs, which may translate into lower depression levels (Podina et al., 2015). Despite this evidence, further research is needed to better understand how self-compassion may influence the pathway from dysfunctional attitudes to depression, namely when this relationship occurs through negative automatic thoughts.

Moreover, despite the existing research in the general population, given the specific features of PPD, more effort should be devoted to examining the nature of the relationships between cognitive variables (i.e., dysfunctional beliefs and negative automatic thoughts) in the postpartum period, as well as the role of self-compassion as a

buffer on these relationships, as these may be the target of empirically driven psychological interventions.

In the context of perinatal distress, the role of specific dysfunctional attitudes or beliefs (i.e., motherhood-related beliefs, characterized by themes of failure, responsibility, and personal inadequacy in the maternal role and maternal role idealization; Church, Brechman-Toussaint, & Hine, 2005; Sockol, Epperson, & Barber, 2014) has been advocated in recent theoretical models (Wenzel & Kleiman, 2015). In fact, while some studies found that general dysfunctional beliefs did not appear to influence the development of postpartum depressive symptoms (Gotlib, Whiffen, Wallace, & Mount, 1991; O'Hara, Rehm, & Campbell, 1982), recent research has shown that dysfunctional beliefs or attitudes towards motherhood were associated with the occurrence of depressive symptoms in the postpartum period (Church et al., 2005; Grazioli & Terry, 2000; Madar, 2013; Phillips, Sharpe, Matthey, & Charles, 2010; Sockol et al., 2014). Specifically, a study conducted by Phillips et al. (2010) showed that while currently depressed women in the postpartum period presented higher levels of dysfunctional beliefs towards motherhood, non-depressed women with a history of prior depression were characterized by a general depression vulnerability but lower dysfunctional beliefs about motherhood.

Furthermore, the role of negative automatic thoughts has also been acknowledged in recent etiological models of perinatal distress (Milgrom, Martin, & Negri, 1999; Wenzel & Kleiman, 2015). In fact, the occurrence of negative and intrusive automatic infant-related and motherhood-related thoughts is common to the majority of postpartum women, even in the absence of depressive symptomatology (Hall & Wittkowski, 2006), although there is also evidence that women with depressive symptoms present more intense and frequent negative thoughts, often related with perceptions of inadequacy in caring for the infant and fear of being alone with the infant (Jennings, Ross, Popper, & Elmore, 1999). Congruently, studies indicate a significant positive association between postpartum negative automatic thoughts and depressive symptoms (Cantilino, 2009; Hall & Papageorgiou, 2005; Hildebrandt, 2013). However, to our knowledge, no studies have examined the relationship among dysfunctional beliefs about motherhood, negative automatic thoughts and depressive symptoms among postpartum women, or have determined whether only postpartum-specific negative thoughts or both postpartum-specific and general negative thoughts play a role in the occurrence of depressive symptoms during the postnatal period. Moreover,

although there is some evidence that self-compassion can have a protective effect on the development of depressive symptomatology in the postpartum period (Cohen, 2010), there is still much to explore about the role of self-compassion in personal reactions to relevant events, such as the birth of a child.

Given the aforementioned gaps and the specificities of the postnatal period, this study focused on better examining the mechanisms involved in the occurrence of depressive symptoms during the postpartum period, namely the role of cognitive variables such as dysfunctional attitudes and negative automatic thoughts. Specifically, the study had two main aims: 1) to examine the direct and indirect effects, via negative automatic thoughts (general and postpartum-specific thoughts), of women's dysfunctional attitudes towards motherhood on their depressive symptoms and 2) to examine the buffer effect of self-compassion in this relationship, that is whether the strength of the relationships was moderated by women's self-compassion levels.

## **Methods**

### **Participants**

The sample comprised 387 women in the postpartum period ( $M = 3.95$  months postpartum,  $SD = 3.25$ ). The women's mean age was 32.30 years ( $SD = 4.23$ ). The majority of women were currently married/living with a partner ( $n = 346$ , 89.4%). Most women were currently employed ( $n = 308$ , 81.1%), had completed higher ( $n = 192$ , 49.6%) or secondary education ( $n = 103$ , 26.6%), and belonged to a middle socioeconomic status ( $n = 335$ , 86.6%). In the sample, 113 women (29.2%) presented clinically significant levels of depressive symptoms.

### **Procedures**

This study was part of a cross-sectional study conducted in Portugal, using an Internet survey that aimed to understand women's cognitive and emotional experience during the postpartum period. Eligibility criteria to participate in the study were: i) being a woman in the postnatal period (up to 12 months postpartum); ii) being 18 years or older; and iii) having a level of literacy that allowed them to understand the assessment protocol. The study was approved by the Ethics Committees of Blind for review. The participants' recruitment occurred both face-to-face (participants were contacted by the research team during their postpartum hospitalization at the Maternity Blind for review) and online (the study was advertised on social media websites, e.g.,

Facebook, and on websites/forums focusing on pregnancy childbirth). In both cases, the study goals were presented and a weblink to the internet survey (hosted by LimeSurvey®) was provided. After accessing the weblink, participants were given information about the study's goals and about the participants' (e.g., voluntary nature of the participation, ability to drop out of the study at any time) and the researchers' roles (e.g., guarantee of anonymity and confidentiality), followed by the informed consent of participants (with the question "*Do you agree to participate in this study?*"). Only individuals who agreed to the study's conditions completed the survey. Access to the survey was secure, and the survey software prevented the same user from completing the survey more than once. Data collection took place between December 2015 and March 2016.

## **Measures**

### ***Sociodemographic information.***

Information concerning participants' sociodemographic characteristics (e.g., age, marital status, educational level, professional situation, and socioeconomic status) and data on their infant (infant's age) was collected through a self-report instrument developed by the authors.

### ***Dysfunctional attitudes toward motherhood.***

To assess dysfunctional attitudes toward motherhood, the Portuguese version of the Attitudes Toward Motherhood Scale (AToM; Sockol et al., 2014; Portuguese version: Costa, Rodrigues, Canavarro, & Fonseca, in press) was used. The AToM is a self-report measure comprising 12 items, answered on a 6-point Likert scale (from 0 = *Always Disagree* to 5 = *Always Agree*), and it is organized in three dimensions: Beliefs related to Others' Judgments (e.g., "*If my baby is crying, people will think I cannot care for him/her properly*"), Beliefs related to Maternal Responsibility (e.g., "*Good mothers always put their baby's needs first*"), and Beliefs related to Maternal Role Idealization (e.g., "*It is wrong to have mixed feelings about my baby*"). Higher scores indicate more dysfunctional attitudes toward motherhood. The Portuguese version of the AToM scale presents good levels of internal consistency ( $\alpha = .84$  for the total scale) and convergent validity with other measures (Costa et al., in press). In our sample, the Cronbach's alpha values ranged from .68 (Beliefs related to Maternal Responsibility) to .90 (Beliefs related to Maternal Role Idealization).

### ***Negative thoughts.***

To assess the frequency of postpartum-specific negative automatic thoughts, the Portuguese version of the Postnatal Negative Thoughts Questionnaire (PNTQ; Hall & Papageorgiou, 2005; Portuguese version: Rodrigues, Costa, Canavarro, & Fonseca, in press) was used. The PNTQ is a self-report questionnaire comprising 17 items, answered on a 4-point scale (from 0 = *Never* to 3 = *Almost Always*). The PNTQ evaluates the frequency of specific postnatal negative thoughts through two dimensions: Baby-related and Motherhood Negative Thoughts (BRMNT; the content of negative thoughts, e.g., “*I don’t want to be alone with my baby*”, “*I am a bad mother*”) and Appraisals of Cognition, Emotion, and Situation (ACES; metacognitive appraisal of thought content; e.g., “*It’s not normal to think the way I do*”, “*There must be something wrong with me*”). Higher scores are indicative of a higher frequency of postpartum negative automatic thoughts. The Portuguese version of the PNTQ scale presents good psychometric indicators, both in terms of reliability (total:  $\alpha = .91$ , ACES factor:  $\alpha = .90$  and factor BRMNT:  $\alpha = .75$ ) and validity (Rodrigues et al., in press). In our sample, Cronbach’s alpha ranged from .75 (BRMNT) to .90 (ACES).

To assess the frequency of general negative automatic thoughts, the Portuguese version of the Automatic Thoughts Questionnaire – Revised (ATQ-R; Kendall, Howard, & Hays, 1989; Portuguese version: Pereira, Matos, & Azevedo, 2014) was used. The ATQ-R assesses the frequency of negative and nonnegative self-statements related to depression, and it has been reported as a measure that successfully discriminates between depressed and non-depressed subjects in clinical and nonclinical populations. Participants are asked to rate each item on a 5-point Likert scale (from 0 = *Not at all* to 4 = *All the time*), according to how frequently each thought has occurred to them during the past week. The ATQ-R comprises two dimensions, one comprising negative automatic thoughts (e.g., “*Nothing gives me pleasure anymore*”, “*I feel the world is against me*”) and one comprising positive automatic thoughts (“*I feel very happy*”). In the present study, only the dimension assessing negative automatic thoughts was used. Higher scores indicate more frequent negative cognitions. The Portuguese version of the ATQ-R scale has good reliability ( $\alpha \geq .89$ ) and validity indicators (Pereira et al., 2014). In our sample, Cronbach’s alpha was .96.

### ***Depressive symptoms.***



To assess the presence of depressive symptoms, the Portuguese version of the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987; Portuguese version: Areias, Kumar, Barros, & Figueiredo, 1996; Augusto, Kumar, Calheiros, Matos, & Figueiredo, 1996;) was used. The EPDS is a widely used 10-item screening scale for postpartum depression. Women were asked to rate how they feel over the previous seven days concerning several symptoms (e.g., sadness, tearfulness), using a 4-point Likert scale. In Portuguese validation studies, good internal consistency ( $\alpha = .85$ ), test-retest fidelity ( $\alpha = .75$ ) and external validity ( $r = .86$ ) were found. Moreover, a score higher than 9 indicates a possible depressive disorder (Areias et al., 1996; Augusto et al., 1996; Figueiredo, 1997). The low threshold for EPDS allows the identification of women that may present some significant postnatal distress symptoms that may be worthy of further assessment, rather only women with an established clinical diagnosis of depression. In our sample, Cronbach's alpha was .88.

### ***Self-Compassion.***

The Self-Compassion Scale (SCS; Neff, 2003b; Portuguese version: Castilho, Pinto-Gouveia, & Duarte, 2015) was used to assess women's self-compassion levels. The SCS is a self-report measure comprising 26 items, answered on a 5-point Likert scale (from 1 = *Almost Never* to 5 = *Almost Always*). The SCS is organized in six dimensions: Self-Kindness (e.g., "*I'm kind to myself when I'm experiencing suffering.*"), Mindfulness (e.g., "*When something painful happens I try to take a balanced view of the situation*"), Common Humanity (e.g., "*When things are going badly for me, I see the difficulties as part of life that everyone goes through*"), Self-judgment (e.g., "*I'm disapproving and judgmental about my own flaws and inadequacies*"), Isolation (e.g., "*When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world*") and Over-identification (e.g., "*When I'm feeling down, I tend to obsess and fixate on everything that's wrong.*"). The mean scores on the six dimensions can be averaged (after reverse-coding negative items) to create an overall self-compassion score. Higher scores indicate higher levels of self-compassion. Regarding its psychometric properties, the Portuguese version of the scale presents high levels of internal consistency for the total score ( $\alpha = .89$ ) and reasonable values for the subscales. Temporal stability also proved to be acceptable (Castilho & Pinto-Gouveia, 2006). In our sample, Cronbach's alpha was .94.

## Statistical Analyses

Statistical analyses were performed using the Statistical Package for the Social Sciences (IBM SPSS, version 22.0; IBM SPSS, Chicago, IL). Descriptive statistics were computed for sociodemographic and study variables. Based on the EPDS cutoff scores (EPDS > 9), women were assigned to two groups: women presenting clinically significant depressive symptoms (EPDS > 9) and women not presenting clinically significant depressive symptoms (EPDS ≤ 9). Comparison tests (Student's *t* tests or MANOVAs, followed by a univariate analysis of variance when the multivariate effect was significant) were conducted to compare the study variables as a function of the presence/absence of clinically significant depressive symptoms. In MANOVAs, the Pillai's Trace was used because it is the most appropriate test statistic when we have uneven group sizes (Field, 2009). Moreover, bivariate Pearson correlations were conducted to characterize the study variables. Effect size measures were presented for the analyses (small:  $\eta^2 \geq .01$ ,  $d \geq .20$ ,  $r \geq .10$ ; medium:  $\eta^2 \geq .06$ ,  $d \geq .50$ ,  $r \geq .30$ ; large:  $\eta^2 \geq .14$ ,  $d \geq .80$ ,  $r \geq .50$ ; Cohen, 1988).

To explore the direct and indirect effects of dysfunctional attitudes towards motherhood on women's depressive symptoms, three mediation models ("model 4") were estimated using the SPSS version of the PROCESS Macro (Hayes, 2013). In these models, dysfunctional attitudes towards motherhood acted as the independent variable (one model was estimated for each dimension of dysfunctional attitudes towards motherhood – Beliefs related to Others' Judgments, Beliefs related to Maternal Responsibility, and Beliefs related to Maternal Role Idealization – with the remaining two dimensions being introduced as covariates in the model), negative automatic thoughts (postpartum-specific and general) acted as the mediators, and depressive symptoms acted as the dependent variable. The mediation models (model 4) were estimated using a procedure that relies on nonparametric bootstrapping (5000 samples). Bootstrapping is a way of estimating statistical parameters from the sample by means of resampling with replacement. Bootstrapping is a non-parametric approach and it does not require the assumption of normality of the sampling distribution (Hayes, 2009), which is particularly relevant in the present study because some of the assessed constructs (e.g., dysfunctional beliefs towards motherhood, depressive symptoms) have a pathological nature and were not expected to be normally distributed in a community sample of women in the postpartum period. The major assumption behind bootstrapping is that the sample distribution is a good approximation to the population distribution

(i.e., the sample is representative of the population). Bias-corrected and accelerated confidence intervals (CI) were created. An indirect effect was significant if zero was not included within the lower and upper CIs.

Finally, conditional process analyses were conducted with the PROCESS to examine whether the hypothesized indirect effects of dysfunctional attitudes towards motherhood on depressive symptoms through negative automatic thoughts were moderated by the women's levels of self-compassion (low, moderate or high-levels of self-compassion). Hence, a moderated mediation model was estimated ("model 59"), in which the moderator (self-compassion) was hypothesized to affect the path between dysfunctional attitudes towards motherhood and negative automatic thoughts (path a), the path between negative automatic thoughts and depressive symptoms (path b), and the direct effect from dysfunctional attitudes towards motherhood to depressive symptoms (path c'). Values for the quantitative moderator (self-compassion) are the mean [moderate self-compassion] and minus/plus one standard deviation from mean [low and high self-compassion, respectively]. Indirect effects were again examined using a bootstrapping procedure (5000 samples).

## Results

### **Preliminary results: Comparison between women presenting and women not presenting clinically significant symptoms**

Both the cognitive variables (dysfunctional attitudes towards motherhood and negative thoughts) and self-compassion were compared across women presenting or not presenting clinically significant depressive symptoms. Descriptive statistics and univariate analyses are presented in Table 1.

[Insert\_Table\_1\_about\_here]

Women who presented clinically significant depressive symptoms had more dysfunctional attitudes towards motherhood (Pillai's Trace = .14,  $F_{3,383} = 20.99$ ,  $p < .001$ ,  $\eta^2 = .14$ ) than women without clinically significant depressive symptoms, namely on the dimensions Beliefs related to Others' Judgments and Beliefs related to Maternal Responsibility. Moreover, women with clinically significant depressive symptoms presented more frequent postpartum-specific negative automatic thoughts (Pillai's Trace = .27,  $F_{2,384} = 71.55$ ,  $p < .001$ ,  $\eta^2 = .27$ ) in both dimensions, and also more frequent general automatic negative thoughts, and lower levels of self-compassion (see Table 1).

**Preliminary results: Associations between the variables**

Bivariate correlations were calculated to examine the pattern of direct relationships between the variables and are reported in Table 2.

[Insert\_Table\_2\_about\_here]

Globally, significant and positive associations were found between the two dimensions of dysfunctional attitudes towards motherhood (Beliefs related to Others' Judgements and Beliefs related to Maternal Responsibility), postpartum negative thoughts, general negative thoughts and depressive symptoms, and significant negative associations were found between self-compassion and the remaining study variables. The associations between the dimension Beliefs related to Maternal Role Idealization and the remaining study variables were weaker and sometimes non-significant.

**Examining the direct and indirect effects of dysfunctional attitudes towards motherhood on depressive symptoms**

The models examining the direct and indirect effects of the relationship between dysfunctional beliefs towards motherhood (Beliefs related to Others' Judgments, Beliefs related to Maternal Responsibility, and Beliefs related to Maternal Role Idealization) and depressive symptoms are presented, respectively, in Figures 1, 2 and 3.

[Insert\_Figure\_1\_about\_here]

More dysfunctional beliefs related to others' judgments and related to maternal responsibility were significantly associated with more frequent post-partum specific and general automatic thoughts (see Figures 1 and 2). However, when controlling for the remaining dimensions, dysfunctional beliefs about maternal role idealization were not significantly associated with postpartum-specific or general automatic thoughts (see Figure 3). Furthermore, the higher the frequency of postpartum-specific negative thoughts related to the appraisals of cognitions, emotions and situations and of general postpartum negative thoughts, the higher the women's depressive symptoms in the postpartum period.

The direct effect of dysfunctional beliefs related to others' judgments on depressive symptoms was not significant (see Figure 1). However, indirect effects of

dysfunctional beliefs related to others' judgments on depressive symptoms were found through the dimensions Appraisals of Cognition, Emotion and Situation (95% CI = .15/.56) and General Negative Thoughts (95% CI = .38/.94) but not through the dimension Baby-related and Motherhood Thoughts (95% CI = -.15/.26).

[Insert\_Figure\_2\_about\_here]

Moreover, a significant direct effect was found in the relationship between dysfunctional beliefs related to maternal responsibility and depressive symptoms (see Figure 2). In addition, significant indirect effects of dysfunctional beliefs related to maternal responsibility on depressive symptoms were found through the dimensions Appraisals of Cognition, Emotion and Situation (95% CI = .09/.46) and General Negative Thoughts (95% CI = .37/.91) but not through the dimension Baby-related and Motherhood Thoughts (95% CI = -.05/.11).

[Insert\_Figure\_3\_about\_here]

Finally, no significant total or direct effects were found in the relationship between dysfunctional beliefs related to maternal role idealization and depressive symptoms (see Figure 3). Moreover, no significant indirect effects were found in this relationship (Baby-related and Motherhood Thoughts: 95% CI = -.05/ .01; Appraisals of Cognition, Emotion and Situation: 95% CI = -.07/ .05; General Negative Thoughts: 95% CI = -.22/.03).

### **Examining the moderator role of self-compassion in the direct and indirect effects of dysfunctional attitudes towards motherhood on depressive symptoms**

No significant conditional effects of self-compassion in the direct effects of dysfunctional attitudes towards motherhood on depressive symptoms were found (Beliefs related to Others' Judgments:  $b = .07$ ,  $SE = .05$ ,  $t = 1.45$ ,  $p = .147$ ; Beliefs related to Maternal Responsibility:  $b = .06$ ,  $SE = .06$ ,  $t = 0.97$ ,  $p = .33$ ; Beliefs related to Maternal Role Idealization:  $b = .02$ ,  $SE = .03$ ,  $t = 0.73$ ,  $p = .46$ ).

However, the significant indirect effects of dysfunctional attitudes related to others' judgments and related to maternal responsibility on depressive symptoms through postpartum-specific and general negative thoughts were moderated by self-compassion, and are presented in Figure 4.

[Insert\_Figure\_4\_about\_here]

Specifically, the indirect effects of dysfunctional attitudes related to others' judgments and related to maternal responsibility on depressive symptoms through Appraisals of Cognition, Emotional and Situation occurred only when women presented low (Beliefs related to Others' Judgements: 95% CI: .14/.67; Beliefs related to Maternal Responsibility: 95% CI: .16/.76) or moderate (Beliefs related to Others' Judgements: 95% CI: .04/.31; Beliefs related to Maternal Responsibility: 95% CI: .02/.25) levels of self-compassion (see Figure 4A and 4C). Moreover, the indirect effects of dysfunctional attitudes related to others' judgments and related to maternal responsibility on depressive symptoms through general negative automatic thoughts occurred only when women presented low (Beliefs related to Others' Judgements: 95% CI: .15/.85; Beliefs related to Maternal Responsibility: 95% CI: .43/1.24) or moderate (Beliefs related to Others' Judgements: 95% CI: .01/.52; Beliefs related to Maternal Responsibility: 95% CI: .13/.67) levels of self-compassion (see Figure 4B and 4D). When women presented higher self-compassion, the indirect effects were not significant, suggesting that more dysfunctional attitudes do not affect depressive symptoms by leading to more postpartum-specific or general negative thoughts.

### **Discussion**

The present study adds to the existing knowledge on the cognitive mechanisms influencing postpartum depressive symptoms, with two main findings: a) more dysfunctional attitudes or beliefs towards motherhood lead to higher postpartum depressive symptoms, and this effect occurs through negative automatic thoughts, both postpartum-specific and general; b) self-compassion appears to exert a buffer effect on the relationship between dysfunctional attitudes towards motherhood and postpartum depressive symptoms. Some specific findings should also be noted.

First, and congruently with prior studies (e.g., Phillips et al., 2010; Sockol et al., 2014), women with clinically significant depressive symptoms presented more dysfunctional attitudes towards motherhood, particularly related to themes of personal failure and responsibility and to others' judgments/evaluations, corroborating the idea that they are cognitive-specific predisposing or vulnerability factors for the occurrence of postpartum depressive symptoms (Milgrom et al., 1999; Wenzel & Kleiman, 2015) that interact with the stress-inducing demands of caregiving. Moreover, women with

clinically significant depressive symptoms presented more frequent negative automatic thoughts, both postpartum-specific and general. In fact, similar results concerning postpartum-specific thoughts were found in prior studies (Cantilino, 2009; Hall & Papageorgiou, 2005; Hildebrandt, 2013), highlighting the important role of negative automatic thoughts in the exacerbation and maintenance of depressive symptoms (Milgrom et al., 1999).

Second, our results showed that more dysfunctional attitudes or beliefs related to others' judgments and maternal responsibility (i.e., beliefs that others will negatively evaluate them as mothers and beliefs about the high demands of the maternal role, in terms of total dedication and availability) lead to higher depressive symptoms, both directly (in the case of beliefs about maternal responsibility) and indirectly, through negative automatic thoughts. Globally, more dysfunctional attitudes towards motherhood among women seem to predispose them to more biased interpretations of daily events, leading to more frequent negative automatic thoughts that may contribute to maintaining or to exacerbating women's depressive symptoms (Milgrom et al., 1999), similar to what occurs in the general population (e.g., David et al., 2005).

On the one hand, it is important to emphasize that only specific types of dysfunctional beliefs – related to others' judgments and maternal responsibility – appear to influence women's depressive symptoms, as these beliefs are particularly related to women's perceptions of their personal value as a mother and of their personal failure in the maternal role (either self-evaluated or by fearing others' judgements). These results are congruent with the findings supporting the important role of perfectionism as a vulnerability factor for the occurrence of postpartum depressive symptoms (Gelabert et al., 2012).

On the other hand, our results are also innovative by showing that dysfunctional beliefs about motherhood appear to lead not only to more frequent postpartum-specific negative thoughts (i.e., related to motherhood and caregiving tasks) but also to more general negative thoughts. Women's dysfunctional attitudes concerning their personal value as a mother may lead to biased interpretations of their self-value ("I'm worthless") and of the future ("My life is not going the way I want it to"), which go beyond the specific postpartum context. Moreover, our results also show that is the metacognitive appraisal of postpartum thoughts' content (i.e., the thoughts that women have about the inadequacy of having motherhood-related or infant-related negative thoughts), and not the simple occurrence of those thoughts, that explain the relationship

between dysfunctional attitudes towards motherhood and depressive symptoms. In fact, the occurrence of negative and automatic infant-related and motherhood-related thoughts is common to the majority of postpartum women (Hall & Wittkowski, 2006), but it is possible that when women present more dysfunctional beliefs towards motherhood, they evaluate the occurrence of those thoughts as inadequate, reinforcing the dysfunctional nature of their beliefs and maintaining or exacerbating their depressive symptoms.

Third, our results emphasize that self-compassion may exert a buffer effect on the relationship between dysfunctional attitudes or beliefs about motherhood and depressive symptoms. These results are in line with the few recent studies that examine the relationship between cognitive vulnerabilities and depressive symptoms in the general population (Podina et al., 2015; Wong & Mak, 2013), and they support the idea that self-compassion may have a protective role for maladjustment (Krieger et al., 2013; Neff, 2003a) in the presence of cognitive vulnerability factors. It is possible that women's more compassionate attitude towards themselves may help them better manage and challenge existing dysfunctional beliefs about the high demands of motherhood and personal failure, as self-compassionate women may present a lower tendency to judge or criticize themselves when they notice negative feelings, cognitions or experiences, and to accept those feelings and experiences as part of the common and shared experience of parenting (Neff, 2003a), which may lead to lower depressive symptoms.

The present study has some limitations that need to be acknowledged. First, the study's cross-sectional design compromises the establishment of causal relationships among the study variables, although the directional paths tested in the analyses were grounded in theoretical models (e.g., Cognitive Theory of Depression, Beck, 1987; Beck et al., 1979) and previous empirical research. Second, although our sample was similar, in terms of sociodemographic characteristics, to other samples of the perinatal population, it was a self-selected sample (due to the online recruitment procedures) that mainly comprised highly educated and married women, which may compromise the representativeness of our results. Finally, our study included only a self-report questionnaire to measure depressive symptoms (EPDS), which does not ensure a clinical diagnosis of depression; although the study results identify mechanisms underlying the occurrence of depressive symptoms in the postpartum period, they



should be replicated in a clinical sample to clearly establish those mechanisms as explaining the clinical diagnosis of PPD.

Finally, the findings of the present study are clinically relevant for several reasons. First, our results underscore the important role of cognitive variables for women's postpartum emotional adjustment, and consequently the need to comprehensively evaluate them with specific measures. Particularly, maternal beliefs or attitudes may function as a specific vulnerability factor for postpartum depressive symptoms (Sockol et al., 2014), and the early identification of women presenting dysfunctional beliefs may allow for the implementation of preventive interventions aiming to challenge those beliefs (e.g., by debating about the myths of perfect motherhood and encouraging women's adoption of more realistic expectations about themselves as mothers; Church et al., 2005). Second, by underscoring the important role of women's negative appraisals (dysfunctional beliefs and metacognitive appraisals of their thoughts' content) on depressive symptoms, our results emphasize that psychological interventions addressing women's postpartum depressive symptoms should include the promotion of a mindful, accepting, non-judgmental and self-compassionate attitude towards themselves and towards their cognitive experiences (Cree, 2015). Specifically, promoting the acceptance of women's cognitive experiences (negative automatic thoughts), rather than trying to control or avoiding them, may help women adopt alternative strategies to manage their thoughts and beliefs (e.g., cognitive reappraisal; Diedrich, Hofmann, Cuijpers, & Berking, 2016).

### **Figure Captions**

Figure 1. Direct and indirect effects of the relationship between dysfunctional attitudes or beliefs towards motherhood (Beliefs related to Others' Judgments) and depressive symptoms, through general and postpartum-specific negative thoughts.

*Note.* Path values represent unstandardized regression coefficients. In the arrow linking beliefs related to others' judgements and depressive symptoms, the value outside the parentheses represents the total effect of beliefs related to others' judgements on depressive symptoms. The value in the parentheses represents the direct effect, from the bootstrapping analyses, of beliefs related to others' judgments on depressive symptoms, after inclusion of the mediators. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Figure 2. Direct and indirect effects of the relationship between dysfunctional attitudes or beliefs towards motherhood (Beliefs related to Maternal Responsibility) and depressive symptoms, through general and postpartum-specific negative thoughts.

*Note.* Path values represent unstandardized regression coefficients. In the arrow linking beliefs related to maternal responsibility and depressive symptoms, the value outside the parentheses represents the total effect of beliefs related to maternal responsibility on depressive symptoms. The value in the parentheses represents the direct effect, from the bootstrapping analyses, of beliefs related to maternal responsibility on depressive symptoms, after inclusion of the mediators. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Figure 3. Direct and indirect effects of the relationship between dysfunctional attitudes or beliefs towards motherhood (Beliefs related to Maternal Role Idealization) and depressive symptoms, through general and postpartum-specific negative thoughts.

*Note.* Path values represent unstandardized regression coefficients. In the arrow linking beliefs related to maternal role idealization and depressive symptoms, the value outside the parentheses represents the total effect of beliefs related to maternal role idealization on depressive symptoms. The value in the parentheses represents the direct effect, from the bootstrapping analyses, of beliefs related to maternal role idealization on depressive symptoms, after inclusion of the mediators. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Figure 4. Conditional indirect effect of dysfunctional beliefs on depressive symptoms through negative automatic thoughts. Figure 4A: Conditional indirect effect of Dysfunctional Beliefs related to Others' Judgements on Depressive Symptoms through postpartum-specific negative thoughts (Appraisal of Cognitions, Emotions and Situations). Figure 4B: Conditional indirect effect of Dysfunctional Beliefs related to Others' Judgements on Depressive Symptoms through general negative thoughts. Figure 4C: Conditional indirect effect of Dysfunctional Beliefs related to Maternal Responsibility on Depressive Symptoms through postpartum-specific negative thoughts (Appraisal of Cognitions, Emotions and Situations). Figure 4B: Conditional indirect effect of Dysfunctional Beliefs related to Maternal Responsibility on Depressive Symptoms through general negative thoughts.

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Table 1. Descriptives and comparison between women with clinically significant depressive symptoms and women without clinically significant depressive symptoms

	<b>Women with clinically significant depressive symptoms</b>	<b>Women without clinically significant depressive symptoms</b>	<i>F/t</i>	<i>η<sup>2</sup>/d</i>
	<i>M (SD)</i>	<i>M (SD)</i>		
DA: Beliefs related to Others' Judgements	2.09 (1.35)	1.15 (1.10)	50.97***	.12
DA: Beliefs related to Maternal Responsibility	2.53 (1.12)	1.78 (1.01)	42.20***	.10
DA: Beliefs related to Maternal Role Idealization	2.44 (1.67)	2.10 (1.83)	2.88	.01
PNT: Baby-Related and Motherhood negative Thoughts	3.45 (3.00)	1.55 (1.87)	57.09***	.13
PNT: Appraisals of Cognition, Emotion and Situation	6.74 (5.35)	1.80 (2.60)	143.30***	.27
General Negative Thoughts	13.77 (10.26)	4.18 (4.14)	13.12***	1.23
Self-compassion	12.18 (2.58)	15.05 (2.58)	9.84***	1.11

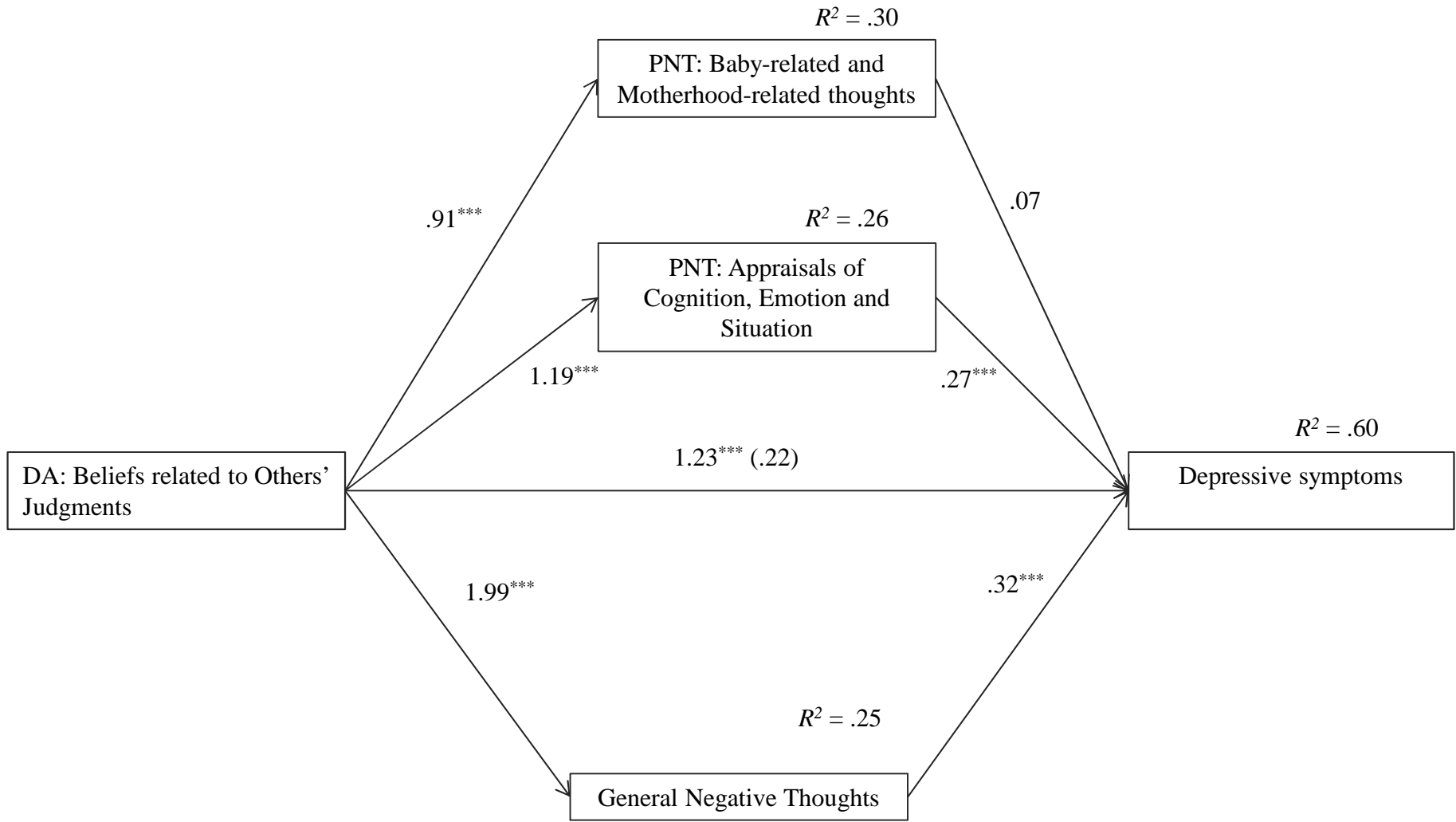
\*\*\*  $p < .001$ .

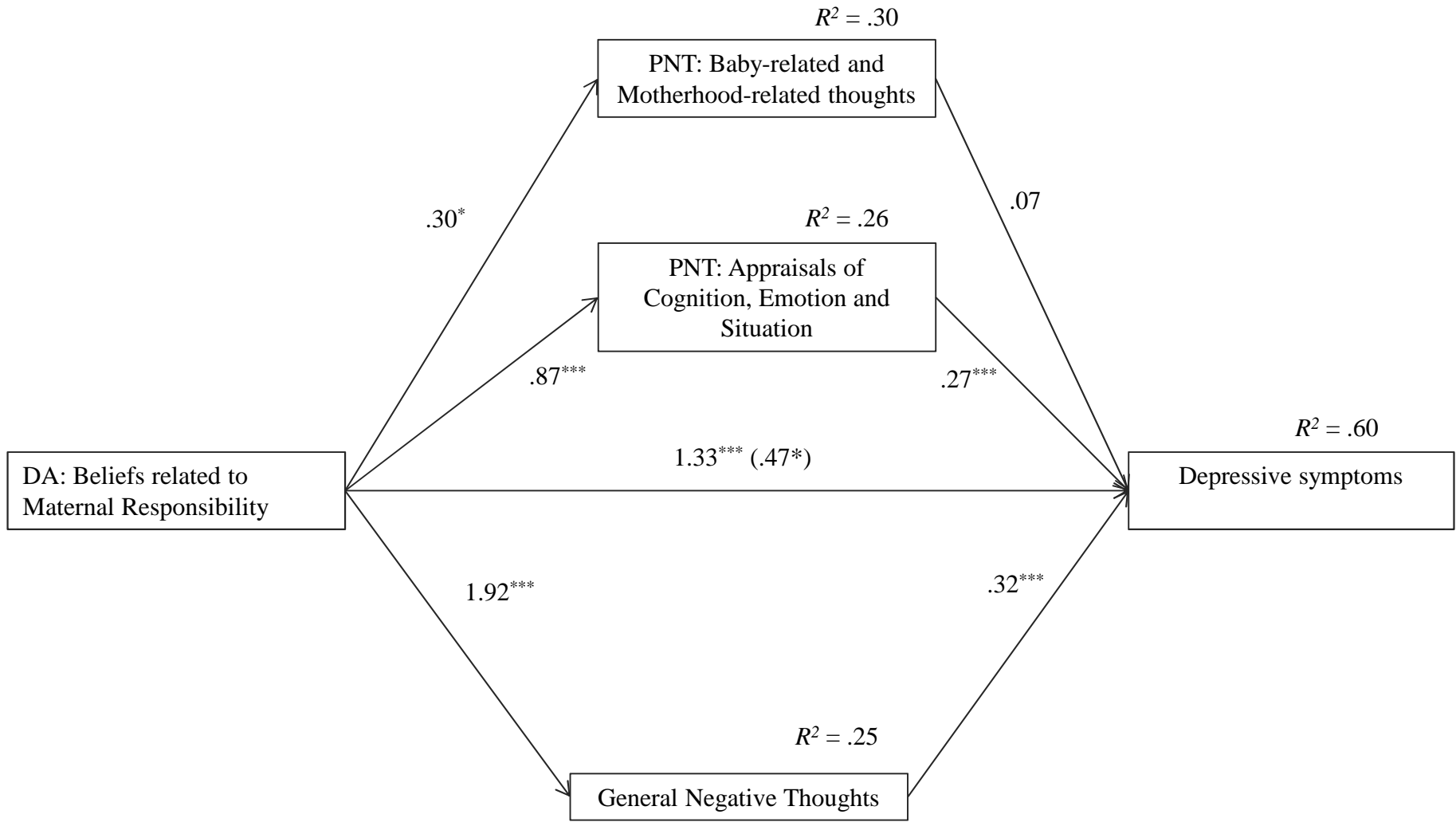


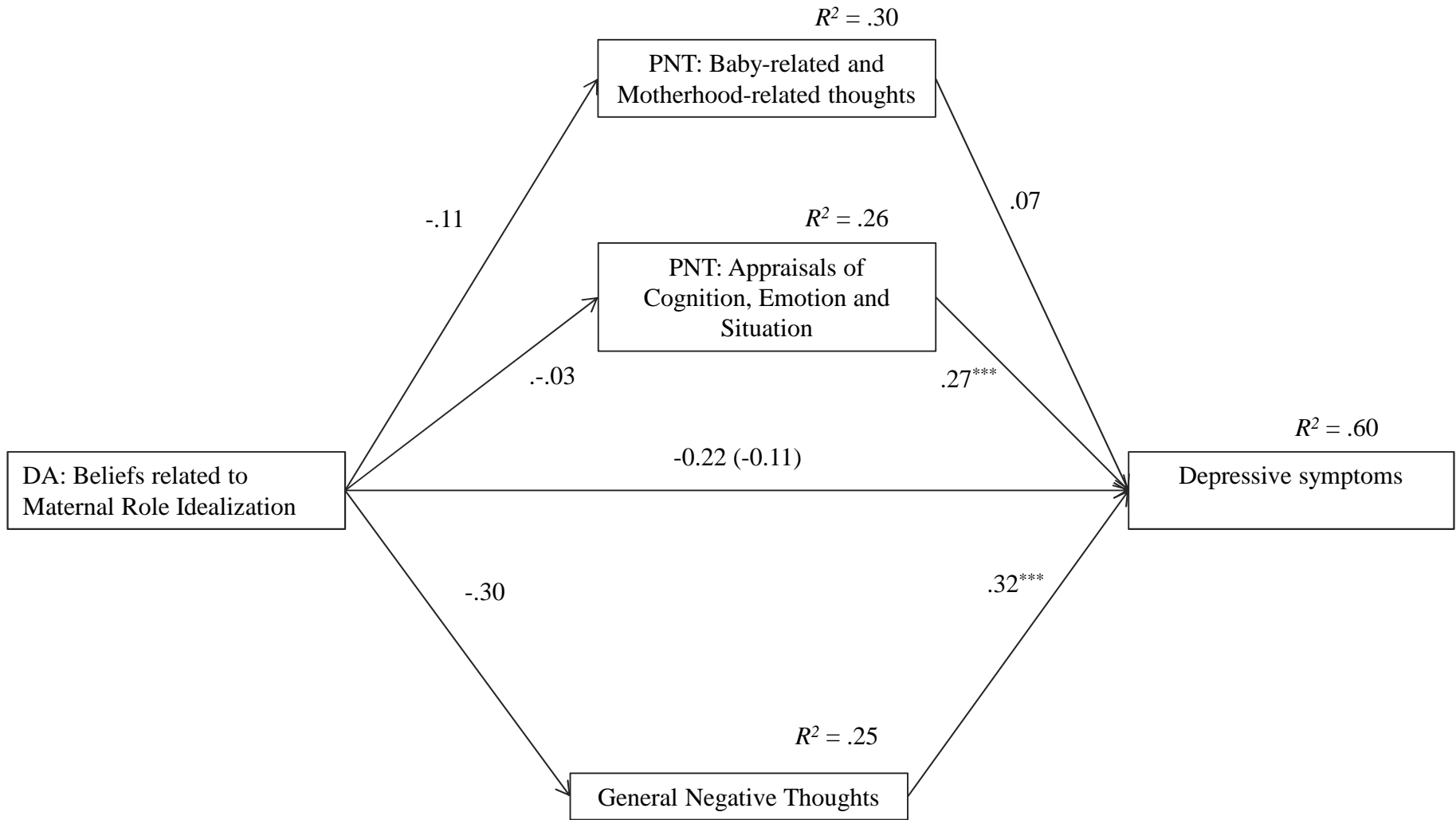
Table 2. Bivariate correlations among the study variables.

	2.	3.	4.	5.	6.	7.	8.
1. DA: Beliefs related to Others' Judgements	.55***	.22***	.53***	.47***	.45***	-.48***	.45***
2. DA: Beliefs related to Maternal Responsibility		.39***	.37***	.41***	.42***	-.43***	.43***
3. DA: Beliefs related to Maternal Role Idealization			.08	.15**	.11*	-.09	.10*
4. PNT: Baby-Related and Motherhood negative Thoughts				.71***	.71***	-.46***	.56***
5. PNT: Appraisals of Cognition, Emotion and Situation					.61***	-.48***	.66***
6. General Negative Thoughts						-.64***	.74***
7. Self-compassion							-.58***
8. Depressive Symptoms							-

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







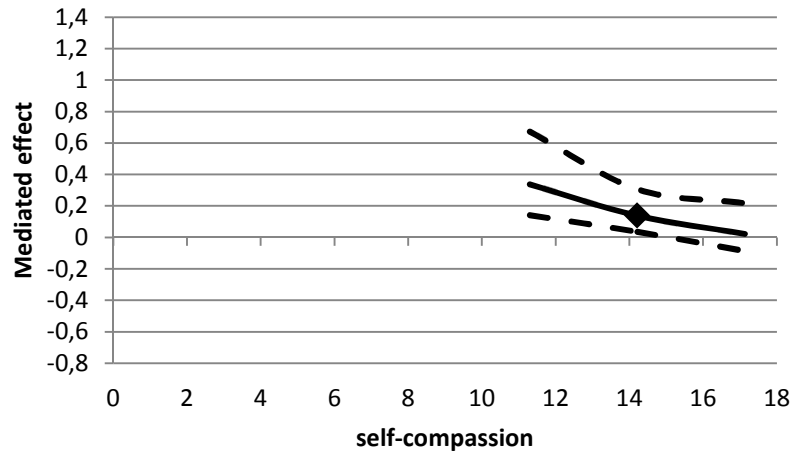


Figure 4A

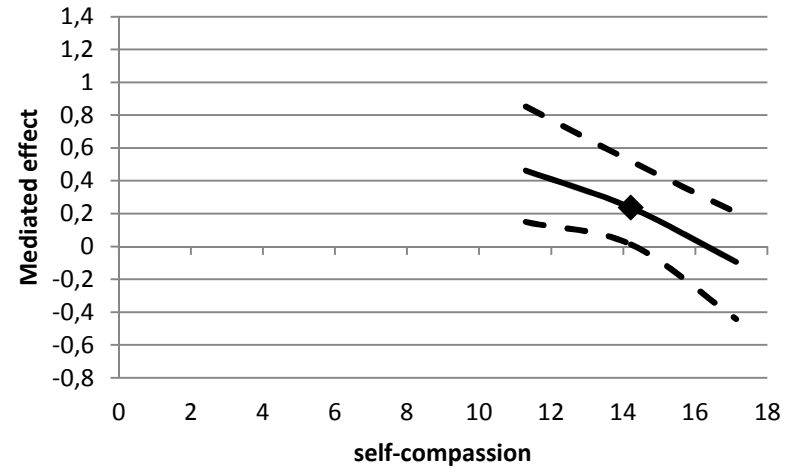


Figure 4B

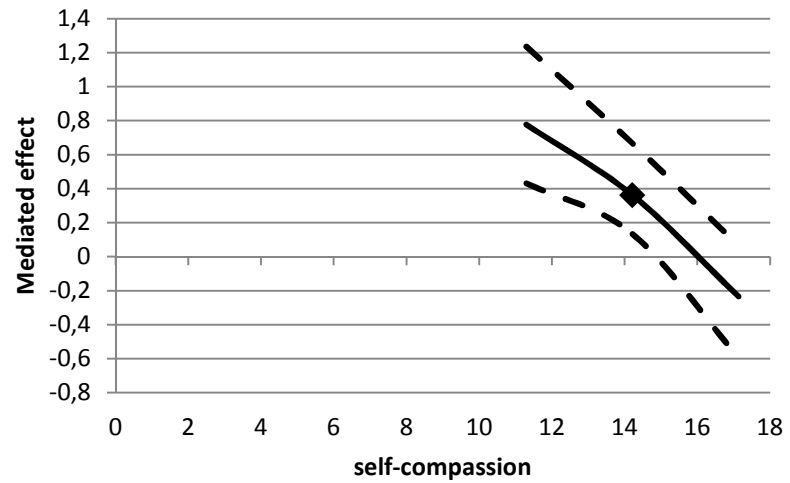


Figure 4C

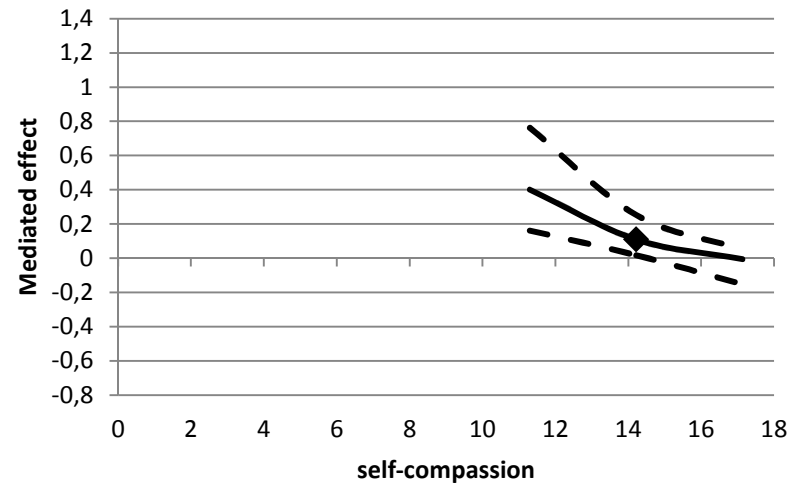




Figure 4D

 Conditional Indirect Effect  
 95% CI Upper/Lower Limit