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Does coping mediate the effects of stress in pregnancy?

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Submitted

6.1 Abstract

Background: The process view of coping suggests that coping may mediate the effect of a stressor on distress. In pregnancy, several specific anxieties and the primary and secondary appraisal may be regarded as stressors besides more common stress-provoking factors such as life events and daily hassles.

Objective: To investigate the role of coping as a mediator in a multidimensional model of distress in a population of normal risk nulliparous pregnant women.

Methods: Self-report data about various aspects of stress-provoking (life events, daily hassles, appraisal of pregnancy and pregnancy-specific anxieties), coping style (Utrecht Coping List-19; emotion-focused coping and problem-focused coping), and stress-resulting (perceived stress, state-anxiety and general psychological well-being) factors were collected in nulliparous pregnant women in early (n=230), mid (n=217) and late (n=172) pregnancy. Path analysis was performed by means of LISREL 8.30.

Results: Coping had mostly direct effects on the distress level, rather than having a mediating role between stressors and the distress response. An exception was found in early pregnancy, when the stress response to primary appraisal of pregnancy was mediated by emotion-focused coping. The best model fit in early pregnancy showed that emotion-focused coping was most effective in reducing levels of distress ($\chi^2 = 12.45$, $df=14$, $p=.57$, $RMSEA < .05$, $RMR=.04$, $CFI=1.00$, $NNFI=1.02$), whereas later in pregnancy problem-focused coping was related to a reduction in distress levels ($\chi^2 = 13.51$, $df=10$, $p=.20$, $RMSEA = .05$, $RMR= .03$, $CFI=.99$, $NNFI=.98$).

Conclusion: Coping is a process that responds to the specific demands of a particular period in normal risk pregnancy. Coping may be regarded as a part of a multidimensional model of distress in pregnancy.

6.2 Introduction

Pregnancy is an important period during which the mother and the fetus are potentially exposed to the negative impact of stress (Cameron et al., 1996). It furthermore entails many life adjustments which are to be dealt with. Many pregnant women report distress during pregnancy, including worries over physical changes, medical problems, and parenting competence (Lederman, 1984; Lobel, 1998; Arizmendi & Affonso, 1987). Moreover, distress during pregnancy has been found to be associated with an adverse birth outcome. Studies on this issue, however, differ in the conceptualization and measurement of prenatal stress, which could account for the inconsistency in findings across studies (for reviews see e.g. Levin & DeFrank, 1988; Lederman, 1995; Paarlberg et al. 1995; Omer & Everly, 1988; Hoffman & Hatch, 1996). In short, some studies have looked at the effect of major life events on birth outcome (e.g. Berkowitz & Kasl, 1983; Newton et al., 1979), while others have used a score on an anxiety questionnaire as conceptualization of stress (Beck et al., 1980). More recently, the effect of daily hassles on birth outcomes has been a topic of research (e.g., Paarlberg et al., 1999).

Stress is presumably most accurately described through a multidimensional concept, with the model of Lazarus & Folkman (1984) as a useful theoretical starting point. In this model a differentiation is made between stress-provoking factors (e.g., life events, daily hassles), stress-mediating or -moderating factors (e.g., coping, social support) and stress-resulting factors (e.g., perceived distress). Although some studies (Newton & Hunt, 1984; Magni et al., 1986) have used anxiety measures, personality factors and life events scores of the same subjects as predictors of birth outcome, these factors were regarded as independent predictors and were not combined in a multidimensional model of prenatal stress. A first attempt to describe prenatal stress as a multidimensional concept was undertaken by Lobel and Dunkel-Schetter (1990) in a study among socioeconomically disadvantaged pregnant women. Structural equation modeling techniques were used to test a single construct of prenatal stress underlying the environmental (life events), perceptual (event distress and perceived distress), and response-based (state anxiety) indicators of stress. The results indicated that stress could be predicted by event distress, state anxiety and perceived stress suggesting that appraisal and emotion may be the central issue to one component of distress (Lobel and Dunkel-Schetter, 1990). These authors did not include environmental conditions (stress-provoking factors) or the mediators or moderators such as coping, social support and personality factors in their model. In fact, the model found consisted only of the stress-resulting part of stress and is therefore unidimensional rather than multidimensional in our view. More recently, Sheehan (1996; 1998) used structural equation techniques to develop a psychosocial measurement model for stressful life events during pregnancy. Various life events and other experiences that were regarded as potentially stressful could be clustered in three factors: economic stressors, social support and family stressors (Sheehan, 1996). These three factors appeared to exert an indirect effect on birth weight rather than a direct effect (Sheehan, 1998). Although these studies provided insight into the relationships between stress provoking factors and a potential mediating factor (social support) on birth outcome, the influence of important stress provoking factors such as daily hassles or other stress mediating factors like coping were not taken into consideration.

Coping style in particular should be taken into account as a possible mediator when study-

ing the relationship between stressors and distress. This is in accordance with a process view of coping, as has been strongly endorsed by Lazarus (1999). Lazarus considered coping to be a mediator rather than a moderator because the coping process arises *de novo* from the transaction between the person and the environment. As has been outlined by Baron and Kenny (1986), a mediator represents the generative mechanism through which the independent variable is able to influence the dependent variable of interest and that, in statistical terms, accounts for the relation between the independent and dependent variables. In contrast, a moderator modifies the strength of the relation between the independent and dependent variables. To test if coping behavior functions as a mediator, it should explain how daily hassles or life events lead to perceived stress, in a similar way as has been found that coping explained a significant amount of the variance in several emotions in a sample of middle-aged women (Folkman and Lazarus, 1988).

An important factor in the stress-coping process is the appraisal of an event, which can be differentiated in two aspects. Firstly, primary appraisal reflects the perceived stressfulness of an event. Secondly, secondary appraisal is the perceived coping options for the event. Both forms of appraisal are supposed to interact (Komproe et al., 1997). Secondary appraisal is in fact an evaluation of coping options and most often the cognitive underpinning of coping. Appraising pregnancy as a pleasant event should provoke fewer stress reactions than viewing pregnancy as an unpleasant and stressful event. Likewise, regarding pregnancy as uncontrollable would result in more distress. Coping may in fact mediate the stress response to the primary and secondary appraisal of pregnancy.

Pregnancy not only is a specific event that may be appraised on an individual basis, it also may result in specific stressors and fears associated with pregnancy itself (DiPietro et al., 2000; Huizink et al., 2000a). Results showed that pregnancy anxiety can be regarded as a relatively distinctive syndrome that is different from general indices of anxiety and depression. Therefore, these pregnancy-related anxieties may provoke a more general stress response.

In an earlier study of the same sample of subjects, we performed confirmatory factor analyses on a coping questionnaire and found two different coping concepts: emotion-focused coping and problem-focused coping (Huizink et al., 2000b). These concepts resembled the 'seeking social support' and 'planful problem solving' scales of the Ways of Coping Questionnaire of Lazarus and Folkman (1984). In the present study, we have used these two concepts as potential mediators in the stress process.

Although research has been carried out on the role of coping in high risk pregnancy (e.g., Killison, 1995; Dukewich, Borkowski & Whitman, 1996; Blechman, Lowell & Garrett, 1999; Eugster & Vingerhoets, 1999; Lukse & Vacc, 1999), the present study is, to our knowledge, the first study to examine the role of coping in a multidimensional model of distress in normal pregnancy. The main questions to be examined were whether (1) coping mediates the distress response when exposed to daily hassles and life events during pregnancy, and (2) coping mediates the distress response to the appraisal of pregnancy and to pregnancy-related anxiety. In spite of the fact that several studies found correlations between coping and distress, this does not necessarily mean that coping influences the degree of distress. The relation may also be the other way around, with distress having an influence on the way people cope. Therefore, as a third question the alternative possibility will be examined: (3) Is coping a response to distress?

6.3 Methods

6.3.1 Participants

All the participants in this study were deliberately included in a larger prospective longitudinal project which also investigated the influence of prenatal psychosocial factors on fetal behavior and on the postnatal development of children. Subjects were recruited from a consecutive series of referrals to the Outpatient Clinic of the Department of Obstetrics of the University Medical Center Utrecht (UMCU), which is a first-line referral center for low-risk pregnancies with responsibilities for mid-wives as well, between January 1996 and July 1998. The UMCU is located outside the city of Utrecht and attracts a mixed rural and urban population of patients. From a total of approximately 650 invited women, 230 agreed to participate. The main reason for refusing to participate was the time-consuming aspect of the study. The study was approved by the ethical committee of the UMCU; participation was on a voluntary basis but written informed consent was required. Only nulliparous women with a singleton pregnancy were included. Characteristics of participants did not differ from those of nonparticipants, except in the case of women with full-time jobs, who were less likely to participate. The descriptives of the participants are summarized in Table 4.1. As shown the sample of participants consisted largely of middle class women, although both lower social and higher social classes were represented. The majority of women (92.4%) lived together with their partner, either in wedlock or unmarried. Furthermore, at the time of their inclusion in the study, the majority of women had a paid job, 54.2 % working less than 38 hours a week and 45.8 % working full-time.

Participants were asked to fill out questionnaires three times during pregnancy; at 15-17 weeks (early pregnancy), 27-28 weeks (mid pregnancy), and 37-38 weeks of gestation (late pregnancy). Of the 230 women who completed the questionnaires on the first occasion, 217 completed the questionnaires on the second occasion and 172 on the third occasion. The main reason for the drop in the number of participants toward late pregnancy was delivery before 37 weeks of gestational age or delivery before the last session of data collection, which was planned near term, had taken place; other reasons were lack of interest, lack of time, twin pregnancy, stillbirth, pregnancy complications that required intensively follow up, or relocation to another city.

6.3.2 Questionnaire measures

The package of questionnaires was composed principally to measure stress related factors, including stress provoking factors such as life events and daily hassles, stress resulting factors such as perceived stress or distress, coping behavior and common symptoms of anxiety and depression, and aspects of personality such as neuroticism and locus of control which may be important as predictors of coping behavior.

6.3.2.1 Stress-provoking factors

Life events Questionnaire (Vragenlijst meegemaakte gebeurtenissen, van de Willege et al., 1985). The life events impact score of this questionnaire was used, which was based on the Social Readjustment Rating Questionnaire (Holmes & Rahe, 1967).

Daily Hassles (Alledaagse Problemen Lijst, Vingerhoets et al., 1989). The daily hassles questionnaire used in this study is a Dutch translation of a selection of items of questionnaires, including the Daily Hassles Scale (Kanner et al., 1981), the Everyday Problem Scale (Burks & Martin, 1985) and the Daily Life Experience Questionnaire (Stone & Neale, 1982). It measures the frequency of occurrences of daily hassles in the past month and gives an intensity score which is the subjective experience of the subject of the unpleasantness of the hassles. In this study, only the frequency score was used in order to stay free from confounding stress provoking and stress resulting factors in the intensity score.

Pregnancy anxieties were assessed by means of the Pregnancy Related Anxieties Questionnaire-Revised (PRAQ-R). Specific fears and worries related to pregnancy were measured on each occasion by means of an abbreviated version of the PRAQ developed by Van den Bergh (1989). An earlier study (Huizink et al., 2000a) showed that three different fears specifically related to pregnancy could be measured by using three items per subscale: fear of giving birth, fear of bearing a physically or mentally handicapped child and concern about one's appearance. This questionnaire was filled out in early, mid and late pregnancy. Cronbach's alpha's of the subscales were all $> .76$ throughout pregnancy.

The appraisal of pregnancy was measured by two single-item instruments. The perceived threat of the situation, or primary appraisal, was measured by the question 'Can you indicate on a ten-point scale the degree to which your pregnancy relates to the most upsetting (=1) and most pleasant event (=10) in your life?'. Secondary appraisal, or the perceived options to control the situation, was assessed with the question 'To what extent do you think you are able to influence the course of your pregnancy?'. Participants could answer on a 5-point scale ranging from 'considerably' to 'not at all'. These two items were answered on each occasion.

6.3.2.2 Stress-mediating factors

Utrecht Coping List (Schreurs et al., 1988). To assess the coping style of our subjects, we used the 'Utrecht Coping List-19' which is an abbreviated form of the 'Utrecht Coping List-30'. An earlier study (Huizink et al., 2000b) using confirmatory factor analyses showed that two factors of coping could be found when using this questionnaire in a sample of pregnant women: emotion-focused coping and problem-focused coping. Each factor contained three items. This questionnaire was filled out three times during pregnancy. Cronbach's alpha's of the factor scores were all $> .71$ throughout pregnancy.

6.3.2.3 Stress-resulting factors

State-Trait Anxiety Inventory (STAI). The STAI (Spielberger et al., 1970) comprises two self-report scales for measuring two distinct anxiety concepts, state-anxiety and trait-anxi-

ety. Both scales contain 20 statements that ask the respondent to describe how she feels at a particular moment in time (state-anxiety) or how she generally feels (trait-anxiety). State anxiety is conceptualized as a transitory emotional state, whereas trait-anxiety refers to relatively stable individual differences in proneness to anxiety. Cronbach's alpha in this study was .88 for state anxiety and .83 for trait anxiety. The STAI was filled out on each occasion.

General Health Questionnaire (GHQ-30; Goldberg, 1972). A Dutch translation of the GHQ-30 (Koeter & Ormel, 1991) was used in this study to measure the psychological well-being of our subjects. The questionnaire contains 30 questions to be answered on a four-point scale. This questionnaire was filled out on each occasion.

Perceived Stress Scale (Vragenlijst Ervaren Stress). Perceived stress was assessed by means of a Dutch translation by Vingerhoets (1989) of the Perceived Stress Scale of Cohen & Williamson (1988). It contains 14 items on perceived stress of an individual during the last month to be answered on a 4-point scale, ranging from 'never' to 'always'. This questionnaire was filled out on each occasion.

6.3.3 Statistical analysis

The mediating role of both emotion- and problem-focused coping was examined by means of path analyses with LISREL 8.30, a structural equation modeling technique. In our path model, the latent construct distress was composed of three indicators (GHQ-30, PSS, State-anxiety) and predicted by various independent latent constructs of stress provoking factors (daily hassles, life events, primary appraisal of pregnancy, secondary appraisal of pregnancy, fear of giving birth, fear of bearing a physically or mentally handicapped child, concern about one's appearance) and two dependent latent constructs of coping (emotion-focused coping and problem-focused coping). Thus, distress is the outcome variable in the recursive path model. The three indicators showed high intercorrelations ($> .60$). Moreover, Cronbach's alpha of the items of all three questionnaires was $> .90$. The goodness of fit between the hypothesized path model and the sample data was subsequently tested. This provided information about the reliability and validity of the model while taking measurement errors into account. Goodness of fit measures used were Chi Square (χ^2) and Chi-square divided by degrees of freedom. The latter is sensitive to sample size, and is therefore regarded as a measure of fit instead of a test statistic. When chi-square is divided by its degrees of freedom the result should be less than six if it is to indicate a reasonable fit to the data. P values of the Chi Square statistic should be $> .05$, thus indicating that the model is not significantly different from the data. Other fit criteria include: Comparative Fit Index (CFI ; $> .9$ indicates a good fit), Non-Normed Fit Index (NNFI ; $> .9$ indicates a good fit), Root Mean Square Error of Approximation (RMSEA), which should be at least less than .08 and Root Mean Square Residual (RMR), which should be less than .05.

When several a priori nested models are tested, the model Akaike's Information Criterion (AIC) can be compared among the models, with the lowest values indicating the best model. In addition, the difference between chi-square can be tested for significance.

6.4 Results

6.4.1 Coping as a mediator of the distress response to daily hassles and life events

Early pregnancy. Firstly, a model was formulated which included both direct effects of daily hassles and life events on distress and mediating effects of coping. Two coping styles were included, problem-focused coping and emotion-focused coping. This model showed a good fit to the data ($\chi^2 = 9.45$, $df = 9$, $p = .40$, $RMSEA = .015$, $RMR = .033$, $CFI = .99$, $NNFI = .98$). However, the path from problem-focused coping to distress was not significant ($t = .38$) and was therefore left out in the next model. This model showed an excellent fit, although the paths from daily hassles, life events to the mediator emotion-focused coping were not significant. Therefore, a model was constructed with only direct effects on distress of daily hassles, life events and emotion-focused coping. This model had an excellent fit to the data ($\chi^2 = 5.24$, $df = 6$, $p = .51$, $RMSEA < .01$, $RMR = .023$, $CFI = 1.00$, $NNFI = 1.01$) and shows that emotion-focused coping indeed has a direct rather than an indirect effect on distress. The model is presented in Figure 6.1. More daily hassles and more life events lead to more distress, whereas more emotion-focused coping leads to less distress.

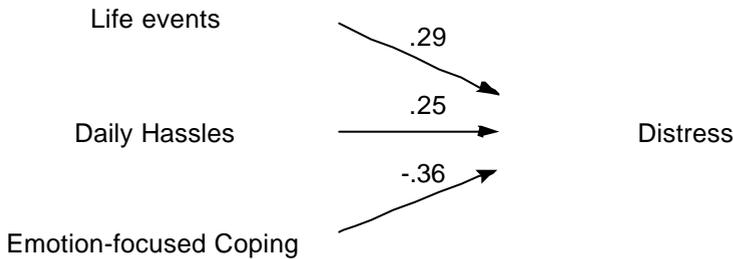
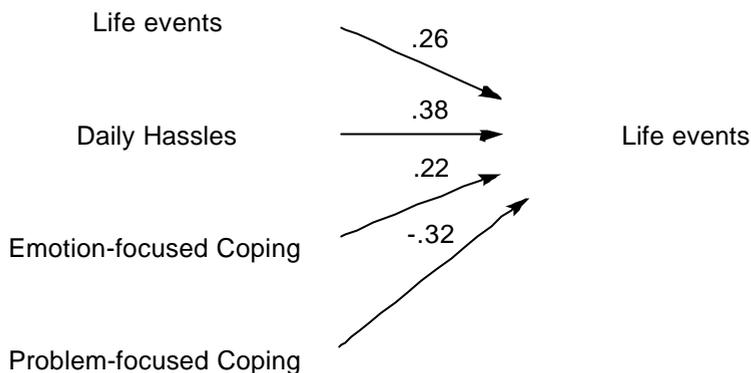


Figure 6.1. Best fitting model in early pregnancy for direct effects of life events, daily hassles and emotion-focused coping on distress.

Mid pregnancy. The first model tested included both direct effects of daily hassles and life events on distress and mediating effects of emotion- and problem-focused coping on distress. Fit criteria showed that the model fitted reasonably well ($\chi^2 = 20.21$, $df = 9$, $p = .02$, $RMSEA = .08$, $RMR = .05$, $CFI = .97$, $NNFI = .96$). However, the paths from life events to problem-focused coping and from daily hassles to problem-focused coping (thus, the mediating paths of problem-focused coping) were not significant ($t = -.38$ and $t = 1.47$, resp.). Therefore, these three paths were left out in the next model. The second model therefore included direct effects on distress of life events, daily hassles, problem- and emotion-focused coping. This model shows a good fit to the data ($\chi^2 = 12.97$, $df = 8$, $p = .11$, $RMSEA = .06$, $RMR = .03$, $CFI = .98$, $NNFI = .96$)

and is presented in Figure 6.2. Thus, in mid pregnancy, emotion- focused coping and problem-focused coping had a direct effect on distress. However, emotion-focused coping appeared to be associated with more distress, which is in contrast to our hypothesis.

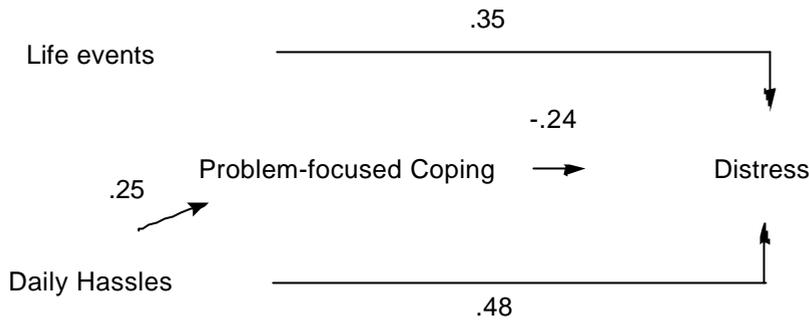
Figure 6.2. Best fitting model for direct effects of life events, daily hassles , emotion- and



problem-focused coping on distress.

Late pregnancy. In late pregnancy, again a model was first tested including both direct effects of life events and daily hassles on distress and mediating effects of emotion-focused coping and problem-focused coping on distress. This model did not show a good fit to the data ($\chi^2 = 20.35$, $df = 9$, $p = .02$, $RMSEA = .09$, $RMR = .06$, $CFI = .96$, $NNFI = .94$). The paths from daily hassles to emotion-focused coping and from life events to emotion-focused coping were not significant ($t = .47$ and $t = .94$ resp.) Also, the path from life events to problem-focused coping was not significant ($t = 1.66$). Moreover, the path from emotion-focused coping to distress was not significant ($t = -1.36$). Therefore, the second model to be tested included direct effects of daily hassles and life events on distress as well as a mediating effect of problem-focused coping for the effects of daily hassles on distress. This mediating effect was as expected. Thus, more daily hassles were associated with more problem-focused coping and in turn this coping style was associated with less distress. The model showed an excellent fit to the data ($\chi^2 = 8.50$, $df = 7$, $p = .29$, $RMSEA = .04$, $RMR = .04$, $CFI = .99$, $NNFI = .98$) and is presented in Figure 6.3a.

Figure 6.3a Model of distress in late pregnancy including a mediating function for problem-



focused coping.

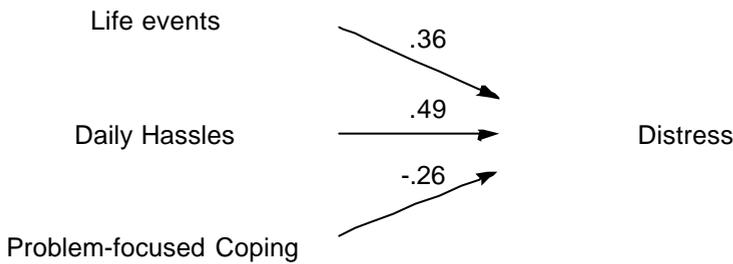


Figure 6.3b Model of distress in late pregnancy including only direct effects. This model showed the best fit to the data.

However, problem-focused coping functions only as a mediator when it meets the following conditions (Baron and Kenny, 1986): 1] Variations in the levels of daily hassles account significantly for variation in problem-focused coping; 2] Variations in problem-focused coping account significantly for variation in distress; and 3] When both paths of condition 1 and 2 are controlled for, a previously significant relation between daily hassles and distress is no longer significant. Although condition 1 and 2 were met, condition three needed to be tested. So, a model was tested including only direct effects of life events, daily hassles, and problem-focused coping on distress. The results showed an excellent fit to the data ($\chi^2 = 5.72$, $df = 6$, $p = .46$, $RMSEA < .0005$, $RMR = .03$, $CFI = 1.00$, $NNFI = 1.01$) and are presented in Figure 6.3b. When we compared the path from daily hassles to distress in Figure 6.3b with the same path in Figure 6.3a, the difference was very small ($.49 - .48 = .01$) and not significant.

Moreover, when we compared both models based on the χ^2 method, an almost significantly better fit is found for the model in Figure 6.3b ($\chi^2 = 2.78$, $df=1$, $p=.10$). The latter model had a slightly lower model AIC (35.72 versus 36.50).

In short, a direct rather than an indirect effect of coping style on distress is found throughout pregnancy.

6.4.2 Coping as a mediator of the distress response to the primary and secondary appraisal of the pregnancy

Pregnancy itself can be regarded as a stress-provoking factor. In the present study, primary and secondary appraisal of the pregnancy were therefore included in a more complex model of prenatal stress. This model included direct effects of daily hassles and life events on distress and a mediating effect for coping between the appraisal of pregnancy and distress. The results are summarized in the next section.

Early pregnancy. The model that fitted best to the data ($\chi^2 = 12.45$, $df = 14$, $p = .57$, $RMSEA < .05$, $RMR = .04$, $CFI = 1.00$, $NNFI = 1.02$) included a mediating effect of emotion-focused coping for the primary appraisal of pregnancy, and direct effects of daily hassles, life events and secondary appraisal of the pregnancy. When women regarded their pregnancy as a pleasant event, more emotion-focused coping was found, which resulted in decreased levels of distress. More daily hassles and life events were related to increased levels of distress and when pregnancy was regarded as a situation that can be controlled only to a small extent, also increased levels of distress were found. No significant correlation coefficients were found between the appraisal of pregnancy and daily hassles or life events, suggesting that these factors were independent predictors of distress.

Mid-pregnancy. No mediating effects for coping were found with regard to the relation between the appraisal of pregnancy and distress. The model that fitted the data best ($\chi^2 = 10.69$, $df = 10$, $p = .38$, $RMSEA < .05$, $RMR = .03$, $CFI = 1.00$, $NNFI = .99$) showed a direct effect of secondary appraisal of the pregnancy on distress, in combination with direct effects on distress of daily hassles, life events and problem-focused coping. No effect of primary appraisal on distress was found in mid-pregnancy. Again, when pregnancy was regarded as a relatively uncontrollable situation, more distress was found. No significant correlation coefficients were found between secondary appraisal of the pregnancy and daily hassles or life events.

Late pregnancy. Coping did not mediate between appraisal of pregnancy and distress in late pregnancy. Direct effects were found for daily hassles, life events, problem-focused coping, and primary appraisal of the pregnancy on distress levels in the model that fitted best to the data ($\chi^2 = 8.53$, $df = 8$, $p = .38$, $RMSEA < .05$, $RMR = .03$, $CFI = 1.00$, $NNFI = .99$). Increased amounts of daily hassles and life events resulted in increased levels of distress, whereas more problem-focused coping and regarding pregnancy as a pleasant event reduced the level of distress. Daily hassles, life events and primary appraisal of the pregnancy were not significantly intercorrelated and can be regarded as independent predictors of distress.

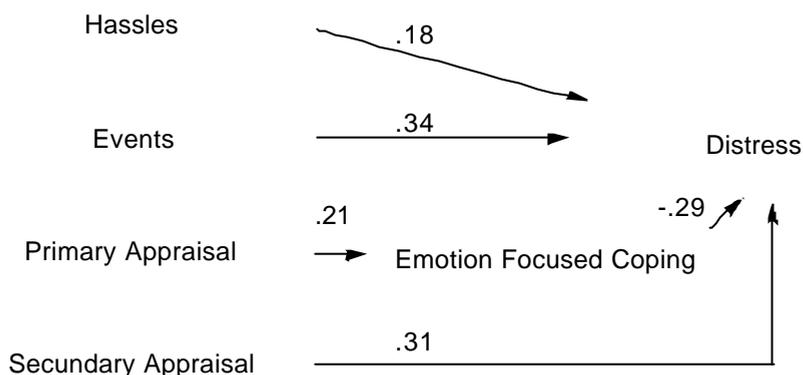
6.4.3 Coping as a mediator of the distress response

to pregnancy-specific anxieties

It is possible that stressors specifically related to pregnancy may provoke a stress response which may be mediated by coping. Therefore, we included three pregnancy-related anxiety scores (fear of giving birth, fear of bearing a physically or mentally handicapped child, and concern about one's appearance) as potentially stress provoking factors into our model of prenatal distress.

In *early pregnancy* it was found that fear of giving birth, fear of bearing a physically or mentally handicapped child, and concern about one's appearance did not account statistically for the level of distress. In addition, neither of these fears resulted in changed levels of emotion-focused coping. Therefore, the model of distress as described in the previous section was found to predict the level of distress in early pregnancy best ($\chi^2 = 12.45$, $df = 14$, $p = .57$, $RMSEA < .05$, $RMR = .04$, $CFI = 1.00$, $NNFI = .99$), and accounted for 35% of the total variance of distress. The model is shown in figure 6.4.

Figure 6.4 Emotion-focused coping as mediator for the effect of primary appraisal of pregnancy on distress in early pregnancy.

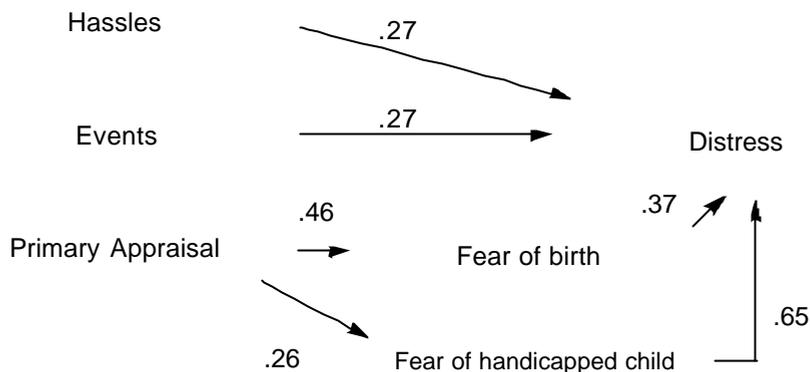


nancy on distress in early pregnancy.

Data derived from *mid-pregnancy* showed that mediating effects of problem-focused or emotion-focused coping were absent for the stress response of pregnancy-related fears on general distress levels. However, when pregnancy was appraised as more uncontrollable, increased levels of fear of giving birth and fear of bearing a physically or mentally handicapped child were found, which, in turn, were associated with increased levels of distress. When these fears were included in the path model of distress, problem-focused coping no longer explained significantly a part of the variance of distress. The model with the best fit to the data ($\chi^2 = 25.47$, $df = 15$, $p = .05$, $RMSEA = .07$, $RMR = .04$, $CFI = .98$, $NNFI = .97$) included daily hassles, life events, secondary appraisal of the pregnancy, fear of giving birth and fear of bearing a physically or mentally handicapped child as predictors of the dependent variable

distress. In total, this model explained 66 % of the variance of distress. The model is shown in Figure 6.5.

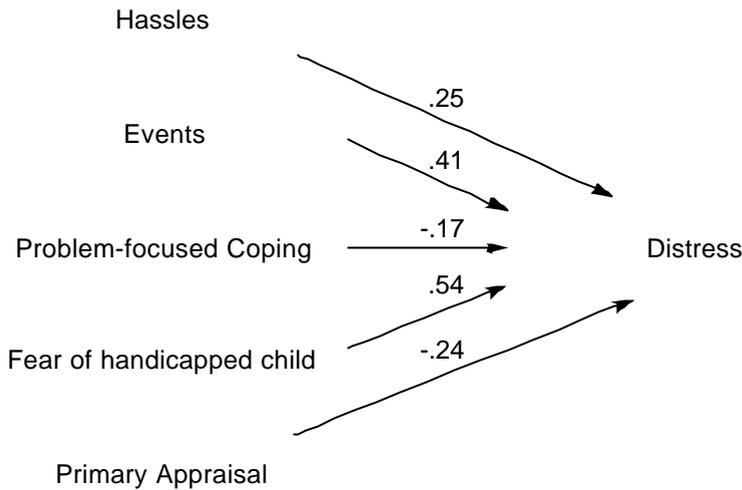
Figure 6.5 Best fitting model of distress in mid-pregnancy when pregnancy-related anxieties



are added to the model.

Late pregnancy. In late pregnancy, problem-focused coping nor emotion-focused coping did mediate the effects of pregnancy related fears on distress. Rather, a direct effect on distress of fear of bearing a physically or mentally handicapped child was found in addition to the direct effects of daily hassles, life events, problem-focused coping and primary appraisal of the pregnancy. The model that fitted best to the data ($\chi^2 = 13.51$, $df = 10$, $p = .20$, $RMSEA = .05$, $RMR = .03$, $CFI = .99$, $NNFI = .98$) is shown in Figure 6.6. In total, this model explained 74 % of the variance in the level of distress.

Figure 6.6. Best fitting model of distress in late pregnancy.



6.4.4 Causal relationship between coping and distress

To examine whether coping scores and the amount of perceived distress were confounded, several models were tested in which distress predicted scores on emotion- or problem-focused coping. None of these models did fit to the data ($p < .0005$) in any part of pregnancy. Therefore, the results suggested a causal relation between coping and distress instead of the other way around.

In addition, it could be that coping would have a prolonged effect on distress. That is, coping in early pregnancy may predict distress levels in mid-pregnancy and coping in mid-pregnancy may predict distress in late pregnancy. The findings of these longitudinal models showed that neither emotion-focused coping nor problem-focused coping could account for distress in the subsequent part of pregnancy.

6.5 Discussion

The purpose of the present study was to examine the role of coping in a multidimensional model of prenatal stress in a population of normal risk first-time expectant mothers. With regard to the first aim of this study, coping appeared to have direct effects on the emotional status of pregnant women rather than having a mediating role between stress provoking factors and distress.

In early pregnancy, increased emotion-focused coping caused decreased levels of distress. In mid and late pregnancy, increased problem-focused coping was related to decreased levels of distress. Also, direct effects of the amount of life events and daily hassles accounted for a significant part of the variation in distress. As pregnancy proceeded, daily hassles in particular had strong effects on distress. These findings partly contradict the process model of coping (Lazarus, 1999), which states that coping arises from the transaction between the person

and the environment and mediates the effect on emotional outcome. Clearly, daily hassles and life events did not provoke a specific coping response in our subjects. In fact, our results suggested that emotion- and problem-focused coping tend to reduce distress, independent of daily hassles and life events. This could be explained by viewing coping as a personality trait, as many have done before. However, several findings argue against this interpretation. First of all, if coping would be a trait aspect of the personality rather than a changing process, the effect of coping on distress would be stable over time. However, our longitudinal models showed that coping scores in early pregnancy did not predict levels of distress in mid-pregnancy, nor did coping scores obtained in mid-pregnancy account for variation in the distress level in late pregnancy. Secondly, a previous study in the same population showed that coping changes throughout pregnancy. In early pregnancy, emotion-focused coping appeared to prevail, whereas emotion-focused coping scores declined with increasing gestation (Huizink et al., 2000b).

These latter findings are even more interesting, when we combine them with the pattern found in the path models of prenatal stress, as described in the present study. In early pregnancy, emotion-focused coping has a negative influence on distress, whereas in mid- and late pregnancy problem-focused coping predicted distress levels negatively. Perhaps, in early pregnancy the emotional adaptations involved with the discovery of being pregnant call for a need of emotion-focused coping. Mid and late pregnancy may involve more practical adaptations, such as preparation of the baby's room and arranging public nursery. Problem-focused coping, therefore, would be a better way of dealing with these practical issues. In mid pregnancy it was found that emotion-focused coping increased distress, whereas problem-focused coping tended to reduce distress levels. This finding suggest that problem-focused coping may be more effective in this particular period of pregnancy. In that respect, coping is a process that responds to the necessary demands and adaptations needed in a certain condition or situation.

It is obvious, however, that in our sample of normal risk pregnant women, daily hassles and life events both had an independent effect on distress and did not give rise to increased levels of either emotion- or problem-focused coping. Presumably, the adaptations to pregnancy are independent of more common stress-provoking factors such as daily hassles and life events.

In that respect it is interesting to notice that the second question addressed in the present study showed that the appraisal of pregnancy contributed significantly to the level of distress. In early pregnancy, regarding pregnancy as a pleasant event gives rise to increased levels of emotion-focused coping, which in turn is related to reduced distress levels. Thus, emotion-focused coping mediates the stress response to the uplift of pregnancy itself. Secondary appraisal of the pregnancy, or the uncontrollableness of the situation, is positively related to levels of distress, independent of the occurrence of daily hassles or life events. Thus, the appraisal of pregnancy indeed results in some degree of distress. What exactly contributes to this distress response is unknown, and it should therefore be studied in more detail, by using a questionnaire that includes pregnancy-related stressors.

Although we did not include the stressors specifically related to pregnancy as described by DiPietro et al. (2000.), some aspects of the pregnancy itself were included in our more complex models. In order to test the aforementioned hypothesis, we examined the role of coping in the stress response to pregnancy-related anxieties. These anxieties have been shown to be

specifically related to pregnancy and could be differentiated from more general anxiety and depression symptoms (Huizink et al., 2000a). The results showed that coping did not mediate the stress provoking effects of these fears. Rather, a direct effect of these fears on distress was found. In mid-pregnancy, the secondary appraisal of pregnancy was associated with increased fears, which in turn raised the amount of distress.

In the present study, coping and distress measures were not confounded. It was found that coping predicted the level of distress, instead of vice versa. Therefore, the findings of the present study demonstrate that coping has an effect on distress independent of daily hassles and life events and should therefore be included in a multidimensional model of prenatal stress.

Thus, in the present study, emotion-focused coping only mediated the effect of primary appraisal of the pregnancy on distress. It could be that the coping scores we have used in this study were not used by pregnant women to mediate their emotional reaction. Therefore, further research is needed to clarify the role of other coping strategies in mediating stress responses. Clearly, emotion-focused coping or problem-focused coping did not mediate the stress response in our sample of relatively normal risk pregnancies. Perhaps, more intense stress provoking factors in high-risk subjects would provoke more coping processes than in our sample, which in turn would mediate the stress response.

The models of distress that we found predicted a large amount of the variance of distress in mid (66%) and late pregnancy (74%), and a moderate amount of variance in early pregnancy (35%). A potential moderator of the effect on distress of daily hassles, life events, primary or secondary appraisal of the pregnancy, and pregnancy-related fears is the available or received social support of the pregnant women. Also, personality aspects such as neuroticism and trait anxiety may modify the distress response to these stress provoking factors. Therefore, in a next study, we will examine if and to what extent these factors will account for the remaining variance of distress, especially in early pregnancy.

In conclusion, coping has a main effect on distress in pregnant women rather than a mediating effect. Furthermore, the most effective coping style to reduce distress varies with increasing gestation. To reduce levels of distress in pregnancy by intervention studies, it is therefore important to take account of this time-specificity of effective coping and to focus on the emotional and practical needs in that particular period of pregnancy.

In future studies, pregnancy-specific stressors should be included as stress-provoking factors, and social support and personality aspects should be studied with regard to their moderating role. In addition, these models of coping strategies in normal risk pregnancy have to be confirmed in a future and independent study group.

6.6 References

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