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# Childhood Somatic Complaints: Relationships with Child Emotional Functioning and Parental Factors

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**Abstract:**

Many schoolchildren experience somatic complaints such as headaches, abdominal pain and fatigue. The aim of the current research is to test the full model of previously found associations between negative affect and somatic complaints in parents and children. Participants were 199 children (aged 8-13, 47% boys) and their parents (aged 31-61, mostly mothers (87%). Self-reports of children and parents on worry, anxiety, depression and somatic complaints were used and parents' reactions to children's emotions wereassessed. The results of the study show that childhood negative affect and parental somatic complaints are positively associated with childhood somatic complaints. In turn, childhood negative affect is related to children's worrying and to parents' responses to children's emotions. The more anxious or depressed children felt, the more they worried. Maladaptive parental responses (such as reprimands and discomfort) to child emotions were positively related to depression. It was also found that parents who experienced more negative affect, reported more somatic complaints and tended to report more maladaptive responses towards their children's emotions.

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## Introduction

Many schoolchildren experience somatic complaints such as headaches, abdominal pain and fatigue: prevalence rates range between 10 and 30% for recurrent or chronic complaints [1-5]. These complaints frequently are associated with psychological problems [6-8]. A significant amount of research during the past few decades has been devoted to determining relationships between various psychological factors and childhood somatic complaints [9]. Some researchers have focused on the positive relationship between negative affect and somatic complaints [10-16]. Other researchers have taken an interest in parental factors that could cause somatic complaints in children [19-25]. These two lines of research have resulted in research outcomes that are theoretically compatible. Still, they have not yet been integrated.

## The Relationship Between Negative Affect and Somatic Complaints

Negative emotions or stress have a physiological component: the body responds in order to enable a person to fight or flight from situations that cause negative emotions or stress. According to the biobehavioral model of pediatric pain and the perseverative cognition hypothesis, negative affect in the form of depression, anxiety or worrying, is an intensified and prolonged psychological state [12,14]. The belonging physiological responses that are present because of this negative affect result in the experience of somatic complaints [12,14]. Previous research clearly shows that children with symptoms of depression or anxiety indeed more often report somatic complaints than their peers without these symptoms [7, 10-12]. Similarly, it has been shown that children who frequently worry experience more complaints than their peers [13]. Whereas anxiety, depression, and worrying are strongly related [15-16], research suggests that at least anxiety and depression have a unique relationship with somatic complaints in children and adults [8, 17-18]. The unique role of worrying is less clear; worrying as a minimum is a strong predictor of negative affect [16]. All three variables were therefore included in the current study.

## Parental Influences on Childhood Somatic Complaints

With respect to the second line of research, several studies have demonstrated a positive relationship between the occurrence of parental somatic complaints (particularly maternal) and child somatic complaints [23-24]. This relationship is probably partly explained genetically, in the sense that children inherit a genetic disposition to more easily develop somatic complaints [19]. Further, it has been suggested that parents may have a more indirect influence on children's somatic complaints by their parenting behavior. For example, early low perceived parental control and insecure attachment have been found to predict later experiences of somatic complaints in children [25].

It is essential to understand that the relationship between negative affect and somatic complaints described above, is not just applicable to children, it is also applicable to adults. Thus, those parents who experience somatic complaints, also often experience negative affect. Parental negative affect is seen as a risk factor for children's functioning. After all, parents with negative affect can respond in maladaptive ways to their children. More precisely, previous research has shown that children whose mothers respond to emotions in an invalidating (e.g., restrictive or punishing) rather than validating (e.g., encouraging expression) way, have more problems with emotion regulation and experience more feelings of anxiety or depression than their peers [26-28]. From these previous studies, it can be concluded that children feel better when parents acknowledge their emotions and respond empathically or supportive than when parents become distressed or try to minimize emotion expression by the child [29]. Theoretically, this would also cause somatic complaints in children, but this has not yet been empirically verified.

### Summarizing the Results from Previous Research

In conclusion, the current literature has demonstrated that negative affect is associated with somatic complaints [7,10-13]. Further, somatic complaints in parents are associated with somatic complaints in children [23-24]. In addition, parents with somatic complaints also often suffer from negative affect [17]. In turn, negative affect in parents is associated with invalidating responses to children's emotions. These invalidating responses to emotions are associated with negative affect in children [26-29]. What has not yet been studied, however, is the full model that includes both the direct effect of parental somatic complaints on children's somatic complaints as well as the indirect effects of negative affect in parents, as depicted in Figure 1: because parental negative affect is associated with maladaptive responses to children's emotions, this results in negative affect in children, that again is associated with children's somatic complaints. In the current study, a first step was made to combine the two lines of research (i.e., childhood negative affect and parental factors in association with childhood somatic complaints).

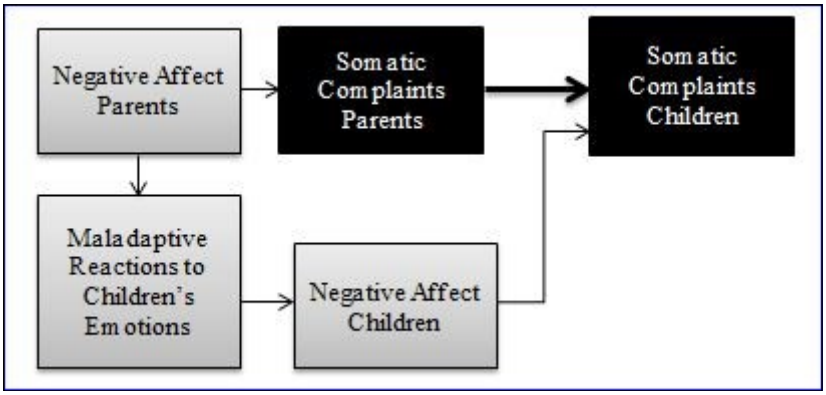


Figure 1. Theoretical explanation of the direct association between somatic complaints in parents and children (black) and the indirect pathway (grey)

### The Current Study

In the current study the aim was to address this full model of direct and indirect associations between parents' negative affect, emotional responses and somatic complaints and children's negative affect and somatic complaints. Simultaneously studying different types of potential influences on children's somatic complaints has the advantage of separating independent effects of each factor that could otherwise be overesti-mated Based on the above described previous findings,the following associations were expected:

- a positive relationship between depression, anxiety, worrying and somatic complaints for children as well as parents
- a direct, positive relationship between parental somatic complaints and child somatic complaints
- positive relationships between parental negative affect and maladaptive reactions to child emotions
- positive relationships between maladaptive maternal reactions to child emotions and negative affect in children

## Method

### Participants

Participants were 199 children (aged 8-13, mean age=10; 47% boys) and their parents (aged 31-61, mean age = 42). Almost all parental questionnaires were completed by mothers (87%). The vast majority of the families were from original Dutch descent (90%; other common ethnic backgrounds were Surinam and

Indonesian). Parental levels of education were representative of the Dutch population.

### 2.2 Procedure

Data collection was part of a larger research project. Sixteen 16 random schools in North Holland were asked to participate. Depending on school size, a minimum of one and a maximum of three classrooms were asked to participate. These were 33 classrooms grade 4 to 6 (Dutch school system group 6-8), with the inclusion of one combination classroom grades 3 /4. Parents received an information letter and were asked for informed consent. Parental consent was received for 73% of the children ($n$ = 600). They were tested in their own classroom at school (this larger data set will be used for a different study). Parents were asked to send their own questionnaires in a prepaid envelop to the University. Of the parent quationnaire, 199 were received that could be used for data analysis; an additional 10% was unusable because parents had left the identification part of the questionnaire empty. No differences were found in child reports of depression, anxiety, worry or somatic complaints between the group with and the group without parental participation.

### Measures

*Children*

The *Children's Depression Inventory short form* is a 10-item self-reported depressive symptoms [30]. Prior research has supported the validity and reliability of the Dutch version for the current age group [31]. For each item, participants are asked to select one of the three statements that best describes the way that the participant has been feeling during the past 2 weeks. For each item, scores are 0 = *absence of symptom*, 1 = *mild symptom*, and 2=*definite symptom*. The internal consistency was .66.

The *Multidimensional Anxiety Scale for Children* is a 39-item self-report instrument that screens for various anxiety problems experienced by children and adolescents 8–19 years of age [32]. Previous studies have found support for the validity and reliability of the Dutch scales in middle childhood [33-34]. Four basic scales are included: Social Anxiety, Physical Symptoms, Harm Avoidance, and Separation/Panic. Items are on a 3 -point scale 0(never true about me) to 3 (often true about me). All subscales had sufficient internal consistencies of .65-.85. For the analyses, the Physical Symptoms subscale was excluded because of overlap in content with childhood somatic complaints ($r$ = .67, $p$ < .01).

The *Non-Productive Thought Questionnaire-Kids* consists of 10 statements, with a 3-point scale from 0 (never true to) 2 = often true [27]. Items measure worry/rumination, regardless of content (e.g., If I have a problem, I cannot stop thinking about it). The internal consistency of the questionnaire was .79.

The *Somatic Complaint List* consists of 11 common somatic complaints that are rated on a 5-point scale (from 1=(almost) never to 5=quite often) [35]. The internal consistency was .76.

*Parents*

The *Parents' Reaction to Children's Positive Emotions Scale* consists of a series of 12 vignettes in which children are likely to experience positive emotions such as joy, pride, excitement, and curiosity [26-28]. The PRCPS includes different contexts (with peers or acquaintances, at a birthday party, in a car, etc.), but the parent is always present. For each situation, parents indicate on a 7-point scale (from 1=very unlikely to 7=very likely) how likely they would be to react as described in each of the six alternative responses. The PRCPS yields four subscales: Socialization, reflecting the degree to which parents explain to their child the reasons why their expressive behavior may be inappropriate given social norms or etiquette; Encouragement, indicating the degree to which parents encourage their child to express positive emotions or

validate their child's positive emotional states; Reprimand, reflecting the degree to which parents react by reprimanding their child for expressing positive emotions; and Discomfort, indicating the degree to which parents feel discomfort, embarrassed, or irritated when their child expresses positive emotions.

The *Coping with Children's Negative Emotions Scale* [36] consists of12 typical situations in which young children are described as experiencing distress and negative affect (e.g., being teased by peers, being scared of injections, being nervous about possibly embarrassing him/herself in public). Similar to the PRCPS, for each situation, the parent is asked to indicate how likely (on a 7-point scale) he or she would be to react in each of six different ways. The CCNES yields six subscales: Punitive Reactions; reflecting the degree to which parents respond with punitive, controlling responses that decrease their exposure or need to deal with the negative emotions of their children; Minimization Reactions, reflecting the degree to which parents minimize the seriousness of the situation or devalue the child's problem or emotional response; Distress Reactions, reflecting the degree to which parents experience negative emotional arousal when children express negative; Expressive Encouragement, reflecting the degree to which parents encourage children to express negative affect or the degree to which they validate child's negative emotional states, Emotion-Focused Reactions reflecting the degree to which parents respond with strategies that are designed to help the child feel better; and Problem-Focused Reactions, reflecting the degree to which parents help the child solve the problem that caused the child's distress.

The PRCPS and the CCNES questionnaires were presented to parents as one integrated questionnaire. All subscales had sufficient internal consistencies of .60-.85, although 4 items had to be removed in order to achieve this, which is consistent with previous research [27].

The *Beck Depression Inventory* is a 21-item scale designed to measure the presence of emotional, behavioural and somatic symptoms of depression over the previous week [37]. Each item is rated on a 4-point scale ranging from 0 to 3. The internal consistency was .80.

The *State Trait Anxiety Inventory- Trait* scale consists of 20 items that predominantly measure affective and cognitive components of anxiety that are more stable rather than situational [38] . Participants rate each item on a scale of 1 (almost never) to 4 (almost always). The internal consistency was 0.92.

The *Penn State Worry Questionnaire* is a 16-item questionnaire that assesses the generality, excessiveness, and uncontrollability of worry, regardless of content [39]. Individuals rate each item on a Likert scale ranging from 1 (not at all true) to 5 (very true). The internal consistency was 0.95.

Parents also completed the *Somatic Complaint List*. The internal consistency was .84.

Statistical Analyses

The data were analyzed with structural equation modeling. In our preliminary analyses, a measurement model was fitted. For the parental reactions, a principal component analyses was first performed in order to determine underlying dimensions. For the other variables, the (sub)scales were used as indicators.

Measurement error variances of the constructs that did not have multiple indicators were fixed based on the reliability estimate. A comparative fit index (CFI) > .90 and a Root Mean Square Error of Approximation of < .80 were considered as indicators of adequate model fit [40-41]. Then, the relationships were further explored, guided by the hypotheses, but build up in steps in order to carefully determine direct and mediating effects. For each subsequent model, the

model fit was evaluated. For the evaluation of each pathway between the constructs, the z-test was used (with a critical z value of |1.96|).

## Results

### Preliminary Analyses

In Table 1, the descriptives are presented as well as the simple correlation between the parent and child variables. A principal component analyses with varimax rotation was carried out on the subscales of the Parental Reactions to Children's Positive Emotions subscales and the Coping with Children's Negative Emotions subscales. The scree plot indicated a two factor structure. Based on this analysis, two latent constructs were defined, with the indicators in parenthesis: Invalidating responses (distress reactions, punitive reactions, minimization reactions, discomfort, and reprimand) and Validating responses (emotion-focused reactions, problem focused reactions, expressive encouragement, and encouragement). Socializing reactions loaded on both factors and were not used in further analyses. For childhood anxiety, the anxiety subscales harm avoidance, separation anxiety, and social anxiety were used. The other variables were represented by a single indicator. The fixed the error variance was fixed on (1-relaibility)*variance of the scale. In the first measurement model, all latent variables were allowed to covary. This model did not reach acceptable model fit, $\chi^2(114) = 322.42$, CFI = .866, RMSEA = .096. Based on the similarity in content, covariation was then allowed between distress reactions and discomfort; expressive encouragement and encouragement; and punitive reactions and minimalizing reactions. This second model resulted in a good model fit, $\chi^2(111) = 249.02$, CFI = .911, RMSEA = .079.

### Model Testing

Our analyses showed that worrying had no direct effect on childhood somatic complaints (z=0.26), whereas depression (z= 2.10) and anxiety (z=3.29) both predicted more somatic complaints. Notice that, as expected, worry was positively associated with anxiety and depression.

With respect to the parent variables, the only significant predictor of childhood somatic complaints was parental somatic complaints ($z$=2.07). It was alsotried to predict parental somatic complaints out of parental anxiety, depression, and worrying and a significant path for anxiety was found ($z$=2.09).

With respect to the question whether childhood depression and anxiety could be predicted by parental depression, anxiety, and/or parental reactions to child emotions; it was found that for child depression, positive ($z$=-2.03) and negative reactions (z=2.14) were significant predictors. Finally, it was examined whether parental reactions could be predicted by parental depression and anxiety. Note that this was tested separately for each variable to avoid problems with multicollinearity. The only significant effect that was found was for depression on invalidating responses ($z$=2.89). The model with all significant paths only is depicted in Figure 2. The fit indices of this model were: $\chi^2(142) = 296.52$, CFI = .901, RMSEA = .074.

## Discussion

In this study, effects of emotional and parental factors on childhood somatic complaints were examined. A particular strength of this study was that all variables were addressed simultaneously in a full model. Because of this, direct as well as indirect effects could be examined. The aim of the study to combine the two paths of previous research was successful. The results of the study show that childhood negative affect and parental somatic complaints are positively associated with childhood somatic complaints. In turn, childhood

**Table 1.** Means and Standard Deviations of All Variabels and Correlations Between the Parent and Child Variables

| | | | Child Variables | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Somatic Complaints | Depression | Social Anxiety | Harm avoidance | Seperation/ panic | Worry |
| Parent Variables | | | M (SD) | M (SD) | M (SD) | M (SD) | M (SD) | M (SD) |
| | M | (SD) | 1.90 (0.51) | 0.26 (0.23) | 2.00 (0.64) | 2.89 (0.45) | 1.82 (0.51) | 0.91 (0.46) |
| Somatic Com-plaints | 1.72 | -0.54 | .23** | 0.07 | 0.09 | 0.03 | .15* | 0.01 |
| Depression | 0.22 | -0.22 | 0.12 | 0.06 | 0.09 | 0 | 0.1 | 0.05 |
| Anxiety | 1.59 | -0.43 | .15* | .14* | 0.01 | -0.03 | 0.05 | -0.04 |
| Worry | 2.2 | -0.68 | .17* | .19** | 0.03 | 0.02 | -0.01 | 0.02 |
| Discomfort | 2.21 | -0.82 | 0.02 | .14* | 0.07 | 0.01 | 0.07 | 0.14 |
| Reprimand | 3.38 | -0.93 | -0.04 | 0.09 | 0.07 | -0.03 | 0.03 | 0.08 |
| Encouragement | 4.27 | -0.86 | 0 | -.18** | -0.06 | 0.11 | -0.05 | 0.01 |
| Socialization | 4.96 | -0.81 | -0.07 | 0.09 | 0.08 | 0.03 | 0.11 | 0.08 |
| Distress | 2.03 | -0.65 | 0.09 | .19** | 0.06 | -0.06 | 0.01 | 0.13 |
| Punitive | 2.08 | -0.62 | 0.06 | .16* | 0.05 | 0.01 | 0.05 | 0.1 |
| Minimization | 2.72 | -0.87 | 0.05 | 0.05 | 0.08 | 0.07 | 0.09 | 0.11 |
| Expressive Encouragement | 4.73 | -1 | 0.03 | -0.08 | 0.02 | .15* | 0.08 | -0.01 |
| Emotion Focused | 5.19 | -0.88 | -0.05 | -0.08 | 0.05 | .16* | 0.01 | 0 |
| Problem Focused | 5.66 | -0.79 | -0.01 | -0.09 | 0.05 | 0.11 | 0.01 | -0.07 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

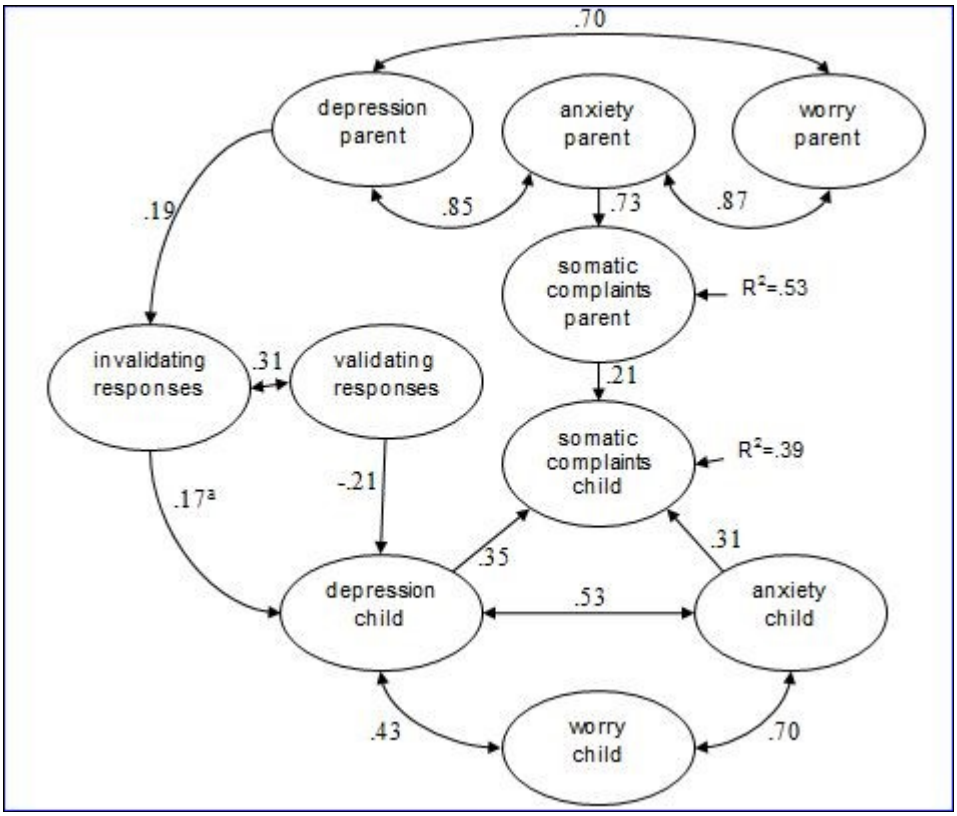


**Figure 2.** Standardized paths in the final model predicting childhood somatic complaints. Arrows indicate the assumed causal direction of the path.

negative affect is related to children's worrying and to parents responses to children's emotions. The more anxious or depressed children felt, the more they worried. Invalidating parental responses to child emotions were positively related to depression whereas validating responses were negatively related to depression. It was also found that parents who experienced more negative affect, reported more somatic complaints and tended to report more invalidating responses towards their children's emotions. As such, the results confirm the expectations as support the model presented in Figure 1.

**Associations Between Negative Affect and Somatic Complaints**

Whereas for children, feelings of depression and anxiety showed independent relationships with somatic complaints, in the parentsonly a direct path from anxiety towards somatic complaintswas found. This result must be cautiously interpreted, however, as previous research with a larger sample has found a relationship between somatic complaints and anxiety as well as depression [17]. The relationships between anxiety, depression, and somatic complaints were stronger for the parents than for the children. Previous research in adults has shown that individuals with anxiety tend to develop depression and that there is high comorbidity between anxiety and depression [42]. This interrelatedness may explain why it is difficult to find separate effects for anxiety and depression.

Interestingly, the relationship between worry and somatic complaints was indirect: in adults it seemed to be mediated by anxiety and in children by anxiety and depression. It has been shown that worry can cause cardiac changes independent of mood changes [43]. In this way, worry can evoke similar physiological responses compared to cognitive solving activity. Similarly, it has been found that appraisal and repetitive negative thoughts are related to levels of cortisol (a

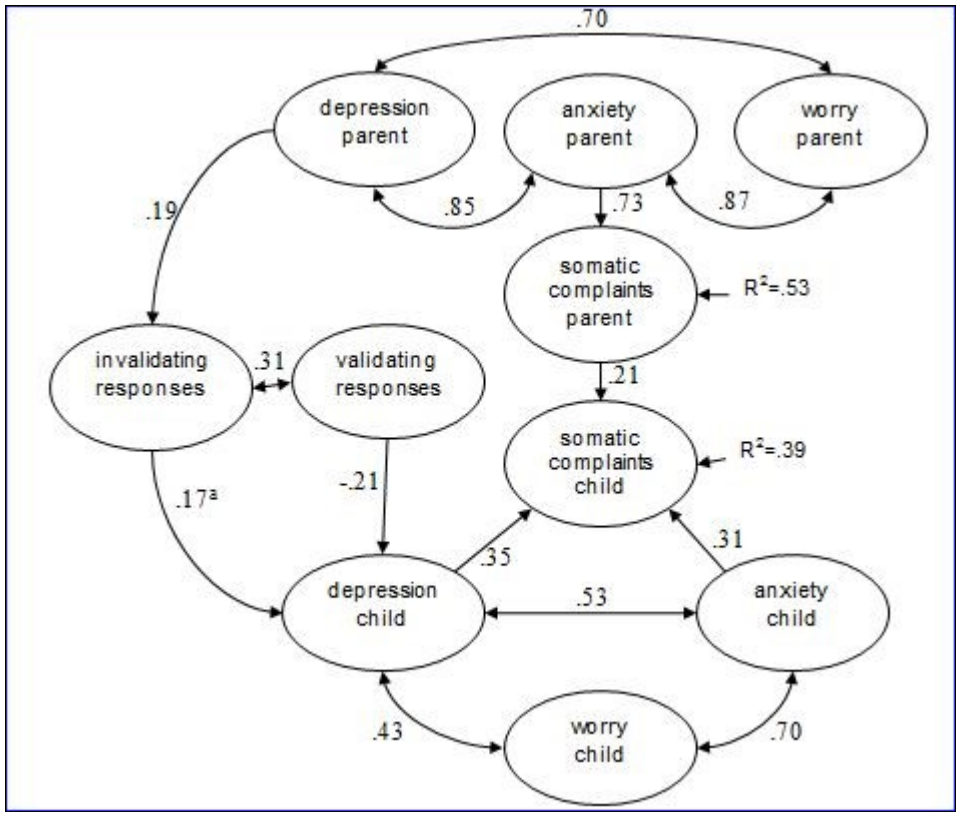


**Figure 2.** Standardized paths in the final model predicting childhood somatic complaints. Arrows indicate the assumed causal direction of the path.

stress-released hormone) and immune reactivity to stress [44]. The current results demonstrate, however, that it is not just cognitive involvement that increases the risk of somatic complaints. Symptoms of anxiety or depression are better predictors, which are in turn positively related to worry.

Whether individuals develop symptoms of depression or anxiety depends on cognitive factors, but also on biological factors (e.g., genetic, hormonal) and emotional factors (e.g., emotional reactivity or the in this study found (in)valididating responses received) [45-47]. Future studies could further investigate the precise role of depression and anxiety. For example, symptom perception might be influenced by depression[44]. Further, it has been suggested that not cortisol and (related) immune reactions to stress, but autonomic nervous system dysfunction (such as enteric nervous system dysfunction in the case of abdominal pain) explain the link between negative affect and somatic symptoms [48-49].

**Parental Factors**

The current results further clearly demonstrate that in so far as parental reactions to child emotions are associated with somatic complaints, this relationship is indirect. As was expected, maladaptive responses to children's emotions by parents are associated with more negative affect in children.

Parents also have a more direct influence through their own somatic complaints and this effect should be further investigated. Previous research supported that at least part of the relationship between parent and child somatic complaints is genetic [50]. Recently, a new focus on genetic influences has emerged. The complexity of genetic influences is now acknowledged. It seems that that are multiple (genetic) factors that influence all or specific somatic symptoms and depression and anxiety [51]. In addition, the need for an understanding of gene x environment effects is

stressed [51-52].

## Study Limitations

There are some limitations of this study that should be taken into consideration. First of all, a community sample was used. It was,therefore, impossibleto investigate depression, anxiety, or somatic complaints within the clinical range. In addition, we had no access to parent's or children's medical records. This might have resulted in an underestimation of effects on somatic complaints. After all, some complaints that were reported might be mainly explained by medical causes. A final limitation that needs to bestressed is the low response rate in parental participation. Although no differences in the child reports were found, it might be that parents who experience parenting problems are more reluctant to answer questions about how they respond to child emotions than parents who experience no such problems. This may have let to weaker associations between parental reactions to child emotions and our other variables than would have been found in the total population.

## Conclusion

In conclusion, the current study has integrated some of the previous findings on childhood somatic complaints by combining effects of negative affect and parental factors in one model. The results confirm that there is a direct association between parental and child somatic complaints. Besides this, both child and parental somatic complaints are related to negative affect. Because parents with negative affect also are more likely to show maladaptive responses to children's emotions, they also indirectly further increase the likelihood of children's somatic complaints through childhood negative affect.

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