# Somatic complaints in childhood: How they are related to children's emotional and social functioning

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# Chapter 7
# My peers, my friend, and I: Peer interactions and somatic complaints in boys and girls

In this article we present two studies about the relations between peer relationships and somatic complaints in children (conducted on the same sample: *M* age at time 1 = 10; *n*1 = 711, *n*2 = 688; 1.5 years between both assessments). In the first study, we focused on social status as rated by classmates (popular, neglected, controversial, rejected, and average), self-reported social anxiety and somatic complaints. The second study focused on possible positive influences of best friends on somatic complaints. We analyzed how reciprocity of the friendship, self-reported disclosure with the nominated best friend and self-reported emotion communication skill were related to children's somatic complaints. The results indicate an influence of peer interactions on somatic complaints. Social anxiety was associated with more somatic complaints, but peer status was unrelated to somatic complaints. Further, for girls with a reciprocated best friend, emotion communication skill was related to fewer somatic complaints. For boys emotion communication skill was negatively associated with somatic complaints when their friendship was unreciprocated, whereas disclosure with the nominated peer was related to the experience of more complaints in this case. The results indicate different associations of the sharing of emotions among boys and girls with regard to somatic complaints. Self-reports on relationships and health may overlap more than classmates' reports of peer status because of shared method variance.

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## INTRODUCTION

Many children experience somatic complaints, such as abdominal pain and headaches, especially in middle childhood and adolescence (Perquin, et al., 2000; Petersen, Bergstrom, & Brulin, 2003). These common complaints can be best understood using a biopsychosocial model (Kaptein, Appels, & Orth-Gomer, 2000). In this model, biomedical, psychological and social factors are considered as possible influences on the perception of somatic complaints. Although it may be obvious that biomedical factors do have an influence, the literature shows that psychological or social influences can also have an impact on the experience of complaints. Better insight into psychosocial influences in addition to medical studies can help understanding the frequency of somatic complaints in childhood.

In response to stress or negative affect, humans experience physiological reactions such as an increased heart rate, perspiration, and muscle tension. These reactions are normal and facilitate responding (Kraaimaat & Van den Bergh, 2000). Yet, physiological reactions have the potential to change biological parameters and can contribute to the development of somatic complaints over longer and/or more intense periods of negative affect (Bhatia, & Tandon, 2005; Charmandari, Tsigos, & Chrousos, 2005; Vingerhoets & Perski, 2000). Several studies have demonstrated that even in childhood, negative affect is associated with more somatic complaints (Campo, Bridge, Ehmann, Altman, Lucas, Birmaher et al., 2004; Diepenmaat, van der Wal, de Vet, & Hirasing, 2006; Jellesma, Rieffe, Meerum Terwogt, Kneepkens, & Kindermann, 2006; Muris & Meesters, 2004). In addition, several psychological variables that contribute to increased negative affect are related to the experience of more somatic complaints. For example, maladaptive coping (Compas, Boyer, Stanger, Coletti, Thomsen, Dufton & Cole, 2006; Walker, Smith, Garber, & Claar, 2007) and low perceived emotional intelligence (Mavroveli, Petrides, Rieffe, & Bakker, 2007) are associated with more negative affect and somatic complaints.

Besides psychological variables, social factors also have the potential of increasing negative affect. This is especially true for children in middle childhood and adolescence, when peers become more important and adult supervision of peer interactions decreases (Gifford-Smith & Brownell, 2003). For example, it has been shown that children who are disliked by many children in their classroom have more symptoms of depression (Oldehinkel, Rosmalen, Veenstra, Dijkstra, & Ormel, 2007). Moreover, children who experience problems with classmates report more symptoms of anxiety (Barrett & Heubeck, 2000). Yet to date, the influence of peer acceptance in relationship to somatic complaints has received little attention. Still, especially when it concerns interactions in the classroom, it might be expected that there is a negative association between acceptance and somatic complaints. After all, children spend a substantial part of the week in the classroom. If relationships with classmates are problematic, children can experience negative affect quite frequently or even chronically, increasing the likelihood of somatic complaints. Indeed, self-reported problems with peers in the

classroom seem to be associated with more somatic complaints (Gadin & Hammarstrom, 2003; Murberg & Bru, 2004; Odegaard, Lindbladh & Hovelius, 2003). However, this relationship has not yet been studied with measures of peer acceptance from peers themselves. In addition, boys and girls feel differently about interpersonal behavior. For instance, girls experience relational aggression as more hurtful than physical aggression and girls who show relational aggression are more likely to be rejected by their peers than boys (Crick, 1996). Gender differences should therefore be taken into account. In our first study, we focused on peer status in the classroom in relationship to somatic complaints in girls and boys.

Based on the outcomes of the first study, a second mechanism was identified through which relationships in the classroom could influence the experience of somatic complaints. In the second study we focused on children's friendships. Friendships serve the purpose of emotional security and support (Gifford-Smith & Brownell, 2003). As children get older, friendships are increasingly determined by intimacy and disclosure (the sharing of personal experiences and feelings). In middle childhood and adolescence, best friendships are formed, friendships with a single, favored peer (Sullivan, 1953). As these friendships are more intimate, they could be helpful in decreasing negative affect. Moreover, talking about emotions with a best friend can increase a feeling of support and provide new strategies for coping with negative situations. Close friends can thus influence children's well-being (LaFreniere, 2000). There are gender differences in the perception of friendships. Girls appreciate their friendships more than boys and report more intimacy (Parker & Asher, 1993). Therefore, in the second study, we investigated possible positive effects of a best friend on the experience of somatic complaints in boys and girls in the same sample 1.5 years later.

## STUDY 1

### INTRODUCTION

In the first study we examined the relationship between peer acceptance in the classroom and the experience of somatic complaints. To date, studies on peer problems and somatic complaints have usually concentrated on self-perceived peer problems (Gadin & Hammarstrom, 2003; Murberg & Bru, 2004; Odegaard et al., 2003). However, self-perceived social status in the group does not necessarily have to coincide with one's actual acceptance by peers. Socially anxious children may be inclined to view relationships as more problematic than their non-anxious peers. Social anxiety has been previously linked to children's somatic complaints. Children with recurrent abdominal pain report more symptoms of social phobia than pain-free peers (Campo et al., 2004). In addition, children with pain complaints have an attention bias towards social threat-related words (Boyer, et al., 2006). Self-reported social anxiety and social status could also interact: socially anxious children with a negative status in the classroom (rejected, neglected or controversial) may be more concerned about their social status.

In this study, we focused on the aforementioned relationships between children's peer contacts and somatic complaints. The objective of this study was to examine the extent to which peer-rated social status and self-rated social anxiety are related to children's somatic complaints. We used classroom peer nominations and took into account children's perceptions of peer interactions through self-report of social anxiety in such interactions.

Children's acceptance by peers is usually categorized into five status types -- popular, rejected, average, neglected and controversial -- based on like-dislike nominations by the other children in the classroom. The reason for this categorization is that the combination of the relative number of like and dislike nominations gives more information than using these nominations as two separate variables. Acceptance and rejection are related, but can not be placed on the opposite ends of a single continuum (Coie, Dodge, & Coppotelli, 1982; Coie & Dodge, 1983). Children liked by many peers and disliked by few are *popular*, children liked and disliked by many peers are *controversial*, children disliked by many peers, but liked by few are *rejected*, children liked and disliked by few peers are *neglected* and children with average numbers of nominations on both dimensions are *average*. Rejected and - to a lesser extent -controversial children are at risk for negative developmental outcomes (Gifford-Smith & Brownell, 2003).

Previous studies have indicated gender differences in the experience of peer relationships. It has been shown that social anxiety is more strongly related to victimization in boys than in girls (Erath, Flanagan, & Bierman, 2007; Saarni, 1999). On the other hand, the stress experienced as a consequence of negative peer relationships seems to be higher for girls. Negative peer relationships imply having less social support, which is particularly appreciated by girls and less by boys (Erath et al., 2007). This idea is further confirmed by the finding that the increased risk of depression associated with a negative peer status is higher for girls than for boys (Prinstein & Aikins, 2004). We therefore analyzed whether there were gender-specific differences in these relationships. Because peer influence might be age-dependent, we controlled for possible age effects.

## METHOD

### PARTICIPANTS AND PROCEDURE

This study was conducted with 717 children from 11 regular primary schools in November 2004. The schools were all part of a school network in towns around Den Bosch, a city in the Netherlands. Because of missing data, 6 children had to be excluded, leaving 711 children in the sample: 324 girls and 387 boys, 8 years and 6 months to 12 years and 8 months, with a mean age of 10 years and 3 months, *SD* = 8 months. The questionnaires were administered in the classroom during regular school hours. Children who were absent on the day of data collection answered the questions in the following week. Written parental consent was obtained from all participating children (90% participation rate). Parents provided additional socio-

demographic information by returning it in a self-addressed university envelope. Most parents were willing to cooperate (78%). Almost all children (90%) came from a two-parent family, and were of Dutch origin (93%). All ranges of income were represented in our sample, with a median net monthly income of € 2000-2600.

MEASUREMENTS

**Classroom social status** was determined by positive and negative classmate nominations (Coie et al., 1982). The nomination procedure itself has not in the past created any risk for children who participate (Bell-Dolan & Wessler, 1994). However, we informed the schools and parents about the nominations before they gave consent. Children were informed with age appropriate explanations about the nomination procedure and about confidentiality. The children were asked to write down three names of classmates they liked and three names of classmates they did not like. The standard score model (Coie et al., 1982; Coie & Dodge, 1983) was used. First, four variables were calculated: like (the number of times the child is nominated as liked), dislike (the number of times the child is nominated as disliked), impact (the sum of the like and dislike scores), and preference (the difference between the like and dislike scores). These variables were then standardized and used to categorize the children into five groups. The *popular* group consisted of children with a negative standard dislike, a positive standard like score and a standard preference score > 1.0. The *rejected* group consisted of children with a negative standard like, a positive standard dislike score, and a standard preference score < -1.0. The *neglected* group consisted of children with standard impact scores < -1.0 and negative standard like and dislike scores. The *controversial* group consisted of children with a standard impact score > 10 and positive standard like and dislike scores. The *average* group consisted of children not belonging to any of the foregoing groups. The nominations were analyzed with KUNST SOCSTAT (Thissen-Pennings & Brink, 1995).

**Somatic complaints** were measured using the Somatic Complaint List (Jellesma, Rieffe, Meerum Terwogt, 2007). This questionnaire consists of 11 items on a 5-point scale from *(almost) never* to *quite often*. An example of an item is: "I (almost) never/seldom/sometimes/often/quite often have a headache". The internal consistency of the scale was good, $\alpha = .83$ (.85 for girls and .87 for boys, $.82 \leq \alpha \leq .84$ if analyzed by group). Parental reports would have been an alternative measure. However, previous research has shown that parents underestimate somatic complaints in their children (Chambers, Reid, Kenneth, McGrath, & Finley, 1998; Waters, Stewart-Brown, & Fitzpatrick, 2003). The range of somatic complaints ratings was 1 to 5 with a mean score of 1.91 ($SD = 0.63$).

**Social Anxiety** was measured with the Social Anxiety Scale for Children (La Greca & Stone, 1993; Mesman & Koot, 1998). This questionnaire consists of 22 items rated on a 5-point scale from *not at all* to *always*. An example of an item is: "I worry that other kids don't like me". The questionnaire's internal consistency was good, $\alpha = .89$ (.89 for girls and .87 for boys, $.83 \leq \alpha \leq .90$ if analyzed by

group). The range of the Social Anxiety Scale for Children was 0-4. Children had a mean score of 1.16 (*SD* = 0.67).

## RESULTS

ASSOCIATIONS AMONG THE VARIABLES

Table 1 presents the mean scores on somatic complaints and social anxiety for each of the classroom status groups and Table 2 for boys and girls. Gender and classroom status effects (popular, rejected, neglected, controversial, average) were determined for the dependent variables (somatic complaints and social anxiety), using analysis of covariance. An analysis of covariance using classroom status as predictor, gender and age as covariates, and somatic complaints as the dependent variable did not reveal a significant effect for classroom status, $F(4, 705) = 1.19$, $p = .31$. There was a significant gender effect with girls reporting more somatic complaints than boys, $F(1, 705) = 8.84$, $p < .01$. An analysis of covariance using classroom status as predictor, gender as covariate, and social anxiety as dependent variable revealed a significant classroom status effect for social anxiety, $F(4, 705) = 4.79$, $p < .01$. The Tukey-Kramer *post hoc* procedure was used to follow up on this significant effect ($\alpha = .05$). Compared to the neglected and rejected children, controversial ones reported less social anxiety. The analysis of covariance also revealed a main effect for gender, with girls reporting more social anxiety than boys, $F(1, 705) = 49.82$, $p < .01$. We also compared the proportion of boys and girls in each of the classroom status categories and found a significant difference, $\chi^2$ ($df = 4$) = 10.34, $p = .04$. Rejected children more often were boys (69.7%) than girls (30.3%), $\chi^2$ ($df = 1$) = 9.52, $p < .01$. There were no significant gender differences on the other categories. Finally, we analyzed the association between social anxiety and somatic complaints and found a moderate correlation, $r = .38$, $p < .01$.

Table 1
*Means (SD) of Somatic Complaints and Social Anxiety by Classroom Status and Gender*

| Variable | Classroom Status | | | | |
|---|---|---|---|---|---|
| | Average | Popular | Neglected | Contro-versial | Rejected |
| Somatic Complaints | 1.92 (0.62) | 1.90 (0.62) | 2.01 (0.68) | 1.89 (0.64) | 1.74 (0.59) |
| Social Anxiety | $1.14_{ab}$ (0.66) | $1.07_{ab}$ (0.52) | $1.31_{a}$ (0.74) | $0.91_{b}$ (0.64) | $1.29_{a}$ (0.74) |

*Note.* Subgroups that do not share subscripts are significantly different

Table 2
*Means (SD) of Somatic Complaints and Social Anxiety by Gender*

| Variable | Gender | |
|---|---|---|
| | Girls | Boys |
| Somatic Complaints | 1.99 (0.66) | 1.84 (0.59) |
| Social Anxiety | 1.34 (0.68) | 1.01 (0.63) |

RELATIONSHIP BETWEEN THE SOCIAL ANXIETY AND CLASSROOM STATUS INTERACTION, AND SOMATIC COMPLAINTS

In order to assess the influence of the interaction effects of social anxiety and classroom status and gender, classroom status was dummy coded using the average group as the reference category for the other groups, and gender was dummy coded using girls as the reference category. In addition, social anxiety was standardized and product terms created in order to avoid multicollinearity problems (Frazier, Tix, Baron, 2004). A stepwise regression was subsequently conducted. As recommended, the main effects were included in the first step, all possible two-way interactions were entered in the second step, and all three way interaction effects were included in third and last step.

The outcomes of this analysis are presented in Table 3. Only social anxiety and rejection contributed to the prediction of somatic complaints, but in opposite directions. Social anxiety was related to more somatic complaints, whereas rejection showed an association with fewer somatic complaints. None of the gender effects or interactions were significant. The long-term relationship between social anxiety and somatic complaints could also be determined, combining the data from the first study with those of the second (see Study 2). Social anxiety had a significant, positive association with somatic complaints 1.5 years later ($r = .27$, $p < .01$). This relationship remained significant after controlling for somatic complaints at the first measurement ($r = .13$, $p < .01$).

Table 3
*Summary of Stepwise Regression Analysis for Peer Relationships Predicting Somatic Complaints*

| Step | Variable | *B* | *SE B* | β | $\Delta R^2$ |
|---|---|---|---|---|---|
| 1 | | | | | .16** |
| | Gender | -.02 | .05 | -.01 | |
| | Popular | .01 | .07 | .01 | |
| | Neglected | .04 | .07 | .02 | |
| | Controversial | .06 | .10 | .02 | |
| | Rejected | -.19 | .07 | -.10** | |
| | Social Anxiety | .24 | .02 | .38** | |
| 2 | | | | | .00 |
| | Gender | -.02 | .05 | -.01 | |
| | Popular | .01 | .07 | .00 | |
| | Neglected | .02 | .07 | .01 | |
| | Controversial | .09 | .11 | .03 | |
| | Rejected | -.20 | .07 | -.10** | |
| | Social Anxiety | .22 | .03 | .35** | |
| | Social Anxiety x Popular | -.02 | .09 | -.01 | |
| | Social Anxiety x Neglected | .09 | .06 | .06 | |
| | Social Anxiety x Controversial | .10 | .11 | .04 | |
| | Social Anxiety x Rejected | .05 | .06 | .03 | |

*Note.* Because standardized variables and product terms of these variables were used, *B*'s are used for interpretation
** $p < .01$

## DISCUSSION

The outcomes of this study show that self-reported social anxiety is associated with more somatic complaints in children. Yet, popularity in the classroom does not seem to be related to fewer somatic complaints; neither is a rejected, a controversial or neglected status related to more somatic complaints. Surprisingly, rejected children even tend to report fewer somatic complaints. Rejected aggressive children are known to have externalizing problems (Newcomb, Bukowski, & Pattee, 1993). Somatic complaints, on the other hand, are strongly associated with internalizing problems (Campo et al., 2004). Neglected children may be expected to have somatic complaints but they are known to not suffer from low self-esteem or loneliness. Having one close friend might be more important than being liked by many classmates (Deater-Deckard, 2001). While being in a group of peers is likely to influence children's feeling of belonging and provide children with opportunities for joint-activity engagement, sharing intimate experiences depends more strongly on the presence of a best friend. For instance, regardless of how well-accepted children are by their peers, children without a best friend feel lonelier than children with a best friend (Parker & Asher, 1993). Therefore, a

reasonable next step was to conduct a second study in which we focused on qualities of children's friendships and their effect on self-reported somatic complaints.

## STUDY 2

## INTRODUCTION

As previously described, anxiety about perceived problems in the relationship with peers can become stressful and associated with somatic complaints. Obviously, peer relationships might also positively affect children's lives. Friends in particular may help children cope with emotional experiences, in that friends talk about problems with each other and thereby learn how to display and regulate emotions (Newcomb & Bagwell, 1995). In stressful situations such as hospitalization, natural disaster, and divorce, support from friends can contribute to children's emotion regulation (Nicholas, Darch, McNeill, Brister, O'Leary, Berlin, & Koller, 2007; Prinstein, LaGreca, Vernberg, & Silverman, 1996; Wasserstein & LaGreca, 1996). Studies in adults also have strongly supported the idea that disclosure decreases stress and has beneficial effects on health (Frattaroli, 2006). In these close interactions, adults and children provide each other with emotional security and a context for expressing emotions. In this second study, we focused on the potential positive role of a best friend on children's somatic complaints.

Research showed that the self-reported quality of friendships is negatively associated with somatic complaints (Rhee, Holditch-Davis, & Miles, 2005). However, because friendship is a relationship with mutual feelings, it will be important to include a measure of mutuality. It has been shown that only the support of a mutual best friend can be a buffer for the negative effects of peer victimization (Hodges, Boivin, Vitaro, & Bukowski, 1999). Furthermore, within mutual friendships, disclosure of emotions may be important for reducing stress. Children who feel secure about disclosing troubling emotions to a friend when they need to would be expected to have fewer somatic complaints. We therefore took into account children's self-reports of emotion communication skills.

In brief, we studied whether having a mutual best friend with whom one could share personal experiences and reports of actually talking about one's emotions are associated with fewer somatic complaints. Possible differences between boys and girls in these relationships and interactions were considered. In western countries, emotion communication seems to be stimulated more in girls than in boys during the preschool years (Adams, Kuebli, Boyle, & Fivush, 1995) and gender specific cultural display-rules of emotion expression continue to exist into adolescence (O'Kearney & Dadds, 2004). These gender differences in acceptance of disclosure might affect the relationship between emotion communication skill, disclosure and somatic complaints in boys and girls.

## METHOD

### PARTICIPANTS AND PROCEDURE

The data for this second study were collected from the same children that participated in Study 1, 5 years later. Of the original 717 children, the 688 participants in the second wave were still attending the same school (308 girls and 380 boys).

### MATERIAL

**Somatic complaints** were again assessed using the Somatic Complaint List (see Study 1).

The children's self-reported **Emotion Communication Skill assessed** their ability to talk about and explain emotions. We used six items from the Emotion Awareness Questionnaire (Rieffe, Meerum Terwogt, Petrides, Cowan, Miers, & Tolland, 2007). An example item is "I can easily explain to a friend how I feel inside" and was rated on a 0 to 2 scale. The internal consistency was $\alpha = .72$ (.75 for girls and .70 for boys, $.63 \leq \alpha \leq .74$ if analyzed by group). Children had a mean score of 1.07 ($SD = 0.45$).

**Mutuality of Best Friendship** was assessed by asking children to write down the name (only one name allowed) of their best friend in the classroom. This nomination could be reciprocated by the friend or not reciprocated if the friend nominated someone else.

**Disclosure** of personal feelings and experiences was assessed using the Intimate Exchange items of Parker and Asher's Friendship Quality Questionnaire (Parker & Asher, 1993). The 6 items were rated on a 5-point scale from *not at all true* to *really true*. Examples are: "We always tell each other our problems" and "We talk about the things that make us sad". Children filled out these items about the child they nominated as their best friend. The internal consistency of this scale was good, $\alpha = .86$ (.85 for girls and .82 for boys, $.83 \leq \alpha \leq .86$ if analyzed by group). The range of the Disclosure scale was 0 to 2. Children had a mean score of 2.34 ($SD = 0.97$).

## RESULTS

### MUTUAL BEST FRIENDS

Four children, two boys and two girls, nominated themselves as being their best friend and an additional 34 children did not nominate a best friend at all. Of these children, there were significantly more boys ($n = 23$) than girls ($n = 11$). Of the other children, 80 nominated a friend that did not participate in the study. Since the reciprocity of their own nomination could not be determined, they were deleted from the main analyses. There were 278 children with a reciprocal nomination and 292 children with a one-sided, non-reciprocal, nomination. Whereas 148 out of the 263 girls (56%) had a mutual best friend, only 130 of the 307 boys (42 %) had a mutual best friend, $\chi^2(10) = 11.00$, $p < .01$.

ASSOCIATIONS BETWEEN THE VARIABLES

Analysis of variance was used to determine the effect of friendship reciprocity (children who failed to nominate a best friend, children with a mutual best friend and children with an unreciprocated best friend) on the two dependent variables (somatic complaints and emotion communication skill). The groups did not differ on somatic complaints, $F(2, 605) = 0.86$, *ns*, but there was a small friendship reciprocity effect on emotion communication skill, $F(2, 605) = 3.07$, $p = .05$, partial $\eta^2 = .01$. Children who failed to nominate a best friend reported more problems with emotion communication skill compared to children with a mutual best friend (Table 3). The children with an unreciprocated best friend did not significantly differ from the other two groups on emotion communication skill, but an independent t-test revealed that children with an unreciprocated nomination did report less disclosure in the interaction with their nominated friend, $t(568) = 5.03$, $p < .01$.

Subsequent independent sample t-tests revealed that girls had higher scores on disclosure, $t(568) = 10.66$, $p < .01$, and somatic complaints, $t(568) = 3.45$, $p < .01$. Although there also seemed to be a trend for girls scoring higher on emotion communication skill, boys and girls did not significantly differ on this variable, $t(568) = 1.79$, $p = .07$ (see Table 3).

Pearson correlations revealed that emotion communication skill and disclosure were correlated, $r = .34$, $p < .01$, and that emotion communication skill had a negative association with somatic complaints, $r = -.16$, $p < .01$. Disclosure and somatic complaints however, were unrelated, $r = .05$, $p = .22$.

Table 4

*Mean (SD) Somatic Complaints, Disclosure and Emotion Communication Skill for Students related to Mutuality of Nominated Best Friend and Gender.*

| | Best Friend (BF) | | | Gender | |
|---|---|---|---|---|---|
| | Mutual BF *M* (*SD*) | Unreci-procated BF *M* (*SD*) | No BF Nominated *M* (*SD*) | Girls *M* (*SD*) | Boys *M* (*SD*) |
| Somatic Complaints | $1.96_a$ (0.55) | $1.90_a$ (0.58) | $1.99_a$ (0.53) | $2.02_a$ (0.59) | $1.85_b$ (0.53) |
| Disclosure | $2.60_a$ (0.89) | $2.20_b$ (1.00) | - | $2.82_a$ (0.83) | $2.03_b$ (0.93) |
| Emotion Comm. Skill | $1.11_a$ (0.44) | $1.06_{ab}$ (0.48) | $0.31_b$ (0.38) | $1.12_a$ (0.47) | $1.05_a$ (0.45) |

*Note.* Subgroups that do not share subscripts are significantly different

AGE EFFECTS

Correlations revealed that age was unrelated to somatic complaints, emotion communication skill and disclosure. There was also no age difference in the children with an unreciprocated or reciprocal best friend.

INTERACTIONS

A stepwise regression analysis was conducted in order to analyze interaction effects on somatic complaints. Gender was dummy coded, using girls as the reference category and best friend was dummy coded, using unreciprocated best friend as the reference category. The independent interval variables were standardized and product terms were subsequently computed. Each order of interaction effects was entered in a new step. All first and higher order effects were interpreted in the step they were entered.

The results of this analysis are presented in Table 5. The four-way interaction was not significant and so is not presented in the table. Most informative was the third step of the analysis, which indicated that the interaction effects of best friend and emotion communication skill and best friend and disclosure were gender dependent.

Estimations of the simple slopes of the groups were computed following the procedure described by Cohen, Cohen, West, and Aiken (2003). Four new variables were created for emotion communication skill and disclosure, each reflecting the standardized scores on emotion communication skill/disclosure of one group, and coded 0 for of the other groups. These variables were entered simultaneously, keeping the group main effects in the regression model, but leaving out the main effects of emotion communication skill and disclosure. The *B* coefficients in this analysis reflect the slopes on somatic complaints for each of the groups, along with the appropriate tests of significance. This made it possible to determine whether emotion communication skill and disclosure were significant predictors of somatic complaints in the specific groups (boys and girls with a reciprocal or unreciprocated best friend).

The results are depicted in *Figure 1,2 and 3* to facilitate interpretation of the interactions. Please note that the graphs reflecting somatic complaints regressed on emotion communication skill depict estimated values of somatic complaints under the assumption that children score average on disclosure. Similarly, the graph reflecting somatic complaints regressed on disclosure shows estimated values of somatic complaints under the assumption that children score average on emotion communication skill. As emotion communication skill and disclosure were positively associated, this assumption cannot be maintained. The graphs are thus only to be used for understanding the found interactions, not for inferring absolute values.

There was a negative association between emotion communication skill and somatic complaints for girls with a reciprocal best friend, $B$ = -0.18, $SE$ = .05, $t(559) = 3.74$, $p < .01$, but not for girls without a reciprocal best friend (*Figure 1*). Emotion communication skill was negatively associated with somatic complaints in boys, but only for boys with an unreciprocated best friend, $B$ = -0.16, $SE$ =.05, $t(559) = 3.54$, $p < .01$ (*Figure 2*). For boys with an unreciprocated best friend, there was also a positive association between disclosure and somatic complaints, $B$ = 0.11, $SE$ = .05, $t(559) = 2.39$, $p = .02$ (*Figure 3*). No other significant effects were found.

Table 5
*Summary of Stepwise Regression Analysis for Best Friendship Characteristics Predicting Somatic Complaints*

| Step | *B* | *SE B* | β | $\Delta R^2$ |
|---|---|---|---|---|
| 1 | | | | .05** |
| Emotion Communication (Com) Skill | -.11 | .02 | -.19** | |
| Disclosure | .03 | .03 | .06 | |
| Gender | -.15 | .05 | -.13** | |
| Best Friend | .03 | .05 | .03 | |
| 2 | | | | .01** |
| Emotion Com Skill | -.06 | .05 | -.11 | |
| Disclosure | .01 | .05 | .01 | |
| Gender | -.09 | .07 | -.08 | |
| Best Friend | .09 | .07 | .08 | |
| Best Friend * Emotion Com Skill | -.02 | .05 | -.03 | |
| Disclosure * Emotion Com Skill | -.05 | .03 | -.08 | |
| Best Friend * Disclosure | -.02 | .06 | -.02 | |
| Gender * Emotion Com Skill | -.06 | .05 | -.08 | |
| Gender * Disclosure | .06 | .06 | .08 | |
| Gender* Best Friend | -.13 | .10 | -.10 | |
| 3 | | | | .02* |
| Emotion Com Skill | .03 | .05 | .05 | |
| Disclosure | -.09 | .06 | -.17 | |
| Gender | -.11 | .08 | -.10 | |
| Best Friend | .02 | .08 | .02 | |
| Best Friend * Emotion Com Skill | -.18 | .08 | -.22* | |
| Disclosure * Emotion Com Skill | -.07 | .05 | -.12 | |
| Best Friend * Disclosure | .16 | .09 | .19 | |
| Gender * Emotion Com Skill | -.20 | .07 | -.26** | |
| Gender * Disclosure | .22 | .08 | .28** | |
| Gender* Best Friend | -.09 | .10 | -.07 | |
| Gender * Best Friend * Disclosure | -.31 | .11 | -.23** | |
| Gender * Best Friend * Emotion Com Skill | .30 | .11 | .24** | |
| Best Friend * Disclosure * Emotion Com Skill | .03 | .06 | .03 | |
| Gender * Disclosure * Emotion Com Skill | .02 | .06 | .03 | |

*Note.* Because standardized variables and product terms of these variables were used, *B*'s are used for interpretation * $p < .05$, ** $p < .01$

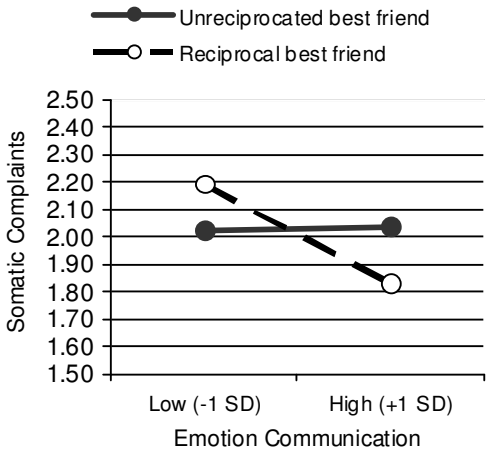
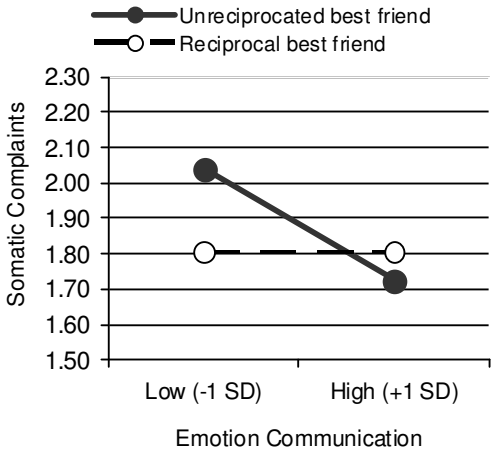



Figure 1. *Interaction between best friendship reciprocity and emotion communication skill predicting somatic complaints in girls at the mean level of disclosure.*

Figure 2. *Interaction between best friendship reciprocity and emotion communication skill predicting somatic complaints in boys at the mean level of disclosure.*



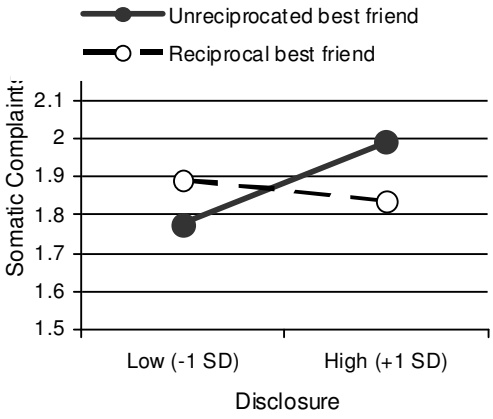




Figure 3. *Interaction between best friendship reciprocity and disclosure predicting somatic complaints in boys at the mean level of emotion communication skill.*

## DISCUSSION

The outcomes of this study showed that being able to communicate about emotions is associated with fewer somatic complaints in girls with a reciprocal best friend. Expressing negative feelings to a friend may mean that the feelings do not get translated into somatic complaints. Longitudinal research is necessary to confirm the causal relationship that is assumed here. For example, there might be a third variable explaining the higher frequency of somatic complaints in some children as well as their poorer skills in emotion communication. Moreover, shared method variance could have positively biased associations we found between different measures of children's self-reports. Therefore, future studies could include a multiple-method design. There was no interaction between disclosure and these findings, nor did we find any effects for girls without a reciprocated best friend. The outcomes for boys differed from those for girls. Emotion communication skill and disclosure were unrelated to self-reported somatic complaints in boys with a reciprocated best friend. However, emotion communication skill was associated with fewer somatic complaints in boys with an unreciprocated best friend, while the opposite appeared for disclosure.

As Windle (1992) argued, even though boys may feel they have friends who provide support, this does not imply that these interactions indeed facilitate more intimate exchanges. It appears that the satisfaction in a friendship depends less on satisfaction with interpersonal closeness in boys than in girls (Zarbatany, Conley, & Pepper, 2004). Boys with more somatic complaints or other internalizing problems especially might feel the need to discuss their feelings with someone. As the negative relationship between emotion communication skill and somatic complaints indicates, this is probably helpful for boys who experience their emotion communication skills to be sufficient. For instance, they may satisfactorily discuss their feelings with a parent or sibling. However, actual emotion disclosure with peers is less accepted among boys (Durkin, 1995; Von Salisch, 2001). Even though a mutual best friend will probably not reject disclosure, the reaction might be less sensitive or helpful than within girls' friendships, and may have a reverse effect for boys. We need more in-depth studies on self-disclosure in friendships to gain insight in these kinds of processes.

## OVERALL DISCUSSION

This research indicated several social mechanisms that might be responsible for heightening and reducing somatic complaints in children. Two relationships were examined, namely peer acceptance and mutual friendship, along with social anxiety and disclosure of emotions to peers. Children who reported more social anxiety experienced more somatic complaints, whereas actual rejected social status in the classroom failed to predict somatic complaints. Social anxiety contributed even to the prediction of somatic complaints 1.5 year later (controlling for the baseline score of somatic complaints). More research is needed to confirm this assumed direction of causality, yet past research is supportive. People with social phobia

were found to react with more somatic complaints to a social stressor (Grossman, Wilhelm, Kawachi, & Sparrow, 2001).

Mutual friendships may be a positive context in which to diffuse social anxiety and other negative emotions. Friendship effects appear to be gender specific. Girls with a mutual best friend who were able to communicate their emotions were somewhat less likely to experience somatic complaints. For boys, on the other hand, emotion communication skills were associated with fewer somatic complaints in the case of a *non*-reciprocated best friend and disclosure with the nominated friend was related to more somatic complaints. Boys' friends may be useful for other types of social support (Durkin, 1995; O'Kearney & Dadds, 2004; Von Salisch, 2001). Nevertheless, the association between better emotion communication skills and fewer somatic complaints for boys with a non-reciprocated best friend indicates that emotion communication may have a positive impact within other relationships.

A limitation of this study was that we did not study the underlying causal mechanisms through which social relationships influence somatic complaints. As discussed in the introduction, the experience of peer problems might increase stress levels (Barrett & Heubeck, 2000; Oldehinkel et al., 2007), whereas friends can help by giving support and providing a context in which to learn other ways of coping (LaFreniere, 2000). These and other possible processes need to be addressed in future studies.

In conclusion, our studies indicate that besides the more frequently studied medical and psychological factors, social factors are also related to children’s experience of somatic complaints. Social anxiety in particular, and to a lesser extent children’s emotion communication are variables of influence. The results of this study underline the importance of acknowledging potential social influences on somatic complaints in childhood.