# Effects of Mental Health Problems and Parenting Behaviors on the Academic Performance of Dutch Pre- and Early Adolescents. The TRAILS Study.

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Abstract

This study examined the possible effects of mental health problems on academic performance in pre- and early adolescence, with perceived parental overprotection, rejection, and emotional warmth as possible moderators for these relations. Furthermore, it was explored whether the effects were different for boys and girls. Data came from a large longitudinal Dutch population sample of pre- and early adolescents (T1: n = 2230; M age = 11.09; 50.8% girls. T2: n = 2149; M age = 13.55; 51.2% girls). Moderation was only found for girls. The findings show that during preadolescence the effects of internalizing problems were related to higher academic performance for girls perceiving little parental overprotection, whereas the opposite pattern was found for girls high on overprotection and for girls low on perceived parental rejection. The impact of mental health problems and parenting behaviors on early adolescents' academic performance 2.5 years later showed that internalizing problems led to higher academic performance for girls low on parental rejection, and externalizing problems led to lower academic performance for girls low on parental overprotection and for girls high on parental emotional warmth. Implications of the results are discussed and directions for future research are given.

KEY WORDS: academic performance, mental health problems, parenting behaviors, preadolescence, early adolescence, gender differences.

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Early academic problems predict a variety of subsequent emotional and behavioral difficulties that emerge in later adolescence (Roeser et. al., 1998), like drop out of school (e.g. Cairns et. al., 1989) and delinquent behavior (e.g. Patterson et. al., 1989). Because of this, it is important to monitor academic performance to prevent problems later in life. Therefore, we want to know which factors can influence academic performance. Important personal factors that influence the academic performance in unfavorable ways are mental health problems among children and adolescents. They can cause diminishing in academic functioning (Roeser et. al., 1998) and poorer educational attainment (McLeod & Fettes, 2007).

Parents are essential in dealing with academic problems because they have much influence on their children and maintain their influences on the academic performance of their children from childhood up to adolescence (Baumrind, 1991). They also play an important role in the effects mental health problems of their children could have. For example, when parents of children with mental health problems, like aggressive behavior, are inconsistent in handling these children, this aggressive behavior may extend to the school environment. Academic failure can be a result of this behavior (Ary et. al., 1999). Adolescents raised in unengaged families are most prone to internalizing and externalizing problems, whereas the opposite is true for adolescents perceiving positive parenting (Lamborn et. al., 1991). It is the behavior of the parents in dealing with mental health problems of their children that could increase or decrease the effects of mental health problems on academic performance. Therefore not only personal factors like mental health problems are related to academic performance, parents as their social environment do as well (Dornbusch et. al., 1987; Bronstein et. al., 1993; Melby & Conger, 1996; Amato & Fowler, 2002; Spera, 2005).

Although some studies have dealt with the influences of mental health problems on the academic performance of adolescents (e.g. Roeser et, al, 1998) and on parenting behaviors and mental health problems among adolescents (e.g. Scaramella et. al., 1999), less is known about the interaction effects between mental health problems and parenting behaviors on academic performance. It is this gap in the literature that asks for studies that examine the personal factors (like mental health problems), as well as the social environment (like family factors) in explaining academic performance. In addition, many studies have focused on elementary school children (Hess & McDevitt, 1984; Grolnick & Ryan, 1989) or middle and late adolescents (Dornbusch et. al., 1987; Lamborn et. al., 1991; Steinberg et. al., 1992; Melby & Conger, 1996; Lee et. al., 2006) to predict academic performance with mental health problems or family factors. Fewer studies have been done with the focus on preadolescents and early-adolescents (Steinberg et. al. 1989; Roeser et. al., 1998; McLeod & Fettes, 2007). Although adolescence is an important period in children's lives when many changes happen, in the context of academic performance the transition from elementary school to secondary school is too. Therefore we will examine the academic performance of pre- and early adolescents.

In short, the goal of this study is a better understanding of the influences of mental health problems among pre- and early adolescents on academic performance and the effects of perceived parenting behaviors on this relation. We want to discover if children with mental health problems in combination with diverse parenting behaviors run more or less risk of school failure. The first aim of this study was to examine the possible effects of mental health problems at age 11 on academic performance at age 11 and age 13.5. The second aim of this study was to examine the possible relations between perceived parenting behaviors and academic performance. The third aim was to examine if the relation between mental health problems and academic performance was moderated by perceived parenting behaviors.

## Theory and Hypotheses

### *Mental Health Problems*

In the present study mental health problems among pre- and early adolescents play a major role. These mental health problems can be divided into internalizing problems and externalizing problems. Internalizing problems are characterized by anxiety, depression, and withdrawal, whereas aggressive and rule-breaking behavior is typical behavior for someone with externalizing problems (Achenbach, 1991a; Verhulst & Achenbach, 1995). According to Sentse et. al. (2009) a distinction between these two conducts is important because they are likely the result of different antecedents.

In choosing this focus, we look at the ways mental health problems influence the academic performance of pre- and early adolescents. To this end, we look at the ability to learn when mental health problems are present and how mental health problems affect academic performance. More specifically, we refer to two specific ways in which mental health problems affect cognition, and as a result of that affect children's learning and performance in school: the activation of memory biases as well as attentional biases (Roeser et. al., 1998). When a child is in a learning situation, negative emotions can influence the child's academic performance through achievement-related beliefs that are activated in memory. These memories can be about past academic difficulties or failures. Activating this kind of memories could lead to avoidance behavior and self-protection which in turn could cause even more academic failures (Roeser et. al., 1998). In addition, activation of the attentional biases means that in a learning setting these biases lead to high levels of anxiety, which results in focusing too much on potential future failure and too little on the school tasks. Poor academic performance becomes the result of this (Roeser et. al., 1998). The memory and attentional biases can be activated due to the low expectations youths with

mental health problems in general hold for themselves. These lower expectations can jeopardize their academic performance (McLeod & Fettes, 2007).

The effects of mental health problems on academic performance begin at an early stage. Academic failure appears in the form of relatively low grades in elementary and middle school and extends through high rates of course failure in high school (see McLeod & Fettes, 2007). Research showed that those youths who have high levels of mental health problems in either childhood or adolescence have poorer educational attainment than other youths (McLeod & Fettes, 2007). McLeod and Fettes also found that mental health problems influenced educational attainment almost regardless of when they occurred. In line with this, we hypothesize that having internalizing and/or externalizing problems is concurrently related to lower academic performance in preadolescence (Hypothesis 1).

Research shows that children with internalizing and externalizing problems fail to achieve expected educational outcomes even when their problems diminish over time (McLeod & Fettes, 2007). Besides that, youths who experience high levels of internalizing or externalizing problems in childhood or adolescence, were significantly less likely to complete high school than youths with stable low levels of these problems. This means that the timing of the problems is inconsequential in predicting high school completion. Because of that, mental health problems could affect academic performance on the long term too. According to this, we also predict a long term effect of mental health problems on academic performance. We hypothesize that having internalizing and/or externalizing problems in preadolescence leads to lower academic performance in early adolescence, controlled for academic performance in preadolescence (Hypothesis 2).

*Parenting Behaviors*

Parenting has been recognized as an important predictor for numerous outcomes of children. For example, warm and supportive parenting behavior has been associated with children's higher educational achievement, fewer behavioral problems, and better mental health (Roeser et. al., 1998; Amato & Fowler, 2002; Spera, 2005; McLeod & Fettes, 2007). Whereas negative parenting behavior has been related to juvenile conduct problems, delinquency, children's lower educational achievement, more behavioral problems and mental health problems (Loeber & Stouthamer-Loeber, 1986; Ary et. al., 1999; Scaramella et. al, 1999; Spera, 2005). These findings suggest that parenting behaviors can change the course of academic performance in favorable or unfavorable directions.

In the present study we focused on the perceived parenting behaviors overprotection, rejection, and emotional warmth. Overprotection can be described as fearfulness and anxiety for the child's safety, guilt engendering and intrusiveness. In early adolescence children's striving for autonomy increases. Controlling behaviors of the parents thwarts the need for pre- and early adolescents' autonomy. As a result of this, their parents' behavior will hinder the child's needs to develop self-regulation, self-reliance, identity, and self-direction (Grolnick & Ryan, 1989; Steinberg et. al., 1989). When parents grant their children autonomy, these children get confidence in their ability to act independently and effectively. It provides them with opportunities to impact outcomes and strengthen self-efficacy (Fulton & Turner, 2008). These needs and characteristics have a positive influence on academic performance, and therefore it is important for a child to develop them. Research showed that granting autonomy was positively related to academic performance, perceptions of control of academic outcomes, school grates and achievement, math and reading scores (Hess & McDevitt, 1984; Grolnick & Ryan, 1989; Steinberg et. al., 1989; Steinberg et. al., 1992; Ginsburg & Bronstein, 1993; Bronstein et. al., 2005; Lee et. al., 2006; Fulton & Turner, 2008). According to these studies

we assume that this parenting behavior is negatively related to academic performance, meaning that perceiving parental overprotection is related to lower academic performance in pre- and early adolescence (Hypothesis 3).

Rejection can be characterized by hostility, punishment, derogation, and blaming of the child. Adolescents who feel that they have been rejected by their parents, show diminishing in their self-confidence and increases in their distress (Lamborn, et. al., 1991). They do not feel confident about their abilities and their competence of their achievement at school. These feelings could lead to learning problems (Roeser et. al., 1998). Parental rejection will jeopardize academic performance by creating tensions between parent and adolescent, increasing stress in the adolescent's life and decreasing adolescent acceptance of parental influence attempts (Melby & Conger, 1996). Diverse studies have showed that children who perceive parental rejection have lower grades, math and reading scores, lower academic performance and decreased adolescents' subsequent academic performance (Dornbusch et. al., 1987; Lamborn et. al., 1991; Ginsburg & Bronstein, 1993; Melby & Conger, 1996; Lee et. al., 2006). In line with the results of these studies, we hypothesize that perceiving parental rejection is also related to lower academic performance in pre- and early adolescence (Hypothesis 4).

Emotional warmth can be characterized as giving children special attention, praising for approved behavior, unconditional love, and being supportive and affectionately demonstrative. Perceiving parental warmth will foster academic achievement by setting appropriate standards for adolescent behavior, monitoring adherence to those standards, and recognize academic achievement (Melby & Conger, 1996). Due to this positive parenting behavior adolescents feel confident about their abilities and their competence of their achievement at school (Lamborn et. al., 1991). Their academic capability beliefs and motivation to succeed in school will also increase because of this parenting behavior (Juang &

Silbereisen, 2002). These feelings of interest, academic valuing, and academically competence can lead to better academic performance. Parents, who demonstrated more warmth, had adolescents with higher positive academic capability beliefs (Steinberg et. al. 1989; Juang & Silbereisen, 2002; Fulton & Turner, 2008) and higher academic performance (Ginsburg & Bronstein, 1993; Melby & Conger, 1996; Chen et. al., 2000). According to earlier research we hypothesize that perceiving parental emotional warmth is related to higher academic performance in pre- and early adolescence (Hypothesis 5).

*Gender Differences*

In exploring the predictors for our study, we found gender differences in mental health problems and the way adolescents react on parenting behaviors. In this section we clarify these gender differences and hypothesize the interaction effects we drawn from these gender differences. We expect that the moderations differ for boys and girls. We therefore hypothesized three-way interactions with gender.

Earlier research showed gender differences in the way mental health problems occur. Adolescent boys display more aggression, are more frequently acting out and have more externalizing problems than girls, whereas girls are more prone to internalizing problems and exhibit a significantly higher level of depressive symptoms than boys (Leadbeater et. al., 1999; Aunola et. al., 2000; MacPhee & Andrews, 2006; Hale III et. al., 2008; Sentse et. al., 2009). We therefore suppose that it is more likely for boys that their externalizing problems affect their academic performance, and for girls that their internalizing problems affect their academic performance. Besides this, the way internalizing and externalizing problems affect their behavior at school also show differences. Externalizing problems, which are more common among boys, are strongly associated with aggressive behavior in the class (e.g. yelling at the teacher) en negatively related to classroom withdrawal behavior (e.g. trying not

to be called in by the teacher, staying out of whole class discussions). Internalizing problems, which are more common among girls, are strongly associated with classroom resistance behavior like failing to complete assignments and missing class (Roeser et. al., 1998).

Earlier studies also found gender differences in sensitivity and the ways boys and girls react on the behavior of their parents. We discuss these findings of gender differences in perceived parental overprotection, rejection and emotional warmth and the way they work on boys and girls. In general, boys perceive more negative parenting behaviors than girls (Markus et. al., 2003; Oldehinkel et. al., 2006). Perceived parental overprotection is such a negative parenting behavior where girls reported significantly lower parental control, than boys did (Chen et. al., 2000). A study of Deslandes et. al. (1998) also showed that psychological autonomy-granting was only a predictor for the school grades of boys, not of girls. According to these results we suggest that parental control is more of a bother for boys than for girls. Parental control is seen by youngsters as an intrusion on their privacy and an undermining of their independence (Loeber & Stouthamer-Loeber, 1986). This especially counts for boys because they feel easily restricted in their personal autonomy (Sentse et. al., in press). These boys may feel angry when they are given too little autonomy (Roeser et al. 1998) which in turn affects their externalizing problems. This could mean that parental overprotection triggers externalizing problems among boys. Therefore the combination of externalizing problems with parental overprotection can strengthen the effects on academic performance in an unfavorable way.

With regard to perceiving parental rearing behavior, girls demonstrate more internalizing problems when they perceive negative parental behavior than boys do (Ge et. al., 1994; Liu, 2003). This could be because boys tend to foster independent activity over affiliation more than girls (Oldehinkel et. al., 2006). Therefore boys are less sensitive to parental rejection compared to girls. Other research showed that the correlation between

perceived parental rejection and internalizing problems was significantly higher for girls than for boys (Hale III et. al., 2008). Also low parental warmth is a predictor for internalizing problems among girls not boys (Hipwell et. al., 2008). This could be because girls have a greater preference for close emotional communication, intimacy, and responsiveness within interpersonal relationships, which makes them more sensitive to perceived parental emotional warmth as compared to boys (Oldehinkel et. al. 2006). A study of Deslandes et. al. (1998) showed that parental warmth was only for girls a predictor for school grades, not for boys. Earlier research suggests that internalizing problems in combination with parental rejection or a lack of parental emotional warmth have more affect on girls than on boys. This means that parental rejection or a lack of parental emotional warmth could enhance the negative effect internalizing problems have on the academic performance of girls.

Taking into account the gender differences in mental health problems and perceived parenting behaviors we hypothesize that for boys, having externalizing problems in combination with perceiving parental overprotection is associated with lower academic performance in pre- and early adolescence (Hypothesis 6). For girls we hypothesize that having internalizing problems in combination with perceiving parental rejection or lack of emotional warmth is associated with lower academic performance in pre- and early adolescence (Hypothesis 7). See Figure 1 for an overview of the hypotheses.

## Method

### *Sample*

This study is part of the Tracking Adolecents' Individual Lives Survey (TRAILS), an ongoing prospective cohort study based on a sample representative of the Dutch population, investigating the development of mental and physical health from preadolescence into adulthood. The present study uses data from the first (T1) and the second (T2) assessment

wave of TRAILS, which ran from March 2001 to July 2002, and September 2003 to December 2004, respectively.

Sample selection involved in two steps. First, five municipalities in the North of the Netherlands, including both urban and rural areas, were requested to give names and addresses of all habitants born between 10-01-1989 and 09-30-1990 (first two municipalities) or 10-01-1990 and 09-30-1991 (last three municipalities), yielding 3483 names. Simultaneously, primary schools (including schools for special education) within these municipalities were approached with the request to participate in TRAILS; that is, provide information about TRAILS participants' behavior and performance at school and allow class administration of questionnaires and individual testing at school. Of the 135 primary schools within the municipalities, 122 (90.4% of the school accommodating 90.3% of the children) agreed to participate in the study.

Second, if schools agreed to participate, parents received a brochure for themselves and for their children with information about the TRAILS study. Shortly thereafter they were contacted by telephone to ask whether they and their child were willing to participate. If both parents and children agreed to participate, parental written informed consent was obtained after the procedures had been fully explained. Of all children approached for enrollment in the study, 76.0% participated, resulting in a sample size of 2230 (i.e., both the child and the parent agreed to participate). The mean age of the children at T1 was 11.09 years (*SD* = 0.55); 50.8% were girls; 10.3% were children who had at least one parent born in a non-Western country; and 32.6% had parents with a low educational level (elementary education or lower tracks of secondary education). Of the 2230 first wave (T1) participants, 96.4% (*n* = 2149) participated in the second wave (T2). At T2, the mean age of the children was 13.55 years (*SD* = 0.54) and 51.2% were girls. A detailed description of the study design, sampling

procedures, data collection, and measures of the TRAILS study can be found in De Winter et al. (2005) and Huisman et. al. (2008).

*Measures*

*Academic performance.* Academic Performance was assessed at T1 and T2 by two different scales. Academic performance of children at T1 was measured by a scale which contained 5 items with an internal consistency of .85. The teacher of the children gave answers on the questions with 1 = often not true to 5 = often true. The scale exist of the items; 'This student has a good work speed', 'This student shows a good commitment', 'This student performs under his/her own level'. On the items: 'The current school results of this student concerning the Dutch language' and 'The current school results of this student concerning mathematics', the teacher answered with 1 = failing to 5 = excellent. The scale exists of the mean of the individual items.

At T2 this scale was completed with four extra items because the children went from elementary school to secondary school where they had more subjects. Three of the four extra items were about the current school results of the subjects: other languages, geography and history, and physics, chemistry and biology. The fourth item was a question about the academic performance in general: 'What do you in general think of the school performance of this student?'. The teacher of the child answered on these items with 1 = failing to 5 = excellent. The internal consistency of the scale at T2 was .90. The scale exists of the mean of the individual items.

*Mental health problems.* Internalizing and externalizing problems were assessed at T1 by the Dutch version of the Child Behavior Checklist (CBCL) and the self-report version of this questionnaire, the Youth Self-Report (Achenbach, 1991a; Achenbach, 1991b; Verhulst & Achenbach, 1995). It contains a list of 112 behavioral and emotional problems, which parents

can rate as 0 = not true, 1 = somewhat or sometimes true, or 2 = very or often true in the past six months. We constructed the scale Externalizing Problems from items corresponding to Aggressive Behavior and Rule-Breaking Behavior. The scale Internalizing Problems was constructed from the items corresponding to Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints (cf. Achenbach, 1991a). Consistent with other reports (e.g., Achenbach, McConaughy, & Howell, 1987; Veenstra et al., 2006; Verhulst & Van der Ende, 1992), the agreement between parent-reported and child-reported problems was only moderate (*r*s = .41 and .39 for externalizing and internalizing problems). However, problem behavior that is rated as present by both parent and child is assumed to be more severe (more generalized) than problems rated by only one informant. Based on this assumption, we used the mean of the standardized parent and child scores as measures of externalizing and internalizing problems in this study.

*Perceived parenting behaviors.* Because research shows that children are influenced by the parental behavior through their mental representation of this behavior, is it important to capture the child's perception of the rearing (Markus et. al., 2003). To assess the perception of actual parental rearing by preadolescents at T1 we used The Egna Minnen Beträffande Uppfostran (My Memories of Upbringing) for Children [EMBU-C] (Markus, Lindhout, Boer, Hoogendijk, & Arrindell, 2003). The original EMBU-C contained 81 items. Markus et al. (2003) developed a shorter version, which we used, though dropping the Favoring Subject factor prior to administration because it was a weak scale (an internal consistency below .60). The EMBU-C scale exists of the factors Overprotection, Rejection, and Emotional Warmth.

The scale for Overprotection contained 12 items with an internal consistency of .70 for fathers and .71 for mothers. Overprotection is characterized by fearfulness and anxiety for the child's safety, guilt engendering, and intrusiveness. An example item is: 'Do you feel that your parents are extremely anxious that something will happen to you?'. The scale for

Rejection contained 12 items with an internal consistency of .84 for fathers and .83 for mothers. Rejection is characterized by hostility, punishment (physical or not, abusive or not), derogation, and blaming of subject. An example item is: 'Do your parents sometimes punish you even though you haven't done anything wrong.' The scale for Emotional Warmth contained 18 items with an internal consistency of .91 for both fathers and mothers. Emotional Warmth is characterized by giving special attention, praising for approved behavior, unconditional love, and being supportive and affectionately demonstrative. An example of an item is: 'Do your parents make it obvious that they love you.' Children could rate the EMBU-C as 1 = no, never, 2 = yes, sometimes, 3 = yes, often, 4 = yes, almost always. Each item was asked for both the father and the mother. The answers for both parents were highly correlated (*r*s = .81 for Overprotection, .67 for Rejection, and .79 for Emotional Warmth), so we felt it was justified to combine them.

*Analyses*

Gender differences in academic performance, mental health problems and perceived parenting behaviors will be examined by means of t-tests. Associations between the variables will be tested by means of Pearson correlations. Because the hypotheses for boys are different from the hypotheses for girls, we will split the dataset into two groups and thus perform the analyses for boys and girls separately. Multiple linear regression analyses were used to test the main and interaction effects of mental health problems and perceived parenting behaviors on academic performance. We controlled for age when we used measures of academic performance in pre- and early adolescence. When we tested academic performance in early adolescence, we controlled for academic performance in preadolescence to rule out that mental health problems and perceived parental behaviors are consequences rather than causes for academic performance. Specifically, two models were tested for each time academic

performance was measured (T1 and T2). The control variables will be entered in the first step. At the second step the main effects of mental health problems and perceived parenting behaviors will be entered. The interaction effects of mental health problems and perceived parenting behaviors will be entered in a third step. We will put all the interaction effects in one model. After that, we put the significant interaction effects in a new model. We will report the results of this model. To provide an impression of the effect size and to facilitate the interpretation of the interaction effect, we wrote out multiple equations using simple slope analysis (Aiken & West, 1991), with low and high levels of the predictors indicating one standard deviation below and above the mean, respectively, while holding all variables to their sample means. A p-value smaller than .05 was considered statistically significant.

## Results

### *Descriptive Analyses*

Gender differences in academic performance, mental health problems and perceived parenting behaviors were examined by means of t-tests. Means and standard deviations of predictors and outcome variables are reported in Table 1, for boys and girls separately. The means of the variables need to be understood in the theoretical range of the variables (1-5 for academic performance T1 and T2, 1-4 for parenting behaviors). Because the variables of mental health problems were based on standardized parent and self reports, the means of these variables are close to 0. All variables included in the present study showed significant gender differences. Compared to girls, boys engaged more in externalizing problems, and perceived more overprotection and rejection by their parents. Compared to boys, girls had higher scores on their academic performance at T1 and T2, had higher levels of internalizing problems, and they experienced more emotional warmth from their parents.

Table 2 contains the correlations between the variables involved in the present study. The mental health problems and perceived parental behaviors variables were associated moderate to high with each other. For boys, academic performance T1 and T2 were not correlated with internalizing problems and academic performance T2 was also not associated with parental overprotection and rejection. The other variables were significantly related to academic performance T1 and T2 in the expected directions. Academic performance T1 and T2 were little to moderately negative correlated with externalizing problems and academic performance T1 was moderately positive correlated with emotional warmth. For girls, all variables were associated significantly to academic performance T1 and T2 in the expected directions except for academic performance T2 and internalizing problems. Academic performance T1 and T2 were moderately negative correlated with externalizing problems and academic performance T1 was moderately positive correlated with emotional warmth.

*Regression Analyses*

To test our hypotheses, we were interested in main effects as well as interaction effects. The Tables 3 and 4 contain the unstandardized regression coefficients and the standard errors for the control variables, mental health problems and perceived parenting behaviors in the prediction of academic performance T1 and T2. To test the possible influences of mental health problems in combination with perceived parenting behaviors on academic performance, we included interactions of internalizing and externalizing problems with perceived overprotection, rejection, and emotional warmth. The results will be discussed below. In discussing the interaction effects, we took the relevant main effects into account by reporting on the simple slopes for children 1 SD below and above the mean on the predictors involved in the interaction term (cf. Aiken & West, 1991). We reported the results in two different tables, for each time academic performance was measured (T1 and T2).

*Main Effects on Academic Performance T1.* After controlling for age we can see from Table 3 that, in line with our hypotheses, externalizing problems and perceiving parental overprotection were related to lower academic performance, and perceiving parental emotional warmth was associated with higher academic performance for boys. In contrast to our hypotheses, internalizing problems and perceived parental rejection were positively related to academic performance. When we look at the results for the girls we can see that externalizing problems and perceived parental overprotection were related to lower academic performance and emotional warmth is associated with higher academic performance, which is in line with our hypotheses. Against our hypotheses the results show that perceived parental rejection is associated with higher academic performance. Internalizing problems was not significantly related to academic performance.

*Interaction Effects on Academic Performance T1.* Table 3 shows two interaction effects for the prediction of academic performance in preadolescence for girls. The internalizing problems by overprotection interaction shows that for those perceiving little parental overprotection, having internalizing problems was significantly related to higher academic performance ($b$ = .12, $t$(980) = 2.49, $p$ < .05). For preadolescent girls high on perceived parental overprotection, having internalizing problems was significantly related to a lower academic performance ($b$ = -.13, $t$ (980) = -3.02, $p$ < .01). This interaction is plotted in Figure 2. Both results were not in line with our hypotheses for girls.

Secondly, we found an interaction between internalizing problems and rejection. We found that for preadolescent girls low on perceived parental rejection, internalizing problems was statistically (only marginally significant) related to lower academic performance ($b$ = -.08, $t$ (980) = -1.82, $p$ < .10). For those perceiving high parental rejection, having internalizing problems was not statistically related to academic performance ($b$ = .07, $t$ (980) = 1.58, $p$ = .12). This interaction is plotted in Figure 3 and is against our hypothesis.

Against our hypotheses no interaction effects were found between internalizing problems and emotional warmth for girls, and between externalizing problems and overprotection for boys.

*Main Effects on Academic Performance T2.* After controlling for age and academic performance T1, Table 4 shows that, internalizing problems led to higher academic performance for boys. This result is against our hypothesis. No main effects were found for externalizing problems or parenting behaviors.

Table 4 also demonstrates that, externalizing problems led to lower academic performance whereas internalizing problems led to higher academic performance (this effect was only marginally significant) for girls. The first effect is in line with our hypothesis, while the second effect is contrary to our hypothesis. We found no main effects for parenting behaviors.

*Interaction Effects on Academic Performance T2.* We can see from Table 4 that there were three significant interactions for the prediction of early adolescents' academic performance for girls. We found a significant interaction between internalizing problems and rejection (see Figure 4). Although the interaction effect was only marginally significant, the simple slope of low parental rejection (written out conform Aiken & West, 1991) was highly significant. That is, for early adolescent girls perceiving low parental rejection, internalizing problems led to higher academic performance ($b$ = .16, $t$ (664) = 2.58, $p$ < .05). For those perceiving high parental rejection, internalizing problems did not statistically led to academic performance ($b$ = .01, $t$ (664) = .22, $p$ = .83). This result is not in line with our hypothesis.

We found two interaction effects with externalizing problems for girls, whom we did not hypothesized. These interactions are plotted in Figure 5 and 6. The externalizing problems by overprotection interaction shows that for those perceiving low parental overprotection, externalizing problems led to lower academic performance ($b$ = -.32, $t$(664) = -4.29, $p$ < .01).

For early adolescent girls perceiving high parental overprotection, externalizing problems statistically did not led to academic performance ($b$ = -.06, $t$ (664) = -.80, $p$ = .42). In addition, we found that for those perceiving little parental emotional warmth, externalizing problems did not led to academic performance ($b$ = -.10, $t$(664) = -1.47, $p$ = .14). Whereas for early adolescent girls high on parental emotional warmth, externalizing problems led to lower academic performance ($b$ = -.28, $t$ (664) = -4.01, $p$ < .01).

Against our hypotheses, no interactions were found between internalizing problems and emotional warmth for girls, and between externalizing problems and overprotection for boys.

## Discussion

The findings of the current study underline the interplay between mental health problems and parenting behaviors, in order to understand, prevent, and intervene in the development of academic performance. Our expectations about the relationships between mental health problems, parenting behaviors and academic performance are summarized in Figure 1. Firstly, based on previous research, we hypothesized that mental health problems and parenting behaviors are related to academic performance, in that internalizing problems, externalizing problems, overprotection and rejection are negatively related and emotional warmth is positively related to academic performance. Secondly, previous studies about this topic show gender differences in mental health problems and the way boys and girls are sensitive to perceiving parenting behaviors. We wanted to examine these differences by combinations of mental health problems and parenting behaviors in predicting academic performance.

We hypothesized that (1) having internalizing and/or externalizing problems in preadolescence was concurrently related to lower academic performance in preadolescence and that (2) having internalizing and/or externalizing problems in preadolescence led to a

decrease in academic performance in early adolescence. In line with our hypotheses and previous research (Hinshaw, 1992; Roeser et. al., 1998; McLeod & Fettes, 2007) we found that having externalizing problems in preadolescence was for both boys and girls related to lower academic performance in preadolescence. Over time externalizing problems predicted lower academic performance only for girls. We found opposite results for the relations between internalizing problems and academic performance. Having internalizing problems was unrelated to a lower academic performance for preadolescent girls, whereas for early-adolescents girls it led to even higher academic performance. We also found this surprisingly positive effect of internalizing problems on academic performance among pre-and early adolescent boys. These results are not in line with our hypotheses and previous studies (e.g. Kessler et. al., 1995; Roeser et. al., 1998; Van Ameringen et. al, 2003; McLeod & Fettes, 2007; Frojd et. al., 2008), which have shown that having internalizing problems is negatively related to academic performance. The positive effect on academic performance may be explained by characteristics of the school climate. Kuperminc et. al. (2001) found that self-critical youths who perceived their school as an orderly place where all are treated fairly and have equal opportunities for learning, and where student–student and teacher–student relationships are positive, did not show the same increases in internalizing and externalizing problems as self-critical youth with negative perceptions of school climate. A positive perception of the school climate may thus reduce the negative effect of internalizing problems on academic performance. Further research is required to examine this relation.

We also hypothesized main effects of parenting behaviors on academic performance. We hypothesized that (3 & 4) perceiving parental overprotection and rejection were related to lower academic performance in pre- and early adolescence, and that (5) perceiving parental emotional warmth was related to higher academic performance in pre- and early adolescence. In line with our hypotheses and results of other studies we found for preadolescents that

perceiving parental overprotection (Heaven et. al., 2002; Bronstein et. al. 2005) was negatively related to academic performance whereas perceiving parental warmth (Melby & Conger, 1996; Scaramella et. al., 1999; Spera, 2005) was positively related to academic performance. Against our hypotheses and previous research (Melby & Conger, 1996; Lamborn et. al., 1991; Harold, 2007) we found that perceiving parental rejection was positively related to academic performance among preadolescent boys and girls. This surprisingly result might be explained by the assumption that children who experience parental rejection have the need to be accepted in another context, like the school environment. We can explain this by the need of children for positive response from their parents. When they do not get this need, they respond emotionally and behaviorally in different ways. These rejected children often increase their bids for positive response of their parents, and become more dependent. Very dependent children are those who have frequent and intense desires for positive response and are likely to make many bids for response (Rohner, 2004). We can translate this thought to our results. These preadolescent boys and girls have the desire for positive response and take many efforts to get this. Performing well at school is one of them; as a result their academic performance gets higher. Another explanation is that children, who have been rejected by their parents, want more appreciation from their parents. Therefore they perform better at school, in the hope that doing that makes their parents accept them more. Against our hypotheses no main effects of parenting behaviors were found in early adolescence, for boys or girls.

Next we hypothesized that parenting behaviors might moderate the effects of mental health problems. Taking into account the gender differences in mental health problems and perceived parenting behaviors we hypothesized for boys, that (6) having externalizing problems in combination with perceiving parental overprotection is associated with lower academic performance pre- and early adolescence. For girls, we hypothesized that (7) having

internalizing problems in combination with perceiving parental rejection or lack of emotional warmth is associated with lower academic performance in pre- and early adolescence. Surprisingly we only found interaction effects for pre- and early adolescent girls, and not for pre- or early adolescent boys. The effects of internalizing and externalizing problems on academic performance were dependent on the level of perceived parental behavior.

We found that only for preadolescent girls high on perceived parental overprotection, having internalizing problems was significantly related to lower academic performance. Internalizing problems as main effect was not significant for preadolescent girls. In other words, preadolescent girls who have internalizing problems and who have parents that protect them too much, run the risk of lower academic performance. We also found that for preadolescent girls low on perceived parental overprotection, having internalizing problems was related to a significantly higher academic performance. Little protection from parents has thus a positive effect on the academic performance of preadolescent girls with internalizing problems. These results are in line with our expectations for boys and earlier research (Loeber & Stouthamer-Loeber, 1986; Roeser et al. 1998), but we did not hypothesize these effects for girls. These results suggest that in this context, overprotection is more of a bother for girls than for boys.

We also found that for preadolescent girls who perceiving little parental rejection, having internalizing problems was related to lower academic performance. We thought that internalizing problems would be associated with lower academic performance for those perceiving high parental rejection, therefore this result is not in line with our hypothesis and previous research (Akse, 2004; MacPhee & Andrews; Hale III, 2008). These girls, who perceive little parental rejection, do not have to deal with this negative parenting behavior. Therefore their internalizing problems could be more of a bother to them than this parenting behavior. Because of their internalizing problems they can feel academically incompetent,

devalue school and feel emotionally distressed. This could lead to low grades, high rates of academic failure, and involvement in problem behaviors in school (Roeser et al. 1998). In our study, it is related to lower academic performance. Another explanation is due to the teachers perceptions. Earlier research showed that the interpersonal attractiveness of teachers is negatively correlated towards their students with internalizing problems (Pace et. al., 1999) and that teachers' expectations of the academic performance of children with internalizing problems are relatively lower than their expectations of other children (McLeod & Fettes, 2007). This could mean that the teachers assess the academic performance of their students with internalizing problems lower than their peers without these problems.

Our results also show interaction effects for early adolescent girls. For these girls internalizing problems led to higher academic performance, only for those who perceive low parental rejection. This result is not in line with our expectations and earlier research (Akse, 2004; MacPhee & Andrews; Hale III, 2008), but not totally unexpected when we look at the main effects. Our main effects show that internalizing problems led to higher academic performance for early adolescent girls. Because they do not experience parental rejection, they do not experience this negative parenting behavior. Therefore their internalizing problems alone play a major role in their academic performance. Because this main effect of internalizing problems leads to higher academic performance, this interaction effect does at well. It also seems that for early adolescent girls, little parental rejection diminishes the negative effect of internalizing problems. Other results of our study show that girls who perceive low parental rejection, experience high emotional warmth. As earlier research showed, perceiving parental warmth has a positive effect on academic performance (Ginsburg & Bronstein, 1993; Melby & Conger, 1996; Chen et. al., 2000). If we look at it this way, this result is not totally strange. Because they do not experience rejection, it could be that the warmth these girls perceive from their parents makes them feel more academically competent,

interested and valuing school. These feelings protect against the negative effects internalizing problems can have on academic performance.

Our results show that for early adolescent girls perceiving low parental overprotection, externalizing problems led to lower academic performance. Perceiving high parental overprotection is a negative parenting strategy as previous research suggests, therefore perceiving little parental overprotection would have a positive effect on academic performance. However, this result shows that it leads to lower academic performance. Therefore this result is not in line with our expectations. We also did not expect to find this effect for girls; we hypothesized this effect for boys in line with expectations based on earlier research (Loeber & Stouthamer-Loeber, 1986; Roeser et al. 1998). It might be the case that girls who are high on externalizing problems do not experience overprotection as a negative but rather fair parenting strategy, given that they need more supervision and control than girls low on externalizing behaviors. Lastly, our study also showed that for early adolescent girls perceiving high parental emotional warmth, externalizing problems led to lower academic performance. Early adolescent girls who have externalizing problems in combination with highly responsive and accepting parents are more likely to have a lower academic performance in early adolescence. This result is also not in line with our expectations or previous research (Rothbaum & Weisz, 1994; Eisenberg et. al., 2005). We assumed that perceiving high parental emotional warmth would have a positive effect on academic performance, but our results showed that it leads to lower academic performance. It seems that for early adolescent girls, experiencing high parental emotional warmth increases the negative effect of externalizing problems. That externalizing problems leads to lower academic performance is demonstrated by our results and previous studies. That these moderation effects especially count for girls perceiving little parental overprotection and for girls perceiving high parental warmth, could be explained by several reasons.

Having externalizing problems in preadolescence may affect the parenting behaviors in early adolescence. Research showed that mothers, who earlier reported that their children have externalizing problems, later reported that they used psychological control in early adolescence (Pettit et. al., 2001). In preadolescence these girls have much freedom and autonomy is granted by their parents. Because the girls showed externalizing problems in preadolescence, it could be that the parents respond to this by using control in early adolescence. Because girls are monitored more closely than boys, parents become more aware of the externalizing problems of their girls and modify their controlling strategies accordingly (Pettit et. al., 2001). Girls also are more sensitive to the controlling behaviors of their parents (Pettit et. al., 2001), which could explain the fact that we found this moderation effect for girls and not for boys. Research also showed that conduct problems predicted decreases in parental warmth and increases in harsh punishment (Hipwell et. al., 2008), meaning that girls' externalizing problems predicted changes in parental warmth and harsh punishment over time. Low parental overprotection and high parental warmth could be changed in an unfavorable way due to the child's behavior. This change in parental behaviors could affect the academic performance of these girls negatively. Secondly, if the parenting behaviors change after preadolescence to unsupportive, coercive, and hostile parenting, due to the externalizing problems these girls have, these girls may adopt this aggressive and uncaring style of interaction with others (Scaramella et. al., 1999). This means that antisocial behavior could extent to the school environment due to the change in parenting behaviors, the externalizing problems, or a combination of both. Research showed that disrespect towards teachers and classmates were negatively related to grades, whereas classroom engagement was positively related to grades (De Bruyn et. al., 2003). Other research showed that externalizing problems among children predicted teacher ratings of lower interpersonal attractiveness and increased personal rejection towards students (Pace et. al., 1999). The antisocial behavior of these girls

at school could result in lower academic performance because the teacher assessed their academic performance. Thirdly, research showed that mean scores for externalizing problems were consistently lower when parents were high on warmth, but also these levels of externalizing problems increased steadily from early till late adolescence (Scaramella et. al., 1999). This means that despite the mean scores for externalizing problems are lower compared to the ones high on parental warmth, externalizing problems did not decrease because of the high parental warmth. In other words, this could mean that during adolescence the effects of externalizing problems on academic performance could not be decreased by parenting behaviors. Further research is required to examine this relation.

We found that mental health problems are not always, or not always in the same way, related to academic performance. Internalizing and externalizing problems are related or lead to higher or lower academic performances in pre- and early adolescence, perceived parenting behaviors specify the conditions in this relation. Despite results of earlier research as well as significant main effects, parental overprotection was not a moderator for the relation of externalizing problems with academic performance for pre- and early adolescent boys. In sum, our results show that under certain conditions, the effects of internalizing and externalizing problems can be positive or negative, especially for girls.

*Strengths and Limitations*

The current study has major strengths compared to previous research in this area. Firstly, we examined both mental health problems and parenting behaviors, with the focus on interactions of mental health problems by parenting behaviors. Earlier studies about these topics focused mainly on the relations of mental health problems with academic performance or parenting behaviors with academic performance. We also examined data from two waves instead of one to predict long-term effects. Predictors were based on parent and child reports.

These reports of multiple informants are a methodological strength, compared to studies that use only data from one single informant and one single wave. Moreover, we made a distinction between boys and girls based on results of earlier research, and tested differences in mental health problems, perceived parenting behaviors, and mental health problems in combination with perceived parenting behaviors. Based on results of earlier research we were particularly interested in gender differences. We controlled for age and academic performance T1 when academic performance T2 was tested, to adjust for possible confounding. Finally, we were fortunate to conduct this study within a uniquely large group of young adolescents, a somewhat understudied age group in the area of effects of mental health problems in combination with perceived parenting behaviors on academic performance. This group of pre- and early adolescents is in the context of academic performance interesting, because these children make the transition from elementary school to secondary school. Other studies in this area mainly focused on early elementary school children or late adolescents to predict academic performance with mental health problems or family factors.

Next to these strengths, several limitations should be mentioned. Firstly, our data were based on questionnaires. It can be argued that observational measures capture more reliable, objective information, but in this large group of participants (T1: n = 2230; T2: n = 2149) it was practically impossible to gather observational data. Moreover, we believe that it is important to have data of experienced mental health problems and perceived parenting behaviors instead of purely objective measures. Secondly, the measurement of the outcome variable academic performance was measured by a single informant instead of multiple informants. We used teacher reports to measure the outcome variable academic performance which were based on the judgments of teachers. Teachers of pre-and early adolescents have great knowledge of the academic performance of their pupils, nevertheless a more valid measurement would be the results of tests who measure academic performance. To conclude,

the current study shows that in order to understand and subsequently prevent a low level of academic performance, it is important to take into account the interplay between personal factors and their social environment. In the social environment outside the family context, the school environment could be important in studying academic performance (Marchant et. al., 2001; Brand et. al., 2008; Brock et. al., 2008). Future research may extend the socializing environment to factors outside the family context such as the school environment or peers.

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Table 1

*Means and Standard Deviations of Academic Performance, Age, Mental Health Problems and Parenting Behaviors*

| | Girls | | | Boys | | | Difference | | |
|---|---|---|---|---|---|---|---|---|---|
| *Variables* | *Mean* | *SD* | *n* | *Mean* | *SD* | *n* | *t* | *df* | *p* |
| **Outcome variables** | | | | | | | | | |
| Academic Performance T1 | 3.77 | .84 | 991 | 3.45 | .92 | 934 | 7.89 | 1878 | <.01 |
| Academic Performance T2 | 3.46 | .76 | 785 | 3.14 | .77 | 766 | 8.08 | 1547 | <.01 |
| **Mental Health Problems** | | | | | | | | | |
| Internalizing Problems | .07 | .83 | 1127 | -.07 | .80 | 1093 | 3.89 | 2218 | <.01 |
| Externalizing Problems | -.17 | .73 | 1128 | .18 | .89 | 1094 | -9.94 | 2117 | <.01 |
| **Parenting Behaviors** | | | | | | | | | |
| Overprotection | 1.84 | .37 | 1123 | 1.88 | .39 | 1083 | -2.81 | 2204 | <.01 |
| Rejection | 1.48 | .29 | 1123 | 1.51 | .33 | 1083 | -5.02 | 2154 | <.01 |
| Emotional Warmth | 3.26 | .49 | 1124 | 3.16 | .51 | 1083 | 4.81 | 2205 | <.01 |

Table 2

*Correlations between Academic Performance, Mental Health Problems, Parental Behaviors and Age, for Girls and Boys* [a]

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| **1. Academic Performance T1** | - | .30** | -.14** | -.19** | -.08* | -.11** | .24** |
| **2. Academic Performance T2** | .27** | - | -.07 | -.19** | -.07* | -.11** | .12** |
| **3. Internalizing Problems** | -.06 | .04 | - | .56** | .28** | .38** | -.19** |
| **4. Externalizing Problems** | -.21** | -.12** | .52** | - | .25** | .44** | -.23** |
| **5. Overprotection** | -.09* | -.01 | .22** | .20** | - | .46** | .13** |
| **6. Rejection** | -.08* | -.04 | .33** | .40** | .41** | - | -.33** |
| **7. Emotional Warmth** | .18** | .09* | -.12** | -.24** | .25** | -.31** | - |

[a] Girls' correlations are printed above the diagonal and boys' correlations below the diagonal.

**: $p < .01$.

*: $p < .05$.

.

Table 3

*Regression Analyses for Academic Performance T1 in Preadolescent Girls & Boys*

| | **T1 Academic Performance Girls** | | | | **T1 Academic Performance Boys** | | | |
|---|---|---|---|---|---|---|---|---|
| | *Main Effects* | | *Full Model* | | *Main Effects* | | *Full Model* | |
| Predictors | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* |
| **Control Variable** | | | | | | | | |
| T1 Age | .00 | .06 | .01 | .06 | -.08 | .06 | -.03 | .06 |
| **Main effects** | | | | | | | | |
| Externalizing Problems | -.15** | .04 | -.16** | .04 | -.20** | .04 | -.20** | .04 |
| Internalizing Problems | -.02 | .04 | -.01 | .04 | .08† | .04 | .09* | .04 |
| Overprotection | -.11** | .04 | -.09** | .04 | -.15** | .04 | -.15** | .04 |
| Rejection | .10* | .04 | .08* | .04 | .10* | .04 | .11* | .04 |
| Emotional Warmth | .24** | .03 | .24** | .03 | .21** | .04 | .21** | .04 |
| **Interaction Effects** | | | | | | | | |
| Internalizing Problems X Overprotection | | | -.13** | .03 | | | .02 | .04 |
| Internalizing Problems X Rejection | | | .08** | .03 | | | -.04 | .03 |
| *R Square* | .09 | | .10 | | .08 | | .08 | |

†: $p < .10$. *: $p < .05$. **: $p < .01$.

Table 4

*Regression Analyses for Academic Performance T2 in Early Adolescent Girls & Boys*

| | **T2 Academic Performance Girls** | | | | **T2 Academic Performance Boys** | | | |
|---|---|---|---|---|---|---|---|---|
| | *Main Effects* | | *Full Model* | | *Main Effects* | | *Full Model* | |
| Predictors | *b* | *SE* | *b* | *SE* | *b* | *SE* | *b* | *SE* |
| **Control Variable** | | | | | | | | |
| T2 Age | -.04 | .07 | -.03 | .07 | - .22** | .07 | -.21** | .08 |
| Academic Performance T1 | .33** | .04 | .31** | .04 | .25** | .04 | .23** | .04 |
| **Main effects** | | | | | | | | |
| Externalizing Problems | -.18** | .05 | -.19** | .05 | -.07 | .05 | -.08$^{\dagger}$ | .05 |
| Internalizing Problems | .09$^{\dagger}$ | .05 | .09$^{\dagger}$ | .04 | .10* | .05 | .11* | .05 |
| Overprotection | -.05 | .04 | -.01 | .05 | .01 | .05 | -.00 | .05 |
| Rejection | -.00 | .05 | -.01 | .05 | -.05 | .05 | -.05 | .05 |
| Emotional Warmth | .04 | .04 | .02 | .04 | .01 | .05 | .01 | .05 |
| **Interaction effects** | | | | | | | | |
| Internalizing Problems X Rejection | | | -.07$^{\dagger}$ | .04 | | | -.02 | .04 |
| Externalizing Problems X Overprotection | | | .13** | .05 | | | .06 | .04 |
| Externalizing Problems X Emotional Warmth | | | -.09* | .04 | | | -.01 | .04 |
| *R Square* | .12 | | .13 | | .09 | | .10 | |

$^{\dagger}$: $p < .10$. *: $p < .05$. **: $p < .01$.

Figure Captions

*Figure 1*. Overview of hypotheses to be tested

*Figure 2.* Interaction between internalizing problems and parental protection in relation to the academic performance of preadolescent girls

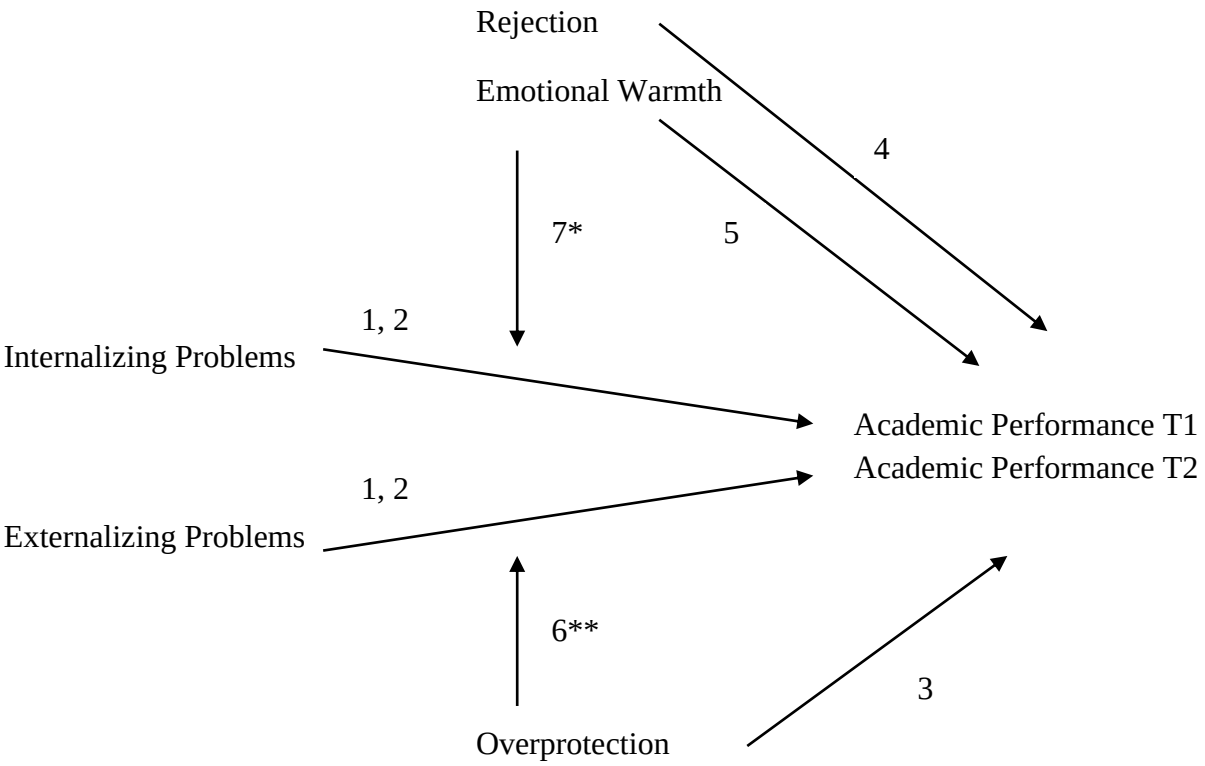
*Figure 3.* Interaction between internalizing problems and parental rejection in relation to the academic performance of preadolescent girls

*Figure 4.* Interaction between internalizing problems and parental rejection in the prediction of the academic performance of early adolescent girls

*Figure 5.* Interaction between externalizing problems and parental overprotection in the prediction of the academic performance of early adolescent girls

*Figure 6.* Interaction between externalizing problems and parental emotional warmth in the prediction of the academic performance of early adolescent girls

(Fig 1)

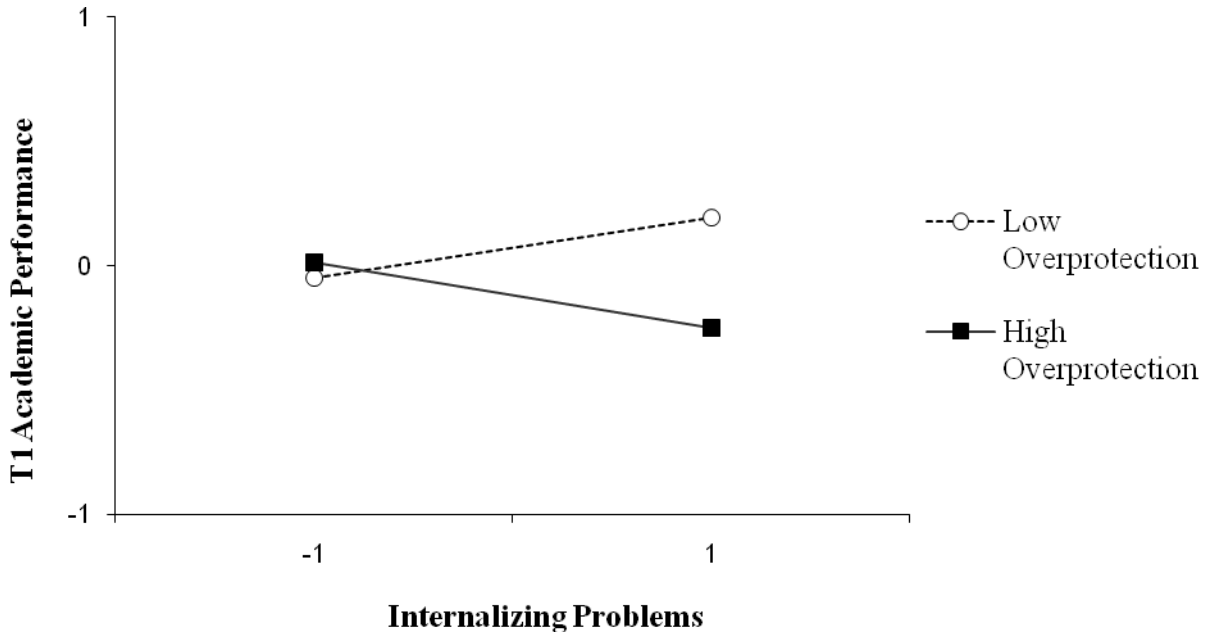



* Hypothesis for girls

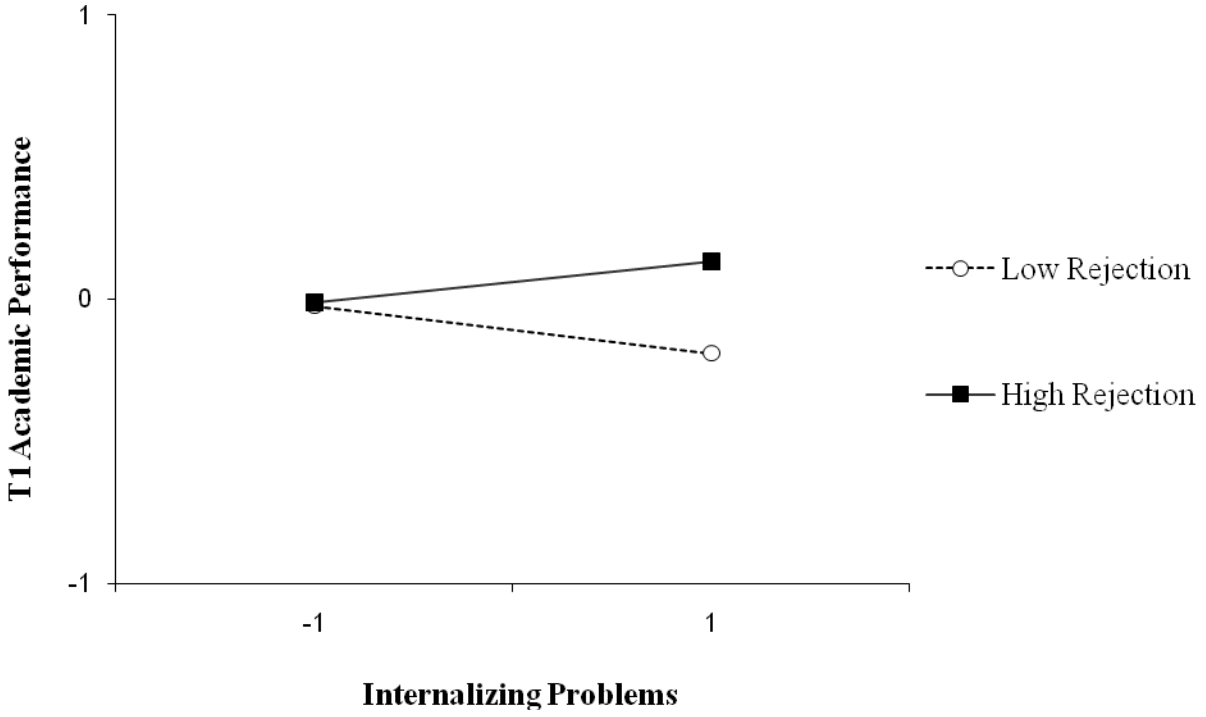
** Hypothesis for boys

Note. The numbers correspond with hypotheses in the introduction.

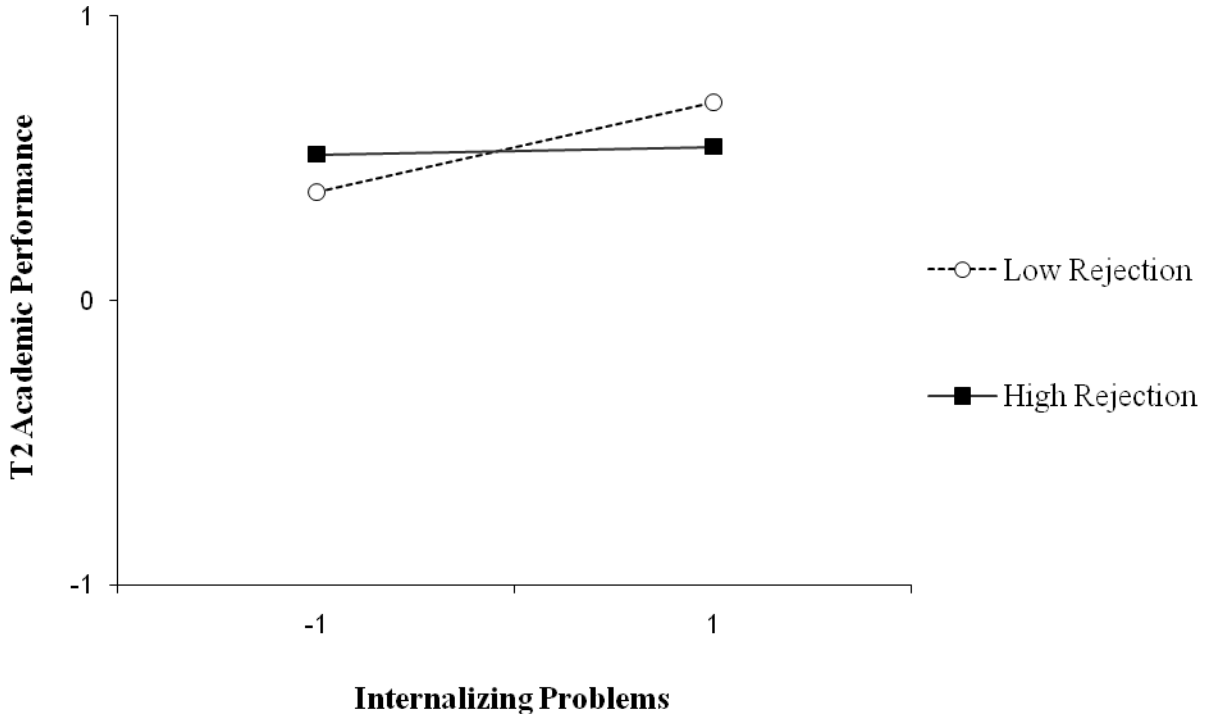
(Fig 2)


1
0
-1
T1 Academic Performance
-1
1
Internalizing Problems
Low Overprotection
High Overprotection

(Fig 3)


1
0
-1
T1 Academic Performance
-1
1
Internalizing Problems
Low Rejection
High Rejection

(Fig 4)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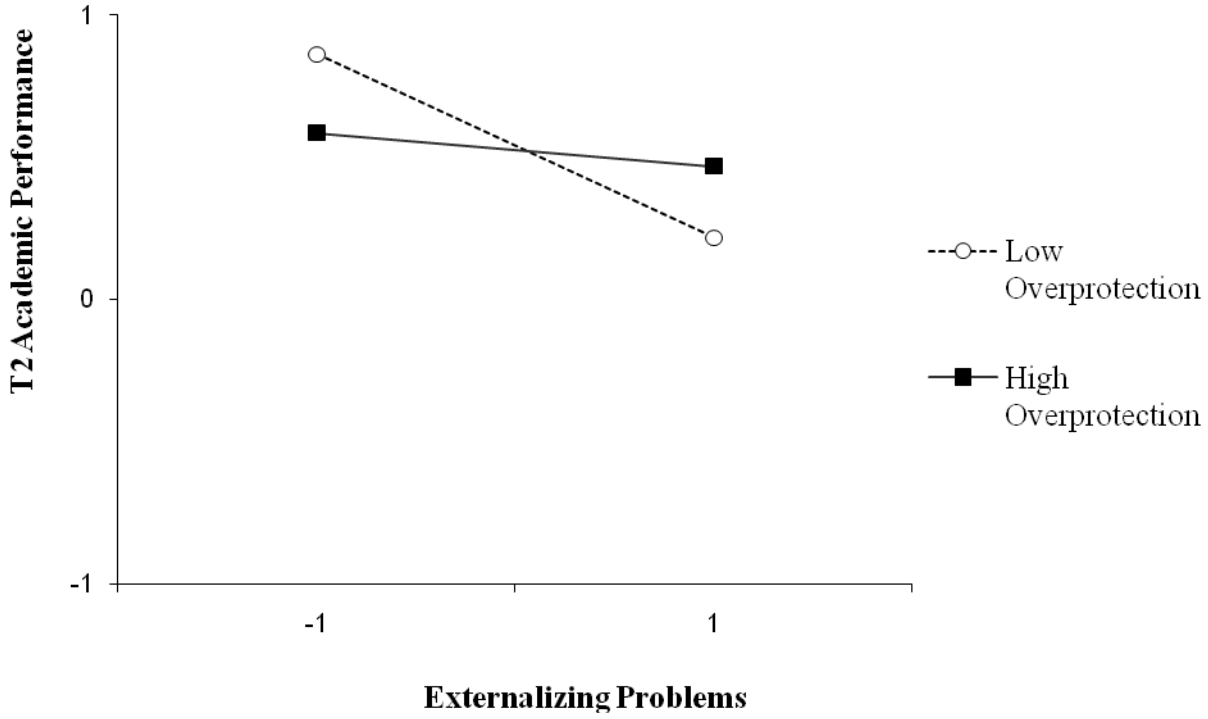
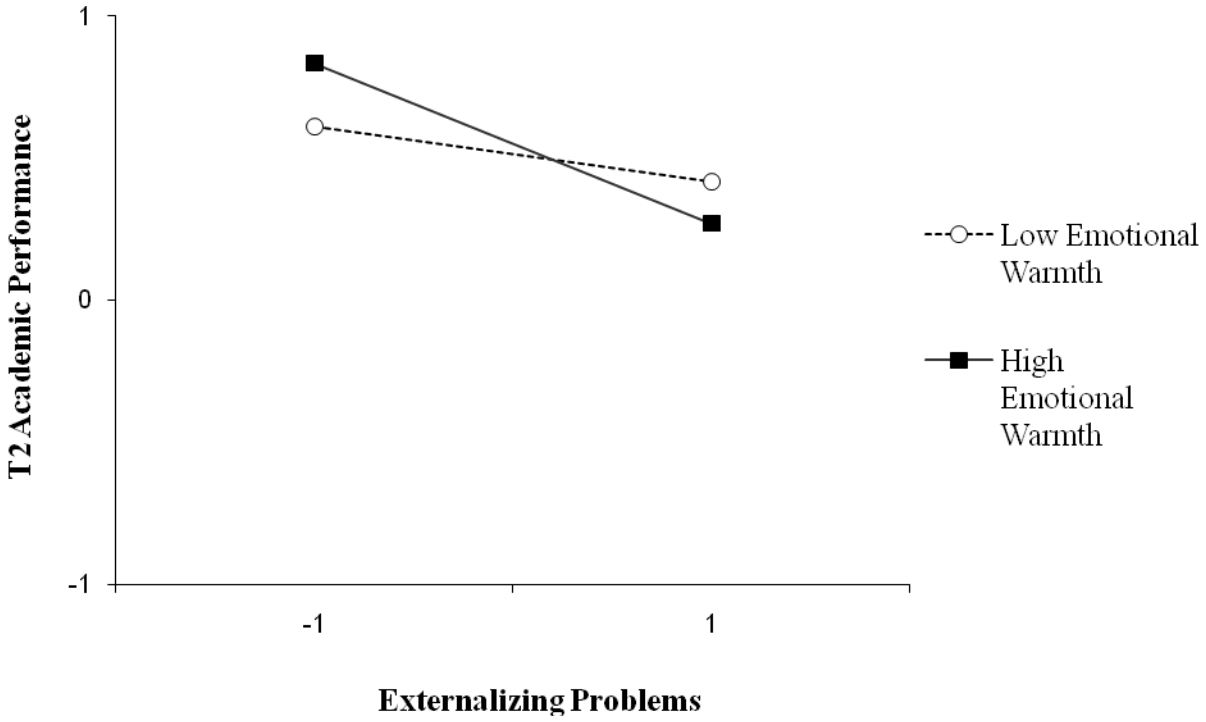
0
-1
T2 Academic Performance
-1
1
Internalizing Problems
Low Rejection
High Rejection

(Fig 5)


1
0
-1
T2 Academic Performance
-1
1
Externalizing Problems
Low Overprotection
High Overprotection

(Fig 6)


1
0
-1
-1
1
T2 Academic Performance
Externalizing Problems
Low Emotional Warmth
High Emotional Warmth