Parental Psychological Control as Predictor for Child Trait Anxiety, Moderated by Child Emotional Maltreatment and Gender

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Abstract

Previous research suggests that higher levels of trait anxiety in adolescents, especially for girls, are a risk of developing one or more anxiety disorders in the future. Furthermore, multiple studies show that certain dysfunctional behaviors of parents such as parental psychological control (PC) and child emotional maltreatment (CEM) seem to be related to anxiety symptoms in adolescents. Therefore, this study aimed to examine risk factors related to trait anxiety, more specifically we examined the role of parental PC, and the potential moderating role of child gender and CEM. A multi-method (i.e., questionnaires, observations), cross-sectional design is used with a sample of 78 adolescents aged between 11 and 17 years, and their parent(s). Two different adolescent-report questionnaires were used to measure trait anxiety and CEM. Parental PC is measured during observations. The hierarchical regression model showed that there is no significant relation between parental PC and adolescent trait anxiety. Furthermore, there was no moderation effect found for both adolescent gender and CEM. In conclusion, this study is one of the first studies that used observational methods to measure parental PC, and which also included fathers as participants. In contrast, the results of this study are not consistent with findings in previous research. A possible explanation for this could be the difference in sample size, method, and the use of a healthy control group. Future research could focus on a combination of observational methods and self-report questionnaires to get a whole view of parental PC.

Keywords: trait anxiety, parental psychological control (PC), gender, adolescence, child emotional maltreatment (CEM).

Parental Psychological Control as Predictor for Child Trait Anxiety, Moderated by Child Emotional Maltreatment and Gender

Anxiety is an emotion with an adaptive function that helps people to respond adequately toward a potentially threatening stimulus or situation (de Visser et al., 2010). According to Spielberger (1972), anxiety can be defined as an unpleasant emotional state including subjective feelings like tension, apprehension, and worry, where the emotional state is accompanied by activation or arousal of the autonomic nervous system. Despite the adaptive function, high levels of anxiety or generalized anxiety could lead to the development of psychiatric disorders like anxiety disorders, that negatively affect the quality of life (de Visser et al., 2010). Previous research shows that the prevalence of anxiety disorders is high. About 15 – 20 % of the population in Europe and the US suffer from an anxiety disorder at some time in their life (Kessler et al., 2005).

It is suggested that the transition from a normal amount of anxiety in healthy individuals to pathological forms of anxiety are on a continuum. Looking at this continuum, Bennet and Stirling (1998) suggest that individuals with higher levels of anxiety (*trait anxiety*), who are in the middle or higher on this continuum, are at risk for developing one or more anxiety disorders described by the DSM-IV. Spielberger (1972) makes a distinction between two types of anxiety, namely state and trait anxiety. State anxiety refers to a temporary emotion, including physiological arousal and consciously perceived feelings of apprehension, dread, and tension that are characterized by a physical response of anxiety. In contrast, trait anxiety could be more seen as personality-based, where an individual is relatively vulnerable to anxiety in a consistent way. Anxiety disorders often develop during childhood and *adolescence* (Goldberg, 1995) and are even the most prevalent psychiatric disorder in this age range (Kashani & Orvaschel, 1988). Looking specifically at trait anxiety, Spielberger (1972) suggests that trait anxiety is mostly influenced by environmental factors during development. To conclude, high levels of trait anxiety are a risk for developing an anxiety disorder and often develop during childhood and adolescence. Therefore, it is important to examine which possible risk factors relate to levels of trait anxiety during childhood and adolescence.

Trait Anxiety and Parental Psychological Control

Adolescence, defined as a period between childhood and young adulthood, is often seen as a difficult period in life (Smetana, 2011). Developing autonomy is one of the important tasks during adolescence. According to Ryan and Deci (2000) developing

autonomy is characterized by the intrinsic motivation and need of adolescents to gain more independence, where autonomy is one of the three important basic psychological needs. Despite the importance of developing autonomy, not all parents stimulate their adolescents' search for autonomy and may even discourage it (Hare et al., 2015). One type of parental behavior that actively limits adolescent autonomy is *psychological control* (PC). This parental behavior is often characterized by giving priority to one's own perspective and trying to get the child along in this perspective, which often results in controlling behavior of the parents towards their child. The behavior of the parents is therefore often described as intrusive and manipulative, and is characterized by multiple aspects such as having a conditionally approving attitude to their children, and the use of parenting tactics to make their children think, behave or feel in ways the parent approves of (Barber, 1996).

When looking at previous studies, parental PC is often measured with self-report questionnaires by adolescents without including the parents in the study (Albrecht et al., 2007; Costa et al., 2016; Cui et al., 2014; Loukas et al., 2005; Nanda et al., 2012; Soenens et al., 2012). In contrast, Pettit et al. (2001) used a combination of questionnaires and interviews where both adolescents' and mothers' perceptions of parental PC were collected. Even though not many studies measured parents' perception of parental PC, Pettit et al. (2001) showed that the adolescent-reported PC and mother-reported PC differed to some extent from each other. For example, they found that mothers reported both early harsh parenting and mothers' judgments of early child behavioral adjustment as antecedents that could predict PC. This was different for adolescents who reported only early harsh parenting as a predictor for PC (Pettit et al., 2001). This could indicate that including both adolescents and their parent(s) might be useful in future research to get a full view of parental PC. In contrast to these inconsistencies among parental PC perspectives, studies on the perceived levels of parental PC by the adolescent on the adolescent outcomes are highly consistent. For example, research shows that higher levels of adolescent reported parental PC are related to adolescent internalizing problems such as anxiety and depressive symptoms (Albrecht et al., 2007; Costa et al., 2016; Cui et al., 2014; Loukas et al., 2005; Nanda et al., 2012; Pettit et al., 2001; Soenens et al., 2012). Studies that used observational methods to measure parental PC during adolescence seem to be limited. According to Hauser Kunz and Grych (2013), they were the first who used observational methods to distinguish the concepts of parental PC and autonomy granting including both parents and adolescents in their study. Their results show that higher levels of fathers' PC were associated with higher adolescent reported internalizing problems such as anxiety and depression. Furthermore, Hauser Kunz and Grych (2013) found that the strength

of using observational methods is that during observations more subtle forms of parental PC could be seen whereas these subtle forms are difficult to measure only using questionnaires. In contrast, other parental PC behaviors such as extreme efforts to manipulate and pressuring behaviors could be more effectively measured with questionnaires that measure behaviors over a longer period and in private settings (Hauser Kunz & Grych, 2013). Because both questionnaires and observational methods seem to have their strengths and weaknesses, using more observational studies in the future could be beneficial to measure overall parental PC.

According to previous studies, high levels of parental PC during child adolescence are associated with multiple outcomes related to psychological distress such as feelings of need, frustration, depression (Costa et al., 2016; Soenens et al., 2012), and anxiety (Loukas et al., 2005; Pettit et al., 2001). One explanation for the strong relation between psychological distress like anxiety symptoms when parents are psychologically controlling is because of adolescents' need for autonomy development which is often accompanied by conflicts with their parents (Smetana, 2011). These confrontations might be the result of a two-way interaction between the parent and the adolescent whereby the parental PC and child anxiety reinforce one another over time (Ballash et al., 2006; van der Bruggen et al., 2008). This is in line with other research, which showed that high levels of parental PC are related to high levels of (trait) anxiety and becomes stronger as children become adolescents (Ballash et al., 2006; Seibel & Johnson, 2001; van der Bruggen et al., 2008). Looking at the literature described above, it seems that parental PC could be a factor that relates to higher levels of trait anxiety during adolescence.

The Influence of Gender

Previous research shows that females are more likely to develop anxiety symptoms and anxiety disorders than males. For example, Lewinsohn et al. (1998) found that 74% of the adolescents with a current anxiety disorder were female and that females were also in the majority (65%) in the group of adolescents who recovered from an anxiety disorder. Furthermore, research shows that especially female adolescents are more likely to report higher anxiety levels related to experienced parental PC (Pettit et al., 2001). Also, Ohannessian et al. (1995) found that female adolescents who had a more different view of family adjustment with their parents reported higher levels of state and trait anxiety than female adolescents who had more similar views with their parents. Thus, according to the literature, it seems that female adolescents are more likely to develop anxiety symptoms than male adolescents, where this *gender* difference is also related to experienced parental PC.

This suggestion could make it interesting to investigate if the relation of observed parental PC and trait anxiety might be influenced by adolescents' gender.

The Influence of Child Emotional Maltreatment

According to Wright et al. (2009), the presence of *child emotional maltreatment* (CEM), consisting of emotional abuse (EA) and emotional neglect (EN), is related to anxiety symptoms in college students with long-term impact. EA and EN are described as the relationship between parent and child, where the relationship includes a repeated pattern of harmful interactions. Therefore, CEM can be described as acts of commission (EA) such as verbal abuse, rejection, terrorization, and isolation, or acts of omission (EN) like ignoring, being psychologically unresponsiveness, or unavailable (Barnet et al., 2005).

Poor parenting methods and CEM have the similarity that they harm the parent-child relationship (Wolfe & McIsaac, 2011). Although this similarity, two factors distinguish them from each other. First, CEM is characterized by a persistent, severe, and escalating pattern of neglectful and/or emotionally abusive parental behavior directed to the child. Those parents are also emotionally maltreating and mostly demonstrate more extreme, appalling, and disturbing behaviors directed to the child than parents with only dysfunctional and poor parenting (Wolfe & McIsaac, 2011). Second, with CEM the parenting methods are related to an increase in the probability of psychological harm or developmental disturbances because the child is continuously exposed to stress symptoms (Wolfe & McIsaac, 2011). Looking further at vulnerability factors for experiencing high levels of trait anxiety in healthy adolescents, Bennett and Stirling (1998) showed that adolescents who rated their mothers as less caring scored significantly higher on trait anxiety than those who rated their mothers as caring. Furthermore, Bowlby (1977) showed that the development of anxiety disorders and symptoms could be influenced by distorted parenting such as unresponsiveness, criticism, rejection, threats of abandonment, or an inversion of the relationship between parent and child. To conclude, previous research both shows that parental PC and the experience of CEM are related to child anxiety. Therefore, it could be that higher levels of CEM above on high levels of parental PC may contribute to higher levels of trait anxiety in adolescents.

Present Study

The main aim of this study is to examine whether parental PC is related to trait anxiety in adolescents. Above this, the aim is to examine if this relation is moderated by gender and/ or child emotional maltreatment. In this present study, gender is defined as the biological sex of the adolescent. Looking at the literature described above, the hypotheses are that:

1. Higher parental PC is related to higher levels of trait anxiety in adolescents.

2. The relation between parental PC and adolescent trait anxiety is moderated by the gender of the adolescent, with a stronger relation for girls than boys.
3. The relation between parental PC and adolescent trait anxiety is moderated by CEM, with a stronger relation for adolescents with higher levels of experienced CEM.

Method

Participants

The current study is part of a broader research project, namely RE-PAIR (Relations and Emotions in Parent-Adolescent Interaction Research). The main research goal of RE-PAIR is to examine the bi-directional relation between parent-child interactions and the negative mood of depressive adolescents. The current study focused on the healthy control group. Participants were included in this study when the adolescent was between 11 and 17 years old, and when the adolescent was living with at least one primary caregiver that also wanted to participate in the study. Participants were excluded in this study when the adolescent had a current psychological disorder or a psychological disorder in the past two years (assessed using the Kiddie Schedule for Affective Disorders and Schizophrenia – Present and Lifetime, K-SADS-PL); had a lifetime depressive disorder in the past (assessed using K-SADS-PL); had a history of psychological treatments or psychotherapy; was using medication for psychological disorders or sleep; the adolescent had an insufficient level of speaking and/or understanding Dutch. Parents were excluded when they had an insufficient level of speaking and/or understanding Dutch.

The original sample consisted of 80 adolescents. Two adolescents were excluded because of missing data of the CTQ-SF (n = 1) or the reminiscence task (n =1). The final sample (N = 78) consists of male adolescents (n = 28, 35.9%, M_{age} = 15, SD = 1.56) and female adolescents (n = 50, 64.1%, M_{age} = 16, SD = 1.13). All male participants reported that the Netherlands is their country of origin, whereas 96.0% female adolescents reported this. Other girls reported China (n = 1) or Taiwan (n = 1) as their country of origin. Most male adolescents reported pre-university education (53.5%) as their current educational level. Other reported educational levels were lower vocational education (21.4%), higher vocational education (17.9%), and other (7.1%). For girls, the reported education levels were pre-university education (44.0%), higher vocational education (30.0%), secondary vocational education (10.0%), secondary higher vocational education (4.0%), lower vocational education (8.0%), and other (4.0%). Looking at the parents of the adolescents, the total sample consists of 141 parents, with 64 (45.4%) fathers (M_{age} = 51, SD = 6.53) and 77 (54.6%) mothers (M_{age}

= 47, *SD* = 4.64). Of those fathers, 55 (85.9%) reported to be the biological father. Looking at the mothers, 73 (94.8%) reported to be the biological mother.

Procedure

The current study used a multi-method (i.e., questionnaires, observations), cross-sectional design. The participants were recruited via advertisements on social media, at GP's, in pharmacies, at municipal health services, in the magazine of the Royal Dutch Touring Club ("de Kampioen"), and researchers' network. Adolescents and/or parent(s) who contacted the researchers for participation received a letter with more information about the RE-PAIR study. The participants who met the inclusion criteria were asked to fill in online questionnaires, next visit the laboratory for one day, fill in an Ecological Momentary Assessment (EMA), take an fMRI scan, and fill in follow up questionnaires. For the current study, some baseline questionnaires and the reminiscence task during research day were used.

Research Day

During the research day, both the adolescent and their parent(s) were asked to complete several tasks, individually and together. At the beginning of the research day, the head researcher welcomed the adolescent and their parent(s) and instructed them in signing the informed consent. Before the tasks could begin several preparations were made. For example, the adolescent was asked to write down two emotional events and indicate how intense (somewhat, moderately, very) these were to them per event.

The participants fulfilled three interaction tasks. Before and after every task, the adolescent and their parent(s) needed to complete a number of questions concerning their mood. Looking at this current study, especially the reminiscence task was important. With this task, both adolescent and parent(s) were placed at a table in a 90° angle with one camera pointed at the adolescent and one at the parent. During the task, the adolescent is asked to share one or both of the events (s)he wrote down at the start of the research day.

Compensation and Ethical Approval

After participating in the study, the adolescent got 15-35 euros and the parent 73-100 euros as compensation for participating in this study. Travel expenses were compensated. This study has been approved by a Medical Ethics Committee on May 2nd in 2018 (NL62502.058.17).

Measures

Multiple questionnaires are used to analyze the data. Also, parental behavior based on observational coding of one of the three interaction tasks is used for statistical analyses, namely the reminiscence task.

Screen for Child Anxiety Related Emotional Disorders (SCARED)

The SCARED is a well-validated questionnaire and is used in the current study to measure long-term anxiety symptoms (trait anxiety) (Steensel & Bögels, 2014). This questionnaire has a total of 31 items and exists of three subscales. Those subscales are symptoms of panic disorder, generalized anxiety disorder, and social phobia. Examples of questions that were asked are "*I am someone that worries a lot*" and "*I get really scared without any reason*." The SCARED significantly correlated with the STAI (State-Trait Anxiety Inventory) which makes that this measure also could be used to measure trait anxiety (Steensel & Bögels, 2014). The internal consistency of the SCARED is measured before analyzing the data which resulted in a Cronbach's alpha of .86. The items were summed to obtain a total score. The total score is used as the outcome variable (Y) to measure adolescent trait anxiety. A higher total score represents higher levels of trait anxiety (Simon & Bögels, 2009).

Childhood Trauma Questionnaire Short Form (CTQ-SF)

The CTQ-SF is a well-validated (Bernstein et al., 2003) self-report questionnaire and is used to examine child emotional maltreatment (CEM) in adolescents. The CTQ-SF exists of 28 items about emotional, physical, and sexual abuse, and emotional and physical neglect in their childhood rated on a 5-point Likert scale (Bernstein et al., 2003). In the current study, the sum score of the subscales emotional neglect and emotional abuse are used. Examples of questions that were asked are "*I knew there was someone to take care of me and protect me during my childhood*" for emotional neglect and "*People in my family said hurtful or insulting things to me during my childhood*" for emotional abuse. Before analyzing the data, items 5, 7, 13, 19, and 28 from the subscale emotional neglect are recoded. Both subscales are internally consistent, with a Cronbach's alpha of .81 for emotional neglect and a Cronbach's alpha of .75 for emotional abuse. Taking the subscales emotional abuse and emotional neglect together gives a Cronbach's alpha of .85. The items were summed to obtain a total score of CEM. A higher total score represents higher levels of experienced CEM (Bernstein et al., 2003).

Observed Parental Psychological Control

To observe parental PC, a coding system is used to quantify parental psychological behaviors via videotapes during the interaction tasks. With this coding system, a 9-point scale is used where a higher score means higher levels of psychologically controlling behaviors. The psychological control scale has three subscales based on several elements. The mean of these subscales indicates the total level of observed parental PC in the task. The elements are coded as low, mild, moderate, or strong in their intensity. The consistency and intensity of the

elements is used to assign a code to each subscale per interaction task (1 = fully absent, 3 = infrequent low, 5 = infrequent mild or one moderate, 7 = frequent low/mild/moderate or one strong, 9 = consistent low/mild/moderate and one or multiple strong). The subscales are:

1. *Constraining verbal expressions*: This subscale is intended to determine to what extent the parent is constraining expressions of the adolescent during the interaction task and consists of three elements. First, the parent shows dominant behavior towards the adolescent (e.g. speaking for the adolescent and asking leading questions). Second, the content of the expression of the parent is dominant (e.g. lecturing, suggesting solutions). Third, the parent shows disinterest towards the adolescent (e.g. ignoring the adolescence).
2. *Guilt induction*: This subscale is intended to determine to what extent the parent shows guilt-inducing behavior during the interaction task. This subscale exists of two elements. First, the parent makes the adolescent unreasonably responsible for something on which the adolescent has no influence on (e.g. a conflict between parents about raising the adolescent). Second, the parent makes his/her perspective and needs more important than that of the adolescent (e.g. limiting the adolescent's emotionality because the parent his/herself is emotional).
3. *Invalidating emotions*: This subscale is intended to determine to what extent the parent shows behavior that invalidates emotions of the adolescent and consists of two elements. First, the parent is filling in emotions for the adolescent (e.g. mind reading behaviors). Second, the parent minimalizes the emotions of the adolescent (e.g. minimalized enthusiasm and telling the adolescent is overreacting).

Videos were coded by independent coders with a high level of intercoder reliability (*ICC range* [.83, .94]). Furthermore, to stimulate intercoder reliability, intervision meetings were held to discuss possible doubts about the video and coding. For this current study, the reminiscence task is used to measure parental PC. The mean score of the subscales were computed to obtain a total score of parental PC and served as predictor variable (X) in the statistical analysis.

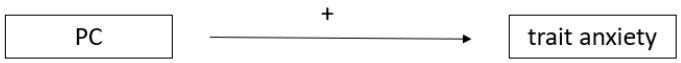
Statistical Analysis

Before analyzing the data with the hierarchical multiple regression, we checked on possible outliers and the assumptions of linearity, homoscedasticity, normality and multicollinearity. The data is checked on outliers by looking at the standardized residuals, the Centered Leverage Value (outlier on the predictor variable), and the influence of a possible outlier (Cook's Distance).

The data is analyzed via the digital program IBM SPSS Statistics version 26 (IBM Corp., 2019). To test the three hypotheses, a hierarchical multiple regression is used consisting of three models. The first model is created with the variables gender parent and age adolescent who served as covariates to control for the possible influence of those variables. The variable trait anxiety served as outcome variable in the hierarchical regression model. In the second model the predictor variables parental PC, gender adolescent and CEM were added to obtain an answer on the first hypothesis, namely the main effect of parental PC and trait anxiety (Figure 1). The variables CEM and gender adolescent are also added as predictor variables in the second model because they serve as moderator variables in the third model.

Figure 1

Hypothesis 1: *Higher parental PC is related to higher levels of trait anxiety in adolescents.*



Next, the third model is created to add the interaction variables PC*gender adolescent and PC*CEM to look for possible moderation effects. For this, both interaction variables are added in model three as predictor variables. To give an answer to the second hypothesis, there is looked at the possible moderation effect between the interaction variable PC*gender adolescent and trait anxiety (Figure 2), and for the third hypothesis to a possible moderation effect between the interaction variable PC*CEM and trait anxiety (Figure 3).

Figure 2

Hypothesis 2: The relation between parental PC and adolescent trait anxiety is moderated by the gender of the adolescents, with a stronger relation for girls than boys.

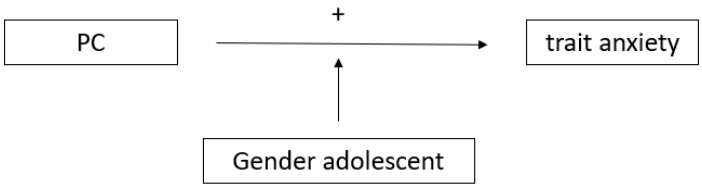
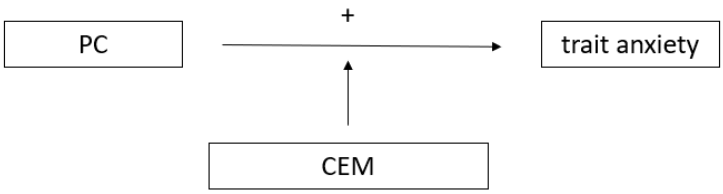


Figure 3

Hypothesis 3: The relation between parental PC and adolescent trait anxiety is moderated by CEM, with a stronger relation for adolescents with higher levels of experienced CEM.



Results

Preliminary Analyses

Before performing the analyses, the data were checked on outliers using boxplots for the variables trait anxiety, parental PC, and CEM. The boxplots showed a total of three outliers. The standardized residuals (z = - 1.99, 3.66) and the centered leverage test (*Centered Leverage Value* = .21) show that there are outliers on the sum score of SCARED (n = 1), the sum score of CEM (n = 2), and mean score of PC. According to the Cook's Distance test, the outliers do not influence the data (*Cook's Distance* = .26). Therefore, the outliers are not removed from the dataset.

Next, the assumptions of the hierarchical regression were checked. The multicollinearity is checked by looking at the values of the Tolerance, Variance Inflation Factor (VIF), and correlations (Table 1). The values show that there is no correlation between the gender of the adolescents, parental PC, and CEM. Furthermore, the histogram with the dependent variable trait anxiety and independent variable parental PC shows that the data of the residuals are normally distributed. Also, the scatterplot shows that the data is both linear and homoscedastic. The histogram with the dependent variable trait anxiety and independent variable CEM also shows that the data of the residuals are normally distributed, linear and homoscedastic. When looking at the data of the variables CEM, parental PC, and trait anxiety separately, it shows that trait anxiety is normally distributed but CEM and parental PC are not. We checked whether log10 transformations improved the distribution, which lead to no approvement. Therefore it is decided to proceed with the non-transformed data. However, it is important to consider the skewedness when interpreting the results of the current study.

Table 1

Pearson Correlation Table

Scale	1	2	3	4
1. Gender Adolescent	-			
2. CEM	- .07	-		
3. SCARED	.40**	.05	-	
4. Parental PC	.14	-.07	.08	-

Note. ** Correlation is significant at the .01 level (2-tailed).

Main Analyses

Relation between Parental PC and Adolescent Trait Anxiety

A hierarchical multiple regression consisting of three models was used to examine the three hypotheses with trait anxiety as the dependent variable. The variables age of the adolescent and gender of the parent were entered in block 1 as covariates. Model 1 revealed that the age of the adolescent and gender of the parent did not contribute significantly to the regression model, ($F(2,138) = 1.95$, $p = .15$) and accounted for 2.7% of the variance in experienced trait anxiety in adolescents ($R^2 = .03$).

Next, the variables parental PC, gender of the adolescent, and CEM were added in block 2 to look at the main effects of these variables in relation to the dependent variable trait anxiety. Model 2 revealed that adding parental PC, gender of the adolescent and CEM do contribute significantly to the regression model, ($F(5,135) = 5.55$, $p < .001$) and explained 14.3% more variance compared to model 1, ($R^2_{Change} = .14$, $F_{Change}(3,135) = 7.76$, $p < .001$). When further analyzing the main effects in model 2, the analysis revealed that only the variable gender of the adolescent is a significant predictor of trait anxiety in adolescents. This means that when the score on the variable gender of the adolescent (1 = male, 2 = female) increases by 1 point, the score of an adolescent on the SCARED increases by 5.80 (*range SCARED* [0, 39]), which indicates that girls have a higher score of trait anxiety than boys, ($B = 5.80$, $t(135) = 4.70$, $p < .001$; Figure 4). The variance uniquely explained by the gender of the adolescent is 13.6%, (*Part* = .37). According to the rules of thumb of Cohen (1988), this indicates a medium to high effect. Furthermore, model 2 shows that the variable CEM is not a significant predictor of higher levels of trait anxiety in adolescents, ($B = 0.10$, $t(135) = .80$, $p = .42$) with a variance uniquely explained by CEM of .4%, (*Part* = .06). Also, model 2 revealed that the variable parental PC is not a significant predictor of higher levels of trait anxiety in adolescents, ($B = 0.23$, $t(135) = .42$, $p = .68$) with a variance uniquely explained by

parental PC of .1%, (*Part* = .03). Thus, looking at the main effects, only the gender of the adolescent is a significant positive predictor for higher levels of experienced trait anxiety in adolescents. Therefore, the hypothesis that higher parental PC is related to higher levels of trait anxiety in adolescents is rejected.

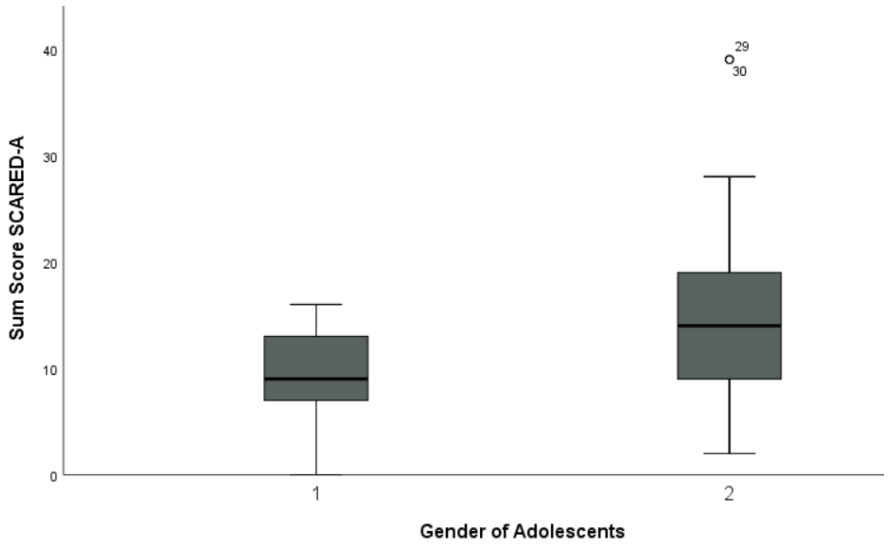
Moderation Effects

To check for moderation effects, the interaction variables PC*gender of the adolescent and PC*CEM were added in block 3. The analysis shows that model 3, which included those interaction variables, is statistically significant as a whole ($F(7,133) = 4.12$, $p < .001$). Furthermore, the analysis revealed that model 3 does not add significantly more variance compared to model 2, ($R^2_{Change} = .01$, $F_{Change}\ (2,133) = .63$, $p = .53$).

When looking specifically at the interaction variable PC*gender of the adolescent, model 3 revealed that there is no moderation effect between the interaction variable PC*gender of the adolescent and trait anxiety in adolescents, ($B = -1.26$, $t(133) = -1.07$, $p = .29$) with a variance uniquely explained by parental PC of .7%, (*Part* = -.08). Therefore, the hypothesis that the relation between parental PC and adolescent trait anxiety is moderated by the gender of the adolescent is rejected. Furthermore, when looking at the interaction variable PC*CEM, model 3 revealed that there is also no moderation effect between the interaction variable PC*CEM and trait anxiety in adolescents, ($B = -.05$, $t(133) = -.37$, $p = .71$) with a variance uniquely explained by parental PC of .1%, (*Part* = -.03). Therefore, the hypothesis that the relation between parental PC and adolescent trait anxiety is moderated by CEM is rejected.

Figure 4

Relation Gender of the Adolescent and Trait Anxiety



Note. Numbers 29 and 30 represent the scores with both of one of the outlying adolescents as described in the preliminary analyses.

Table 2

Coefficients Table of the Multiple Hierarchical Regression Analyses

	Unstandardized coefficients		Standardized coefficient		
	B	*SE*	*β*	*t*	*p*
Model 1					
Covariate 1 (gender parent)	.13	1.21	.01	.11	.92
Covariate 2 (age adolescent)	.90	.46	.17	1.97	.05
Model 2					
Main effect 1 (CEM)	.10	.12	.06	.80	.42
Main effect 2 (gender adolescent)	5.80	1.23	.39	4.70	< .001**
Main effect 3 (PC)	.23	.54	.03	.42	.68
Model 3					
Interaction effect 1 (PC*gender adolescent)	-1.26	1.18	-.40	-1.07	.29
Interaction effect 2 (PC*CEM)	-.05	.14	-.13	-.37	.71

Note. With dependent variable sum score on SCARED.

* p < .05; ** p < .001.

Discussion

The goal of the current study was to examine whether observed parental PC is related to trait anxiety in adolescents. Above this, the goal was to examine if this relation is moderated by the gender of the adolescent and/ or experienced CEM. It was expected that higher levels of parental PC are related to higher levels of trait anxiety in adolescents. Furthermore, it was expected that this relation is moderated by the gender of the adolescent and experienced CEM, with a stronger relation for girls, and/ or higher levels of CEM. The results of this current study reveal that those expectations were not met and therefore, all hypotheses are rejected. Looking further at the results, one significant result was found. The multiple hierarchical regression model showed that the gender of the adolescent is a significant predictor for higher levels of trait anxiety in adolescents, with higher levels of trait anxiety for girls than boys. This main effect has a medium to high effect with a variance uniquely explained by the gender of the adolescent of 13.6%.

According to previous research, higher levels of parental PC are related to higher levels of internalizing problems such as anxiety symptoms in adolescents (Albrecht et al., 2007; Costa et al., 2016; Cui et al., 2014; Loukas et al., 2005; Nanda et al., 2012; Pettit et al., 2001; Soenens et al., 2012). Those findings are in contrast with the results in this current study which found no significant relation between parental PC and adolescent trait anxiety. An explanation for this could be the difference in methodology according to measuring parental PC. Most previous studies used adolescent-report questionnaires and did not include parents as the respondent (Albrecht et al., 2007; Costa et al., 2016; Cui et al., 2014; Loukas et al., 2005; Nanda et al., 2012; Soenens et al., 2012), or used a combination of interviews and questionnaires (Pettit et al., 2001). In this current study, a questionnaire is used to measure trait anxiety, and an interaction (i.e., reminiscence; sharing memory of an emotional event) task between the parent and the adolescent as the setting to measure observational parental PC. Hauser Kunz and Grych (2013) were the first ones who used observational methods including both the adolescent and their parents. They found that fathers', but not mothers' parental PC was associated with internalizing problems such as anxiety. Hauser Kunz and Grych (2013) also discussed the use of observational methodology to measure parental PC. For example, they discuss that observational methods could be beneficial to measure subtle forms of parental PC, but that it is hard to capture other kinds of parental PC such as guilt induction and love withdrawal. Therefore, they suggest that questionnaires could be more effective to measure those kinds of behavior because questionnaires assess behaviors that

happened in the private setting and measure a longer period of time than could be done with just observational methods. When looking at this current study, parental PC is measured during observations with a coding system consisting of three subscales, including guilt induction and possible signs of love withdrawal such as ignoring and lecturing the adolescent. Therefore, it could be that measuring parental PC only via observations in a short time period could explain that the relation between parental PC and trait anxiety in adolescents in this current study is non-significant. Furthermore, it is tried to also include subtle forms of parental PC when creating the coding system because it was already expected that parental PC would not be observed very often. Even though, the results show that 93.6% of the parents got the score 1 on the parental PC scale 'guilt induction' what means that indeed guilt induction was barely observed during the interaction task.

The result that the relation between gender of the adolescent and higher levels of trait anxiety is stronger for girls, corresponds with the results of other studies. Multiple studies show that girls are more likely to experience higher levels of anxiety symptoms and are more likely to develop anxiety disorders (Lewinsohn et al., 1998; McLean & Anderson, 2009). When looking specifically at higher order vulnerability factors, girls are also more likely to score higher on trait anxiety than boys (McLean & Anderson, 2009), which is in line with the significant result in this research according to trait anxiety and gender differences.

When looking further at gender differences, Lewinsohn et al. (1998) used three groups (current anxiety disorder, recovered from anxiety disorder, and a no-disorder control) to investigate the female preponderance in anxiety disorders. With respect to the understanding of female preponderance in anxiety disorders, they found that significantly more female participants reported having a current anxiety disorder or recovered from one than male participants, which is also in line with more recent research (McLean et al., 2011). In contrast, the no-disorder group showed no significant difference in gender when looking at anxiety symptoms. When looking at this current study, the sample only existed of healthy adolescents with no (history) of anxiety disorders. Therefore, the study of Lewinsohn et al. (1998) could support the finding that there is no moderation effect found in this current study because their study showed that there is only a difference in gender with a preponderance for females when looking at adolescents who have a current anxiety disorder or recovered from one. Moreover, Lewinsohn et al. (1998) found that ten psychosocial variables such as self-esteem, major life events, and emotional reliance are associated with both anxiety and gender, whereas girls scored more often pathological than boys. To check if those psychosocial variables could explain the gender differences, Lewinsohn et al. (1998) also used the psychosocial variables

as covariates to see if the association with gender would reduce or disappear. Importantly, they found that after controlling for the psychosocial variables, the effects of gender all remained significant and were not substantially reduced. Therefore, this could indicate that the relation between the gender of the adolescent and anxiety symptoms is strong on its own, which could explain the significant result for this main effect in the current study, even though the other results were not significant. Next to that, the finding that the influence of gender on anxiety symptoms was not substantially reduced after controlling for the psychosocial variables could indicate that only environmental factors do not fully cover the explanation for the female preponderance in anxiety disorders (Lewinsohn et al. 1998). In contrast, the results of Lewinsohn et al. (1998) show that next to environmental factors, genetic and biological factors such as gender also play an important role in gender differences when looking at anxiety disorders, which is also supported by other research (McLean et al., 2011; Schiele & Domschke, 2018; Xu et al., 2012). This could explain why no moderation effect was found in the current study: experiencing parental PC could also concerns an environmental psychosocial factor.

Furthermore, according to previous research, it seems to be plausible that higher levels of CEM above on high levels of parental PC could contribute to higher levels of trait anxiety because both concepts are related to anxiety symptoms in adolescents (Bennett & Stirling, 1998; Bowlby, 1977). In this current study, no significant moderation effect is found between CEM, observed parental PC, and trait anxiety. A possible explanation for this finding could be that high levels of experienced CEM were not measured enough in this study to find an effect. For example, when looking at the distribution of the variable CEM, the distribution was positively skewed which suggests that most participants scored low on this scale. An explanation for the low scores could be that this study used a sample of healthy control adolescents which could make the chance to find an effect more difficult. The findings of Hagborg et al. (2022) are in line with this explanation. They studied the psychometric properties of the CTQ-SF in an adolescent sample with a clinical group and a healthy community group. Their results show comparable scores on the subscales EN and EA with this current study when looking at the community sample. As expected, they also found that the clinical sample scored significantly higher on all scales, including the subscales EN and EA when comparing the healthy community group with the clinical group. The result that especially clinical groups score higher on experienced CEM is in line with other studies that researched CEM and used the CTQ-SF. For example, Bruce et al. (2012) used a sample with a social anxiety disorder where the scores on the subscales EA and EN are comparable with the

clinical scores of Hagborg et al. (2022). Looking further to this present study, the distribution of the variable parental PC is also positively skewed, which suggests that most participants scored low on parental PC as well. Therefore, it seems that low scores on parental PC and CEM results in no effect on levels of trait anxiety in healthy control groups, which is different in studies who used clinical samples. For example, when looking at the cut-off scores of the CTQ-SF, 2.8% of the adolescents in this present study scored moderate to high on the subscale EA *(*EA ≥ 13) and 4.2% on the subscale EN (EN ≥ 15) (Hagborg et al., 2022). Because of this, further research could focus on using the cut-off scores of the CTQ-SF and looking at possible cut-off scores for the SCARED to increase the probability to find an moderation effect between parental PC, trait anxiety and CEM if there is one. Moreover, the CTQ-SF that is used to measure experienced CEM contains both questions about the home situation and overall experiences during childhood, and not just specifically for experiences with their parent(s). Therefore, it could be that there will be a significant effect when the adolescents are asked questions only about the home situation that refers to the relationship with their parent(s) during childhood.

Limitations and Strengths

A couple of limitations need to be considered when interpreting the results of the current study. When comparing other relevant studies that researched the relation between parental PC and anxiety symptoms in adolescents, there is a large difference in sample size. For example, Albrecht et al. (2007) used a sample size of 530 adolescents, Costa et al. (2016) of 302 adolescents, and Loukas et al. (2005) 745 adolescents which is much bigger than the sample size of 141 in this current study. According to Leary (2014), the sample size could affect the statistical power whereas a larger sample size provides higher power which increases the change to detect effects if there are any effects. Furthermore, when it is expected to find small effects, a bigger sample size is needed to detect those small effects than when strong effects are expected (Leary, 2014). Because this current study shows that higher levels of experienced parental PC and CEM are not presented often in this particular sample, it could be that a bigger sample size was needed to detect possible effects. Therefore, the sample size differences might contribute to the difference in results, when comparing similar studies with this current study. Another limitation is that the distributions of the variables CEM and parental PC are right-skewed (positively skewed) which suggests that most participants in this study scored low on CEM and parental PC (Leary, 2014). Therefore, the scales of the variables were not optimally used which could affect the results, also because most statistical models such as linear models are based on normally distributed data. Furthermore, another

limitation could be the generalizability of the results to other populations. First, in this study female adolescents were overrepresented. Second, all male adolescents and 96.0% of the female adolescents reported that The Netherlands is their country of origin. Third, 53.5% of male adolescents and 44.0% of female adolescents reported that pre-university is their current education level, which could make this education level also overrepresented. Because some characteristics are overrepresented, this could influence the external validity.

Furthermore, this current study has also its strengths, such as the use of observational methods. Subtle behaviors can be measured more effectively with observations than with only questionnaires (Hauser Kunz & Grych, 2013). Moreover, there are very few studies at this moment that used observational methods to measure parental PC. Therefore, this study could give other insights into measuring and interpreting experienced parental PC in adolescents. Moreover, the use of observational methods to measure parental PC instead of using questionnaires is important to check to what extent the results of previous research are generalizable, making it important to use other types of measurement, such as observations. A second strength of this study is that fathers were taken part in the project, which is in contrast with studies in the past. Other strengths of this current study could be the high intercoder reliability (ICC range [.83, .94]) of the observation methods and the dyadic setting of the interaction task (i.e., the adolescent was observed with only one parent at the time), because parents could influence each other during family interactions (Hauser Kunz & Grych, 2013).

Conclusion

To conclude, this research is one of the first studies that used observational methods to measure parental PC in interaction with their adolescent child. This study showed that there is a contrast in results comparing previous studies with this current study regarding the relation between parental PC and trait anxiety in adolescents. Possible explanations for this could be the differences in methodology, the use of a healthy control group, and sample size. Furthermore, this study does support the findings in other studies that girls are more likely to experience higher levels of trait anxiety than boys. A recommendation for further research could be to use more observational methods to measure parental PC in adolescents in combination with questionnaires to get a whole view of experienced parental PC. The recommendation to use more observational methods to measure parental PC is in line with Cui et al. (2014) who said that observational methods are important to get more objective measures and to increase the validity. The last recommendation is to use a larger sample to see if the results remain nonsignificant.

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