

The direction of effects between perceived parental behavioral control and psychological control and adolescents' self-reported GAD and SAD symptoms

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Abstract This study examined the direction of effects and age and sex differences between adolescents' perceptions of parental behavioral and psychological control and adolescents' self-reports of generalized anxiety disorder (GAD) and separation anxiety disorder (SAD) symptoms. The study focused on 1,313 Dutch adolescents (early-to-middle cohort $n = 923$, 70.3%; middle-to-late cohort $n = 390$, 29.7%) from the general population. A multi-group, structural equation model was employed to analyze the direction of the effects between behavioral control, psychological control and GAD and SAD symptoms for the adolescent cohorts. The current study demonstrated that a unidirectional child effect model of the adolescents' GAD and SAD symptoms predicting parental control best described the data. Additionally, adolescent GAD and SAD symptoms were stronger and more systematically related to psychological control than to behavioral control. With regard to age–sex differences, anxiety symptoms almost systematically predicted parental control over time for the early adolescent boys, whereas no significant differences were found between the late adolescent boys and girls.

Keywords Adolescent · Behavioral control · Effect model · Generalized anxiety disorder · Psychological control · Separation anxiety disorder

Introduction

In an attempt to better understand the effects parenting practice characteristics have on the development and maintenance of adolescent anxiety, several theoretical models have been proposed [9, 26, 56, 61, 74] that try to explain the findings of recent studies that indicate that parenting characteristics differ between families with high levels of anxiety and non-anxious families [21, 28, 32, 84]. Parental control is considered one of the most important of these parenting characteristics [83].

Literature reviews of empirical studies on parental control have demonstrated that parental controlling behaviors and adolescent anxiety are significantly related to one another [21, 53, 55]. Studies of parents with anxious children and adolescents have shown that these parents use significant more controlling behaviors; however, most of these previous studies have been cross-sectional as opposed to longitudinal. Therefore, one of the most important questions remains the direction of effects parental control and child anxiety have on one another [21, 44]. Knowledge as to the direction of effects is needed in the development of evidence-based interventions [21].

In a review of the literature of the direction of effects in parent–adolescent interactions, Branje, Hale and Meeus [25] discussed three of the most prominent models [43]. The first model, the parent effect model, assumes that specific parental behavior has a major influence on individual adolescent problem behavior; in other words, parental control eliciting adolescent anxiety. It is suggested that severe parental control leads to child perceptions of the environment as uncontrollable, resulting in non-adequate coping behavior and anxiety in children and adolescents and preventing the adolescent from acquiring developmental-appropriate behaviors [14, 21, 27, 31, 56]. The

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adolescent remains dependent of his or her parents, which can lead to anxiety disorder symptoms such as separation anxiety disorder (SAD) symptoms [14, 83].

The second model, the child effect model, supposes that a child's characteristics are influential in shaping parental behavior [17, 18, 41, 51]. According to this model, adolescent anxiety elicits severe parental control. An adolescent with a temperament characterized by high arousal and emotionality may elicit increased parental control and over-involvement as the parents attempt to reduce the adolescent's stress while adapting to the sensitivity of their adolescent in specific situations. Conversely, negative emotional appeals from the anxious adolescent can lead to parents becoming less sensitive and more demanding in accommodating their child's demands [21, 31, 56, 61].

The final model, the reciprocal effects model, emphasizes the bi-directionality of effects in which children and parents influence each other and contribute to each other's individual developmental outcomes [17, 43, 62]. According to this model, severe parental control and adolescent anxiety reciprocally affect each other, adolescent anxiety eliciting changes in parental control and parental control influencing adolescent anxiety [52].

With respect to the direction of the effects of parental control on adolescent anxiety and/or vice versa, no clear-cut consensus has yet been reached [9, 13, 44, 52, 54]. Therefore, in light of the aforementioned models, the purpose of the current study is to explore the direction of effects between perceived parental control and adolescent anxiety disorder symptoms.

The parenting literature differentiates parental control into two constructs: parental behavioral control and parental psychological control [9, 10]. Research demonstrates that each construct has its own distinct impact on child outcomes [12, 67].

However, the differentiation of behavioral control and psychological control has been criticized. Recent studies and literature reviews have noted that behavioral control and psychological control and emotional and behavioral outcomes cannot be clearly distinguished [34, 69, 76]. It is suggested to define parental control as two dimensions of parenting: parental control and parental structure. Parental control is characterized by pressure, intrusiveness and dominance of the parents in relation to the adolescent's feelings, thoughts and behaviors. Parental structure is characterized by the organization of the adolescent environment to facilitate the adolescent's competence [34, 76].

Nevertheless, in a very recent study by Soenens and Vansteenkiste [69], the authors argue for the continuation of the differentiation of parental behavioral control and parental psychological control. They specifically argue that one form of parental control refers to the attempts of parents to regulate and structure the behavior of their child, in

other words, parental behavioral control. They go on to suggest that this form of parental control is different from the second form of parental control that "...refer[s] to a controlling, pressuring or coercive parenting environment that controls children's feelings, thinking, and behaving" [69, p. 86], in other words, parental psychological control.

In light of the aforementioned, it is clear that this debate has been ongoing and has not yet come to a definitive conclusion. Since the goal of this study is to explore the direction of effects between perceived parental control and adolescent anxiety disorder symptoms with respect to the three aforementioned effect models, we believe using the more traditional approach of measuring parental control in light of behavioral control and psychological control will allow us to examine possible similarities and differences between the two.

Mechanisms explaining the relationship between adolescent anxiety and parental control have been based on models that characterized the role of personal control and self-efficacy as determinants of anxiety [e.g., 26, 44]. Different expressions of parental controlling behaviors (i.e., behavioral control and psychological control) result in the adolescent not mastering developmental tasks required to equip the adolescent to sufficiently deal with anxiety symptoms common to adolescent development. For example, parental behavioral control can lead the adolescent to a weak sense of self-efficacy, which in turn can lead to an increased vulnerability to developing anxiety disorder symptoms [26, 44], whereas parental psychological control can lead adolescents to develop a cognitive bias with perceptions of events as out of the adolescent's control, which, in turn, can also lead to an increased vulnerability to anxiety disorder symptoms [84].

With regard to the definition of behavioral control, Soenens and Vansteenkiste [69] criticized the term 'control' in behavioral control, since the term 'control' can be understood in two different ways. In the first place, control can refer to the attempts of parents to regulate and structure the behavior of their child. Secondly, control can refer to a controlling parenting environment [69, p. 86]. In the current study, parental behavioral control is defined as the adolescent's perception of both the provision of regulation and structuring and a controlling and pressuring parenting environment [69]. The exploration of the relationship between parental behavioral control and adolescent anxiety is based on the suggestion that, on the one hand, the adolescent's daily life in a controlling and pressuring environment [69] may contribute to adolescents' perceptions of the environment as uncontrollable and prevent growth of developmental-appropriate behaviors [14, 21, 26, 31, 57]. On the other hand, adolescent anxiety may elicit parental behavioral control in which the parents take on more decisions for their adolescent to provide safety and

predictability for the adolescent [44]. This environment, created by parental behavioral control, can lead the adolescent to a weak sense of self-efficacy, which in turn can lead to an increased vulnerability to the development of anxiety disorder symptoms.

It should also be noted that in this study parental psychological control is defined as the intrusive and manipulative behaviors of parents (i.e., influence thoughts, feelings and attachment, associated with guilt induction and shaming) that hamper the development of independence and autonomy of their adolescents [10–12, 21]. Additionally, as mentioned, parental psychological control can lead adolescents to develop a cognitive bias of events as out of their control, which in turn can also lead to an increased vulnerability to anxiety disorder symptoms.

Perceived parental psychological control and adolescent depressive disorder symptoms as defined by the DSM-IV-TR as internalizing problem behavior demonstrated a positive relationship in recent longitudinal research [68, 70]. However, the majority of the aforementioned studies of parental control and adolescent anxiety as internalizing problem behavior have focused on general adolescent anxiety symptoms, as opposed to specific DSM-IV-TR anxiety disorder symptoms. Hence, longitudinal investigation of parental behavioral control and parental psychological control associated with specific types of DSM-IV-TR adolescent anxiety disorder symptoms [5] is presently lacking and is needed in order to better illuminate the relationship between perceived parental control and specific adolescent anxiety disorder symptoms. Of these specific adolescent anxiety disorders, two DSM-IV-TR anxiety disorders are specifically related to problematic parenting: generalized anxiety disorder (GAD) [35, 48, 55] and SAD [30].

GAD is one of the most commonly occurring adolescent anxiety disorders [29, 54, 75, 78, 80] characterized by frequent, excessive worry [5, 6]. Social-evaluative concerns were at the center of adolescent GAD worry symptoms [39, 79, 81] and interpersonal problems with parents were found to be related to adolescent GAD symptoms [35, 46, 47, 73].

SAD as a syndrome is characterized by non-age appropriate and excessive anxiety regarding separation from caregivers or from home [5]. This means that an adolescent remains extremely dependent on his or her parents for his daily functioning in a phase in which growing independence is expected [79]. Extreme distress occurs when the adolescent is separated from attached persons [30].

Positive associations between perceived parental psychological control and GAD symptoms have been found in cross-sectional studies of pre-adolescents [48] and adolescents [35, 55]. With respect to the association between

perceived parental behavioral control and psychological control and adolescent SAD, to our knowledge no empirical studies have yet been conducted.

As noted, the goal of the present study is to investigate the direction of effects between perceived parental behavioral and psychological control and perceived adolescent GAD and SAD symptoms. Since consensus has not yet been formed as to which of the three models best explains parental behavioral and psychological control and adolescent GAD and SAD anxiety symptoms, no specific hypothesis of the direction of effects can be made. For the current study, age and gender differences between parental behavioral and psychological control and GAD and SAD symptoms will be explored. However, since parental behavioral and psychological control and adolescent GAD and SAD symptoms have not been studied together in one and the same research design in the past, no specific hypotheses can be formulated.

Method

Participants

The data for this study were collected as part of a large-scale research project *Conflict And Management Of Relationships (CONAMORE)* [45]. The longitudinal sample consisted of 1,313 participants divided into an early-to-middle adolescent cohort ($n = 923$; 70.3%), who were 12.4 years of age ($SD = 0.59$) on average, and a middle-to-late adolescent cohort ($n = 390$; 29.7%) with an average age of 16.7 years ($SD = 0.80$) during the first wave of measurement. Most participants identified themselves as being Dutch (84.9%). Smaller proportions of participants identified themselves as belonging to various non-Western ethnic groups (15.1%). Most participants lived with both parents (84.9%), a minority lived with their mother (10.7%), father (1.4%) or someone else (2.9%). Regarding educational level, around 60% of the participants were in pre-university or in preparatory higher professional education, and around 40% were in preparatory secondary vocational education. The early-to-middle adolescent cohort consisted of 468 boys (50.7%) and 455 girls (49.3%), and the middle-to-late adolescent cohort consisted of 169 boys (43.3%) and 221 girls (56.7%). The cohorts did not differ in home situation, ethnic composition or educational level. Sample attrition was 1.2% across the three waves with a 2-year interval between each of the waves: in waves 1, 2 and 3, the number of participants was 1,313, 1,293 and 1,275, respectively. Missing indicator item values were estimated in SPSS, using the EM procedure.

Procedure

The adolescents who participated in this study completed the questionnaires during the homeroom study period, which lasted for an hour. Adolescents were informed of the research foregoing to this study and were given the opportunity not to participate. Prior to the study, both adolescents and parents received written information and, if the adolescent chose to participate, were required to provide written informed consent. Verbal instructions as to how to fill in the questionnaires were given to the adolescents by the research assistants just prior to the testing to complement the written instructions printed above each questionnaire. At the end of the homeroom study period, the research assistants collected the questionnaires. These assistants additionally conducted the data entry so as to insure that the data remained anonymous to the researcher.

Measures

Perceived behavioral control and psychological control

To measure perceived behavioral and psychological control, use was made of the scales ‘behavioral control’ and ‘psychological control’ of the Children’s Reports of Parental Behaviour Inventory (CRPBI) [40, 63–65]. Both control scales of the CRPBI consist of ten items for each scale, with scores ranging from 0 (never) to 4 (always). Example questions are: “My parents are very strict with me” (behavioral control) and: “My parents do not look at me if I disappointed them” (psychological control). Confirmatory factor analyses demonstrated an acceptable fit with the data of the entire adolescent sample for behavioral control ($\chi^2/df = 3.33$, GFI = 0.98, CFI = 0.99, RMSEA = 0.04) as well as for psychological control ($\chi^2/df = 3.65$, GFI = 0.97, CFI = 0.98, RMSEA = 0.05). In this study, Cronbach’s alphas across the waves were 0.65–0.77 for the behavioral control scale and 0.86 and 0.87 for the psychological control scale.

GAD symptoms and SAD symptoms

To measure GAD and SAD symptom scores, the GAD and the SAD subscales of the screen for child anxiety-related emotional disorders (SCARED) were used. The SCARED is a self-report questionnaire, designed for children and adolescents, which measures the occurrence of anxiety disorder symptoms on a three-point Likert scale: 1 (almost never), 2 (sometimes), 3 (often) [19, 20]. The GAD symptom subscale consists of nine items. An example item for a GAD symptom is: “I worry about other people liking me”. The SAD symptom subscale consists of eight items. An example item for a SAD symptom is: “I follow my

mother or father wherever they go.” Reliability [49] and construct validity of the SCARED are strong [37]. The GAD and SAD scales both have acceptable fits with the data of the entire sample tested in confirmatory factor analyses (GAD: $\chi^2/df = 4.03$, CFI = 0.99, RMSEA = 0.06; SAD: $\chi^2/df = 3.17$, CFI = 0.98, RMSEA = 0.05). Cronbach’s alphas for the scale GAD across the three waves ranged from 0.82 to 0.86 and Cronbach’s alphas for the scale SAD ranged from 0.67 to 0.77.

Data analysis

In this study, a structural equation model based on maximum likelihood estimation was employed (AMOS) [7, 22] to examine the relationship between parental behavioral and psychological control and adolescent GAD symptoms over time, as well as parental behavioral and psychological control and adolescent SAD symptoms over time. The model fits were evaluated by means of three indices: the comparative fit index (CFI: a value of 0.95 or greater represents a good fit), the normed fit index (NFI: a value of 0.95 or greater represents a good fit) and the root mean square error of approximation (RMSEA: a value of 0.05 or less represents a good fit and a value of 0.08 or less is an acceptable fit) [42].

Analyses of the entire adolescent group and multi-group analysis were then conducted to explore the effects of age and sex of the adolescents. The four groups of the multi-group analysis were early adolescent boys ($n = 468$), early adolescent girls ($n = 455$), late adolescent boys ($n = 169$) and late adolescent girls ($n = 221$). Four different models were examined. First, a restricted model was tested in which all the estimated parameters were required to be equal across the four groups. Next, a second model was tested in which the estimated parameters were allowed to differ for the different age groups (i. e., early and late adolescents), and a third model in which the estimated parameters were allowed to differ for the sex groups. Finally, a fourth non-restricted model was tested in which all the parameters were allowed to differ across both age and sex cohorts. While structural equation modeling produces many different parameters, only the significant cross paths related to the study’s examination of the effect models are discussed in “Results”.

Results

Descriptives

The means and standard deviations of the entire adolescent group and the adolescent age and sex cohorts for perceived parental behavioral and psychological control and

Table 1 Means and SD of the total adolescent group and age and sex groups for perceived behavioral control, perceived psychological control, perceived adolescent generalized anxiety disorder (GAD) symptoms and adolescent separation anxiety disorder (SAD) symptoms

	Entire adolescent group (<i>n</i> = 1,313) <i>M</i> (SD)	Early adolescent boys (<i>n</i> = 468) <i>M</i> (SD)	Early adolescent girls (<i>n</i> = 455) <i>M</i> (SD)	Late adolescent boys (<i>n</i> = 169) <i>M</i> (SD)	Late adolescent girls (<i>n</i> = 221) <i>M</i> (SD)
Behavioral control T1	3.02 (0.57)	3.04 (0.49)	3.07 (0.51)	2.88 (0.61)	2.96 (0.74)
Behavioral control T2	2.95 (0.57)	3.01 (0.47)	3.08 (0.56)	2.73 (0.61)	2.70 (0.64)
Behavioral control T3	2.90 (0.66)	2.96 (0.59)	3.15 (0.59)	2.53 (0.64)	2.54 (0.67)
Psychological control T1	2.24 (0.73)	2.39 (0.78)	2.07 (0.66)	2.43 (0.66)	2.11 (0.72)
Psychological control T2	2.10 (0.66)	2.31 (0.66)	2.01 (0.60)	2.12 (0.64)	1.86 (0.64)
Psychological control T3	2.01 (0.64)	2.13 (0.62)	1.99 (0.65)	1.99 (0.61)	1.80 (0.64)
GAD symptoms T1	1.38 (0.39)	1.30 (0.37)	1.40 (0.38)	1.30 (0.35)	1.54 (0.44)
GAD symptoms T2	1.38 (0.40)	1.29 (0.35)	1.42 (0.42)	1.32 (0.33)	1.54 (0.44)
GAD symptoms T3	1.38 (0.41)	1.24 (0.31)	1.46 (0.43)	1.28 (0.33)	1.57 (0.48)
SAD symptoms T1	1.32 (0.31)	1.32 (0.33)	1.37 (0.31)	1.25 (0.30)	1.28 (0.25)
SAD symptoms T2	1.31 (0.29)	1.31 (0.31)	1.35 (0.30)	1.18 (0.18)	1.30 (0.24)
SAD symptoms T3	1.24 (0.27)	1.24 (0.28)	1.28 (0.27)	1.15 (0.21)	1.24 (0.24)

adolescent GAD and SAD symptoms are presented in Table 1. In general, the mean scores of perceived parental behavioral and psychological control decreased systematically over time. For early adolescent girls, only the mean scores of parental behavioral control increased over all waves.

The mean scores of GAD symptoms were stable over time for the entire group. GAD mean scores decreased for early adolescent boys over all waves, increased for the late adolescent boys from the first to the third wave and decreased from the third to the fifth wave. GAD mean scores increased over all waves for early adolescent girls. For late adolescent girls, the mean scores of GAD symptoms were stable from the first to the third wave and increased from the third to the fifth wave. The mean scores of SAD symptoms decreased over time for the entire group: the early adolescent boys, early adolescent girls and late adolescent boys. For the late adolescent girls, only the mean scores of SAD symptoms increased from the first to the third wave and decreased from the third to the fifth wave.

Initial correlations, correlations of the stability paths and correlations of the cross paths have been computed for the total adolescent group and age and sex groups and are presented in Table 2.

Total group and multi-group SEM analyses

The model tested for the total adolescent group provided a good fit to the data for perceived parental behavioral control and adolescent GAD symptoms, $\chi^2/df = 1.12$, NFI = 1.00, CFI = 1.00, RMSEA = 0.01, and perceived parental behavioral control and adolescent SAD symptoms: $\chi^2/df = 4.46$, NFI = 0.99, CFI = 1.00, RMSEA = 0.05. The model provided an acceptable fit to the data for perceived parental psychological control and adolescent

GAD symptoms: $\chi^2/df = 7.73$, NFI = 0.99, CFI = 0.99, RMSEA = 0.07; and perceived parental psychological control and adolescent SAD symptoms: $\chi^2/df = 7.50$, NFI = 0.99, CFI = 0.99, RMSEA = 0.07.

A non-restricted model that allowed for age and sex differences provided the best fit to the data. Specifically, the model fits for perceived parental behavioral control and adolescent GAD symptoms were $\chi^2/df = 0.77$, CFI = 1.00, NFI = 1.00, RMSEA = 0.00; perceived parental behavioral control and adolescent SAD symptoms were $\chi^2/df = 0.85$, CFI = 1.00, NFI = 0.99; RMSEA = 0.00; perceived parental psychological control and perceived adolescent GAD symptoms: $\chi^2/df = 2.93$, CFI = 0.99, NFI = 0.99, RMSEA = 0.04; and perceived parental psychological control and perceived adolescent SAD symptoms: $\chi^2/df = 3.09$, CFI = 0.99, NFI = 0.98, RMSEA = 0.04. For all four models, the χ^2/df ratio, the CFI, NFI and the RMSEA of the final models were better than those of the restricted models and the non-restricted models that only allowed for either age differences or for sex differences.

Figure 1 represents the model for the entire adolescent group and the four non-restricted models that allowed for age and sex differences for perceived parental behavioral control and psychological control, and adolescent GAD and SAD symptoms, respectively. As noted in “Method”, only the significant cross paths related to the study’s examination of the effect models are presented.

Initial correlations and cross paths of behavioral control and GAD symptoms

The initial correlations at the first wave between behavioral control and GAD were only significant for the early

Table 2 Pearson correlations for perceived parental behavioral control, perceived parental psychological control, perceived adolescent generalized anxiety disorder (GAD) symptoms and perceived adolescent separation disorder (SAD) symptoms of the total adolescent group and age and sex groups

Parameter	Entire group	Early adolescent boys	Early adolescent girls	Late adolescent boys	Late adolescent girls
Initial correlations					
BcW1-GADW1	0.07	0.06	0.10*	0.16*	0.02
BcW1-SADW1	0.05	0.05	0.03	0.04	−0.02
PcW1-GADW1	0.12**	0.16**	0.19**	0.24**	0.11
PcW1-SADW1	0.12**	0.14**	0.14**	0.19*	0.02
Stability paths					
BcW1-BcW2	0.37**	0.20**	0.37**	0.44**	0.47**
BcW2-BcW3	0.55**	0.43**	0.46**	0.60**	0.62**
PcW1-PcW2	0.35**	0.20**	0.34**	0.49**	0.50**
PcW2-PcW3	0.47**	0.36**	0.45**	0.46**	0.64**
GADW1-GADW2	0.35**	0.20**	0.34**	0.49**	0.50**
GADW2-GADW3	0.62**	0.46**	0.61**	0.64**	0.72**
SADW1-SADW2	0.42**	0.35**	0.47**	0.39**	0.49**
SADW2-SADW3	0.46**	0.34**	0.51**	0.38**	0.59**
Cross paths					
BcW1-GADW2	0.07**	0.06	0.10*	0.21**	0.02
GADW1-BcW2	0.07*	0.13**	0.04	0.15	0.14*
BcW2-GADW3	0.08**	0.13**	0.10*	0.12	0.11
GADW2-BcW3	0.07*	0.06	0.11*	0.19*	0.10
BcW1-SADW2	0.06*	0.04	0.04	0.05	0.06
SADW1-BcW2	0.14**	0.13**	0.10*	0.05	0.16*
BcW2-SADW3	0.12**	0.11*	0.09*	0.01	0.02**
SADW2-BcW3	0.12**	0.06	−0.01	0.25**	0.23**
PcW1-GADW2	0.04	0.12*	0.05	0.22**	0.06
GADW1-PcW2	0.11**	0.15**	0.14**	0.21**	0.25**
PcW2-GADW3	0.05	0.12**	0.11**	0.14	0.23**
GADW2-PcW3	0.20**	0.25**	0.23**	0.28**	0.25**
PcW1-SADW2	0.07*	0.13**	0.07	0.18*	−0.03
SADW1-PcW2	0.16**	0.16**	0.14**	0.19*	0.24**
PcW2-SADW3	0.09**	0.12**	0.15**	0.14	0.15*
SADW2-PcW3	0.16**	0.20**	0.09	0.32**	0.16*

W1, W2, W3 wave 1, wave 2, wave 3, Bc behavioral control, Pc psychological control, GAD generalized anxiety disorder, SAD separation anxiety disorder

* $p < 0.05$; ** $p < 0.01$

adolescent girls and the late adolescent boys. With regard to the cross paths between the constructs, results revealed that behavioral control on the first wave only significantly predicted GAD symptoms on the second wave for late adolescent boys. GAD on the first wave predicted behavioral control on the second wave for early adolescent boys and late adolescent girls. The association between behavioral control from the first wave to GAD on the second wave for late adolescent boys was as strong as the association between GAD on the first wave to behavioral control on the second wave for the late adolescent girls.

Initial correlations and cross paths of behavioral control and SAD symptoms

The initial correlations between behavioral control and SAD symptoms were not significant for the total adolescent group or any of the adolescent age and sex cohorts. Inspection of the cross paths revealed that a unidirectional pattern emerged; adolescents' SAD symptoms on one wave consistently had a significant influence on perceived parental behavioral control on the next wave. From the first wave to the second wave, this applied to the total adolescent group, the early adolescent boys, early adolescent girls

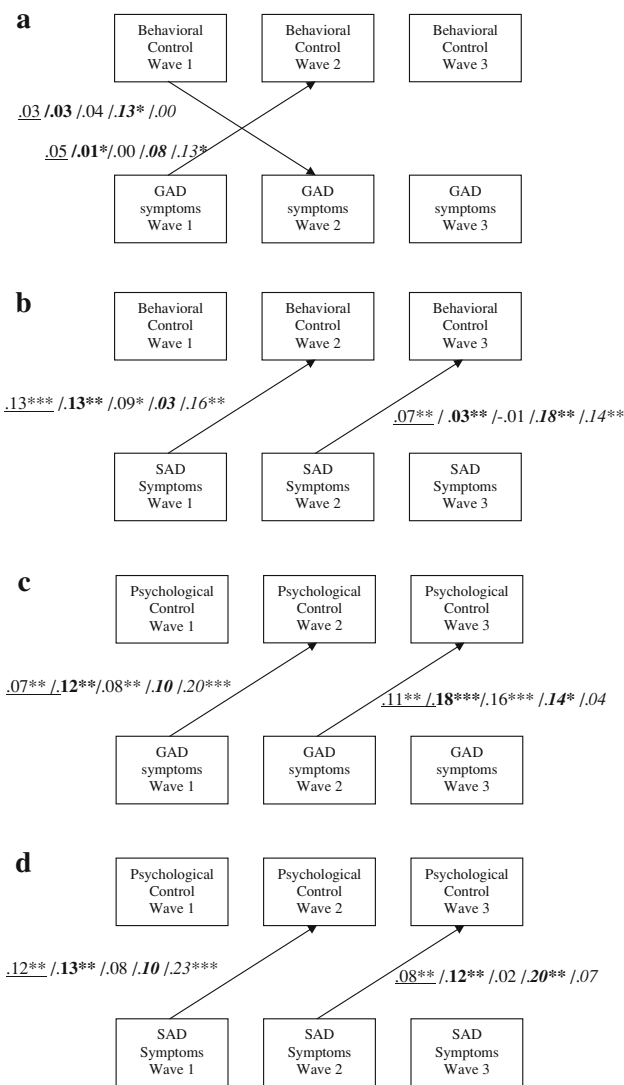


Fig. 1 **a** Standardized estimates of the statistically significant cross paths in a three-wave path model for adolescent-reported parental behavioral control and adolescent GAD symptoms for the total adolescent group and for all four age–sex groups, **early boys**, early girls, **late boys** and **late girls**. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. All stability paths are significant. The complete overview of the results can be obtained from the first author. **b** Standardized estimates of the statistically significant cross paths in a three-wave path model for adolescent-reported parental behavioral control and adolescent SAD symptoms for the total adolescent group and for all four age–sex groups, **early boys**, early girls, **late boys** and **late girls**. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. **c** Standardized estimates of the statistically significant cross paths in a three-wave path model for adolescent-reported parental psychological control and adolescent GAD symptoms for the total adolescent group and for all four age–sex groups, **early boys**, early girls, **late boys** and **late girls**. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. **d** Standardized estimates of the statistically significant cross paths in a three-wave path model for adolescent-reported parental psychological control and adolescent SAD symptoms for the total adolescent group and for all four age–sex groups, **early boys**, early girls, **late boys** and **late girls**. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

and late adolescent girls. From the second wave to the third wave, this pattern concerned the total adolescent group, early adolescent boys, the late adolescent boys with the strongest association and late adolescent girls.

Initial correlations and cross paths of psychological control and GAD symptoms

Initial correlations on the first wave for psychological control and GAD symptoms were positive and significant for the total adolescent group, early adolescent boys, early adolescent girls and late adolescent boys. The cross paths demonstrated a clear unidirectional pattern; GAD on the first wave predicted psychological control on the second wave and GAD on the second wave predicted psychological control on the third wave for both the total adolescent group and the early adolescent boys and girls. From the first wave (GAD) to the second wave (psychological control), this pattern also occurred for the total adolescent group and the late adolescent girls; from the second wave to the third wave this pattern also occurred for the late adolescent boys.

Initial correlations and cross paths of psychological control and SAD symptoms

Initial correlations on the first wave were positive and significant for the total adolescent group, early adolescent boys, early adolescent girls and late adolescent boys. The cross paths showed a specific unidirectional pattern from SAD symptoms to psychological control for the total adolescent group and the early adolescent boys. From the first wave to the second wave, the cross path was also significant for late adolescent girls.

Discussion

The purpose of the current study was to investigate the direction of effects between perceived parental behavioral and psychological control, and adolescent self-reported GAD and SAD symptoms, and to explore age and sex differences.

Effect models

The results of this study overall demonstrate a clear pattern of a unidirectional effect model, specifically a child effect model [25, 43] to describe the data. This child effect model demonstrates that adolescents with high initial levels of self-reported anxiety symptoms perceive their parents as becoming more controlling over time. This finding may be interpreted in two ways. The first interpretation is that

adolescents suffering from anxiety symptoms perceive more controlling behaviors from their parents. This finding is in agreement with previous studies of cognitive biases of individuals with anxiety symptoms [3, 59]. Riskind and Williams [57] suggested that a dysfunctional looming cognitive style (LCS) might best describe individuals with anxiety symptoms. The LCS assumes that the generation of harm-related scenarios and appraisals leads to cognitions (e.g., worry) that activate specific behavioral responses [58]. For individuals with GAD symptoms, systematic biases have been found in the ways these individuals interpret ambiguous events, report threat-related automatic thoughts and process threat-related information [16, 57].

A second possibility is that parents of adolescents reporting anxiety symptoms actually change their behaviors and become more controlling toward their adolescents with self-reported anxiety symptoms. According to the child effect model, a child's characteristics are influential in shaping parental behavior [17, 18]. Adolescents with GAD or SAD symptoms may elicit parental behavioral control and parental psychological control as the parents try to prevent stress while adapting to the sensitivity of their adolescent in specific situations. In previous studies, it has been suggested that, in general, negative emotional problems of adolescents could easily lead to negative emotional responses of their parents [2, 60]. More specifically, negative appeals from adolescents with GAD or SAD symptoms can lead to parents becoming less sensitive and more demanding (through behavioral control and psychological control) [21, 56].

Perceived parental psychological control and adolescent anxiety symptoms

With respect to the child effect model, adolescent GAD and SAD symptoms are stronger and more systematically associated with parental psychological control than with parental behavioral control. Adolescents with self-reported GAD and SAD symptoms perceive their parents as becoming increasingly psychologically controlling over time. The finding of significant associations between psychological control and adolescent anxiety is in agreement with previous cross-sectional studies [35, 55]. This specific connection between parental psychological control and anxiety as internalizing problem behavior could stem from a cognitive bias that make adolescents with anxiety symptoms perceive their parents as more psychologically controlling [3].

Age and sex differences

The exploration of age and sex differences demonstrated that for the early adolescents, the child effects were

stronger for the boys; for the late adolescents, the child effects did not differ between boys and girls. This finding is partly in agreement with a longitudinal study, demonstrating that the influence of the cognitive bias of perceived negative parental behaviors, such as parental control, decreases over time for adolescent boys, whereas for adolescent girls their sensitivity to perceived negative parental behaviors increases [35].

Possible treatment implications

The results of this study can have some practical implications for the treatment of adolescents with anxiety symptoms and their parents. With respect to adolescents with GAD and SAD symptoms, the American Academy of Child and Adolescent Psychiatry indicates that the Multimodal Treatment Approach [4] should be the first choice in treating adolescents with anxiety symptoms. Cognitive-behavioral therapy (CBT) has been indicated as the first choice for anxious youth [1, 24, 66, 82]. Studies comparing family-focused (FCBT) and child-focused (CCBT) interventions demonstrated that both approaches led to ongoing reductions in child anxiety. Recently, support has been found for an advantage of a FCBT program above a CCBT program for child and early adolescent anxiety disorder symptoms in a 1-year follow-up design [82]. This line of research is ongoing.

With respect to specific therapy findings for adolescent SAD, it has been shown that for adolescents with SAD symptoms, interventions that improve parent–child interactions and teach parenting skills that reinforce the adolescent's positive adaptive coping and stimulate developmental-appropriate behavior and autonomy are important ingredients in successful treatment [4]. Additionally, based on the results of this study, we would suggest treatment should also be supplemented with parental psycho-education, since adolescents with SAD symptoms perceive an increase of parental controlling behaviors over time.

As to adolescent GAD, reviews of specific GAD treatment outcome research indicated that CBT as a part of the Multimodal Treatment Approach is the first choice of all other treatments [e.g., 1, 24]. Several studies have indicated that especially for late adolescents, the integration of CBT with a family component [15, 33, 71] or CBT in a combination with interpersonal therapy [23] is advisable. In light of our findings, we would suggest that specific attention should also be paid to the adolescent's perception of parental control in the parent–adolescent interaction. This is important since it is known that for adolescents with GAD symptoms, and especially for late adolescent girls, the quality of their relationships forms a central theme in their frequent and excessive worry [35, 38].

Limitations

In terms of the limitations of this study, it should be first noted that the research sample only comprised adolescents from the general population. Nevertheless, research in community populations can provide insight into developmental issues relevant to the clinical setting [35].

Secondly, when interpreting the results, it is important to bear in mind that perceived adolescent GAD and SAD symptoms were assessed by self-report. When we refer, for instance, to adolescent GAD symptoms, we are speaking of self-reported GAD symptoms. In the field of research on adolescent anxiety, the adolescent self-report has been widely accepted for use [36, 72]. However, this should not be confused with a clinical diagnosis of an anxiety disorder. Additionally, parental behavioral control and parental psychological control were also assessed by the use of adolescent self-reports. Recently, it has been suggested that adolescents are able to distinguish when their parents are controlling their activities [8, 50, 67]. Nevertheless, since parental reports of their own parenting behaviors were not included in the current study, it cannot be said for sure whether the adolescent perception is in agreement with actual parental behaviors or if adolescent anxiety symptoms play a role in the evaluation of parental behaviors.

Furthermore, in this study, attention is only given to both parents as a unit, rather than focusing attention on the father and the mother separately. It is possible that adolescent boys and girls respond in a different way to their mothers and fathers. Additionally, it is also possible that parents' gender socialization influences eventual differences in their controlling behaviors [8]. A multi-informant perspective could be used in future studies of adolescent anxiety and parental control to help judge the findings of this study.

In the current study, behavioral control has been measured by the CRPBI subscale 'behavioral control'. According to the recent theoretical insights [34, 69, 77], the ambiguous interpretation of the term control in behavioral control is visible in the CRPBI subscale 'behavioral control' [63, 69] used in this study. It is unclear whether the positive associations between behavioral control and adolescent GAD and SAD symptoms were exactly driven by structure and regulation, by pressuring parenting, or by both. The suggestion to develop distinguished measures of parental regulation and structure, on the one hand, and control, on the other hand, will definitively refine the measurements of parenting dimensions [34, 69, 76].

The positive relationship between parental psychological control and depression as internalizing problem behavior has been demonstrated in a longitudinal design [68]. It is conceivable that depression also plays a role in the relationship between parental psychological control and

adolescent anxiety. Therefore, future longitudinal research to explore the relationship between psychological control and co-occurring symptoms of adolescent anxiety and depression may provide new insights.

Summary

To conclude, the current study demonstrates a clear unidirectional child effect model in the relationship between adolescent GAD and SAD symptoms and perceived parental behavioral control and parental psychological control. In other words, adolescents suffering from anxiety symptoms perceive their parents as becoming increasingly controlling, less sensitive and more demanding over time. Additionally, it was found that adolescent GAD and SAD symptoms are stronger and more systematically related to psychological control than to behavioral control possibly due to a cognitive bias on the part of the adolescent. With regard to the exploration of age and gender differences, GAD and SAD symptoms almost systematically predicted parental control over time for the early adolescent boys, whereas no significant differences were found for the late adolescents. The findings of the current study may indicate that adolescents with GAD and SAD symptoms might need specific psychotherapy focused on restructuring the adolescent's perception of the parent–adolescent relationship, as well as the need for parental psycho-education in the context of the Multimodal Treatment Approach.

Conflict of interest None.

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