# The Relationship between Family Functioning and Conduct Disorder Symptoms in Children of Depressed and Anxious Parents: A Gender-Based Analysis

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## Abstract

**Introduction:** Conduct disorder (CD) develops in early youth and has significant consequences. Offspring of patients with depression and/or anxiety are at higher risk of developing CD, though mechanisms remain largely unclear. This study examines the relationship of family cohesion and family adaptability with CD symptoms in these vulnerable offspring, while considering the possible role of offspring depression and anxiety and the potential moderating role of gender.

**Method:** Cross-sectional data on 280 offspring of parents treated for depression and/or anxiety who live with both parents were analysed. Family cohesion and adaptability were measured with the Dutch Family Dimension Scale, CD symptoms were assessed using a DSM-V-based questionnaire. Multivariable regression analyses examined the relationships of family cohesion and adaptability with CD symptoms in offspring, and examined the potentially confounding role of depression/anxiety symptoms and moderating role of gender.

**Results:** Cohesion and adaptability showed a negative (ß = -.30, $p < .001$) and positive (ß = .12, $p < .001$) relationship with CD symptoms, respectively. After accounting for offspring depression and anxiety symptoms, the association of cohesion remained significant (ß = -.26, $p < .001$), whereas the association of adaptability did not (ß = .09, $p = .165$). Gender did not significantly moderate these associations ($p = .247$, and $p = .508$, respectively).

**Discussion:** Low family cohesion was related to more CD symptoms in offspring of parents with depression and/or fear. Family adaptability was positively related to CD symptoms, but this relationship was largely explained by comorbid symptoms of depression and fear in offspring. Longitudinal research is needed to examine causality and the direction of this relationship. The findings suggest an importance of considering family cohesion and adaptability in treating and preventing CD.


*Key words:* Conduct disorder, family cohesion, family adaptability, gender analysis

# The Relationship between Family Functioning and Conduct Disorder Symptoms in Children of Depressed and Anxious Parents: A Gender-Based Analysis

## Conduct Disorder

Conduct disorder (CD) is a psychiatric disorder affecting 2%-11% of the worldwide population (Ayano et al., 2023; Mohammadi et al., 2021), usually emerging in childhood or adolescence (Vermeiren, 2003) and impacting the person affected and their environment extensively (Fairchild et al., 2019; Frick, 2006). The disorder is typified by repetitive and persistent behaviours which violate the rights of others or age-appropriate societal norms and values, such as theft, bullying, physical aggression, running away and truancy (Sajadi et al., 2020). These are all clinical symptoms of CD, whereas subclinical symptoms are behavioural problems similar to CD, but their frequency and intensity are lower than required for an official diagnosis. These behaviours are often troublesome as well and present a risk of developing more serious behavioural problems later in life (Loeber et al., 2008). Symptoms of CD are about 4 times as common in boys than in girls before adolescence, and during adolescence boys outnumber girls by about 2:1 (Frick, 2006; Loeber et al., 2000). This distinction is caused by the different developmental pathways in boys and girls. In boys the disorder either starts during childhood and continues into later life, or it emerges during adolescence (Fairchild et al., 2019; Moffit, 1993). For girls, the onset is generally in adolescence and recovery is more frequent (O'Keefe et al., 1998; Zahn-Waxler et al., 2008). CD can have wide-ranging effects, including family disruptions, peer victimization, poor academic performance, heightened anxiety, depression, suicide risk, and early substance abuse (Vermeiren, 2003). Child delinquents are also 2 to 3 times more likely to become serious offenders, with longer delinquency careers compared to juveniles who start offending at a later age (Loeber & Farrington, 2000). Given these consequences, it is unsurprising that

CD is a leading cause of referral to child and adolescent mental health services (Coghill, 2013; Fairchild et al., 2019; Frick, 2006).

**Parental Psychopathology**

Children of parents with mental health issues, such as depression or anxiety, have a higher chance of developing a wide range of mental health problems (Weissman et al., 2016; Beidel & Turner, 1997; Lewis et al., 2017), including CD (Cummings & Davies, 1994; Goodman & Gotlib, 1999; Kim-Cohen et al., 2005; Sweeney & Wilson, 2023). Notably, only Cummings and Davies write about conduct problems (which could mean subclinical symptoms), while others focus on the clinical diagnosis of CD. Parental psychopathology can negatively impact offspring through both genetic and environmental pathways. Research shows that temperament, often inherited, can lead to emotion regulation difficulties in children of anxious or depressed parents, increasing the risk of CD (Hwang & Rothbard, 2003; West & Newman, 2003). Additionally, parental psychopathology may result in lower socioeconomic status due to reduced work capacity, which is linked to a higher risk of CD in children (Piotrowska et al., 2015; Ridley et al., 2020). It also affects family dynamics, leading to issues such as poor supervision, harsh parenting, and negative parent-child interactions (Cumming & Davies, 2004; Dodge & Pettit, 2003; Jewell & Stark, 2003; Murray & Farrington, 2010). While general levels of psychopathology in offspring of parents with psychopathology are known to be higher, there is limited research looking into CD symptoms and their underlying mechanisms specifically.

**Family Functioning**

Families with parents suffering from psychopathology often show impairments in family functioning (Sell, Barkmann et al., 2021; Sell, Daubmann et al., 2021; Wiegand-Grefe et al., 2019) which can contribute to the development of CD through family cohesion and family adaptability (Fendrich et al., 1990; Haddad et al., 1991; Jewell & Stark, 2003; Smets &

Hartup, 1988). Family functioning typically encompasses two dimensions: family cohesion, referring to how close and connected family members feel to each other, and family adaptability, referring to how easily a family can change its structure, roles and rules to adapt to stress (Buurmeijer & Hermans, 1988; Olson, 1983). Extreme levels of both cohesion and adaptability are said to be problematic for individuals and relationships in the long run (Olson, 2000). For children with CD and CD symptoms however, the majority of research has found a linear instead of a curvilinear relationship (George et al., 2006; Haddad et al., 1991; Meyer et al., 2000; Qiao et al., 2024). Low family adaptability (a more strict, rigid family) has been shown to increase the risk of CD and CD symptoms, even after accounting for genetic factors and parental CD (Meyer et al., 2000). Besides, offspring with CD have been shown to perceive their families as more rigid and structured than offspring without CD (Pillay, 1998). Haddad and colleagues (1991) found that boys with CD often come from families with a significantly lower level of cohesion, and that quality of family relations — tying into the factor of cohesion — is the strongest predictor of antisocial behaviour in boys. They also found that the relationship between cohesion and CD is stronger than with other forms of psychopathology, aligning with research showing CD to be one of the few psychiatric disorders significantly influenced by the environment (Fairchild et al., 2019, Fendrich et al., 1990). Girls were excluded from the sample however, illustrating the major gap in our knowledge of CD in girls (Freitag et al., 2018; Keenan et al., 1999; Lindner et al., 2016; Pajer et al., 2008). Besides, none of the studies about the relationship between family functioning and CD were conducted in a sample of children from families with parental psychopathology, which shows another gap in current research. Research in such a sample would be a relevant contribution to our knowledge since family dysfunction is especially common in this population.

**Gender Differences**

Family functioning is an important risk factor for CD, but due to limited research on the disorder in girls it remains unclear whether its effects are the same for both boys and girls (Henry et al., 1993; Silverthorn & Frick, 1999). Studies on CD primarily focus on boys due to their more prevalent and overt symptoms (Crick & Zahn-Waxler, 2003). Differences in the onset and symptoms of the disorder between boys and girls may stem from different risk factors, suggesting different influences in developing the disorder for boys and girls (Moffitt, 1993). Early-onset CD, which tends to persist into adulthood and is more common in boys, is strongly associated with family dysfunction and low cohesion, potentially placing boys in such environments at a higher risk (McCabe et al., 2001; Silberg et al., 2014). However, Silverthorn and colleagues (1999; 2001) challenge the notion that this two-trajectory model applies only to boys. They argue that girls have similar risk factors as boys with early-onset CD, suggesting family dysfunction affects both genders similarly when it comes to CD development. Research on gender differences in the relationship between family functioning and CD is thus scarce and sometimes contradictory. Broader findings suggest that girls are generally more vulnerable to familial stress, which often manifests itself in depressive symptoms and other emotional difficulties (Davies & Windle, 1997; Skeer et al., 2011). Moreover, family discord and low family support have been found to predict problem behaviours in girls, but not boys (Davies & Windle, 1997; Windle, 1992). Girls also tend to be more sensitive to family dynamics, especially in maladaptive or nurturing environments, influencing their development of empathy (Robinson et al., 1994). These findings could mean that family functioning may have a stronger effect on girls than boys, but evidence for this statement has so far been indirect and not focused on CD symptoms. Furthermore, CD symptoms have not been researched in a sample of offspring of parents with depression and/or anxiety, while this could provide valuable insights.

### The Current Study

This study aims to investigate the relationship between family functioning and the severity of CD symptoms in children of parents with depression and/or anxiety, and possible gender differences herein. To do so, it uses data from the ARIADNE (Adolescents at Risk of Anxiety and Depression: Combined Neurobiological and Epidemiological Approach), a cohort study including 522 offspring of anxious and/or depressed parents. The research question of this study reads: "What is the relationship between family functioning and conduct disorder symptoms in offspring of depressed and/or anxious parents, and how does this differ between boys and girls?". A few hypotheses were conducted based on a literature review. It is expected that: 1a) low family cohesion is associated with more severe symptoms of CD, and 1b) low family adaptability is associated with more severe symptoms of CD. Moreover, it is hypothesised that gender has a significant moderating role; the relationship between family cohesion and CD symptoms is expected to be stronger for girls (*hypothesis 2a*) and the relationship between family adaptability and CD is also expected to be stronger for girls (*hypothesis 2b*). Understanding the interactions between parental psychopathology, family dysfunction, and child development of CD — while accounting for gender-specific differences — is crucial for the development of targeted interventions that can reduce the risks for this vulnerable population.

## Method

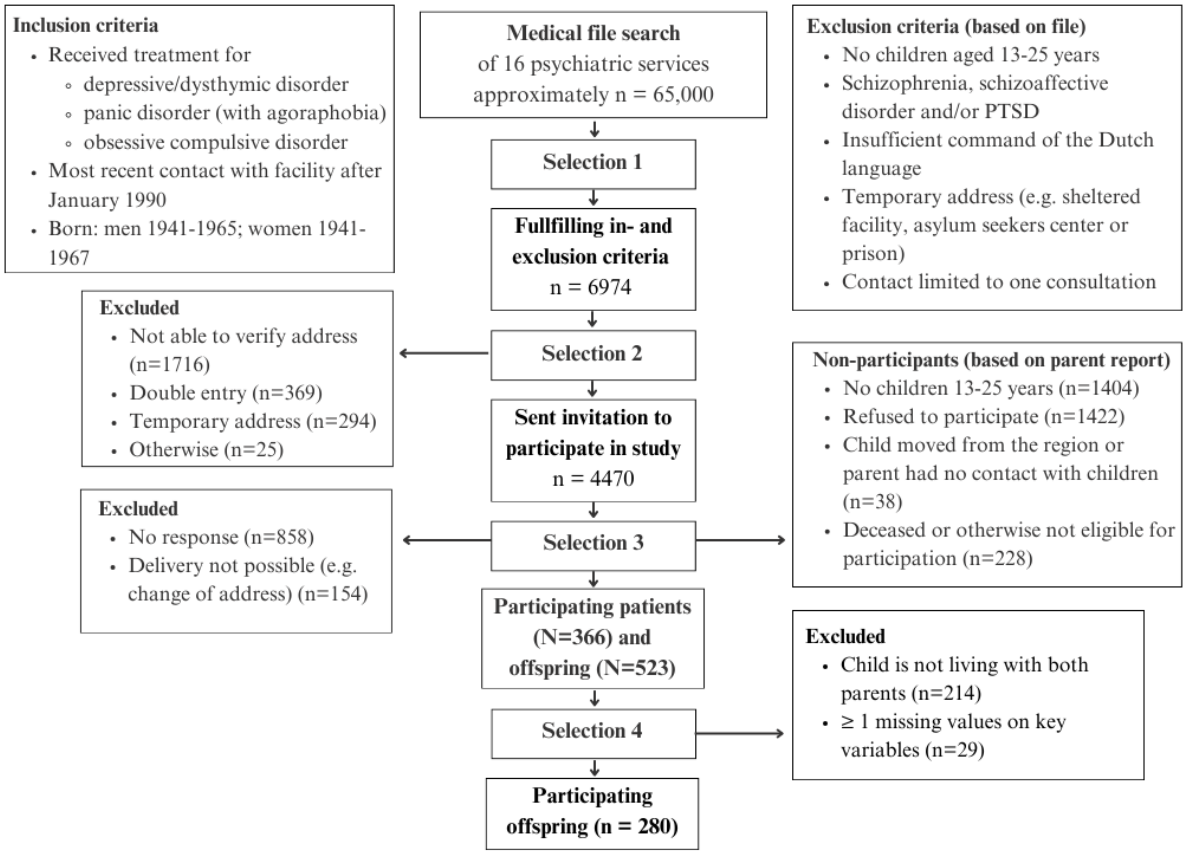
### Participants and Procedure

The present study used data from the baseline assessment of the ARIADNE-study. This is a large prospective clinical and population cohort study into the development and course of, among others, depression and anxiety disorders in offspring of psychiatric patients. The ARIADNE-study included a sample of 522 offspring (aged 13-25 years) of 366 patients

who were treated for depressive and/or anxiety disorder (including panic, panic disorder and obsessive compulsive disorder) at one of 16 psychiatric services in the northern provinces of the Netherlands; Drenthe, Friesland and Groningen. The selection procedure is shown in Figure 1. The participating parent is from now on referred to as the index parent. Index parents were contacted by the research team and both the index parent and the child had to sign an informed consent form at their first appointment. The index parents were assessed by, among others, conducting the Composite Intergenerational Diagnostic Interview (CIDI; Kessler & Üstün, 2004). The baseline assessment showed that 88.7% of index parents had a depressive disorder, 48.7% had an anxiety disorder and 42.6% had comorbidity of depression

**Figure 1**

*Flowchart of study design*



and anxiety. Offspring were also assessed via a psychiatric diagnostic interview, and filled in multiple questionnaires. The offspring sample consists of 223 males and 299 females, aged between 13 and 25 years old (M = 18.1; SD = 3.2). Participants were allowed to withdraw from participating at any time in the research process. The ARIADNE-study was approved by the Medical Ethical Review Committee of the University Medical Centre Groningen on November 6th, 2001. The present study was approved by the FERB on November 20th, 2024.

Only offspring living with both parents were included as family cohesion and adaptability may be less relevant for children not living with their families, excluding 214 people from the sample. Then, participants with missings on any key variable (CD symptoms, offspring depression, offspring anxiety, family cohesion and family adaptability) were deleted from the sample. This led to the exclusion of another 29 people from the sample. The final sample consisted of 280 offspring.

## Measures

### *Family Functioning*

Family functioning was assessed in offspring using the Cohesion and Adaptability scales of the Dutch Family Dimension Scales (FDS; Buurmeijer & Hermans, 1988). The FDS is adapted from the Family Adaptability and Cohesion Evaluation Scales (FACES; Olson, 1986). Family cohesion, defined as "The emotional bonding that family members have toward one another" (Olson et al., 1983, p. 69), was measured with 23 questions. Offspring rated questions on cohesion on a 4-point scale ranging from "Never true" to "Always true". An example question measuring cohesion was "In our home, we are constantly asking for each other's help". The cohesion score was computed by recoding negatively worded items measuring cohesion and then summing these items to make a new variable. Scores between 23 and 92 were possible. Family adaptability, defined as "The ability of a family system to change its power structure, roles and rules in response to circumstantial and developmental

stress" (Olson et al., 1983, p. 69), was measured with 13 items. Again, participants rated questions on a 4-point scale ranging from "Never true" to "Always true". An example question measuring adaptability was "In our family, the rules are constantly changing". Negatively worded items were recoded again and all items measuring adaptability were summed into a new variable. Scores between 13 and 52 were possible. Cronbach's alpha was calculated, showing a score of .84 for the Cohesion scale and .80 for the Adaptability scale; both good scores for internal consistency.

***Severity of CD Symptoms***

CD symptoms were measured with 19 items based on the DSM-IV. Examples of these items are "I often start fights" and "I have threatened with a weapon". Offspring scored these items with a self-report form on a 4-point scale, ranging from "Never" to "To a very strong extent". The items were then summed to make a new variable. Scores on this variable could range from 19 to 76. While the used list was not validated, the internal consistency had an acceptable score of .75. Besides, the items were consciously chosen based on the DSM-IV, which is a validated measurement tool.

***Gender***

Gender was measured with a two-point scale, allowing participants to choose between male or female.

***Covariates***

Age, offspring depression severity and offspring anxiety severity were included as covariates. Offspring depression was measured by summing the items measuring depression symptoms, which were based on the DSM-IV measures of depression. An example of such an item is "Often has a low mood". These items were assessed using the CIDI, using a 2-point scale. Scores on offspring depression could range from 12 to 33. Offspring anxiety was

measured by summing the items measuring generalised anxiety symptoms, social anxiety symptoms, panic symptoms and agoraphobic symptoms. These items were also based on the DSM-IV. An example item measuring offspring anxiety is “Worries excessively about everyday things”. These items were also assessed using the CIDI, using a 2-point scale. Scores on offspring anxiety could range from 23 to 60.

## Statistical Analyses

Statistical analyses were performed using the software IBM SPSS version 27 (2020). First, the data was checked for outliers, which was done using boxplots. Then, descriptives of all key variables were given. Statistical assumptions for the statistical model of linear regression were checked, of which a detailed description is included in Appendix A.

### *Cohesion and Adaptability and Severity of Conduct Symptoms*

To examine the relationship of family cohesion (*hypothesis 1a*) and family adaptability (*hypothesis 1b*) with severity of CD in offspring, a multivariable linear regression analysis was performed. This analysis included family cohesion and family adaptability as the independent variables, CD symptoms as the dependent variable, and sex and age of offspring as covariates. To account for the possible role of offspring depression and anxiety in the presence of CD symptoms, a second multivariable linear regression analysis was performed. In this analysis, offspring depression and offspring anxiety were added as covariates.

### *Gender as a Moderator*

To examine whether gender moderated the associations between cohesion (*hypothesis 2a)* and adaptability (*hypothesis 2b*) and the severity of CD symptoms, another multivariable linear regression analysis was performed. Family cohesion and family adaptability were the independent variables, CD was the dependent variable, and sex, age of offspring, offspring

depression, offspring anxiety and the interaction terms of gender and family cohesion and gender and family adaptability were included as covariates.

## Results

### Descriptive Statistics

Of the included sample of offspring, 67.1% showed at least one CD symptom, with a mean score of 21.2. The mean score of the included sample on family cohesion was 64.7 (min = 42, max = 86), and 22.8 on family adaptability (min = 15, max = 38). The mean score on offspring depression was 17.0, the mean score on offspring anxiety was 33.3. Descriptives of all key variables are shown in Table 1. The correlations between these variables are shown in Table 2.

**Table 1**

*Descriptives of key variables*

| Variable | Mean | SD | Range |
|---|---|---|---|
| Age of offspring | 17.0 | 2.6 | 13-25 |
| Family cohesion | 64.7 | 7.8 | 42-86 |
| Family adaptability | 22.8 | 5.0 | 15-38 |
| Conduct symptoms | 21.2 | 2.9 | 19-40 |
| Offspring depression severity | 17.0 | 5.2 | 12-33 |
| Offspring anxiety severity | 33.3 | 8.3 | 23-60 |

**Table 2**

*Correlations between key variables*

| | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | Female sex | - | | | | | | |
| 2 | Age of offspring | -.17** | - | | | | | |
| 3 | Family cohesion | .02 | -.11 | - | | | | |
| 4 | Family adaptability | .01 | -.08* | .51** | - | | | |
| 5 | Conduct symptoms | -.15* | -.15* | -.35** | .31* | - | | |
| 6 | Offspring depression severity | .16** | .02 | -.31** | .34** | .28** | - | |
| 7 | Offspring anxiety severity | .25** | -.01 | -.19** | .26** | .16** | .78** | - |

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

*. Correlation is significant at the .05 level (2-tailed).

**Associations of Cohesion and Adaptability with CD Symptoms**

To examine the relationships of family cohesion and family adaptability with the severity of CD symptoms in offspring (*hypothesis 1a* and *hypothesis 1b*, respectively), a multivariable linear regression analysis was performed (see Table 3, model 1). Results showed that cohesion was negatively ($t$ = -4.72, ß = -.30, $p < .001$) and adaptability was positively ($t$ = 2.20, ß = .14, $p$ = .028) related to the severity of CD symptoms after adjustment for female gender and age. To examine if these results persisted after correcting for offspring depression and anxiety, another multivariable linear regression analysis was performed (See Table 3, model 2). The results showed that the relationship between family cohesion and CD symptoms remained significant ($t$ = -4.07, ß = -.26, $p < .001$), but the relationship between

family adaptability and CD symptoms did not ($t$ = 1.39, ß = .09, $p$ = .165). This means that *hypothesis 1a* was confirmed, and *hypothesis 1b* was rejected.

**Table 3**

*Results multivariable linear regression analyses*

| | Model 1[a] | | Model 2[b] | | Model 3[c] | |
|---|---|---|---|---|---|---|
| | ß | p | ß | p | ß | p |
| Cohesion | -.30 | <.001 | -.26 | <.001 | -.47 | .016 |
| Adaptability | .14 | .028 | .09 | .165 | -.04 | .856 |
| Female gender | -.18 | .001 | -.21 | <.001 | -1 | .160 |
| Age | -.20 | <.001 | -.21 | <.001 | -.21 | <.001 |
| Offspring depression severity | - | - | .25 | .005 | .24 | .006 |
| Offspring anxiety severity | - | - | -.50 | .556 | -.05 | .549 |
| Cohesion x Gender | - | - | - | - | .65 | .247 |
| Adaptability x Gender | - | - | - | - | .23 | .508 |

[a] Model 1 includes cohesion and flexibility as independent variables and is adjusted for female gender and age.

[b] Model 2 is additionally adjusted for depression severity and anxiety symptoms.

[c] Model 3 additionally includes the interaction terms of cohesion x gender and adaptability x gender.

### Moderation by Gender

To examine whether gender moderated the associations of family cohesion and family adaptability with the severity of CD symptoms (*hypothesis 2a* and *hypothesis 2b*, respectively), another multivariable linear regression analysis was performed including two interaction terms (cohesion x gender and adaptability x gender). The results are shown in Table 3, model 3. The results showed no moderating role of gender in both the association of cohesion ($t = 1.16$, ß = .65, $p = .247$) and the association of adaptability ($t = 0.66$, ß = .23, $p = .508$). This indicated that *hypothesis 2a* and *hypothesis 2b* were both rejected.

## Discussion

### Main Findings

The purpose of this study was to examine the relationships of family cohesion and adaptability with CD symptoms in offspring of parents treated for depression and/or anxiety, and if gender had a moderating role in this. This study showed that family cohesion was negatively related to CD symptoms, even after correcting for offspring depression and anxiety, which confirmed *hypothesis 1a*. The results also showed a significant positive relationship between family adaptability and CD, but this relationship was largely explained by offspring depression and anxiety, leading to non-significance after correction. This finding disconfirmed *hypothesis 1b*, since a significant negative relationship was expected. Gender did not have a significant moderating role in either relationship, disconfirming *hypothesis 2a* and *2b*.

### Family Cohesion and CD Symptoms

The finding that family cohesion is negatively related to CD symptoms aligns with previous studies (Haddad et al., 1991; Qiao et al., 2024), the same is true for the finding that this relationship stays significant when correcting for offspring depression and anxiety

(George et al., 2006). The higher explained variances of the models in Georges' and our study compared to that of the other studies (Haddad et al., 1991; Qiao et al., 2024) suggests that a model correcting for offspring psychopathology is better at examining the relationship between cohesion and CD symptoms. Previous research has suggested multiple relationships underlying the relationship between family cohesion and CD symptoms; some state that a high level of family cohesion is a protective factor against CD, while low family cohesion causes CD symptoms (Barber & Buehler, 1996; Moos & Moos, 1994; Olson et al., 2019; Young et al., 2011). An underlying mechanism is that low family cohesion leads to more involvement of offspring with deviant peers, which in turn increases CD symptoms (Cashwell & Vacc, 1996; Chen et al., 2014). Other research, however, shows an opposite relationship; conduct problems elicit poor family outcomes such as low cohesion (Fanti & Centifanti, 2013; Sajadi et al., 2020). An underlying mechanism is CD symptoms causing marital problems, which in turn predict low family cohesion (Doohan et al., 2009; Sajadi et al., 2020). Considering these findings, the relationship between CD symptoms and family cohesion is expected to be bidirectional. This is in line with the transactional model proposed by Sameroff (1975), which states that there are continuous interactions between a child and its environment where both influence each other. Together, this emphasises the importance of longitudinal research examining this relationship.

**Family Adaptability and CD Symptoms**

Before correcting for offspring depression and anxiety, family adaptability was found to be significantly positively related to CD symptoms, contrary to previous research (Meyer et al., 2000; Pillay, 1998). Whereas more rigid (less adaptable) families were expected to be related to more CD symptoms, the opposite direction of this relationship may reflect the complexity of the concept of family adaptability. Although the Circumplex model defines adaptability as the family's ability to change its roles, rules and structures (Olson et al., 1983),

the items used by the Family Dynamics Scale suggest high adaptability to be maladaptive (e.g. “In our family, a major argument can arise at the most unexpected moments”, “Our house is like a ship without a captain”). High levels of adaptability might entail erratic discipline, lack of leadership and dramatic role shifts, interfering with family stability instead of being a sign of healthy flexibility. Indeed, erratic parental discipline is a risk factor for developing CD in children (Murray & Farrington, 2010; Kazdin, 1995), and improvement in parental discipline decreases CD symptoms (Sagar et al., 2019). Children with CD symptoms may benefit from clear structures, democratic discipline and stricter rules to keep their behaviour ‘on track’. In light of this explanation, our expectations might have been based on findings that were more of an exception than a rule. Besides, neither of the articles showing a negative relationship between adaptability and CD symptoms provided an explanation. Rather, the subjectivity of the self-report measures they used was emphasised; maybe offspring perceived their family as highly inflexible due to dissatisfaction with their parents’ response to their own challenging behaviour (Pillay, 1998).

After correcting for offspring depression and anxiety, the relationship between family adaptability and CD symptoms was no longer significant. Previous research showing a relationship between family adaptability and CD symptoms did not correct for comorbid depression and anxiety symptoms (Meyer et al., 2000; Pillay, 1998). Offspring of parents with depression and/or anxiety are often seen to develop similar problems, and the comorbidity rate of CD and depression is especially high in offspring of depressed parents (Van Santvoort et al., 2015; Weissman et al., 2021). This shows the importance of such a correction. However, this comorbidity is not limited to our specific population; CD in general is often comorbid with various disorders such as depression and anxiety (Copeland et al., 2013; Greene et al., 2002; Richards & O’Hara, 2014), but also ADHD and substance use disorder

(Krueger et al., 2005). Future research is thus recommended to correct for all major disorders that are frequently comorbid with CD, regardless of the sample.

Previous research has not focused on offspring of parents with depression and/or anxiety, while parental psychopathology could influence the levels of family adaptability significantly. Parents with depression are more withdrawn and display more inconsistent discipline (Cummings & Davies, 1999; Goodman & Gotlib, 2002; Kavanaugh et al., 2006). Furthermore, parental depression has been related to more role confusion among offspring and offspring taking over their depressed parents' roles, which are signs of high family adaptability (Abraham & Stein, 2013). This suggests our sample may have higher levels of adaptability compared to families with healthy parents, calling for more research on adaptability and CD in other populations.

**Gender as a Moderator**

No moderating role of gender in the relationship between either measure of family functioning and CD symptoms was found, which was not in line with previous research. However, previous research either looked at depression and empathy instead of CD symptoms (Robinson et al., 1994; Skeer et al., 2011), or looked at a broader concept of social support or family discord instead of family cohesion and adaptability (Davies & Windle, 1997; Windle, 1992). Due to the cross-sectional design of this study, no conclusions can be drawn about the direction of the relationships found. For instance, if longitudinal research finds CD symptoms to cause less family cohesion and more family adaptability, a moderating role of gender would not be expected. Since the DSM-V does not differentiate between CD symptoms in boys and girls (American Psychiatric Association, 2013), gender is not expected to play a role in the way CD symptoms impact a family.

**Limitations and Suggestions for Further Research**

This study has given us more information on the relationship between family

functioning and CD, but there are also limitations to address. Firstly, the study had a cross-sectional design, which does not allow causal conclusions regarding the influence of CD symptoms on family functioning or the other way around. Previous research has shown support for both directions of the relationship (Barber & Buehler, 1996; Fanti & Centifanti, 2013; Sajadi et al., 2020; Young et al., 2011). Longitudinal research is needed to clarify the direction of the relationship. This is recommended to follow the offspring from a young age until late adolescence, since CD symptoms often develop in early childhood and either disappear in late adolescence or develop into more chronic behavioural disorders and delinquency (Moffit, 1993).

Correcting for depression and fear is a strength of this study, since CD is often comorbid with these disorders (Copeland et al., 2013). However, CD not only frequently co-occurs with depression and anxiety, but also with externalising disorders such as substance use disorder and ADHD in various samples, which we did not correct for (Krueger et al., 2005; Mohan et al., 2023). Offspring depression and anxiety played a role in the relationship between family functioning and CD symptoms in our study, so other comorbid disorders may play a role as well. That is why future research, regardless of sample, is recommended to correct for comorbidity when investigating the relationship between family functioning and psychopathology.

In this study we consciously chose to exclude children who do not live with both parents from the sample. This was done because family cohesion and adaptability do not influence children not living with their families as much, which could affect our results. This may have led to a sample of relatively “well-functioning” families, since it also excludes families with divorced parents and families where one parent has passed away. Divorce leads to less perceived family cohesion (Spitz & Steinhausen, 2023), so does loss of a parent (Birgisdóttir et al., 2019). Future research is needed to examine the possible effects of divorce

and parental loss on the relationship between family functioning and CD symptoms. It is suggested to follow a large number of families until offspring leaves home and then compare offspring who experienced divorce or parent loss to offspring who did not.

**Clinical Implications**

Despite its limitations, the results of this study have relevant implications for prevention and treatment. The relationship between family cohesion and CD symptoms in offspring highlights the importance of intervention programmes targeting at-risk youth, focusing on family functioning. One promising intervention is the Incredible Years programme, an evidence-based intervention designed to prevent, reduce and treat CD in children (Webster-Stratton, 2011). This is achieved by increasing emotional and social competence in children, improving parenting practices and strengthening parent-child relationships (Arruabarrena et al., 2022; Webster-Stratton, 2000). An optional supplement of this programme addresses parental challenges such as depression, making it very suitable for the population we studied (ADVANCE parent programme; Webster-Stratton, 2011). While the programme promotes consistent discipline and clear rules, contributing to a healthy level of adaptability, it prioritizes strengthening parent-child relationships, encouraging positive parenting, and enhancing social and emotional competence in children – all of which are closely tied to the concept of cohesion. By mostly focusing on cohesion, the programme aligns well with the findings from our study.

**Conclusion**

In conclusion, this study has shown a relationship between family functioning and CD symptoms, with family cohesion being negatively related and family adaptability being positively related to CD symptoms. After correcting for offspring depression and anxiety, the association of cohesion stayed significant, but the association of adaptability did not. This study did not show a moderating role of gender in these relationships. Future research is

suggested to use a longitudinal design so the direction of the relationship between family functioning and CD symptoms can be examined. Insights of this study can be used for improving prevention and treatment programmes and show the importance of interventions such as the Incredible Years programme in decreasing CD symptoms in children by improving family environments.

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# Appendix A

## Statistical assumptions

The assumptions for multivariable linear regression analyses are linearity, independence of residuals, normality of residuals, homoscedasticity, absence of outliers and no multicollinearity. For every analysis separately, these assumptions were assessed.

The relationship between the independent variable and the dependent variable (CD symptoms) should be linear. This applies to both the predictor and the moderator, and their interaction with the dependent variable. This was examined by reviewing the scatterplots. The independence of the residuals (errors) was assessed with the Durbin-Watson statistic, where values between 1.5 and 2.5 are considered acceptable. Normality of residuals were checked with histograms and Q-Q plots of residuals. The variance of the residuals should be constant (homoscedastic) across levels of the independent variable moderator and their interaction term. This was assessed using the standardized residuals plot. The absence of outliers was checked using Cook's distance. Lastly, the absence of multicollinearity was checked using the VIF values.

The scatterplots showed a linear relationship between cohesion and CD symptoms, as well as between adaptability and CD symptoms. The Durbin-Watson statistic showed a very slight negative autocorrelation between CD symptoms and family cohesion and adaptability ($d$ =2.10), which further reduced after correcting for offspring symptoms of depression and anxiety ($d$ = 2.07). There was also a very small negative autocorrelation between CD symptoms and the interaction between gender and family cohesion and family adaptability ($d$ = 2.07). These autocorrelations were small enough to not be problematic for the independence of errors. The histograms of the residuals showed a slightly positively skewed distribution, while the Q-Q plots showed a deviation from normality in the tails of the distribution.

However, given the large sample size of our study, such non-normality is not likely to markedly impact tests (Schmidt & Finan, 2017). The residual plots displayed a random distribution of residuals, indicating homoscedasticity of the predicted values of CD for every model. Cook's distance values remained below a value of 1, which means there was no sign of problematic outliers in any of the models. Lastly, the VIF values of model 1 and model 2 showed no sign of multicollinearity in the sample.

# Appendix B

## Data Collection

A systematic literature search was conducted as a form of data collection, which focused on interventions for offspring of parents with depression and/or anxiety, who themselves have either or both of these disorders.

The systematic literature search was conducted using Google Scholar, an online search engine for scholarly articles, and WorldCat, an online catalogue that contains a wide range of scientific literature. Terms such as ‘offspring intervention strategies’, ‘parental psychopathology’ and ‘offspring depression’ were included in a search string to find relevant articles. After screening the titles of the articles that came up, the articles that did not seem relevant were excluded. The articles that seemed relevant to this literature search were analysed. Three articles were used (Smithee et al., 2021; Clarke et al., 2001; Clarke et al., 2002). Important to note is that one of these three included children with subclinical symptoms of depression (Clarke et al., 2002). Two studies found promising effects of treatment on offspring psychopathology (Smithee et al., 2021; Clarke et al., 2001). After including articles examining interventions for parents, two more articles were found (Weissman et al., 2015; Verdeli et al., 2004), which showed that effectively treating parents could lead to less offspring psychopathology.