Gender Constellations in Families with Parental Chronic Medical Condition and Adolescent Functioning

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Abstract

This study examined whether adolescents show lower adolescent functioning when a same-sex parent as compared to an opposite-sex parent has a chronic medical condition, as well as when the adolescent is female as compared to male. Parental illness included multiple sclerosis, rheumatoid arthritis, brain damage, neuromuscular disease, and other illnesses. Adolescent functioning was defined by perceived stress, internalising and externalising problems, school-related self-esteem, and grade point averages.

The self-report data stemmed from 129 Dutch adolescents between 10 to 20 years of age (mean age = 15.9 years, 51.9% females) living with one parent with a chronic medical condition. Perceived stress levels were measured with the Dutch Stress Questionnaire for Children, internalising and externalising problems with the Youth Self Report, and school-related self-esteem with the School Perception Questionnaire. Likewise, the average grade point averages of the previous school year were collected.

Results showed no significant differences in adolescent functioning between adolescents with same-sex compared to opposite-sex ill parents, and adolescents with ill mothers compared to adolescents with ill fathers. Girls showed significantly more internalising problems than boys, but no differences in stress levels and academic functioning.

Adolescent identification with a same-sex parent may be less impactful than expected, and more easily influenced by factors such as stress, culture, SES, and competing effects like the social power theory of parental identification, or even facilitate protective factors related to the parent-child relationship.

Keywords: Parental chronic medical condition, gender, adolescent functioning, stress, mental health, academic functioning.

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A chronic medical condition (CMC) is an illness state involving one or more organ systems that impact physical and psychological functioning, and necessitate ongoing care over a prolonged period of time (Larsen & Lubkin, 2009; Sieh, 2012). Adolescents of families with a parent affected by a CMC are more prone to lower adolescent functioning as defined by increased perceived stress (Sieh, Meijer, & Visser-Meily, 2010), internalising problems such as depression, anxiety, withdrawal, and somatization (Sieh, Visser-Meily, & Meijer, 2012a), externalising problems such as social issues, aggressive, and deviant behaviour (Sieh, Oort, Visser-Meily, & Van der Leij, 2010), and lower academic functioning (Sieh, Visser-Meily, & Meijer, 2012a; Sieh, Visser-Meily, & Meijer, 2012b).

These areas of lower adolescent functioning are important areas. Adolescent stress, mental health problems, and low academic functioning are associated with elevated risk of psychopathology, drug use, lower income, less stable relationships, and decreased quality and length of life in adulthood (Goodman, Joyce, & Smith, 2011; Jokela, Ferrie, & Kivimäki, 2009; Kessler, Amminger, Aguilar-Gaxiola, Alonso, Lee, & Ustun, 2007; McGue & Iacono, 2005). Low academic achievement in young caregivers is amongst the strongest predictors of later unemployment (Dearden & Becker, 2000). As early interventions can prevent future problems (Heckman, 2004; Sieh, 2012), identifying adolescents at greater risk for or in the early stages of such lower functioning is an important topic. Further, while symptoms can be managed (Brown, 2006), a CMC is generally lifelong (Wallander, Thompson, & Alriksson-Schmidt, 2003), autoimmune diseases are on the rise (Bach, 2008), the population is reaching older ages associated with more health problems, and parents are having children later in life. Consequently, the prevalence of children growing up with chronically ill parents, estimated to be around 10%, is increasing (Sieh, 2012; Worsham, Compas, & Ey, 1997).

Research has shed light on important risk factors that indicate an adolescent's increased probability for lower functioning. Adolescent stress is such a risk factor (Sieh, 2012; Visser et al., 2004). Adolescent stress is associated with mental health problems and low academic functioning in the normal population (Goldstein, Boxer, & Rudolph, 2015; Hanson et al., 2015), and assumed to mediate the impact of parental CMC on adolescent internalising and externalising problems, and low academic functioning (Duchesne &

Ratelle, 20120; Pakenham, Bursnall, Chiu, Cannon, & Okochi, 2006; Pederson & Revenson, 2005; Sieh, Visser-Meily, Meijer, 2012b). Yet, the level of impact of parental CMC on adolescent functioning through stress and other working mechanisms can depend on a third variable: a moderator. As Goodman et al. (2011) point out, it is important to understand these moderators as they can lead to substantially differential adolescent outcomes and reveal subgroups of adolescents at especially high risk. Based on indications from previous research, this paper investigates the moderating impacts of gender constellations in the link between parental CMC and adolescent functioning (Barkmann, Watson, Romer, & Markwort, 2007; Compas et al., 1994; Sieh, 2012; Visser et al., 2004) as outlined in figure 1.

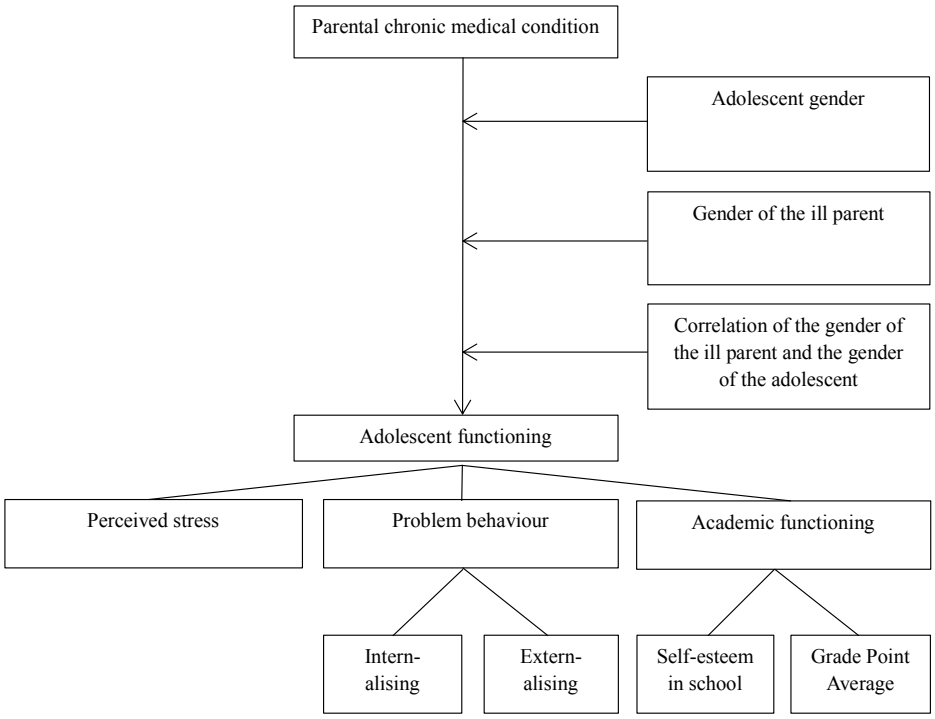

Figure 1. The moderating role of gender constellations in the link between parental CMC and adolescent functioning.

The impact of parental CMC on adolescent functioning depends on the adolescent gender. Adolescents with ill parents experience an increase in family responsibilities

(Helseth & Ulfaet, 2003) which has been shown to be a risk factor for adolescent internalising problems (Pakenham et al., 2006; Sieh, Visser-Meily, Oort, & Meijer, 2012), as well as decreased academic success (Banks et al., 2002; Duchesne & Ratelle, 2010). Specifically girls may take over a more motherly role for their ill parent or siblings, putting them at a higher risk (Barkmann et al., 2007; Compas et al., 1994; Grant & Compas, 1995). Girls also experience more stressful events in relation to the increased family responsibilities (Grant & Compas, 1995). In general, females experience more emotional distress from negative experiences in their relationships and social networks as they define their self-worth and identity more in terms of their relationships with others (Berenson, Crawford, Cohen, & Brook 2005; Hill & Lynch, 1983; Maccoby, 1990; Rudolph, 2002). Hence, adolescent girls may feel more personally affected by their parent's CMC. Females also experience a significantly greater amount of involvement in 'network events' defined as undesirable and stressful events in the immediate and larger social network (Kessler & McLeod, 1984) due to the social expectation that females are supposed to be more empathetic (Gilligan, 1982), the greater number of demands of social support (Gove, Hughes, & Galle, 1983), and the greater involvement in a greater number of other people's lives, distresses, and needs (Kessler & McLeod, 1989). Wagner, Compas, and Howell (1988) explain how major life events (such as having a parent with CMC) is not directly related to psychological symptomatology, but that that relationship is mediated by the amount of daily negative events. In the case of adolescent girls the amount of daily negative events is a greater amount than boys as adolescent girls experience more network events in their intimate and peer relationships (Leadbeater, Blatt, & Quinlan, 1995; Rudolph, 2002). Hence, girls are more likely than boys to feel overloaded by the additional network event that is their parent's illness. This can lead to the elevated levels of mental health problems and lower academic functioning (Sieh, Visser-Meily, & Meijer, 2012a).

Research on the moderating role of the ill parent's gender is less clear. In general women report more stress in relation to their illness than men (Compas et al., 1994), and have higher incidences of depression in the general population (Kessler & McLeod, 1984) which can influence adolescent stress and problem behaviour in families with parental CMC (Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004; Sieh, Dikkers, Visser-Meily, & Meijer, 2012). Higher rates of stress and depression in ill mothers could lead to a heightened vulnerability for adolescents with ill mothers as compared to ill fathers, but research does not point into this direction. A specific vulnerability for girls with ill mothers

has been found in cancer patients (Compas et al., 1994; Wagner & Compas, 1995; Welch, Wadsworth, & Compas, 1996), but cannot be generalized to all adolescents as it may not translate to boys being more affected by a motherly illness. The studies that reports main effects show no difference in internalising problems or perceived stress for motherly and fatherly illness (Sieh, Meijer, & Visser-Meily, 2010**;** Welch, Wadsworth, & Compas, 1996). A moderating effect of the gender of the ill parent is, therefore, not expected, or expected to be minor.

Beyond the scope parental or adolescent gender alone, the data seems to indicate a vulnerability of adolescents with same-sex as compared to opposite-sex ill parents. Studies on parental cancer tend to emphasize a vulnerability of girls with ill mothers (Compas et al., 1994; Wagner & Compas, 1995; Welch, Wadsworth, & Compas, 1996). However, around half of patients in those samples had breast and gynecological cancers. More worrisome to girls, this overrepresentation may have inflated the results (Barkmann et al., 2007; Romer, Schulte-Martwot, & Riedesser, 2002). Yet, Compas et al. (1994) found that boys with ill fathers and girls with ill mothers have higher stress scores than boys with ill mothers and girls with ill fathers, despite 32% breast and 21% gynecologic cancers potentially influencing girls' vulnerability, and only 5% testicular cancer potentially influencing boys' vulnerability. Further, a study with a wider range of parental CMCs also concluded a heightened vulnerability for adolescents with same-sex ill parents, with boys of ill fathers most affected (Barkmann et al., 2007). The current paper suggests that a heightened vulnerability for boys with ill fathers might have gone under-emphasized due to the large representation of illnesses related to the female gender. In a sample with more heterogeneous diagnoses, an effect of same-sex vulnerability for both girls and boys might transpire more.

Interestingly, the illness of a same-sex parent does not have a particular effect on younger children, but does make a difference for adolescents (Barkmann et al., 2007; Compas et al., 1994). The vulnerability of adolescents with ill same-sex parents could be related to the phenomenon of gender intensification that is typical in adolescence: As sex differences become more apparent in the physical development (i.e. puberty), children move further towards traditional gender identity, and adopt gender stereotypes more in attitude and behaviour (Basow & Rubin, 1999; Berk, 2008). Adopting the attitudes and behaviours of a certain group one perceives to belong to is consistent with classic group formation: The Self-Categorisation Theory (SCT: Turner, Hogg, Oakes, Reicher, &

Wetherell, 1987) has shown that group formation is based merely on a minimal group paradigm (MGP**:** Tajfel, Billig, Bundy, & Flament, 1971) such as a different gender. The Social-Identity Theory (SIT; Tajfel & Turner, 1979) has demonstrated how individuals then maintain a personal and a collective self-concept related to that in-group, switching between both depending on contextual cues and relevance of that social identity. Thus, adolescents may relate to their parents differently depending on the parent's gender. A large-scale multi-national study found that boys show greater identification with their father, and found partial support for girls showing greater identification with their mother in adolescence (Thomas, Brigham, Weigert, & Winston, 2012). From a social learning perspective, children are more heavily influenced by models that they perceive as more similar to themselves (Bandura, 1977), and so, especially during adolescence with a salience of the gender-group identification due to gender-intensification, modeling of a same-sex adult or parent can be increased (Bandura, 1977; Juni, Rahamim, & Brannon, 1985; Perry & Bussey, 1979). Studies have shown that same-sex parents have a greater influence than opposite-sex parents for both positive and negative influences (Deater-Deckard, & Dodge, 1997; Connell & Goodman, 2002; Hops, 1992; Koestner, Zuroff, & Powers, 1991).

In the context of parental illness, gender-linked identification is important to consider. As the SCT demonstrated, individuals experience an increased awareness of in-group individuals (Tajfel, 1971) such as the same-sex ill parent and look onto this group for guidance, reassurance, and models of behaviour, attitudes, and cognitions while distancing themselves from models perceived as an out-group such as the opposite-sex healthy parent (Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). As parents with a CMC are often impaired in health and psychological functioning (Brown, 2006; Lubkin & Larsen, 2006), and are more limited in their activities and abilities (Anderson, 2004), adolescents with a same-sex as opposed to opposite-sex ill parent may perceive a greater lack of guidance and increased disorientation. Increased levels of negative coping of the same-sex ill parent such as maladaptive behaviours, and affective and cognitive disturbances may be taken on more easily by the adolescents (Connell & Goodman, 2002) leading to stress, and mental health difficulties for the adolescents themselves. As according to the SIT, group identification influences self-perception and self-esteem (Tajfel & Turner, 1979), and influences adolescents' abilities to cope with developmental difficulties (Palmonari, Pombeni, & Kirchler, 1990). A struggling

parent with a CMC may lead to lower qualities of self-perception of the adolescents themselves.

This study will examine the moderating roles of several gender constellations in families with parental CMC in the link between parental illness and adolescent functioning using a wider range of parental CMCs than previous research, and a wider range of adolescent functioning areas by additionally exploring academic functioning. The study's primary goal will be to explore the interaction effect, and so whether the illness of a parent has a greater impact on adolescent functioning when the same-sex parent as compared to the opposite-sex parent is the ill one. The study's secondary goals will be to examine the main effects, and so how parental and adolescent gender alone moderate the impact of parental illness on adolescent functioning. It is hypothesized that, in families with parental CMC:

1. Adolescent functioning will be lower in the areas of perceived stress, internalising and externalising problems, school-related self-esteem, and grade point average for adolescents with a same-sex as compared opposite-sex parent with a CMC (H1).
2. Adolescent functioning will not differ significantly in the areas of perceived stress, internalising and externalising problems, school-related self-esteem, and grade point average between adolescents with a mother with a CMC and adolescents with a father with a CMC (H2).
3. Adolescent functioning will be lower in the areas of perceived stress, internalising and externalising problems, school-related self-esteem, and grade point average when the adolescent is female as compared to male (H3).

Comment [DS1]: too vague

Method

Participants

Data were collected for 161 adolescents. Adolescents with severe somatic or psychiatric disorders, substance abuse or addiction were not eligible for participation. Data of 24 adolescents were taken out before the analysis as the gender of their ill parent was not known, data from four adolescents from two sets of parents were taken out as both parents were ill, and four adolescents from four sets of parents could also not be included in the analysis as both parents indicated the same gender. Finally, data from 129 adolescents and 79 parents with a CMC were used for the analysis with an average of

approximately two children per household. Descriptive statistics for both adolescents and ill parents are included in Table 1. Adolescent age ranged from 10 to 20 years old (mean age = 15.9, 51.9% female). Ill parents' mean age was 45.41 years old for mothers, and 49.97 years old for fathers. In 63.8 % of the cases, the mother was the ill parent. Adolescents and ill parents were all Dutch at the exception of two parents who were German. Both parents and adolescents were highly educated at a training college and Bachelor's degree levels, and pre-university education level, respectively. Together with a relatively high monthly family net income level of approximately 600 euros higher than the average household in the Netherlands (Statistics Netherlands, Den Haag/Heerlen, 2016), this puts the sample in a medium to high socioeconomic status (Milne & Plourde, 2016). Most adolescents (64.3%) and parents (54%) indicated that they were not religious. From the individuals that indicated a religion, 15.5% of adolescents and 24.1% of ill parents indicated that they were Roman Catholic. The sample mostly consisted of married or cohabitating parents. Parental CMC was defined as a disease or a traumatic injury impairing health, involving one or more organ systems and lasting 6 months or longer (Sieh, 2012). Parental CMCs consisted of a majority with multiple sclerosis, seconded by rheumatoid arthritis, brain damage, and neuromuscular disease, followed by spinal cord injury, inflammatory bowel disease, Parkinson disease, diabetes type I with physical complications, and other CMCs. The average time since diagnosis was 12.27 years.

Measurements

Adolescent functioning comprised five variables from three areas. All were measured on a continuum. Participants' questionnaire response rate was very high at least at 98%.

Perceived stress was measured with the Dutch Stress Questionnaire for Children [Stress Vragenlijst voor Kinderen (SVK)] (Hartong et al., 2003). The SVK included 17 items answered on a Likert scale from 1 (*completely not true for me*) to 4 (*completely true for me*). An examplatory item was "I often feel rushed". Scores range from 17 to 68, whereby a higher score indicates more stress in the previous three months. Internal consistency and validity were tested in children of parents with Parkinson's disease, α = .83 (Dufour, Meijer, Van de Port, & Visser-Meily, 2006), and a high level of internal consistency was also found in this study, α = .82.

Mental health was assessed by measures of internalising and externalising problems using the Youth Self Report (YSR; Achenbach, 1991). The YSR consists of a 3-point scale indicating *not true* (0), *somewhat/sometimes true* (1) or *very/often true* (2). Thirty-one items can be summed to obtain a score on internalising problems (i.e., anxious, withdrawn, or depressed behaviour, and somatic complains) and thirty items can be summed to obtain a score on externalising problems (i.e., social issues, aggressive, and deviant behaviour). The YSR has shown good reliability and validity in previous studies (Achenbach, 1991; Achenbach & Edelbock, 1995; Sieh, Visser-Meily, Oort, & Meijer, 2012). Raw scores were standardized into T-scores with a mean population distribution of 50 and a standard deviation of 10 (Sieh, 2012). Mean T-scores above 60 suggest borderline clinical relevance and T-scores above 63 suggest clinical relevance that should be further investigated by psychological professionals (Bordin et al., 2013). Although the YSR was designed for ages 11 to 18 (Achenbach, 1991), it has shown good reliability and validity for other age groups such as younger youths from 7 to 10 and 11 to 14 year olds (Ebesutani, Bernstein, Martinez, Chorpita & Weisz, 2011), and older youths up to 20 years of age (Sieh, 2012; Verhulst, Van der Ende, & Koot, 1997). Both scales also showed high levels of internal consistency in this study, as determined by $\alpha = .91$ on standardized items in the internalising problems scale, and $\alpha = .82$ on standardized items for the externalising problems scale.

Academic functioning was measured in two ways. Firstly, school-performance was assessed by inquiring the average grade point average (GPA) of the previous school year, ranging from 4 and below (insufficient) to 10 (excellent). Secondly, the School Perception Questionnaire (SPQ; Van der Wolf, 1995) was used to assess school-related self-esteem. An examplatory item out of the 8 items was “I think that I perform well at school”. Higher scores represent higher school-related self-esteem. The questionnaire had a high level of internal consistency in this study, $\alpha = .90$.

Procedure

Data were taken from the sample collected between 2008 and 2011 in relation to creating and assessing the Screening Instrument for Adolescents of Parents with Chronic Medical Condition (SIAPCMC), and for the doctoral dissertation of Sieh (2012). Families with parental CMC were recruited through general health practitioners, health organizations, rehabilitation and community centers, hospitals, schools, and public places

(e.g. libraries) across the Netherlands. Collaborating staff was instructed by the project manager and posted brochures and posters in waiting rooms and public spaces. Families had to contact the researchers by e-mail or phone to show their interest of participation. Research assistants visited the families at home to implement several questionnaires. Participants could contact the project manager to ask for additional information. After informed consent had been given by both parents and adolescents, research assistants administered a test battery at the family home. Adolescent participants received a cinema voucher worth 10 Euros. The participating families were informed about the project status at four occasions. This project has been approved by University of Amsterdam, ethics committee of department of Child Development and Education.

Data Analysis

Five two-way independent ANOVAs were conducted with two factors (gender of the adolescent; gender of the parent with a CMC) at two levels (male; female) on each dependent variable: perceived stress (SVK), internalising problems (YSR), externalising problems (YSR), school-related self-esteem (SPQ), and school performance (GPA), with Bonferroni's adjustment for multiple testing, $p < .01$ (from $p < .05$). As no statistically significant interaction effect between the two factors on any of the dependent variables was found (with and without Bonferroni adjustment), main effects and pairwise comparisons were run for each dependent variable with 95% confidence intervals and Bonferroni-adjusted p-values.

Assumptions were tested with a residual analysis for each dependent variable and each of the four conditions in the design (Laerd Statistics, 2015; Pallant, 2013). Outliers were determined by boxplot assessment, normality with the Shapiro-Wilk's normality test, and homogeneity of variances with the Levene's test for equality of variances ($p < .05$).

Results

Preliminary analysis

Baseline characteristics for adolescents and ill parents overall and per group are shown in Table 1. The four groups of hypothesis 1 were determined via Crosstabulation in SPSS (Field, 2013) using the adolescent's and ill parent's gender, and were relatively unequal in numbers. The group 'boys with ill fathers' showed different adolescent and parent scores as compared to the three other groups: adolescents were younger by about

one year and, therefore, on a slightly lower education level too. Whereas they were on a less determined path between pre-vocational secondary education, senior general secondary education, and pre-university education, the other groups were on average on a pre-university education level; the monthly family net income was also lower by approximately 600 euros. The groups 'boys with ill fathers' and 'girls with ill fathers' had a higher mean age of the ill parents by around 3 and 5 years. The two groups for hypothesis 2 consisted of 83 adolescents (40 girls and 43 boys) of 52 ill mothers, and 46 adolescents (27 girls and 19 boys) of 27 ill fathers. Fathers were 4.56 years older on average, and adolescents with ill mothers were on a slightly higher educational level (pre-university) than adolescents with ill fathers (between pre-vocational secondary education and senior general secondary education).

Assumptions

The assumptions of no outliers and normal distribution were frequently violated in hypothesis 1 and 2. Most outliers found throughout the variables were assessed as being 1.5 box-lengths away from the edge of a boxplot and are not considered too troublesome (Laerd Statistics, 2015; Pallant, 2013). However, ANOVAs are sensitive to extreme points as assessed as being more than 3 box-lengths away from the edge of a boxplot which were found in the variables for academic functioning (Laerd Statistics, 2015; Pallant, 2013).

As Weisburg (2014) suggests, a comparative analysis with transformed data was made, and did not yield any differential results. Most data, but not all, could be normalized by trimming outliers to a value slightly higher than the largest value in the normal range (Laerd Statistics, 2015), and by using square root or log 10 transformations (Laerd Statistics, 2015).

Effect sizes and Observed power

In regards to this study's relation to the type I error (a false positive result), effect sizes (partial eta squared, η^2) revealed that the only significant result (girl's significantly higher internalising problem scores as compared to boys) had a medium effect size, $\eta^2 = .06$ (Cohen, 1988). In regards to this study's relation to the type II error (a false negative), observed power was between .05 and .69, lower than the recommended .80 corresponding to an 80% chance of finding a true effect (Pallant, 2010). The complete list of values is presented in Table 4.

Main Analysis

Hypothesis 1

The first hypothesis was not supported as adolescent perceived stress, internalising and externalising problems were not significantly higher, and grade point averages and school-related self-esteem were not significantly lower for adolescents with an ill same-sex parent as compared to an ill opposite-sex parent. These non-significant effects were found for both girls and boys (see Table 4).

The tendencies of the data were opposite to expectations. At the exception of girls' grade point averages (the smallest between-group difference), the scores showed higher adolescent functioning for boys and girls in all areas when the same-sex parent as compared to the opposite-sex parent was the ill one (see Table 2).

Hypothesis 2

The second hypothesis was supported as adolescent perceived stress, internalising and externalising problems were not significantly higher, and grade point averages and school-related self-esteem were not significantly lower for adolescents with an ill mother as compared to an ill father (see Table 4).

The data did not indicate any systematic tendencies towards lower adolescent functioning for adolescents with ill fathers or ill mothers. Adolescents showed higher levels of stress and internalising problems, and lower school-related self-esteem when the father is the ill one, yet higher levels of externalising problems and lower grade point averages when the mother is the ill one (see Table 3).

Hypothesis 3

The third hypothesis was not supported as results showed no significant differences between boys' and girls' functioning for most areas: perceived stress, externalising problems, school-related self-esteem, and grade point averages. However, unweighted marginal mean scores for adolescent internalising problems were higher for girls (M = 52.18, SE = 1.49) than for boys (M = 46.06, SE = 1.65), a statistically significant mean difference of 6.12, 95% CI [1.72, 10.51], p = .007 (see Table 4).

The data did not indicate any systematic tendencies for all areas towards lower adolescent functioning in either girls or boys. Girls showed higher levels of perceived stress and internalising problems, and lower school-related self-esteem, but boys showed higher levels of externalising problems and lower grade point averages (see Table 3).

Table 1

Means and standard deviations for adolescents and ill parents overall and per group.

		Hypothesis 1				Hypothesis 2		Hypothesis 3	
Group	All adolescents	Girls w/ ill mothers	Girls w/ ill fathers	Boys w/ ill mothers	Boys w/ ill fathers	All ill mothers	All ill fathers	All girls	All boys
Adolescents (*N*)	129	40	27	43	19	83	46	67	62
Mean age (*SD*)	15.19 (2.32)	15.32 (2.31)	15.39 (2.65)	15.34 (2.27)	14.25 (1.97)	15.33 (2.25)	14.92 (2.44)	15.35 (2.43)	15.01 (2.20)
Age range	10.72-20.88	10.75-20.60	10.72-20.88	11.47-20.06	10.82-17.95	10.75-20.60	10.72-20.88	10.72-20.88	10.82-20.06
Mean education[1] (SD)	6.84 (3.27)	7.15 (3.13)	6.85 (3.23)	7.37 (3.24)	5.00 (3.30)	7.27 (3.17)	6.09 (3.35)	7.03 (3.15)	6.65 (3.41)
Mean religiosity[2] (SD)	3.95 (1.14)	3.93 (1.07)	3.41 (1.31)	4.30 (0.94)	4.00 (1.20)	4.01 (1.00)	3.65 (1.26)	3.72 (1.17)	3.67 (0.89)
Parents w/ CMC (N)	79	-	-	-	-	52	27	-	-
Mean age (SD)	46.99 (4.92)	45.49 (4.05)	51.09 (4.52)	45.33 (4.25)	48.40 (5.23)	45.41 (4.12)	49.97 (4.95)	47.61 (5.01)	46.28 (4.75)
Mean education[3] (SD)	4.29 (1.39)	4.46 (1.34)	4.00 (1.30)	4.25 (1.30)	4.42 (1.77)	4.36 (1.32)	4.17 (1.51)	4.28 (1.34)	4.31 (1.45)
Mean income[4](SD)	5.39 (1.91)	5.54 (1.68)	5.73 (1.82)	5.55 (1.84)	4.12 (2.37)	5.54 (1.75)	5.09 (2.12)	5.61 (1.72)	5.12 (2.10)
Mean religiosity[2] (SD)	3.17 (1.31)	3.12 (1.35)	3.41 (1.25)	2.93 (1.19)	3.42 (1.54)	3.02 (1.27)	3.41 (1.36)	3.24 (1.03)	3.08 (1.32)

Notes. [1]Education levels range from 1 (elementary school) to 12 (university) with 5 being a general path between pre-vocational secondary education, senior general secondary education, and 7 being a pre-university education level. [2]Religiosity ranges from 1 (very religious) to 5 (absolutely not religious) with 3 being 'a little bit religious' and 4 being 'not religious'. [3]Education levels for the ill parent ranges from 1 (elementary school) to 6 (university) with 4 being a pre-university educational level, and 5 being a training college level or bachelor's degree level. [4]The monthly net family income is measured in Euro and ranges from 1 (less than 1000,-) to 8 (4000,- or more) with 4.12 being an income of approximately 2100 euros, and 5.50 of approximately 2750 euros (Sieh, 2012).

Table 2

Dependent variables' total mean scores and standard deviations, and mean differences between groups for hypothesis 1.

	All adolescents	Girls w/ ill mothers	Girls w/ ill fathers	Mean difference	Boys w/ ill mothers	Boys w/ ill fathers	Mean difference
Adolescents (*N*)	129	40	27	-	43	19	-
Mean perceived stress (*SD*)	40.21 (7.67)	40.68 (8.20)	43.19 (7.37)	2.51	38.79 (7.53)	38.21 (6.26)	0.58
Mean internalising problems (*SD*)*	49.09 (12.27)	49.58 (13.34)	54.78 (11.33)	5.20	46.70 (11.58)	45.42 (10.52)	1.28
Mean externalising problems (*SD*)*	45.34 (10.76)	44.03 (12.66)	44.37 (7.92)	0.34	47.16 (10.59)	45.37 (10.54)	1.79
Mean self-esteem in school (*SD*)	32.12 (5.82)	32.13 (5.97)	30.67 (6.04)	1.46	32.21 (5.95)	33.95 (4.59)	1.74
Mean grade point average (*SD*)	6.93 (0.87)	6.94 (1.04)	7.04 (0.81)	0.10	6.84 (0.69)	7.00 (0.97)	0.16

Notes. * Values were standardized into T-scores.

Table 3

Dependent variables' total mean scores and standard deviations, and mean differences between groups for hypothesis 2 and 3.

	All adolescents w/ ill mothers	All adolescents w/ ill fathers	Mean difference	All girls w/ ill parents	All boys w/ ill parents	Mean difference
Adolescents (*N*)	83	46	-	67	62	-
Mean perceived stress (*SD*)	39.71 (7.87)	41.13 (7.30)	1.42	41.69 (7.92)	38.61 (7.12)	3.08
Mean internalising problems (*SD*)*	48.08 (12.46)	50.91 (11.84)	2.83	51.67 (12.74)	46.31 (11.19)	5.36
Mean externalising problems (*SD*)*	45.65 (11.67)	44.78 (8.99)	0.87	44.16 (10.93)	46.61 (10.52)	2.45
Mean self-esteem in school (*SD*)	32.17 (5.93)	32.02 (5.67)	0.15	31.53 (6.00)	32.74 (5.59)	1.21
Mean grade point average (*SD*)	6,89 (0.87)	7.02 (0.87)	0.13	6.98 (0.95)	6.89 (0.78)	0.09

Notes. * Values were standardized into T-scores.

Table 4

Result statistics for hypothesis 1, hypothesis 2, and hypothesis 3.

Dependent variable	F	Df interaction [1]	Df error term [2]	p-value	Partial eta squared [3]	Observed power [4]
Hypothesis 1						
Mean perceived stress	1.22	1	125	.27	.01	.24
Mean internalising problems	2.13	1	125	.15	.02	.16
Mean externalising problems	0.28	1	125	.60	.002	.05
Mean self-esteem in school	2.20	1	124	.14	.02	.31
Mean grade point average	0.04	1	124	.85	.000	.05
Hypothesis 2						
Mean perceived stress	0.47	1	125	.49	.004	.14
Mean internalising problems	0.78	1	125	.38	.06	.11
Mean externalising problems	0.13	1	125	.72	.001	.06
Mean self-esteem in school	0.02	1	125	.90	.000	.05
Mean grade point average	0.64	1	124	.43	.005	.13
Hypothesis 3						
Mean perceived stress	5.98	1	125	.02	.05	.68
Mean internalising problems	5.38	1	125	.007	.06	.69
Mean externalising problems	1.06	1	125	.31	.008	.22
Mean self-esteem in school	2.44	1	125	.12	.02	.34
Mean grade point average	0.18	1	124	.68	.001	.07

Notes. [1] Degrees of freedom for the interaction. [2] Degrees of freedom for the error term. [3] Effect sizes are presented with partial eta squared (η^2) where $\eta^2 = .01$ is a small, $\eta^2 = .06$ is a medium, and $\eta^2 = .14$ is a large effect size (Cohen, 1988). [4] Pallant (2010) recommends an observed power of at least .80, so an 80% chance of finding a true effect.

Discussion

This study examined whether the impact of parental CMC on adolescent functioning in the areas of perceived stress, internalising and externalising problems, school-related self-esteem, and grade point average is moderated by parent-child gender constellations. It was hypothesized that adolescent functioning would be lower when the same-sex is ill as compared to the opposite-sex parent (H1), would not differ for adolescents with an ill mother as compared to an ill father (H2), and would be lower when the adolescent is female (H3). However, this study found no significant difference in any areas of adolescent functioning between adolescents with a same-sex as compared to opposite-sex ill parent, an ill father or an ill mother. Girls' and boys' functioning did not differ significantly at the exception of elevated internalising problems for girls. The tendencies of all areas of adolescent functioning were opposite to the expectations in H1, and were not consistently leaning towards any particular direction in H2 and H3.

The study's findings on H1 contradict previous research on stress and internalising problems such as Barkmann et al.'s (2007), and Compas et al.'s (1994), Grant and Compas' (1995), and Welch, Wadsworth, and Compas' (1996). The discrepancy is remarkable as all studies used a form of the YSR as a measurement instrument. However, non-significant results do not mean that such an interaction effect does not exist in the population (Faraway, 2015; Fox, 2008; Laerd Statistics, 2015; Searle, 2006), especially as the probability of detecting an interaction effect is low in general (Aiken & West, 1991; Laerd Statistics, 2015), and as a result of this study's low power. Barkmann et al. (2007) used 1950 participants as compared to the 129 participants in this study, or the 50-55 in Compas et al. (1994), Wagner and Compas (1995), and Welch, Wadsworth, and Compas' (1996). The latter studies used samples in high periods of stress close to the time of parent's cancer diagnoses, and with 40% of men and 38% of women not expected to be alive five years after the study, resulting in considerably higher adolescent YSR scores. It may, therefore, be that samples with higher numbers and stronger levels of the effect may be more likely to pick up on the effect, or that the gender-linked identification effect mainly becomes relevant in high-stress samples.

The influence of a same-sex ill parent as a moderator may also be dampened by participants being from the Netherlands, a country with strong gender egalitarian values (European Union, 2015) ranking high within Europe in policies and social norms such as

equal labour force participation and wage equality (2013 World Economic Forum, 2016). The previous studies' samples were from the United States of America and Germany, and from the 1990's. According to the Social-Identity and Self-Categorisation Theories (Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), social identities become more or less accessible depending on contextual cues and personal and emotional relevance (Oakes, 1987; Tanti, Stukas, Halloran, & Foddy, 2011). In this way, a culture less focused on gender norms and differences triggers a social identity relevant to the gender of the adolescent less frequently, making the potential vulnerability related to gender-linked parental identification less relevant.

Another explanation relates to the gender-linked parental identification hypothesized to underlie the heightened vulnerability of adolescents with same-sex ill parents being influenced or overpowered by other effects. McDonald (1977; 1980) found that university students identified more with a parent that they perceived as more powerful rather than of the same-sex. He called this the social power theory of parental identification and defined parental power as the adolescent's perception of that parent as a figure for guidance and advice, of competence and knowledge, in the right to control the adolescent's behaviour, and the parent's ability to control positive and negative reinforcement (McDonald, 1980). Acock and Yang (1984) found that gender-linked identification and the social power theory of parental identification were linked in a way that students identified with the same-sex parent more, granted that they perceived that parent as powerful in the respects mentioned previously. These two effects may also be relevant for adolescents, and alter gender-linked parental identification due to parental illness weakening parental power.

Alternatively, lower YSR scores may be a sign of protective factors within this sample, rendering the participating adolescents more resilient. Participants were from a medium to higher SES as shown by higher education and income levels (Milne & Plourde, 2016; Statistics Netherlands, Den Haag/Heerlen, 2016). This has been shown to correlate with high levels of protective factors such as financial security and high levels of attachment security (Malhomes, & King, 2012). Notably, girls were not significantly more stressed than boys despite the highly established research finding that girls experience more stress both in the general population and within the framework of parental CMC (Kessler & McLeod, 1989; Rudolph, 2002; Visser et al., 2004) indicating a relatively

resilient sample of adolescents. This could render the heightened vulnerability of adolescents with a same-sex ill parent less pronounced.

The tendency of the data is counter-hypothesis, with girls of ill mothers and boys with ill fathers coping better than girls with ill fathers and boys with ill mothers. Results may, therefore, indicate that gender-linked parental identification can act protectively. The illness of a parent can improve the parent-child relationship by fostering closeness and bonding (Pakenham & Cox, 2012; Visser et al., 2004). As Mikulincer and Shaver (2012) point out, stress is an important factor for attachment style change with the potential for stronger attachment security when the attachment figure is physically and emotional available in a time of distress. In a medium to higher SES sample correlated with higher levels of attachment security (Malhomes, & King, 2012), the gender-linked parental identification and the perception of belongingness fostered by self-categorisation and social identity could facilitate positive bond formation yielding the adolescents with a same-sex ill parent more resilient than adolescents with an opposite-sex parent. Further, individuals from a medium to higher SES are likely to cope better with their illness and receive greater support (Braveman et al., 2005), allowing the same-sex adolescent to model high levels of coping.

Considering H2, the results were consistent with previous research showing no significantly lower adolescent functioning when the father or the mother was the ill one (Sieh, Meijer, &Visser-Meily, 2010; Visser et al., 2004; Welch, Wadsworth, & Compas, 1996). The tendencies of the data showed that adolescent functioning was higher for adolescents with ill mothers as compared to ill fathers. These trends are counter-indicative of the proposed idea that the generally elevated levels of ill mothers' stress in relation to their disease (Compas et al., 1994), and elevated levels of stress and internalising problems of females in general (Kessler & McLeod, 1989; Rudolph, 2002) may lead to lower adolescent functioning when the mother is the ill one.

It needs to be noted that the results were influenced by unequal numbers. The group with ill fathers contained 27 girls and 19 boys. As girls with ill fathers had highest levels of perceived stress and internalising problems, and lowest levels of school-related self-esteem and externalising problems, the overall adolescent scores were skewed. Hence, the tendency of the data indicated lower adolescent functioning when the father was the ill one, at the exception of externalising problems. Nevertheless, such a counter-indicative

tendency may indicate that a heightened vulnerability for adolescents with an ill mother as compared to an ill father in the general population is either small or non-existent.

Adolescents struggling slightly more when the father is the ill one may be explained by caregiver strain that needs to be taken into account in relation to the impact of parental CMC on adolescent functioning. Just as mothers are more likely to be stressed from their own cancer than fathers (Compas et al., 1994), mothers perceive their spouses cancer as more serious than fathers do their spouses' (Compas et al., 1994). Although only slightly, female caregivers experience more caregiver strain as shown by higher levels of stress, mental health problems, and lower subjective and physical well-being (Pinquart & Sorensen, 2006). Heightened levels of caregiver strain of the healthy parent has been associated with being a risk factor for lower adolescent functioning as that parent may be less available to the adolescent (Sieh, Visser-Meily, Oort, & Meijer, 2012; Visser-Meily et al., 2005).

In regards to H3, only internalising problems were significantly elevated for girls as compared to boys. The perceived stress levels were also higher in girls than in boys, but after Bonferroni adjustment, these were no longer significant. Considering that this sample may have been high in protective factors due to the medium to high SES, the results seem to be in line with previous research which found a heightened vulnerability of adolescent girls in families with parental CMC for internalising problems and stress (Barkmann et al., 2007; Compas et al., 1994; Sieh, 2012; Welch, Wadsworth, & Compas, 1996). The higher vulnerability to stress and internalising problems of girls is not exacerbated by parental CMC in a way that it also translates into a higher vulnerability to externalising problems or academic functioning, at least in a sample from a medium to higher SES and Western culture. The tendencies for adolescent functioning seem to reflect the tendency by gender of the normal population where girls also show higher levels of stress, internalising problems and grade point averages, yet lower externalising problems and lower school-related self-esteem than boys (Bongers, Koot, Van der Ende, & Verhulst, 2003; Kessler & McLeod, 1984; Rudolph, 2002; Voyer & Voyer, 2014).

This study had some limitations. The generalizability of the results may be reduced due to the selectiveness of the sample that came from a medium to higher SES. Additionally, the participants were from the Netherlands, therefore a Western culture. Higher and lower SES oftentimes differ on important economic, social, and psychological

factors (Malhomes, & King, 2012), and so do participants from different cultural backgrounds. The study results were also related to research on a variety of parental CMCs, therefore, specific inferences onto specific illness groups should be avoided (Sieh, 2012).

Furthermore, assumptions of normality and of no outliers were frequently violated for hypothesis 1 and 2. This was counter-acted by a comparative analysis with transformed data which did not show any different effects. Even though the sample size was in a good range (Stevens, 1996; Wilson VanVoorhis & Morgan, 2007), and ANOVA is seen as rather robust to violations of normality (Laerd Statistics, 2015; Maxwell & Delaney, 2004), the results may be interpreted with some caution. This study's small effect sizes were not a problem as the majority of variables did not show significant results, but the weak power can be a significant issue for statistical conclusions validity as it frequently leads to type II error, failing to recognize important effects (Kazdin, 2003). It must be considered that the non-significant results of this study may be due to low power, especially considering the low power in general of detecting interaction effects (Aiken & West, 1991; Laerd Statistics, 2015).

Future studies may investigate the reliability of this study's results. A larger sample size that yields sufficient power is crucial to accept or reject the existence of an interaction effect (Kazdin, 2003). This paper showed that the interaction effect of gender may be more impactful in certain samples than others. Future research should vary the study sample with a more heterogeneous sample population, comparative studies of different SES backgrounds, cultural differences, and parental illness types. Ill parents from a lower SES may struggle with stronger symptoms, more elevated levels of stress, a more limiting experience with disability, and lack of support in illness than individuals from a higher SES (Braveman et al., 2005) which can accentuate the effects of parental illness on adolescents. A more heterogeneous sample may be less likely to contain protective factors, and allow a more generalizable result. A comparison between cultures with strong gender egalitarian values and cultures where gender roles are more expressed in traditions and social norms could yield significantly differential effects as adolescents from cultures with stronger gender norms may be more affected by their and their ill parent's gender.

This study concludes that the moderating role of gender constellations in families with parental CMC may be influenced by factors such as stress levels, culture norms

(especially in relation to gender traditions), SES, and competing effects like the social power theory of parental identification. Identification with an ill same-sex parent may even facilitate protective factors for an adolescent related to the facilitation of parent-adolescent relationship formation. A potential facilitation of protective factors by the relationship with an ill same-sex parent under favourable conditions underlines the importance of supporting families with parental CMC in order to promote such positive developments. Yet, the study also emphasizes that sample size is particularly important for detecting the interaction effect of adolescents' increased vulnerability with an ill same-sex parent. Parental gender may not act as a major moderator in families with parental CMC. Girls are more affected, specifically for internalising problems, but this does not extend to a wider range of areas in adolescent functioning such as academic functioning. This study calls for the consideration of gender as an influencing factor in family systems within the framework of parental CMC.

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