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Faculteit der Sociale Wetenschappen



Parent-Child Attachment in Single Parent Families

Stefan Inthorn, BSc

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Supervisor: Sieh, D. S.; PhD

Faculty Social and Behavioral Sciences – Leiden University

Department: Clinical Psychology

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Student number: S1437232

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Abstract

Adolescents in single parent families are at an increased risk of problem behavior. Few studies showed that low quality of parent-child attachment may increase problem behavior in adolescents. Additionally, research showed that low quality of parent-child attachment is related to more parental depressive symptoms. The aim of this study was to examine whether and to what extent family type and parental depressive symptoms influenced parent-child attachment as experienced by adolescents. It was expected that adolescents in single parent families displayed a lower quality of parent-child attachment than adolescents in non-separated families. Also, it was expected that a greater amount of parental depressive symptoms was related to a decrease in the quality of parent-child attachment and that this decrease in quality of parent-child attachment was greater in single parent families than in non-separated families. It was also expected that parental depressive symptoms mediated the relationship between family type and parent-child attachment. The sample consisted of 93 single parent families with 133 adolescents and 67 non-separated families with 112 adolescents. Adolescents filled in the shortened version of the Inventory of Parent and Peer Attachment, and parents completed the Beck Depression Inventory to measure parental depressive symptoms. Results indicated higher quality of parent-child attachment in single parent families compared to non-separated families, which appeared to be caused by higher quality of mother-child attachment compared to father-child attachment. Parental depressive symptoms predicted father-child attachment only. No mediation effect of parental depressive symptoms was found. This study emphasizes the need to differentiate between mothers and fathers when examining parent-child attachment.

Keywords: Single parent families, parent-child attachment, parental depressive symptoms, adolescents

Introduction

Children and adolescents seem to be more prone to problem behavior when being raised by a single parent (Carlsund, Eriksson, Löfstedt, & Sellström, 2012; Weihrauch, Schafer, & Franz, 2014). A single parent family is a family in which one or multiple children live with one parent (Sieh, Meijer, Oort, Visser-Meily, & Van der Leij, 2012). In 2007, the percentage of children living in single parent families was estimated 14% within European countries (Organization for Economic Co-operation and Development, 2014). Behavioral problems of children in single parent families consist of decreased school achievement, impairment in social development (e.g., problems in getting along with parents, teachers or peers), and more delinquent behavior (Lipman, Boyle, Dooley, & Offord, 2002; Weihrauch et al., 2014). Children from single parent families are also at an increased risk of developing psychiatric problems such as conduct problems, depressive symptoms, anxiety, and suicidal thoughts or attempts (Blum et al., 2000; Lipman et al., 2002). Further, they are more likely to smoke and are at a greater risk of underage drinking, and substance abuse (Carlsund et al., 2012; Manning & Lamb, 2003; Vanassche, Sodermans, Matthijs, & Swicegood, 2014; Weihrauch et al., 2014). Carlsund et al. (2012) found that 15-year old adolescents in single parent families were almost twice as likely to be a smoker, to have been drunk once, and to have had their first sexual intercourse than adolescents in non-separated families (odds ratios are respectively: 1.80, 1.79, and 1.89). Blum et al. (2000) found similar results in those risk behaviors, although differences between single parent and non-separated families appear not as large (no odds ratios available) compared to those found by Carlsund et al. (2012).

With an increasing number of single parent families and an increased risk of problem behavior in children from single parent families, it is important to investigate why children in single parent families show more problem behavior. Identifying the mechanisms that lead to increased problem behavior could help develop preventive measures. One possible mechanism that is thought to increase problem behavior is parent-child attachment (Carlson, Sampson, & Sroufe, 2003). To our knowledge, no studies have investigated whether children or adolescents from single parent families have lower quality of parent-child attachment than those from non-separated families. The purpose of this study is to identify risk factors for lower quality of parent-child attachment by investigating whether and to what extent family type and parental depressive symptoms influence parent-child attachment as experienced by adolescents.

Parent-Child Attachment

Parent-child attachment can be defined as the emotional bond between child and caregiver, which emerges over time from a history of parent-child interactions (Carlson et al., 2003). Attachment theory, originally designed by Bowlby, provides definitions of different types of parent-child attachment. Parent-child attachment develops in early infancy and can be discerned in secure and insecure attachment. When a child is securely attached to the parent (i.e., high quality of parent-child attachment), the parent is consistent and sensitive in contact with the child (Brown & Wright, 2001). When a parent behaves frighteningly, dismissive, inconsistently, or intrusively in contact with the child, an insecure parent-child attachment (e.g., low quality of parent-child attachment) will develop. Lower quality of parent-child attachment is associated with lower social competence (e.g., leadership, functioning in crowds, and sustaining personal friendships) and an increase in violent behavior (Carlson et al., 2003; Savage, 2014). Also, it proved to be linked to an increased risk of developing anxiety or depression in children and adolescents (Carlson et al., 2003; Kerns & Brumariu, 2014; Savage, 2014).

Attachment style will primarily develop in the first year of childhood and determines social-emotional behavior for the rest of the person's life (Carlson et al., 2003). According to attachment theory, parent-child attachment is a stable feature during the life course, however, it can be influenced by environmental factors (Allen, Boykin McElhaney, Kuperminc, & Jodl, 2004). Allen et al. (2004) found that attachment can change during adolescence due to psychological, familial, and environmental stressors such as depressive symptoms, parent-child interaction, and socioeconomic status. They recorded parent-child attachment during a period of two years in adolescents between 16 and 18 years old, and controlled for the initial level of attachment. However, Allen et al. (2004) only included family income as a familial stressor. It is therefore interesting to examine whether living in a single parent family also acts as a familial stressor. For example, life events, such as divorce or parental bereavement, may be considered as major psychosocial stressors. Perhaps daily life may be more stressful without the help of a spouse/parent. Allen et al. (2004) hypothesize that both adolescents and parents may experience a greater degree of stress due to low income. Due to financial difficulty parents may be unable to provide the amount of support and comfort that adolescents need to cope with the experienced stress. According to attachment theory, such circumstances will lead to lower quality of parent-child attachment (Allen et al., 2004). Accordingly, Sieh Visser-Meily, and Meijer (2012) found that adolescents in single parent families experience more stress than adolescents in non-separated families. Furthermore,

Harvey and Byrd (2000) found that higher quality of parent-child attachment reported by students (e.g., secure attachment) correlated with higher degrees of cohesion within families. Lower quality of parent-child attachment correlated with an increase of conflicts within families.

Allen et al. (2004) show that parent-child attachment improves during adolescence when no major stressful event occurs. Nonetheless, when a major stressful event does occur, the quality of parent-child attachment seems to decrease over time. A study by Buist, Deković, Meeus, and van Aken (2002) contradicts these results, showing a lower quality of parent-child attachment. However, Buist et al. (2002) do not make a differentiation between adolescents experiencing a major stressful event and adolescents who do not. Even so, Allen et al. (2004) found that parent-child attachment was stable over time when adolescents with and without major stressful events were combined in the analysis as opposed to the decrease in the quality of parent-child attachment found by Buist et al. (2002). However, after the age of 16 this decrease in parent-child attachment appears to have leveled off in the study by Buist et al. (2002). This may explain why Allen et al. (2004) found no overall decrease, as their analysis focused on the age period between 16 and 18 years of age. In conclusion, the results emphasize that age should be taken into account when examining parent-child attachment.

With regard to gender, girls have a higher quality of parent-child attachment than boys (Buist et al., 2002). Also, the course in which the quality of parent-child attachment declined with age was found to differ by gender. With regard to the quality of mother-child attachment, girls showed a steady decline of quality with age, whereas boys demonstrated a steep decline of quality till the age of 13 after which it raised until the age of 15 where the quality of parent-child attachment lowered again. Father-child attachment showed a steady lowering of quality among boys, whereas girls demonstrated a higher quality after the age of 15. Nonetheless, Ruschena, Prior, Sanson, and Smart (2005) found that girls demonstrate more problem behavior than boys after a divorce or parental bereavement. This suggests that girls may have lower quality of parent-child attachment compared to boys, although Buist et al. (2002) showed higher quality of parent-child attachment in girls. Even though the reason for this discrepancy seems unclear, parental separation could have a stronger effect on problem behavior among girls than boys. Further, Ruschena et al. (2005) did not correct for initial problem behavior before a divorce or parental separation. More baseline problem behavior among girls might have resulted in more problem behavior in girls compared to boys after parental separation.

Parental Depression

A review conducted by Chen and Kovacs (2013) indicates that parents with a depression tend to be indifferent, more critical, impatient, and hostile towards their child, resulting in lower quality of parent child attachment. In light of the theory of Allen et al. (2004), parental depressive symptoms may induce stress in both child and parent, whilst the parent is also less able to provide support for the child to cope with stress, leading to a decrease in the quality of parent-child attachment.

An epidemiological survey by Hasin, Goodwin, Stinson, and Grant (2005) showed that adults who are divorced, separated, or widowed have a one-year and life-time depression prevalence of respectively 7.89 % and 18.80 %. This means that the odds of suffering from depression are twice as high compared to non-separated adults. Similar results were found in other studies comparing the prevalence of depression between separated and non-separated parents (Wade & Cairney, 2000; Wood, Repetti, & Roesch, 2004). As depression is more prevalent among single parents, it may partially effectuate a lower quality of parent-child attachment. Moreover, depression might mediate the effect on parent-child attachment. Mediation is a sequence in which a variable explains the relationship between a predictor and an outcome variable (Field, 2013). When testing for a mediation effect, the relationship of the predictor on the proposed mediator and the effect of the proposed mediator on the outcome variable is tested (i.e., mediation) rather than the direct effect of the predictor on the outcome variable (e.g., as in a regression analysis). Mediation analyses give insight into the mechanisms between two or more variables that influence each other. Studies by Wood et al. (2004) and Di Stefano and Cyr (2014) found that parental depression partially mediated the association between divorce and internalizing and externalizing behavior in children. Notably, Di Stefano and Cyr (2014) found that when controlling for environmental and parental characteristics, such as parental depression, family type no longer predicted aggressive behavior and anxiety in children. With regard to the higher prevalence of depression among single parents, it is worth examining whether parental depressive symptoms could influence the relationship between family type and parent-child attachment. Wood et al. (2004) point out that only limited research has been conducted on the effect of depression and parental separation on children's behavior and parent-child attachment.

Aim of the Study

The focus of this study is to identify whether being raised in a single parent family and parental depressive symptoms are related to lower quality of parent-child attachment in adolescents. Figure 1 illustrates a model of the relations between family type, parental depressive symptoms, and parent-child attachment this study examined. In this study, parent-child attachment was based on the degree of communication, trust, and alienation from the parent(-s) as experienced by the adolescent. Parental depressive symptoms was based on the number of depressive symptoms as reported by the parent(-s). Also, we examined whether a higher amount of parental depressive symptoms was related to a greater decrease in the quality of parent-child attachment in single parent families than in non-separated families, in which the parent and adolescent had a spouse/second parent to rely on. At last, this study examined whether parental depressive symptoms mediated the relationship between family type and parent-child attachment.

Age and gender of the adolescents were included as covariates as parent-child attachment differs between gender and changes during adolescence (Buist, et al., 2002; Allen et al., 2004).

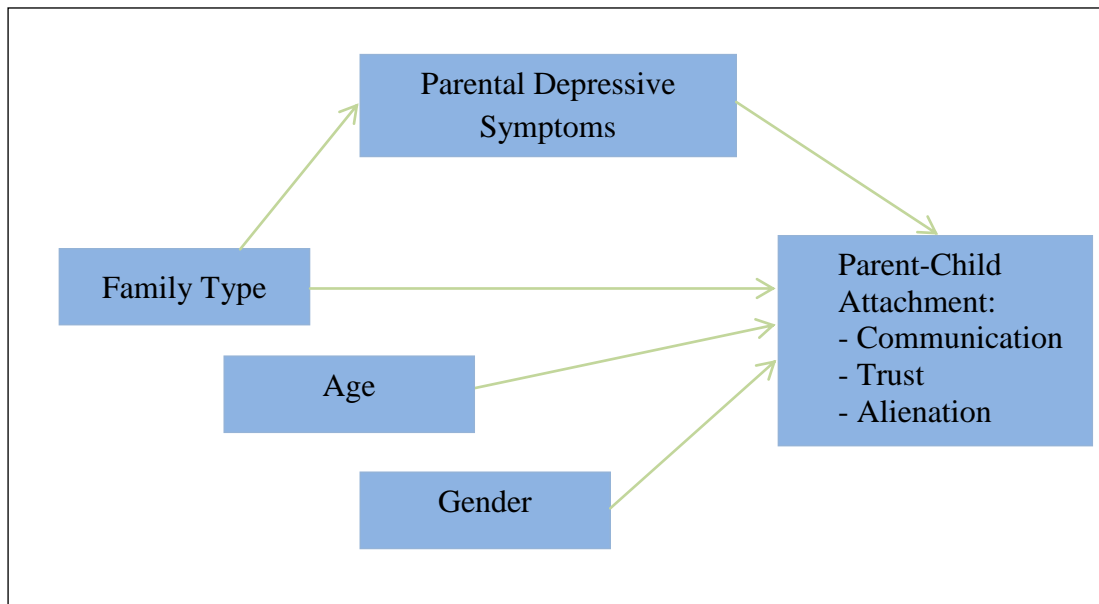


Figure 1.1. Parent-child attachment influenced by family type and parental depressive symptoms. Parental depressive symptoms is proposed as a mediator between family type and parent-child attachment. Gender and age are included as covariates.

Hypotheses

Firstly, it was expected that adolescents in single parent families displayed a lower quality of parent-child attachment than adolescents in non-separated families. Secondly, it was expected that a greater amount of parental depressive symptoms was related to a decrease in the quality of parent-child attachment. Thirdly, it was expected that parental depressive symptoms was related to a greater decrease in the quality of parent-child attachment in single parent families than in non-separated families. Lastly, it was expected that parental depressive symptoms mediated the relationship between family type and parent-child attachment.

Methods

An existing data set was acquired between 2008 till 2011 in a study by Sieh, Meijer, Visser-Meily, Oort, and van der Leij (2010). The data were collected from three types of families: families with one parent having a chronic medical condition, single parent families without a chronic medical condition (single parent families) and non-separated families without a parent having a chronic medical condition (non-separated families). This study used the data of single parent families and non-separated families.

Participants

The participating families consisted of adolescents (10 to 20 years) and their parent(-s). Families were included as a single parent family when the adolescent was living with one adult for most of the week (Sieh et al., 2010). Families in which the parent lived with another adult, such as his or her own mother, sibling, or partner, were not considered single parent families. When a family consisted of two parents, it was categorized as a non-separated family. In both groups, adolescents with a substance abuse, physical illness or psychiatric illness were excluded. Families were also excluded if a parent suffered from a severe or chronic medical disease lasting more than six months. There were 135 adolescents from 94 families included as single-parent families, and 114 adolescents of 69 families were included as non-separated (Sieh et al., 2012). Two of those non-separated families, in which the parents were of the same gender, were not included in the analyses as families with same-sex parents were underrepresented in the sample. This could give an inaccurate representation of parent-child attachment in families with same-sex parents, and, because of the small representation, could also induce statistical interference in the results if their family situation would differ in any way.

Procedure

The participating families were recruited in the Netherlands through posters and brochures at schools, public libraries, community centers, and general practitioners' offices. When interested, the families could contact the project manager by e-mail or telephone in order to take part in the study (Sieh et al., 2012). The families were screened for eligibility by phone and received additional information and informed consent papers after the screening. After active informed consent was signed by the parents or adolescent (in case the adolescent was over 18 years old), an appointment was made with the research assistants to administer the questionnaires at the families' homes. After completion of the questionnaire, the adolescent received either a cinema ticket, gift voucher or a mobile phone cover. The ethical commission of the research institute of Child Development and Education of the University of Amsterdam approved the study (Sieh et al., 2012).

Measures

Families were assigned to the single parent family group (coded 0 in SPSS) or non-separated family group (coded 1) based on the information about their current family situation. To measure the degree of parental depressive symptoms, the Dutch version of the Beck Depression Inventory (BDI) was administered to the parent. The BDI is a 21-item questionnaire used to measure the presence and severity of depressive symptoms (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI has a rating scale from (0) *experiencing no complaints on the subject* to (3) *experiencing a great deal of complaints on the subject*. For example, when asked about mood, parents were presented with the following answers: (0) *I do not feel sad*, (1) *I feel sad*, (2) *I am continuously sad and I cannot dismiss this feeling*, and (3) *I am so sad or unhappy and I cannot stand it anymore*. The total score of the BDI can range from 0 to 63, with higher scores indicating more depressive symptoms. The cut-off scores for the BDI were used to gain insight into the number and severity of depressive symptoms in the sample. Scores ranging from 0 – 9 indicated none to minimal depression, 10 – 18 indicated mild depression, 19 – 29 indicated moderate depression, and 30 – 63 indicated severe depression. In non-separated families, the BDI was administered to both parents, from which the mean of the BDI scores was calculated in order to be able to compare it with those of single parent families. A study by a national Dutch test committee (COTAN) showed that the Dutch version of the BDI has similar internal consistency and reliability as the original U.S. version of the BDI (Van der Does, 2002). The Dutch BDI has an internal consistency

varying between Cronbach's $\alpha = .88$ and $\alpha = .92$. The test-retest reliability of the BDI was found to be $r = .82$.

Parent-child attachment was measured using a short version of the Inventory of Parent and Peer Attachment (IPPA), developed by Raja, McGee, and Stanton (1991). The questionnaire was translated into Dutch. Pertaining to the original IPPA (Armsden & Greenberg, 1987), the shortened IPPA version has reduced the number of statements regarding parent-child attachment from 25 to 12 per parent. The shortened IPPA measures (in-)secure attachment and includes the subscales *communication*, *trust*, and *alienation from the parent*. Adolescents completed the questionnaire for both the mother and father. With regard to single parent families, the questionnaire was answered for the single parent only. The mean of the IPPA scores of both parents in non-separated families was calculated to be able to compare it with the IPPA scores of single parent families. An example of an IPPA-V question is: *I tell my father about my problems and troubles*. Answers were given on a 4-point scale from (1) *almost never or never* to (2) *sometimes*, (3) *often*, to (4) *almost always*. A higher score indicated more problems in communication, more distrust, and/or more feelings of alienation with the parent. The three parent subscales of the original IPPA have a high internal consistency; *communication*: Cronbach's $\alpha = .91$, *trust*: $\alpha = .91$, *alienation*: $\alpha = .86$ (Armsden & Greenberg, 1987).

Statistical Analyses

Statistical analyses were conducted using IBM SPSS, version 21. The expectation maximization imputation method was used to impute missing values for questionnaires and demographic variables. Beforehand, Little's MCAR test (Field, 2013) was performed to test whether the data was missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR). The imputation and Little's MCAR test were performed separately for single parent families and non-separated families because these groups supposedly differed from each other.

T-tests were performed on the means of the adolescents' age, adolescents' education, parent-child attachment, parents' age, parental depressive symptoms, and net family income. Also, the mean relationship duration of the parents for the non-separated families and the percentage of male and female adolescents in both groups were calculated.

Kolmogorov-Smirnoff tests and histograms of the normality were performed to test whether the dependent variables (e.g., parent-child attachment, communication, trust, and alienation) were normally distributed. If a Kolmogorov-Smirnoff test proved to be significant

($p < .05$) the variable was not normally distributed. If the normality or homoscedasticity of the dependent variables showed irregularities, hierarchical multiple regression analysis was performed with a bootstrap procedure using 2000 samples (Field, 2013; Howell, 2013). Further, multivariate outliers were checked, using the Cooks' D method. A case was considered an outlier when the Cooks' D was greater than 0.1. Possible exclusion of such cases was to be evaluated. To control for high correlations between predictor variables (e.g. intercorrelations), multicollinearity of the predictor variables was examined using the tolerance values. In case a *tolerance value* < 0.1 , multicollinearity was regarded high, and possible exclusion of variables was to be assessed (Meyers, Gamst, & Guarino, 2006). To examine which predictor variables had high intercorrelations, a correlation matrix was presented.

A hierarchical linear regression analysis was used to determine the degree to which family type and depression predicted parent-child attachment. Family type (1) and parental depressive symptoms (2) were entered first as these variables were the main variables in the model presented in this study. An interaction effect of family type and parental depressive symptoms was entered as a third variable. Age was included as the fourth variable followed by the interaction effects of (5) age and family type and (6) age and parental depressive symptoms. Gender was included as the seventh predictor followed by the interaction effects of (8) gender and family type and (9) gender and parental depressive symptoms. The same procedure was repeated for the three subscales of the IPPA-V as dependent variables. The interaction effects were included to detect possible differences between family type and moderation effects of parental depressive symptoms, age, or gender. To prevent multicollinearity with other predictor variables, the interaction effects were centered (Field, 2013; Howell, 2013). The explained variance (R^2) of the model was produced to examine the percentage of variance that is explained by this model. The significance of the models and predictor variables were assessed with a significance threshold of $p < .05$. The squared semi-partial correlation of each predictor variable was computed in order to determine the unique explained variance of each predictor variable. Hereby, covariance between the predictor variables was accounted for contrary to standard Pearson correlations.

A mediation analysis was performed to examine whether parental depressive symptoms explained the difference in parent-child attachment between single parent families and non-separated families. A mediation bootstrapping procedure was conducted as it is widely recommended for mediation analysis (Field, 2013; Howell, 2013). As advised by Howell (2013) and Field (2013), a macro called PROCESS was used because IBM SPSS does

not include this feature. The PROCESS macro can estimate moderation and mediation models using “an ordinary least squares or logistic regression-based path analytic framework” (Hayes, 2015). Family type was included as the predictor variable, parent-child attachment as the outcome variable, and parental depressive symptoms as the mediating variable. Parental depressive symptoms were considered to be a mediating variable when the confidence interval of the indirect effect did not include zero; i.e., the confidence interval must be higher or lower than zero (Field, 2013). The Sobel test of the indirect effect was not calculated because it becomes inaccurate when the normal distribution of the variables is skewed. The confidence interval method is deemed more reliable, although it cannot provide a *p*-value. In case the direct effect of family type on parent-child attachment was no longer significant, parental depressive symptoms proved to be fully mediating the effect. Parental depressive symptoms were considered to partially mediate the effect when the direct correlation between family type and parent-child attachment remained significant. Effect sizes of both the direct and indirect effect were calculated to determine their power. An effect size of $d = 0.2$ was considered a small effect, $d = 0.5$ a medium effect, and $d = 0.8$ was considered a large effect (Field, 2013). The effect size was considered significant when $p < .05$.

Results

One single parent family was excluded from the study because the data of the parent were missing. The remaining sample consisted of 93 single-parent families with 133 adolescents and 67 non-separated families with 112 adolescents. Missing values were missing completely at random (MCAR) as Little’s MCAR test was non-significant for all data except for the scores on the IPPA-V questionnaire in non-separated families ($p < .001$). Upon inspection, 4 values were missing with no more than 1 missing value per question. As the IPPA-V scores of the single parent group and all other variables were MCAR and there was no indication to assume these values were related, it was expected that the data were missing at random (MAR). Therefore, the expectation maximization imputation method was applied.

Demographics

Descriptive data of both groups are shown in Table 1 and Table 2. We executed *t*-tests with a bootstrap procedure (2000 samples) due to violations of normality and homoscedasticity. Adolescents of both family types did not differ in age, gender, or education. A higher quality of parent-child attachment was found in adolescents from single parent

families ($d = 1.26, p < .05$) compared to adolescents from non-separated families, as well as better parent-child communication ($p = .009$) and a near threshold significance effect of parent-child trust ($p = .06$). Single parent families had a lower net family income per parent than non-separated families ($d = 2.23, p < .001$). There were remarkably more non-separated families with an income of €4000 or more (24.6%). With a mean relationship duration of 20.4 years, non-separated parents appeared to have long relationships. Further, single parents had more depressive symptoms than parents in non-separated families ($d = 2.23, p < .01$). There were twice as many single parents with mild depressive symptoms (17.2%) compared to non-separated parents (8.2%).

Assumptions

Visual inspection of the standardized residuals and the standardized predicted values indicated that the dependent variables (e.g., the IPPA-V total score and subscale scores) were linear. The distributions appeared to be skewed, indicating that the normality assumption was violated. The Kolmogorov-Smirnov test proved to be significant ($p < .001$) for both the total score and the subscales, confirming that the distributions were non-normal. Further, the standardized residuals did not appear to be evenly distributed around zero on the scatterplot, indicating a violation of homoscedasticity. As the normality and homoscedasticity assumptions appeared to be violated, a bootstrapped regression analysis was performed to circumvent these violations. Multicollinearity did not occur as the tolerance values remained well above .1. Cook's D analysis did not indicate any outliers for parent-child attachment (max. value $< .1$). However, one case was detected as an outlier on both communication (Cooks' $D = .12$) and alienation (Cooks' $D = .25$). As no causes were found that would explain the strong influence of this case and because bootstrapping is considered robust to outliers, it was not excluded.

Predicting Parent-Child Attachment

A hierarchical regression analysis using bootstrap (2000 samples) was performed to determine the influence of family type and parental depressive symptoms on parent-child attachment. The fourth regression model had the best fit, which included family type, parental depressive symptoms, the interaction effect of family type and parental depressive symptoms,

Table 1

Demographics of Single Parent Families and Non-Separated Families

Characteristics	Single parent families	Non-separated families
Parents (<i>n</i>)	93	134
Mean age (<i>SD</i>)	47.4 (5.60)	47.7 (5.20)
Mean relationship duration (<i>SD</i>)		20.4 (5.90)
Mean family income ^a (<i>SD</i>)	3.65 (1.90)	5.88 (1.70)***
Less than €1000,-	6.5%	2.2%
€1000-€1499,-	28.0%	0.7%
€1500-€1999,-	21.5%	6.5%
€2000-€2499,-	17.2%	11.6%
€2500 -€2999,-	9.7%	18.8%
€3000 - €3499,-	4.3%	21.7%
€3500 - €3999,-	7.6%	13.8%
€4000,- or more	5.4%	24.6%
Adolescents (<i>n</i>)	133	112
Mean age (<i>SD</i>)	14.89 (2.73)	14.59 (2.25)
Gender (Girls)	51.9%	53.6%
Education		
Primary education	16.5%	10.7%
High school	63.2%	78.7%
Lower vocational education	1.5%	0%
Intermediate vocational education	10.5%	4.5%
Higher vocational education	3.0%	0.9%
University	3.8%	2.7%
Other	1.5%	2.7%

Note. ^a Family income mean is based on categories ranging from 1 to 8; 1 = less than €1000 and 8 = €4000 or more.

*** $p < 0.001$. Significance tests are two-tailed.

and age ($p < .05$). The second model was not significant as parental depressive symptoms were not a significant predictor. However, the interaction effect of family type and parental depressive symptoms proved significant in the two subsequent models which led to the fourth model as the best fit. The details of the parent-child attachment model can be found in Table 3. An explained variance of .12 ($p < .001$) indicated that 12% of parent-child attachment was predicted by this model. Although parental depressive symptoms was not a significant predictor, it remained in the model because the interaction effect of family type and parental depressive symptoms proved to have a significant effect ($p = .047$). A plot of the interaction effect (Figure 2) showed that an increase in parental depressive symptoms correlated with a greater decline in the quality of parent-child attachment in non-separated families

($R^2 = 0.07$) compared to single parent families ($R^2 = 0.0007$). Thus, adolescents in non-separated families appeared to have lower quality of parent-child attachment with a parent who had severe depressive symptoms. The variables that were not included in this model did not prove to have a significant effect in subsequent models.

Table 2

Differences Between Family Types on Parental Depressive Symptoms and Parent-Child Attachment based on t-tests

Variables	Single parent families	Non-separated families
Mean depressive symptoms (<i>SD</i>)	5.7 (5.65)	3.7 (2.82)**
None - Minimal depressive symptoms	81.7%	91.0%
Mild depressive symptoms	17.2%	8.2%
Moderate depressive symptoms	0%	0.7%
Severe depressive symptoms	1.1%	0%
Mean parent-child attachment (<i>SD</i>)	40.8 (5.49)	39.5 (4.27)*
Mean parent-child communication (<i>SD</i>)	12.1 (2.96)	11.2 (2.35)**
Mean parent-child trust (<i>SD</i>)	14.4 (1.90)	14.0 (1.61)†
Mean parent-child alienation (<i>SD</i>)	14.3 (1.70)	14.4 (1.37)

Note. † $p < .06$. * $p < .05$. ** $p < .01$.

The semi-partial correlations appeared to be biased because they were higher than the zero-order correlations. It was likely caused by violating the independence of residuals assumption. Therefore, the explained variance using the square of the standard Pearson correlations are displayed in Table 3 instead of the explained variance derived from semi-partial correlations.

Three additional hierarchical regression analysis using bootstrap were done (Table 3) to examine the influence of family type and parental depressive symptoms on the separate subscales of the IPPA-V (e.g., *communication*, *trust*, and *alienation*). Communication was significantly predicted by family type ($p = .002$) and age ($p < .001$). Therefore, a regression analysis was conducted with only family type and age as predictors. This model predicted 11% of communication. Trust was predicted by family type ($p = .006$), the interaction effect of family type and parental depressive symptoms ($p = .024$), and age ($p = .001$). Nine percent of the variability in trust was predicted by this model ($p < .001$). Parental depressive symptoms was kept in the model as the interaction effect of family type and parental depressive symptoms was significant ($p = .02$). A plot of the interaction effect (Figure 2) showed that an increase in parental depressive symptoms correlates with a decline in trust in non-separated

families ($R^2 = .08$), compared to single parent families who appeared unaffected by an increase of parental depressive symptoms ($R^2 = .001$). Thus, adolescents in non-separated families appeared to have less trust in a parent who had severe depressive symptoms. Family type and parental depressive

Table 3

Hierarchical Multiple Regression of Family Type, Parental Depressive Symptoms, Adolescents' Gender, and Adolescents' Age on Parent-Child Attachment.

Models & Predictors	Model estimates	
	R^2	b
Model <i>parent-child attachment</i>	.12***	
Family type	.02**	-1.80
Parental depressive symptoms	.00	-.03
Family type and depressive symptoms	.01*	-.31
Adolescents' Age	.09***	-.58
Model <i>communication</i>	.11***	
Family type	.03**	-1.00
Adolescents' age	.08***	-.31
Model <i>trust</i>	.09***	
Family type	.01**	-.62
Parental depressive symptoms	.00	.01
Family Type and depressive symptoms	.02*	-.16
Adolescents' Age	.04***	-.15
Model <i>alienation</i>	.08***	
Family type	.00	-.13
Parental depressive symptoms	.02	-.02
Family type and depressive symptoms	.04**	-.13
Adolescents' Age	.04***	-.12

Note. Single parent families are coded 0 and non-separated families are coded 1 for the beta-weights. * $p < .05$. ** $p < .01$. *** $p < .001$. Significance tests are two-tailed.

symptoms were not significant predictors for alienation. However, the interaction effect of family type and parental depressive symptoms ($p = .01$) and age ($p = .001$) proved significant. The explained variance of the model was 8%. Family type and parental depressive symptoms were kept in the model due to the significance of the interaction effect. Plotting the interaction effect (Figure 2) revealed that non-separated families had a greater decline ($p = .01$) in alienation when parental depressive symptoms increased ($R^2 = .11$) compared to single parent families ($R^2 = .005$). Thus, adolescents in non-separated families appeared more alienated

from a parent who had severe depressive symptoms. In conclusion, family type and age were significant predictors in all models. The interaction effect of family type and parental depressive symptoms was significant in all models but communication.

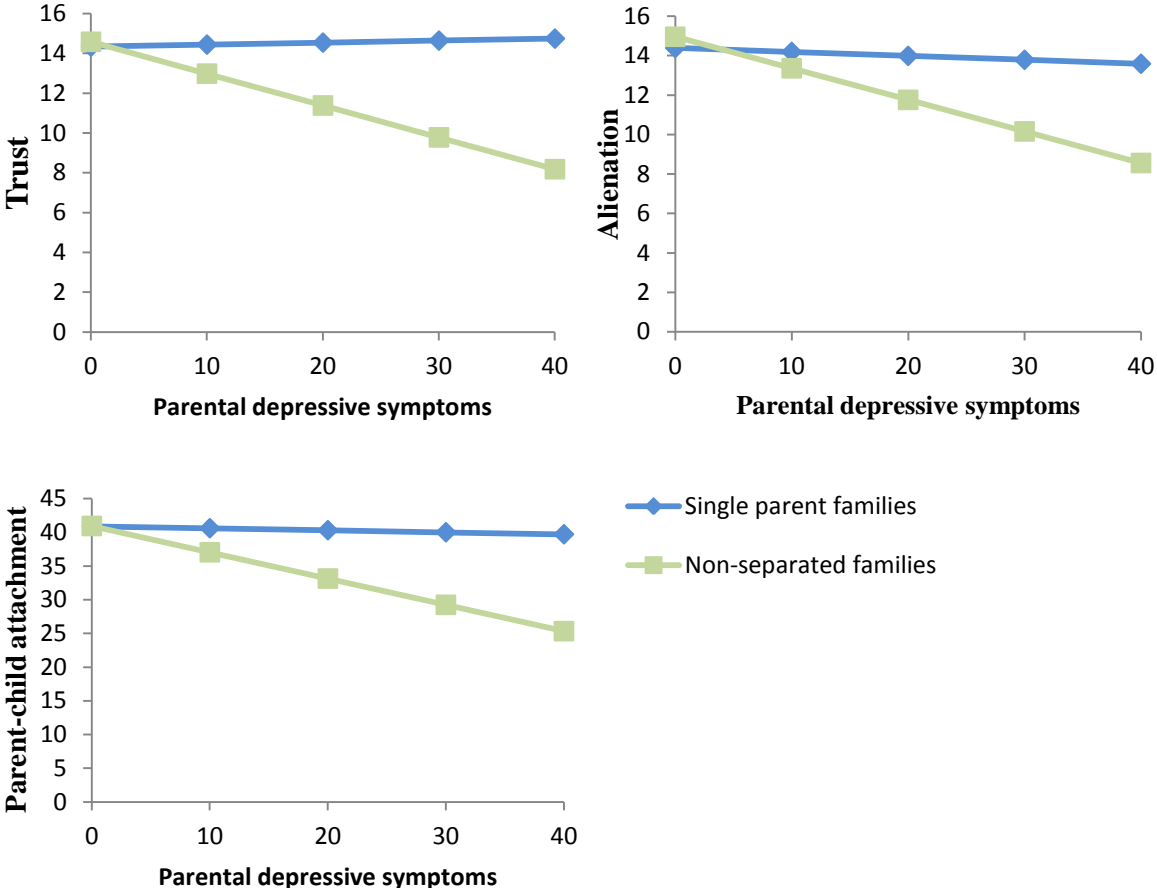


Figure 2. Interaction effect of family type and parental depressive symptoms on trust, alienation and parent-child attachment. The effect of parental depressive symptoms on parent-child attachment is displayed for both single parent families and non-separated families.

Mediation Analyses

A mediation analysis was done to examine whether parental depressive symptoms mediated the relationship between family type and parent-child attachment (Figure 3), but no significant mediation effect was found ($b = .17$, CI $[-.07, .52]$). This was expected after the regression analysis revealed no significant effect of parental depressive symptoms on parent-child attachment. The mediation analysis revealed a significant effect of family type on parental depressive symptoms ($b = -1.94$, $p = .001$). The correlation between family type and parental depressive symptoms was $r = .15$ ($p < .05$)

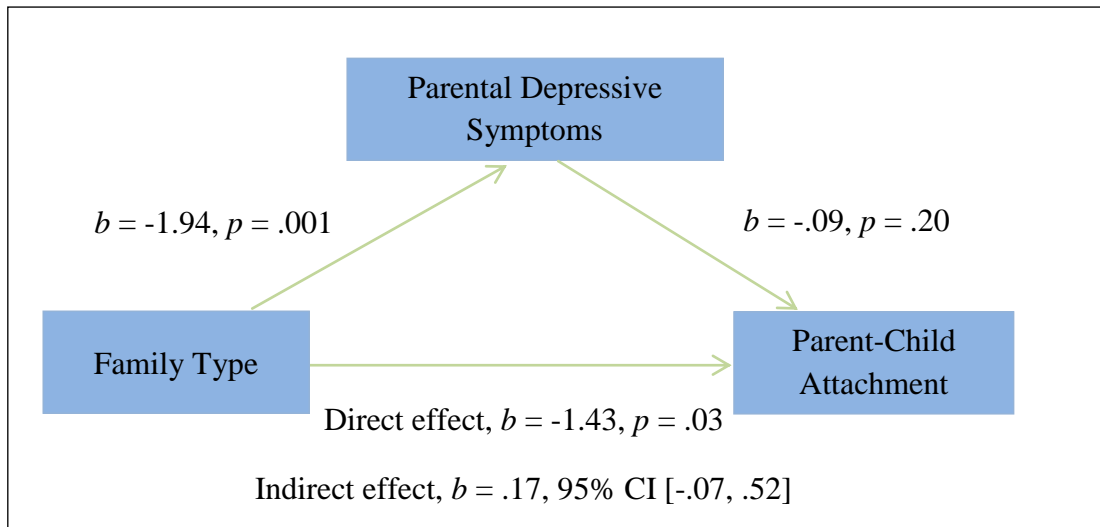


Figure 3. Mediation model of parent-child attachment predicted by family type and mediated by parental depressive symptoms. The direct effect is calculated within the mediation model.

Additional Analyses

The finding that adolescents in single parent families had higher parent-child attachment than adolescents in non-separated families seems to contradict findings of other studies. Possibly, the combined scores of parents in the non-separated families may have created a bias. Because 81.2% of single parents were mothers, the higher quality of parent-child attachment found in single parent families may be attributable to parental gender. Therefore, additional *t*-tests were performed to examine differences between mother-child attachment and father-child attachment in both family types. Further, *t*-tests were performed to examine possible differences between mother-child attachment of both family types and also of father-child attachment between both family types ($p < .05$). As parental depressive symptoms scores may also have been affected by this bias, additional *t*-tests were also performed for parental depressive symptoms between mothers, fathers, and between mothers and fathers of both family types.

As shown in Table 4, mother-child attachment did not differ between family types. Also, no difference was found in father-child attachment between family types. Mother-child attachment was higher than father-child attachment in both single parent families ($p = .006$) and non-separated families ($p < .001$). Further, mothers from single parent families showed significantly more parental depressive symptoms than mothers from non-separated families ($p < .002$).

Table 4

Mean parent-child attachment scores and mean BDI scores comparison between mothers and fathers of single parent families and non-separated families.

Variables	Mean parent-child attachment scores	Mean BDI scores
Single mothers – Non-separated mothers	41.38 – 40.97	5.90 – 3.70 **
Single mothers – Single fathers	41.38 – 38.04 **	5.90 – 4.56
Single fathers – Non-separated fathers	38.04 – 38.02	4.56 – 3.72
Non-separated fathers – Non-separated mothers	38.02 – 40.97 ***	3.72 – 3.70

Note. * = $p < .05$. ** = $p < .01$. *** = $p < .001$.

Due to the differences found in the quality of parent-child attachment, additional regression analyses were conducted for mother-child attachment and father-child attachment separately. The same hierarchical order was used as before, with a significance threshold of $p < .05$. Age was the only significant predictor for mother-child attachment ($p = .001$), with mother-child attachment decreasing by age. A regression analysis with age as the only predictor had an explained variance of 8.9% (Table 5).

Table 5

Hierarchical Multiple Regression of Mother-Child Attachment and Father-Child Attachment.

Models & Predictors	Model estimates	
	R^2	b
Model <i>mother-child attachment</i>	.09***	
Adolescents' Age	.09***	-.60
Model <i>father-child attachment</i>	.19***	
Parental depressive symptoms	.08***	-.59
Adolescents' Age	.10***	-.65
Gender and parental depressive symptoms	.01*	.50

Note. Boys were coded 0 and girls were coded 1 for gender.

* $p < .05$. ** $p < .01$. *** $p < .001$. Significance tests are two-tailed.

The quality of father-child attachment significantly decreased when parental depressive symptoms ($p = .001$), and age ($p = .001$) increased. Also, a significant interaction effect of the adolescents' gender and parental depressive symptoms was found ($p = .03$), indicating that boys had lower quality of father-child attachment compared to girls, when the father had many parental depressive symptoms.

A regression analysis with parental depressive symptoms, adolescents' age, and the interaction effect of the adolescents' gender and parental depressive symptoms (Table 5) predicted 19.2% of the quality of father-child attachment.

Discussion

General Discussion

The aim of this study was to examine whether parent-child attachment was influenced by family type and parental depressive symptoms. In the first regression model, family type proved to be significantly related to parent-child attachment. More specifically, family type predicted communication and trust between the parent and the adolescent but not alienation. Single parent families had a slightly higher quality of parent-child attachment than non-separated families, contrary to what was predicted. Parental depressive symptoms were only related to parent-child attachment in non-separated families. In these families, more parental depressive symptoms were related to a lower quality of parent-child attachment. More specifically, parental depressive symptoms appeared to be related to adolescents' trust in and alienation from the parent. This indicates that depression may be a risk factor for low quality of parent-child attachment in non-separated families.

However, additional analyses show that the higher parent-child attachment in single parent families and the relation with parental depressive symptoms is the result of a bias caused by the combined scores in non-separated families. Results show that mother-child attachment differed significantly with father-child attachment in both family types and with 81.2% of single parents being mothers, high quality of mother-child attachment resulted in higher quality of parent-child attachment scores in single parent families. Additional analyses showed that there was no difference in parent-child attachment between mothers from both family types and no difference in parent-child attachment between fathers. In conclusion, there was a difference in parent-child attachment between single parent families and non-separated families, but it appeared to be attributable to higher quality of mother-child attachment compared to father-child attachment. The interaction effect of family type and parental depressive symptoms was likely to be caused by the bias, as it was not a significant predictor in separate regression analyses for mother-child attachment and father-child attachment. The interaction effect did not appear to be a characteristic for non-separated families, but attributable to father-child attachment, which was significantly related to parental depressive symptoms.

Parental depressive symptoms did not mediate the relationship between family type and parent-child attachment. This was congruent with the additional regression analyses where family type was not significant and parental depressive symptoms was significantly related to father-child attachment only. However, contradictory is the finding that single mothers showed significantly more depressive symptoms than non-separated mothers. Because Chen and Kovacs (2013) indicated that parental depressive symptoms are related to lower quality of parent-child attachment and separated adults have higher prevalence of depression (Hasin et al., 2005), the mediation analysis was expected to be significant. Apparently, depressive symptoms of mothers did not influence mother-child attachment in this study.

The first hypothesis was rejected as adolescents from single parent families and non-separated families displayed equal quality of parent-child attachment. Although low quality of parent-child attachment is linked to increased problem behavior (Carlson et al., 2003; Kerns & Brumariu, 2014; Savage, 2014), it may not be related to increased problem behavior in adolescents from single parent families. The finding that quality of parent-child attachment was not higher in single parent families appears contradictory to the findings of Scott et al. (2013), who reported lower quality of parent-child attachment in single parent families. However, these effects were only found for adolescents of age 11-14, whilst this study had mean ages of 14.89 (single parent families) and 14.59 (non-separated families). Perhaps younger adolescents are more negatively affected in some ways by single parenthood. Also, Scott et al. (2013) may have included more single fathers in their sample, leading to a significant overall outcome, but this was not analyzed in their study. Further, their sample consisted of many low income families who may be more at risk for lower quality of parent-child attachment. Even though family income was taken into account, certain social and environmental factors might have influenced the results.

The second hypothesis was partially accepted since parental depressive symptoms predicted father-child attachment but not mother-child attachment. Because there was no difference in parent-child attachment between the two family types, the third hypothesis, stating that parental depressive symptoms related to a greater decrease in the quality of parent-child attachment in single parent-families, was rejected. These results contradict the findings of Di Stefano and Cyr (2014) and the review of Chen and Kovacs (2013), who found a relation between depression and lower parent-child attachment in both family types. Even more contradictory is that Di Stefano and Cyr (2014) only included mothers in their sample, whilst the results of this study show that mother-child attachment is not related to parental

depressive symptoms. Perhaps the SAQM used by Di Stefano and Cyr (2014) may have been less specific, as it is a screening instrument with only 6 items regarding depression whilst the BDI is specifically designed to measure depressive symptoms. The review of Chen and Kovacs (2013) was focused on the effects of parental depressive symptoms on early childhood parent-child attachment. All the same, adolescents might understand the situation better than young children and might apply specific coping strategies to deal with parental depressive symptoms, although current literature shows inconsistent results about the development of coping strategies with age (Skinner & Zimmer-Gembeck, 2007). However, this would not explain why father-child attachment is still related to parental depressive symptoms in adolescence whilst mother-child attachment is not. Adding to the contradiction is that single mothers had more parental depressive symptoms than non-separated mothers in this study, even though there was no difference in mother-child attachment between family types. Further, the results of parental depressive symptoms on father-child attachment do not fit within the theory posed by Allen et al. (2004), which states that stressors lead to reduced support and comfort from caregivers and, therefore, adolescents experience lower quality of parent-child attachment. Because non-separated families consist of two parents, it was expected that the adolescents in non-separated families would have maintained the support and comfort from the non-depressed parent. As father-child attachment and depressive symptoms of the father were equally related in both family types and thus not influenced by mothers in non-separated families, the hypothesis of Allen et al. (2004) does not seem to apply to the results of this study.

No mediation effect of parental depressive symptoms on the relation between family type and parent-child attachment was found, rejecting the fourth hypothesis. Separate regression analyses for mother- and father-child attachment indicated no significant correlation with family type, confirming the results of the mediation analyses. Nonetheless, Di Stefano and Cyr (2014) and Wood et al. (2004) found that parental depressive symptoms mediate the relationship between family type and problem behavior. Therefore, parental depressive symptoms appear to mediate problem behavior through a variable other than parent-child attachment.

The age of the adolescent proved to be a significant predictor of parent-child attachment. With an increase of age, parent-child attachment appeared to decrease. Even more, the adolescents' age had a higher explained variance (9 - 10%) than the main predictors. This result supports the finding of Buist et al. (2002), who also found a decrease of parent-child attachment with age. The findings in this study appear to contradict those of Allen et al. (2004)

who found no change in the quality of parent-child attachment with age. But, the mean age of the adolescents in this study was 14 years. Buist et al. (2002) found that after the age of 16, the decrease in quality of parent-child attachment was no longer significant. Since Allen et al. (2004) focused on ages of 16 to 18, it may explain the difference with the results in this study.

No effect of gender on parent-child attachment was found in both families. This is opposed to the results of Buist et al. (2002), who found differences in parent-child attachment between genders. However, Buist et al. (2002) performed a cohort study using a within-subject design, measuring the change of parent-child attachment of each participant over 3 years. This design allowed Buist et al. (2002) to obtain more detailed results, which showed that parent-child attachment differed by gender and, more importantly, that differences between gender can vary with age in a non-linear way. This non-linear pattern may have caused the effect of gender to be non-significant, because the means of these patterns are likely of similar size. Consequently, as multiple regression analysis is only able to calculate linear effects, it cannot identify differences in gender which only occur at certain ages. In other words, it is likely that the mean of the both genders do not differ significantly, but that there are differences in parent-child attachment at certain ages between boys and girls.

Limitations

This study was based on a Dutch sample. Other countries and cultures may have different patterns or values regarding parent-child attachment. Especially collectivistic cultures are known to have different customs with regard to family structure and social interaction (Shiraev & Levi, 2010), possibly limiting the results of this study to Dutch society and Western societies. Furthermore, this study did not include families with same-sex parents as they were underrepresented in the available sample. The results give insight into parent-child attachment of heterosexual parents and their children, but may be less applicable for families with same-sex parents. Nonetheless, other studies show that there is no difference in parent-child attachment between children with same-sex parents and those with heterosexual parents (Erich, Kanenberg, Case, Allen, & Bogdanos, 2009; Golombok et al., 2014). Regarding single parent families, there are multiple reasons that can cause parents to separate. Among others, this can be due to bereavement, divorce, or long distance relationships. Each cause for separation may have had a different impact on parent-child attachment. Also, this study did not register how long the parent of a single parent family had been a single parent. For example, a divorce or bereavement may have been recent or may have occurred several years before. According to Hetherington (2003), the quality of parent-child attachment may

be lower after parental separation, but the quality of parent-child attachment improves over time as parents become more sensitive to the needs of the child and more authoritative again. In this study, it is unclear whether the results on parent-child attachment and parental depressive symptoms were affected by differences between recent and long term parental separation and bereavement. Furthermore, the sample of this study had few parents with a depression. Therefore, the effect of moderate to severe parental depressive symptoms on parent-child attachment is an extrapolation based on parents with few depressive symptoms. Estimates of the extrapolated data are less reliable and if more parents with moderate or severe parental depressive symptoms were included, the results may have been different. Now, the results may be less representative for families with a moderate to severe depressed parent.

The IPPA-V questionnaire was a shortened version of the IPPA, and was based on four questions of each subscale that had the highest item-total correlation coefficients on its specific scale. Even though the item-total correlations were good, one may ask whether the constructive validity of the IPPA-V is as good as that of the IPPA as it has not been investigated in any study we know of. In other words, it is questionable whether the IPPA-V measures parent-child attachment accurately and in a complete manner.

A statistical limitation of this study was the violation of the assumption of independence. This study included a number of families with multiple siblings. Siblings live within the same environment and may therefore share certain environmental and familial characteristics; i.e., their traits share variance. Multiple regression assumes total independence between participants, therefore this study has violated its assumptions which may have led to statistical bias. The violation reduces the accuracy of the variance of the results. For example, the semi-partial correlations may have been affected by this issue since they proved to be incorrect (i.e., greater than the standard Pearson correlations). This indicates that other variables may have been biased as well. The extent of this bias cannot be known as the effects caused by the violation are unpredictable.

Future Research

New studies should focus on differentiating between the cause of parental separation to obtain a more detailed view on the relation between parental separation and the quality of parent-child attachment. In case of parental separation or long distance relationships, adolescents are likely to still be in contact with both his parents. Although living with one parent, the other parent may still play an important role in the adolescent's life. For example,

if both parents are still supporting the adolescent, he/she might experience less strain than someone who has lost a parent. Future research should investigate whether different circumstances are related to differences in parent-child attachment. Additionally, to test more accurately whether depression will have an influence on parent-child attachment, future studies should test samples with clinically depressive participants. Such studies would be more representative for families with a depressed parent, whereas this study is more representative of families with no or little parental depression.

Future research could try to validate the findings of this study by using a multi-level modelling technique. It may increase the validity of the results in this study, as it accounts for non-independence between participants (e.g., siblings). Combined with the inclusion of additional covariates, such studies could contribute to a more detailed insight in the quality of parent-child attachment.

Conclusion

Parent-child attachment differed between family types, but appeared to be caused by higher quality of mother-child attachment compared to father-child attachment. As single mothers were more prevalent than single fathers, the quality of parent-child attachment was higher in single parent families. Parent-child attachment is therefore unlikely to relate to problem behavior by adolescents of single parent families. However, the finding that parent-child attachment cannot explain increased problem behavior in single parent families does not mean that lower quality of parent-child attachment cannot lead to increased problem behavior. This study focused on differences in the quality of parent-child attachment between two family types, not whether lower quality parent-child attachment relates to increased problem behavior. Furthermore, this study found lower father-child attachment compared to mother-child attachment. Also, father-child attachment appeared related to depressive symptoms of the father. Additional studies are needed to confirm this result and investigate why only father-child attachment may be affected. More research in risk factors and protective factors regarding the effect of parental depression might explain the results. Nonetheless, it shows that it is necessary to differentiate between mothers and fathers when comparing parent-child relationships between single parent families and non-separated families in order to prevent results from becoming too generalizing and to take into account the complex nature of family relationships. Furthermore, younger adolescents are possibly more at risk for lower quality of parent-child attachment due to separation of the parents (Scott et al., 2013). Also, parent-child

attachment seems to decrease in older adolescents. Comparing children or younger adolescents with older adolescents might reveal why children and young adolescents may be more at risk for lower quality of parent-child attachment. Such insights may reveal protective factors which, in practice, could be utilized to help families maintain a good parent-child attachment.

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