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Parental Divorce and Offspring Depressive Symptoms: Dutch Developmental Trends During Early Adolescence

*In this study, we investigated if the association between parental divorce and depressive symptoms changes during early adolescence and if developmental patterns are similar for boys and girls. Data were collected in a prospective population cohort of Dutch adolescents (*N = *2,149), aged 10 – 15 years. Outcome variables were self-reported and parent-reported depressive symptoms. The effects of divorce were adjusted for parental depression. In both self-reported and parent-reported data, we found a three-way interaction of gender, age, and parental divorce, indicating that with increasing age, parental divorce became more strongly associated with depressive symptoms among girls, but not boys. These results suggest that girls with divorced parents are at particularly high risk to develop depressive symptoms during adolescence.*

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Key Words: adolescence, depression, divorce, gender, longitudinal.

During the past four decades, parental divorce has become an increasingly common experience for children and adolescents in Western societies (Latten, 2004). Divorce is a multifaceted process. It implies the falling apart of the family, which is often a painful experience with possibly long-lasting consequences such as loss of income and diminished parenting (Cherlin, Chase-Lansdale, & McRae, 1998). In addition, children whose parents divorce are generally exposed to more conflict and bitterness than children who grow up in stable marriages. The association

between marital discord and divorce is far from straightforward, and the two have been found to interact to influence children's well-being (e.g., Hanson, 1999; Morrison & Coiro, 1999). In the present study, the aim was not to disentangle the effects of divorce and discord. Rather, we used parental divorce as a marker (with considerable intracategory variance) of family-related stressors and losses.

Evidence has mounted that parental divorce increases the probability of offspring depressive symptoms (e.g., Kelly, 2000; Strohschein, 2005). Girls and boys are equally likely to be confronted with parental divorce, but the depressogenic effect of this experience may be different for both genders. There is little evidence for such gender differences in childhood (Amato, 2001), but in adolescence, girls have been proposed to be more sensitive to parental discord than boys (Crawford, Cohen, Midlarsky, & Brook, 2001). Cyranowski, Frank, Young, and Shear (2000) developed a model explaining why interpersonal adversity may affect girls more than boys and why this gender difference may emerge only in adolescence. Briefly, the model postulates that, because of sociocultural and hormonal changes, girls' affiliative need (i.e., preference for close emotional relationships) intensifies during adolescence. In other words, compared to boys, girls become increasingly sensitive to interpersonal matters in this phase of life. This increase in affiliative need coincides with the adolescent shift from parental to peer/romantic attachments (Nelson, Leibenluft, McClure, & Pine, 2005). Peers and peer interactions become more important, and the amount of interpersonal stressors increases (Rudolph & Hammen, 1999), which may trigger latent vulnerabilities in the interpersonal domain. The combination of increased affiliative need with the adolescent transition from parents to peers is assumed to set the stage for the development of depressive symptoms in vulnerable girls (Hankin & Abramson, 2001). Parental divorce and related discord may impinge on abilities to engage in relationships in a confident and effective way (Cummings & Davies, 1994) and hence be a source of interpersonal vulnerability. In fact, Wallerstein and Corbin (1989) showed that girls from divorced parents were more likely to encounter relationship problems in adolescence and young adulthood than girls from intact families. Because of the combination of high exposure and high sensitivity to interpersonal stressors, we hypothesized that daughters of divorced parents would have rising levels of depressive symptoms during early adolescence. There was no reason to expect such an effect among boys; quite on the contrary, there are indications that boys become less sensitive to life stress in this phase of life (Angold, Worthman, & Costello, 1997).

Associations between parental discord and offspring depressive symptoms may be confounded by parental depression (O'Connor, Plomin, Caspi, & DeFries, 2000). Both the risk of marital breakdown and depressive symptoms are partially genetically influenced, either directly or through an adverse family environment (Rutter & Silberg, 2002). Moreover, the genetic contribution to depression has been found to be greater among adolescent girls than among boys or preadolescent girls (Jacobson & Rowe, 1999). Hence, parental depression could lead to spurious associations between parental divorce and offspring depression. To adjust for possible confounding, we included an index of parental depression in the analyses. Parental depression may not only cause divorce, but the opposite is possible as well (Johnson & Wu, 2002). In that case, including parental depression can lead to overadjustment of the effects of divorce. To avoid misleading conclusions in any direction, we analyzed the data both with and without accounting for parental depression.

The aim of this study was to test the hypothesis of emerging gender differences in the effects of parental divorce on depressive symptoms during early adolescence (age 10–15) in a large representative population sample of Dutch adolescents. We used both self-reported and parent-reported depression measures because each informant may perceive different aspects of problem behaviors (Kraemer et al., 2003) and be liable to specific response biases. Self-reported depressive symptoms may be biased because boys have a tendency to underreport such problems (Sigmon et al., 2005). On the other hand, parents' value as informants is limited because parent-offspring closeness and time spent together decrease during adolescence (Sourander, Helstelä, & Helenius, 1999). Furthermore, little is known about if and how a divorce affects parental reports of offspring mental health problems. Therefore, an additional goal was to examine to what extent associations were informant dependent.

To our knowledge, no study has yet compared girls with boys regarding developmental patterns of divorce-related depressive symptoms during early adolescence, despite the great opportunities

parental divorce offers to better understand gender-specific trajectories of risk of depression. Divorce is a relatively common experience, which is equally likely to occur among girls and boys. It is largely person independent. Furthermore, parental divorce can be a continuing source of mental health problems for years following the event (e.g., Cherlin et al., 1998). We examined if the association between parental divorce and depressive symptoms changed with increasing age and if developmental patterns were similar for boys and girls.

METHOD

Sample

The TRacking Adolescents' Individual Lives Survey (TRAILS) is a prospective cohort study of Dutch adolescents, with the aim to chart and explain the development of mental health from early adolescence into adulthood. The present study is based on data from the first (T1) and second (T2) assessment waves, which ran from, respectively, March 2001 to July 2002 and September 2003 to December 2004.

Sample selection involved two steps. First, five municipalities in the North of the Netherlands, including both urban and rural areas, were requested to give names and addresses of all inhabitants born between 10-01-1989 and 09-30-1990 (first two municipalities) or 10-01-1990 and 09-30-1991 (last three municipalities), yielding 3,483 names. Simultaneously, primary schools (including schools for special education) within these municipalities were requested to pass on students' lists, provide information about participants' behavior and performance at school, and allow class administration of questionnaires and individual tests at school. School participation was a prerequisite for eligible adolescents and their parents to be approached by the research staff, with the exception of adolescents already attending secondary schools (<1%), who were contacted without involving their schools. Of the 135 primary schools within the municipalities, 122 (90.4% of the schools accommodating 90.3% of the adolescents) agreed to participate in the study.

If schools agreed to participate, parents (or guardians) received two information brochures, one for themselves and one for their son or daughter, and a research staff member visited the school to inform eligible adolescents about the study. Shortly thereafter an interviewer contacted parents by telephone to give additional information, answer questions, and ask if they and their son or daughter were willing to participate in the study. Respondents with an unlisted telephone number were requested by mail to pass on their number. If they reacted neither to that letter nor to a reminder letter sent a few weeks later, staff members paid personal visits to their house. Parents who refused to participate were asked for permission to call back in 2 months to minimize the number of refusals due to temporary reasons. If both parents and adolescents agreed to participate, parental written informed consent was obtained after the procedures had been fully explained. Adolescents were excluded from the study if they were incapable of participating due to mental retardation or a serious physical illness or handicap or if no Dutch-speaking parent or parent surrogate was available and it was not feasible to administer any of the measurements in the parent's language. Of all adolescents approached for enrollment in the study ($N = 3{,}145$), 6.7% were excluded because of mental or physical incapability or language problems. Of the remaining 2,935 adolescents, 76.0% ($N = 2{,}230$, mean age = 11.09 years, $SD = 0.56$, 50.8% girls) were enrolled in the study. Responders and nonresponders did not differ with respect to the prevalence of teacher-rated problem behavior or regarding associations between sociodemographic variables and mental health outcomes (De Winter et al., 2005).

Of the 2,230 baseline participants, 96.4% ($N = 2{,}149$, 51.0% girls) participated in the first follow-up assessment (T2), which was held 2 to 3 years after T1 (mean number of months 29.44, $SD = 5.37$, range 16.69 – 48.06). Mean age at T2 was 13.56 years ($SD = 0.53$). We excluded adolescents of whom a biological parent had died before T1 ($n = 38$), adolescents who had always lived with a single parent ($n = 32$), and adolescents who lived with foster parents or other caregivers ($n = 8$). Furthermore, we excluded persons with missing mental health data from both informants (T1: $n = 3$, T2: $n = 55$), leaving 2,149 T1 cases and 2,016 T2 cases to be included in the analyses.

Measures

Data collection. At T1, well-trained interviewers visited one of the parents or guardians (preferably

the mother, 95.6%) at their homes to administer an interview covering a wide range of topics, including developmental history and parental psychiatric history. In addition, the parent was asked to fill out a self-report questionnaire. Children filled out questionnaires at school, in the classroom, under the supervision of one or more test assistants. Intelligence and a number of biological and neurocognitive variables were assessed individually. Teachers were asked to fill out a brief questionnaire for all study participants in their class. T2 involved only questionnaires for the adolescents, their parents, and their teachers. As in T1, the adolescents completed their questionnaires at school. Measures that were used in the present study are described more extensively below.

Parental divorce. Separation or divorce of the parents before T1 was assessed at the parent interview at T1; separation or divorce between T1 and T2 was assessed as part of a life events checklist administered at T2, filled out by the adolescent. Information on contact frequency with the nonresidential parent and remarriage/cohabitation of the residential parent was only available at T1.

Depressive symptoms. At T1 and T2, internalizing and externalizing problem behaviors were assessed by the Child Behavior Checklist (CBCL), one of the most commonly used parent-report questionnaires in current child and adolescent psychiatric research (Achenbach, 1991a). It contains a list of 120 behavioral and emotional problems, which parents can rate as 0 = *not true*, 1 = *somewhat or sometimes true*, or 2 = *very or often true* in the past 6 months. Adolescents filled out the self-report version of the CBCL, the Youth Self-Report (YSR; Achenbach, 1991b). The original, empirically derived, scales of these questionnaires did not distinguish between anxiety and depressive problems. To improve the correspondence with clinical diagnostic categories, Achenbach, Dumenci, and Rescorla (2003) constructed DSM-IV scales, based on expert ratings. The resulting Affective Problems scale consists of 13 items (α parent reports = 0.68 – 0.73, self-reports = 0.72 – 0.77) covering depressed mood, anhedonia, loss of energy, feelings of worthlessness and guilt, suicidal ideation, sleep problems, and eating problems. The scale has been found to correspond closely to DSM-IV Major Depressive Disorder (Van Lang, Ferdinand, Oldehinkel, Ormel, & Verhulst, 2005). Test-retest reliabilities of the DSM-IV scales are good (parent reports: $r = .88$; self-reports: $r = .79$; Achenbach et al., 2003).

Parental depression. Parental depression, anxiety, substance abuse, antisocial behavior, and psychosis were measured at T1 by means of the TRAILS Family History Interview. Each syndrome was introduced by a vignette describing its main symptoms, followed by a series of questions to assess lifetime occurrence, professional treatment, and medication use. The interview assessed both biological parents, using a single informant, typically the mother. Parents were assigned to any of the categories 0 = *(probably) no*, 1 = *(probably) yes*, or 2 = *(probably) yes and treatment and/or medication*. Lifetime prevalences of depression as assessed with the Family History Interview were comparable with those found in adult population samples in the Netherlands with a standardized diagnostic interview (Bijl, Ravelli, & Van Zessen, 1998), that is, 15.4% for males and 27.4% for females. If data were missing on one parent, the values were imputed by group means. An index for parental depression was calculated by adding the scores of both parents. The index ranged from 0 (63.2%) to 4.

Statistical Analysis

Missing items were dealt with by corrected-item-mean (CIM) imputation (Huisman, 2000), whereas missing data at the scale level (self-reports: T1 $n = 27$, T2 $n = 36$, parent reports: T1 $n = 136$, T2 $n = 192$) were handled by multiple imputation, using the ICE (Imputation by Chained Equations) approach available in the statistical package Stata (StataCorp, 2003). Given other variables in the data set, we created five data sets with imputed missing values, which were joined in subsequent analyses (Royston, 2005). A p value smaller than .05 was considered statistically significant.

At T1, the age of the sample ranged from 10 to 12 years, whereas the range was 12 to 15 years at T2. Hence, the pooled distribution of T1 and T2 covered all ages between 10 and 15 years, and we decided to analyze the data from both assessment waves jointly. Consequently, the majority of the adolescents were represented in the resulting data set twice: once with T1 data and once with T2 data. The fact that observations within

individuals are not independent was taken into account by using the cluster option of Stata.

We tested main and interaction effects of parental divorce, gender, and age, both adjusted and unadjusted for parental depression, on self-reported depressive symptoms by linear regression analysis, with standard errors adjusted for repeated (i.e., dependent) observations within individuals. Main effects were entered in the first step, two-way interactions in the second step, and the three-way interaction of parental divorce, gender, and age in the third step. Age was included as the actual age minus 10. By this transformation, the main effects of divorce and gender (which pertain to the group with age = 0), refer to 10 year olds instead of 0 year olds; otherwise it does not affect the results. Interactions were only maintained if statistically significant. In case of three-way interactions, all two-way interactions with the variables involved were included as well, regardless of their significance. This procedure was repeated with parent-reported depressive symptoms as the dependent variable. To facilitate the interpretation of the interaction effects, the divorce-, gender-, and age-specific estimated number of depressive symptoms were plotted in a series of graphs.

RESULTS

Descriptive statistics are presented in Table 1. None of the variables showed significant gender differences, except self-reported (YSR) depressive problems at T2, which were higher in girls. Self-reported problems were higher than parent-reported problems (CBCL).

In total, 518 (24.1%) adolescents experienced a parental divorce before T2, 450 before T1 and 68 between T1 and T2. The time lag between the divorce and the assessment was not significantly associated with depressive problems (p values $> .21$). Of all children with a divorce before T1, 17.7% had no contact with the nonresidential parent, 8.4% a few times per year, 35.6% a few times per month, and 38.3% weekly or more at T1. Usually, the nonresidential parent was the father; in only 5.8% did the mother live elsewhere. The residential parent had remarried or cohabited with another partner in 36.7% of the cases. Neither frequency of contact with the nonresidential parent nor remarriage/cohabitation of the residential parent were related to T1 self-reported (frequency of contact: $F_{3,395} = 0.47$, $p = .70$; remarriage/cohabitation: $F[1,435] = 1.74$, $p = .19$) or parent-reported depressive symptoms (frequency of contact: $F[3,370] = 2.44$, $p = .06$; remarriage/cohabitation: $F[1,405] = 0.43$, $p = .51$).

Table 2 shows the main and interaction effects of parental divorce, gender, and age on self-reported (YSR) and parent-reported (CBCL) depressive symptoms, adjusted for parental depression. These analyses were performed on the joint data set of T1 and T2, and missing data were handled by multiple imputation. Not adjusting for parental depression yielded largely similar effects, with slightly stronger effects of divorce and a slightly weaker divorce × gender interaction. Other regression coefficients differed less than .01 from the ones presented in Table 2 (data available upon request).

Table 1. *Descriptive Statistics of the Variables Used in This Study, Separately for Girls and Boys*

	Mean (*SD*) or %		Gender differences		
Variables	Girls	Boys	χ^2 / t	*df*	*p*
Age at T1	10.58 (0.64)	10.61 (0.64)	−1.03	2147	.30
Age at T2	13.07 (0.62)	13.05 (0.59)	0.57	2014	.57
Parental depression (range 0 – 4)	0.73 (1.13)	0.70 (1.10)	0.61	2019	.54
Parental divorce	25.0%	23.2%	0.98	1	.32
Age at the time of the divorce	6.34 (3.80)	5.84 (3.64)	1.46	467	.14
YSR Depressive Problems T1	3.89 (3.18)	3.69 (3.23)	1.47	2108	.14
YSR Depressive Problems T2	4.16 (3.75)	2.87 (2.77)	8.73	1900[a]	<.001
CBCL Depressive Problems T1	2.36 (2.47)	2.54 (2.60)	−1.56	1987	.12
CBCL Depressive Problems T2	1.98 (2.50)	1.90 (2.47)	0.71	1816	.47

Note: YSR = Youth Self-Report, CBCL = Child Behavior Checklist.

[a]Adjusted for unequal variances.

Table 2. *Summary of Regression Analyses for Variables Predicting Adolescents' Depressive Symptoms*

	Self-reported depressive symptoms (YSR)		Parent-reported depressive symptoms (CBCL)	
Predictors	*B*	*SE B*	*B*	*SE B*
Constant	3.53**	0.13	2.15**	0.10
Parental depression (0 – 4)	0.24**	0.06	0.46**	0.05
Divorce	0.50	0.31	0.77**	0.24
Gender (girls)	0.29	0.18	−0.12	0.14
Age	−0.29**	0.04	−0.19**	0.04
Divorce × Gender	−0.71	0.43	−0.33	0.35
Divorce × Age	−0.02	0.11	−0.14	0.09
Gender × Age	0.24**	0.07	0.01	0.05
Divorce × Gender × Age	0.37*	0.16	0.27*	0.13
R^{2a}	3.3%		6.4%	

Note: YSR = Youth Self-Report, CBCL = Child Behavior Checklist. Age was included as age − 10. Analysis of the combined data from T1 and T2 (total $N = 4{,}165$), adjusted for dependent observations within individuals.

[a]In the nonimputed data set.

*$p < .05$; **$p < .01$.

The results are graphically represented in Figure 1.

Despite some notable differences between the self-reported and parent-reported symptom scores, the three-way interaction of parental divorce, gender, and age was statistically significant for both measures and indicated that girls became increasingly sensitive to the effects of parental divorce during early adolescence. Self-reported depressive symptoms were not significantly related to divorce or gender at age 10. Between age 10 and age 15, the number of symptoms reported by boys decreased, regardless of parental divorce. For girls, the trend in reported depressive symptoms depended on whether or not they had experienced a parental divorce: Whereas the number of symptoms in girls without a divorce remained approximately constant across ages, a significant age-related rise was seen in girls who had experienced a divorce. With parent-reported depressive symptoms as the outcome variable, the age-related patterns for boys and girls without a divorce closely resembled each other. Boys with divorced parents had relatively many parent-reported depressive symptoms at age 10, but the effect of the divorce had disappeared at age 15. For girls who had experienced a divorce, the difference with girls without a divorce and the difference with boys increased between age 10 and age 15.

The statistical approach used (i.e., multiple imputation and effects adjusted for dependence of observations within the same person) did not yield indicators of effect size. In the nonimputed data set, the predictor variables explained 3.3% of the variance in the YSR scores and 6.4% of the variance of the CBCL scores.

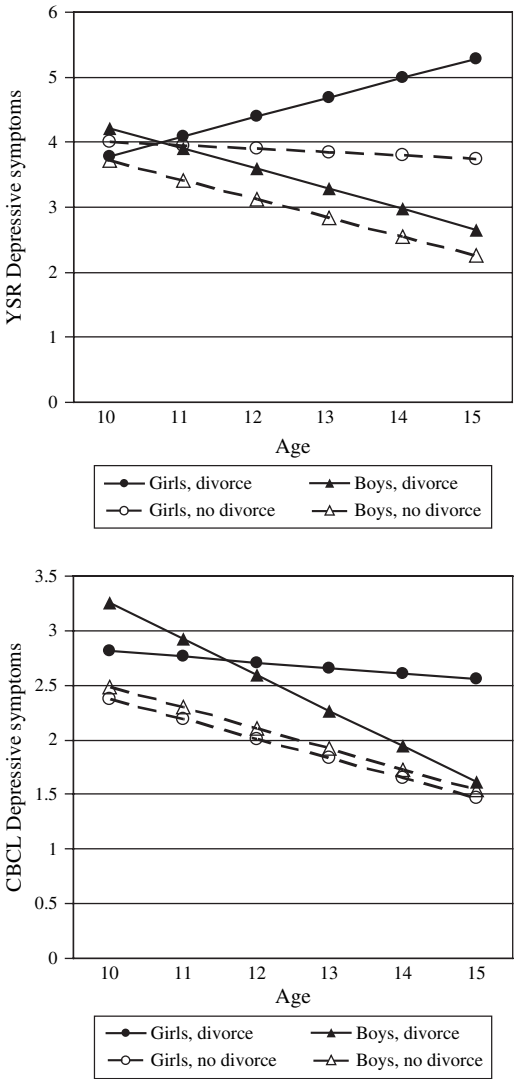
Discussion

The aim of this study was to test the hypothesis of emerging gender differences in the effects of parental divorce on depressive symptoms during early adolescence (age 10 – 15 years) in a large representative population sample of Dutch adolescents. Our findings indicated that parental divorce was more strongly associated with depressive symptoms in middle adolescent girls than in middle adolescent boys or early adolescents. This effect was found for both self-reported and parent-reported depressive symptoms.

Emerging Gender Differences in Early Adolescence

Although the effect of parental divorce was approximately similar for boys and girls at age 10, gender differences increased during adolescence. The association between divorce and boys' depressive symptoms was not modified by age, but girls became more sensitive to the depressogenic effect of divorce as they grew older. This result is even more remarkable in light of the finding that the mean number of girls' depressive

FIGURE 1. GRAPHICAL PRESENTATION OF THE INTERACTION OF PARENTAL DIVORCE, GENDER, AND AGE IN RELATION TO DEPRESSIVE SYMPTOMS.



symptoms hardly changed or even decreased (depending on the informant) between early and middle adolescence. In other words, the effect cannot be explained by floor effects (that is, no power to detect differences) at age 10.

Our findings contradict two previous studies on the association of parental divorce and adolescent depression (Aseltine, 1996; Fergusson, Horwood, & Lynskey, 1994), both of which did not find significant differences between boys and girls. Tentatively, this inconsistency might be due to our larger sample size or the fact that we did not adjust for family-related factors, such as the frequency of adverse events, but considered divorce as a marker of family-related stressors and losses. Our results are consistent with reports suggesting that the effect of stressful experiences on depression is greater among adolescent girls than among preadolescent girls or boys (e.g., Crawford et al., 2001; Rudolph & Hammen, 1999). The finding that gender differences in the effects of divorce became evident only in adolescence stresses the notion that the biological and sociocultural changes associated with this period of life impinge on girls differently than on boys. Our results further suggest that the rising incidence of depression in adolescent girls (e.g., Oldehinkel, Wittchen, & Schuster, 1999) is at least partly due to a heightened sensitivity to interpersonal events. This has been proposed to result from an increase in affiliative needs, fueled by social pressures to behave in a feminine way and puberty-related hormonal changes, for instance in levels of oxytocin (Cyranowski et al., 2000).

The time lag between the divorce and the time of measurement was not significantly associated with the amount of depressive symptoms. Wallerstein and Corbin (1989) also showed that consequences of parental divorces during childhood may be revealed only during the transitional phase of adolescence: Girls who initially adapted well after the divorce developed problems in relationships with men in adolescence. For daughters of divorced parents, the increase in interactions with peers and romantic affiliations in adolescence may trigger latent vulnerabilities in interpersonal conduct, rooted in the divorce or related factors, setting the stage for the development of depressive symptoms. The divergent trends in boys and girls could also be explained by putative differences in the relationship with the residential parent, which is usually the mother. Mother-daughter relationships have been reported to be closer than mother-son relationships (e.g., Surrey, 1991), especially in single-parent families (Dolgin, 1996), and girls' greater affiliative need may make them more empathetic and sensitive than boys to maternal affairs and distress.

Self-Reported Versus Parent-Reported Symptoms

It is well established that parents and adolescents can have different perceptions of adolescents'

mental health (Kraemer et al., 2003), but less is known about how parental divorce is related to the disparity between the two. Our results indicate that parent-reported differences between early adolescents with and without a divorce are larger than differences based on self-reports. Possibly, parents assume that their children are more affected by the divorce than they actually are, particularly when they are still relatively young.

Parents tend to become less aware of their child's behaviors and emotions during adolescence (Sourander et al., 1999). Although the age trends in self- and parent-reported symptoms are not directly comparable because parents reported considerably fewer problems than their offspring, it is remarkable that parent-reported symptoms increased less (or decreased more) than self-reported symptoms across age groups, particularly in girls, which could mean that parents become less aware of or attuned to their children's emotions indeed. An alternative, but not necessarily conflicting, explanation is that the self-reported depressive symptoms suffered age-related response biases due to changing role expectations.

Despite all differences between self- and parent-reported symptoms, the three-way interaction of divorce, gender, and age was significant in both. This suggests that the effect is fairly robust.

Strengths, Limitations, and Recommendations for Future Research

Our study has a number of important assets. To start with, it was based on a large longitudinal population sample of early adolescents and used multiple informants to assess depressive symptoms, which limits the influence of respondent-specific response biases. Furthermore, we adjusted for possible confounding by parental depression.

A limitation is the lack of clinical diagnoses. In early adolescence, the prevalence of DSM-IV major depressive disorder is still low, but subclinical depressive symptoms, which are manifest in a considerable proportion of the adolescents, are strongly predictive of later episodes of major depression (Pine, Cohen, Cohen, & Brook, 1999). Hence, we believe that an increase in depressive problems signifies a greater risk of (future) depressive disorder. Information about the onset of the depressive symptoms was missing as well, implying that we do not know whether the divorces preceded the depressive symptoms or vice versa. Reverse causality (i.e., offspring depressive symptoms preceding parental divorce) does not seem very likely, as we adjusted the effects for parental depression. Still, it is possible that parental divorce and offspring depression share other common causes, which inflated the associations between the two. However, although this could have led to an overestimation of the main effects of divorce, it is less likely to underlie the diverging trends in boys and girls found in our study.

It should be noted that the effects were small and call for replication in other samples. In addition, our results highlight areas that need further research. First, prospective studies in birth cohorts could help to investigate the causal direction of the divorce-depression link in greater depth. Second, research is called for that further explores mechanisms bringing about the increased risk of depression among daughters of divorced parents, for instance, if and how the divorce has led to altered coping strategies for interpersonal conflicts or unfavorable partner choices. Obviously, an intriguing question is if sons of divorced parents, who do not seem to have an increased risk of depressive problems, do experience similar relationship problems as daughters. In general, trying to find out why boys do *not* develop depressive symptoms after a parental divorce may turn out to be just as informative as studying why girls do.

NOTE

This research is part of the TRacking Adolescents' Individual Lives Survey (TRAILS). Participating centers of TRAILS include various departments of the University Medical Center and University of Groningen, the Erasmus University Medical Center Rotterdam, the University of Utrecht, the Radboud Medical Center Nijmegen, and the Trimbos Institute, all in the Netherlands. Principal investigators are J. Ormel (University Medical Center Groningen) and F.C. Verhulst (Erasmus University Medical Center). TRAILS has been financially supported by various grants from the Netherlands Organization for Scientific Research NWO (Medical Research Council program grant GB-MW 940-38-011; ZonMW Brainpower grant 100-001-004; ZonMw Risk Behavior and Dependence grant 60-60600-97-118; ZonMw Culture and Health grant 261-98-710; Social Sciences Council medium-sized investment grants GB-MaGW 480-01-006 and GB-MaGW 480-07-001; Social Sciences Council project grants GB-MaGW 457-03-018 and GB-MaGW 452-04-314; and NW0 large-sized investment grant 175.010.2003.005); the Sophia Foundation for Medical Research (projects 301 and 393); the Dutch Ministry of Justice (WODC); and the participating universities. We are grateful to all adolescents, their parents, and the teachers who participated in this research and to everyone who worked on this project and made it possible.

REFERENCES

Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/4 – 18 and 1991 profile*. Burlington, VT: University of Vermont.

Achenbach, T. M. (1991b). *Manual for the Youth Self-Report and 1991 profile*. Burlington, VT: University of Vermont.

Achenbach, T. M., Dumenci, L., & Rescorla, L. A. (2003). DSM-oriented and empirically based approaches to constructing scales from the same items pools. *Journal of Clinical Child and Adolescent Psychology*, *32*, 328 – 340.

Amato, P. R. (2001). Children of divorce in the 1990s: An update of the Amato and Keith (1991) meta-analysis. *Journal of Family Psychology*, *15*, 355 – 370.

Angold, A., Worthman C. M., & Costello, E. J. (1997, February). *Puberty and depression: A longitudinal epidemiological diagnostic study*. Presented at the Annual Meeting of the American Psychopathological Association, New York.

Aseltine, R. H. (1996). Pathways linking parental divorce with adolescent depression. *Journal of Health and Social Behavior*, *37*, 133 – 148.

Bijl, R. V., Ravelli, A., & Van Zessen, G. (1998). Prevalence of psychiatric disorder in the general population: Results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Social Psychiatry and Psychiatric Epidemiology*, *33*, 587 – 595.

Cherlin, A. J., Chase-Lansdale, P. L., & McRae, C. (1998). Effects of parental divorce on mental health throughout the life course. *American Sociological Review*, *63*, 239 – 249.

Crawford, T. N., Cohen, P., Midlarsky, E., & Brook, J. S. (2001). Internalizing symptoms in adolescents: Gender differences in vulnerability to parental distress and discord. *Journal of Research on Adolescence*, *11*, 95 – 118.

Cummings, E. M., & Davies, P. (1994). *Children and marital conflict: The impact of family dispute and resolution*. New York: Guilford Press.

Cyranowski, J. M., Frank, E., Young, E., & Shear, K. (2000). Adolescent onset of gender differences in lifetime rates of major depression. A theoretical model. *Archives of General Psychiatry*, *57*, 21 – 27.

De Winter, A. F., Oldehinkel, A. J., Veenstra, R., Brunnekreef, J. A., Verhulst, F. C., & Ormel, J. (2005). Evaluation of nonresponse bias in mental health determinants and outcomes in a large sample of preadolescents. *European Journal of Epidemiology*, *20*, 173 – 181.

Dolgin, K. G. (1996). Parents' disclosure of their own concerns to their adolescent children. *Personal Relationships*, *3*, 159 – 169.

Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1994). Parental separation, adolescent psychopathology, and problem behaviors. *Journal of the American Association of Child and Adolescent Psychiatry*, *33*, 1122 – 1131.

Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability-transactional stress theory. *Psychological Bulletin*, *127*, 773 – 796.

Hanson, T. L. (1999). Does parental conflict explain why divorce is negatively associated with child welfare? *Social Forces*, *77*, 1283 – 1316.

Huisman, M. (2000). Imputation of missing item responses: Some simple techniques. *Quality and Quantity*, *34*, 331 – 351.

Jacobson, K. C., & Rowe, D. C. (1999). Genetic and environmental influences on the relationships between family connectedness, school connectedness, and adolescent depressed mood: Sex differences. *Developmental Psychology*, *35*, 926 – 939.

Johnson, D. R., & Wu, J. (2002). An empirical test of crisis, social selection, and role explanations of the relationship between marital disruption and psychological distress: A pooled time-series analysis of four-wave panel data. *Journal of Marriage and Family*, *64*, 211 – 224.

Kelly, J. B. (2000). Children's adjustment in conflicted marriage and divorce: A decade review of research. *Journal of the American Academy of Child and Adolescent Psychiatry*, *39*, 963 – 973.

Kraemer, H. C., Measelle, J. R., Ablow, J. C., Essex, M. J., Boyce, W. T., & Kupfer, D. J. (2003). A new approach to integrating data from multiple informants in psychiatric assessment and research: Mixing and matching contexts and perspectives. *American Journal of Psychiatry*, *160*, 1566 – 1577.

Latten, J. (2004). Trends in samenwonen en trouwen. De schone schijn van burgerlijke staat [Trends in cohabitation and marriage. The appearances of civil state]. *CBS Bevolkingstrends*, *52*, 46 – 60.

Morrison, D. R., & Coiro, M. J. (1999). Parental conflict and marital disruption: Do children benefit when high-conflict marriages are dissolved? *Journal of Marriage and the Family*, *61*, 626 – 637.

Nelson, E. E., Leibenluft, E., McClure, E. B., & Pine, D. S. (2005). The social re-orientation of adolescence: A neuroscience perspective on the process and its relation to psychopathology. *Psychological Medicine*, *35*, 163 – 174.

O'Connor, T. G., Plomin, R., Caspi, A., & DeFries, J. C. (2000). Are associations between parental

divorce and children's adjustment genetically mediated? An adoption study. *Developmental Psychology*, *36*, 429 – 437.

Oldehinkel, A. J., Wittchen, H.-U., & Schuster, P. (1999). Prevalence, 20-month incidence and outcome of unipolar depressive disorders in a community sample of adolescents. *Psychological Medicine*, *29*, 655 – 668.

Pine, D. S., Cohen, E., Cohen, P., & Brook, J. (1999). Adolescent depressive symptoms as predictors of adult depression: Moodiness or mood disorder? *American Journal of Psychiatry*, *156*, 133 – 135.

Royston, P. (2005). Multiple imputation of missing values: Update. *The Stata Journal*, *5*(2), 1 – 14.

Rudolph, K. D., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development*, *70*, 660 – 677.

Rutter, M., & Silberg, J. (2002). Gene-environment interplay in relation to emotional and behavioral disturbance. *Annual Review of Psychology*, *53*, 463 – 490.

Sigmon, S. T., Pells, J. J., Boulard, N. E., Whitcomb-Smith, S., Edenfield, T. M., Hermann, B. A., et al. (2005). Gender differences in self-reports of depression: The response bias hypothesis revisited. *Sex Roles*, *53*, 401 – 411.

Sourander, A., Helstelä, L., & Helenius H. (1999). Parent-adolescent agreement on emotional and behavioral problems. *Social Psychiatry and Psychiatric Epidemiology*, *34*, 657 – 663.

StataCorp (2003). *Stata statistical software: Release 8.0*. College Station, TX: Stata Corporation.

Strohschein, L. (2005). Parental divorce and child mental health trajectories. *Journal of Marriage and Family*, *67*, 1286 – 1300.

Surrey, J. L. (1991). The "self-in-relation": A theory of women's development. In J. V. Jordan, A. G. Kaplan, J. B. Miller, I. P. Stiver, & J. L. Surrey (Eds.), *Women's growth in connection* (pp. 51 – 66). New York: Guilford Press.

Van Lang, N. D. J., Ferdinand, R. F., Oldehinkel, A. J., Ormel, J., & Verhulst, F. C. (2005). Validity of the DSM-IV scales Affective Problems and Anxiety Problems of the Youth Self-Report. *Behaviour Research and Therapy*, *43*, 1485 – 1494.

Wallerstein, J. S., & Corbin, S. B. (1989). Daughters of divorce: Report from a ten-year follow-up. *American Journal of Orthopsychiatry*, *59*, 593 – 604.