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Adult mental health and social outcomes of adolescent girls with depression and conduct disorder

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Abstract
Follow-up studies of adolescent depression and conduct disorder have pointed to homotypic continuity, but less information exists about outcomes beyond mental disorders and about the extent to which adolescents with different disorders experience different versus similar difficulties during the transition to adulthood. We assessed the continuity of adolescent disorder by following girls in a complete birth cohort who at age 15 were depressed (n = 27), conduct disordered (n = 37), or without a mental health disorder (n = 341) into young adulthood (age 21) to identify their outcomes in three domains: mental health and illegal behavior, human capital, and relationship and family formation. We found homotypic continuity; in general, depressed girls became depressed women and conduct disordered girls developed antisocial personality disorder symptoms by age 21. Conduct disorder exclusively predicted at age 21: antisocial personality disorder, substance dependence, illegal behavior, dependence on multiple welfare sources, early home leaving, multiple cohabitation partners, and physical partner violence. Depression exclusively predicted depression at age 21. Examples of equifinality (where alternate pathways lead to the same outcome) surfaced, as both adolescent disorders predicted at age 21: anxiety disorder, multiple drug use, early school leaving, low school attainment, any cohabitation, pregnancy, and early child bearing.

Thirty years ago, the most common diagnosis given adolescents in outpatient clinics was "transient situational disorder" (Rutter, Graham, Chadwick, & Yule, 1976); their psychiatric concerns were not given much prognostic weight. Later research has acknowledged that a mental disorder in adolescence has potentially long-term effects on adult mental health. What is less clear is to what degree a mental disorder in adolescence influences the adult life course beyond mental health, and if different adolescent disorders have different outcomes in adulthood. The goal of this study is to extend our knowledge of the continuity

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of adolescent disorder by following girls, who at age 15 were depressed or conduct disordered, into young adulthood (age 21) to identify their outcomes in the domains of mental health and illegal behavior, human capital, and relationship and family formation.

To tap both *homotypic continuity,* which refers to the continuity of similar behaviors or phenotypic attributes over time (e.g., depression at Time 1 predicts depression at Time 2), and *heterotypic continuity,* which refers to the continuity of an inferred genotypic attribute presumed to underlie diverse phenotypic behaviors (e.g., depression at Time 1 predicts school underachievement at Time 2; Kagan, 1969), we examined, in addition to mental health outcomes, a series of measures that reflect the developmental tasks of the transition to adulthood.

By following up two differently disordered adolescent populations, we set the stage to address the question about differential outcomes. Is the principle of *equifinality* (Cicchetti & Cohen, 1995) in effect, whereby different disorders at Time 1 lead to the same outcome at Time 2? That is, does adolescent psychopathology, regardless of its specific form (depression or conduct disorder), predict similar mental health and social outcomes in adulthood? Or, is there differential *specific continuity,* whereby different disorders at Time 1 lead to different outcomes at Time 2? That is, do depressed girls follow pathways that lead to adult outcomes different from those of conduct disordered girls?

We studied the young women enrolled in the Dunedin Multidisciplinary Health and Development Study. The outcomes of boys in this birth cohort have been widely reported (Moffitt, 1990; Moffitt, Lynam, & Silva, 1994; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996), but this is among the few reports to focus exclusively on the girls (Caspi, Lynam, Moffitt, & Silva, 1993). Because women, as mothers of future generations, may play a critical role in the intergenerational transmission of poor mental health and social functioning, it is important to understand the extent of continuity of adolescent psychopathology into young womanhood (Downey & Coyne, 1990; Sameroff & Chandler, 1975).

Adolescent Depression and Conduct Disorder

We elected to study depression and conduct disorder for several reasons. While anxiety disorders tend to be the most prevalent in childhood and early adolescence, epidemiological studies of psychiatric disorders show that this prevalence tends to diminish after puberty (Costello, 1989) when there are increased rates of conduct disorder for both boys and girls and increased rates (more than double preadolescent rates) of depression for girls. Prevalence studies of nonclinical samples have found anxiety disorders, conduct disorder, and depression to be the most common in adolescence (Kashani et al., 1987; McGee et al., 1990). Thus, although conduct disorder and depression may not be the most prevalent adolescent disorders, they are consistently among the most common ones. Furthermore, conduct disorder and depression are often considered to be the most crippling adolescent disorders for future adjustment. As an ultimate measure of the potentially devastating nature of these disorders, Andrews and Lewinsohn (1992) found that female adolescent suicide attempts occur in conjunction with depression and disruptive behavior disorders, but not with anxiety disorders.

Follow-up studies of adolescent depression

Petersen et al. (1993) reported average prevalence rates for adolescent clinical depression of 42% across 6 clinical studies and 7% across 14 nonclinical studies. Longitudinal studies of depression, primarily with clinical samples, have consistently found that depressed children and adolescents are at high risk for subsequent depression (Garber, Kriss, Koch, & Lindholm, 1988; Harrington, Fudge, Rutter, Pickles, & Hill, 1990; Kandel & Davies, 1986; Kovacs, Feinberg, Crouse–Novak, Paulauskas, & Finkelstein, 1984; Rao et al., 1995). However, depressed girls seem to be at no greater risk than nondepressed psychiatric comparison groups for nonaffective disorders such as substance abuse and anxiety (Garber et al., 1988; Harrington et al., 1990).

Some studies have looked beyond mental

health outcomes to outcomes of social adjustment. Results show that depressed children and adolescents are more likely than comparison groups to have dropped out of school (Kandel & Davies, 1986), to have become a parent (Rao et al., 1995), and to have been involved in delinquent activities (Kandel & Davies, 1986), and less likely to have well-adjusted interpersonal relations with parents and partners/spouses (Garber et al., 1988; Kandel & Davies, 1986). More research is needed to evaluate the hypothesis that "once in a depressed trajectory in development, an individual becomes more likely to stay on this course because of the tendency to both alienate and withdraw from the very social supports that can minimize negative effects" (Petersen et al., 1993, p. 161).

Follow-up studies of adolescent conduct disorder

Conduct disorder is likewise a disorder of concern for adolescent girls, with prevalence rates ranging from 4 to 9.2% (Cohen, Cohen, & Brook, 1993; Zoccolillo, 1993). Some studies of adolescent conduct disorder report that conduct problems are much more common in boys (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993); others report few gender differences (Kashani et al., 1987; McGee et al., 1991). The few longitudinal studies of conduct disordered girls report that these girls are at risk for the externalizing disorders of antisocial personality disorder (ASPD), alcohol abuse/dependence, and drug abuse/dependence (Robins, 1966, 1986; Robins & Price, 1991; Zoccolillo, Pickles, Quinton, & Rutter, 1992). Conduct disordered girls also seem to be at risk for internalizing disorders (Robins, 1986; Robins & Price, 1991).

Studies looking beyond mental health outcomes to outcomes of social adjustment report that adolescent conduct disorder predicts arrests (Robins, 1986), poor interpersonal relations with partners/spouses and peers (Robins, 1986; Robins & Price, 1991), use of social services (Robins & Price, 1991), early pregnancy (Robins & Price, 1991; Zoccolillo & Rogers, 1991), contacts with the legal system (Zoccolillo & Rogers, 1991), and "pervasive social maladaptation" across multiple life domains (Zoccolillo et al., 1992). However, the dearth of studies of conduct disordered girls leaves unclear the extent of continuity of their antisocial behavior into adulthood.

Methodological advantages of this study

The design of the Dunedin study offers five methodological advantages for research into long-term outcomes of girls who were depressed or conduct disordered in adolescence. First, as an epidemiological investigation of a complete birth cohort, this study includes both individuals who have and have not received treatment for their mental disorders. Like the Kandel and Davies (1986) study of depression and the Epidemiological Catchment Area (ECA) studies (Robins, 1986; Robins & Price, 1991), this sample avoids the biases inherent in clinical samples, which tend to overrepresent more impaired and comorbid cases, as well as cases of longer duration, thus limiting generalizability. Attributing the characteristics and course of clinical patients to the entire population with the disorder is misleading (Cohen & Cohen, 1984).

Second, the epidemiological sampling frame of this study provided us with both psychiatric comparison groups (like the clinical studies, e.g., Harrington et al. (1990), Kovacs et al. (1984), Garber et al. (1988)) and a nonpsychiatric comparison group (like Rao et al., 1995). Psychiatric comparison groups are essential to addressing issues of equifinality and specificity in the continuity of psychopathology. Moreover, in the current study, the nondisordered comparison group, like the depressed and conduct disordered groups, was representative of the distribution in the population, allowing for valid group comparisons (Mednick, 1978).

Third, this study used *DSM* criteria to define cases. This design element is shared by many studies of conduct disorder but only some studies of depression. Different definitions of caseness can yield different results. For example, three commonly used, but different, conceptualizations of depression are: *depressed mood* (feelings of sadness and un-

happiness), *depressed syndrome* (a constellation of behaviors and emotions that form a pattern), and *depressed disorder* (a disease model with strict criteria of presence, duration, and severity of symptoms, along with evidence of distress and impaired functioning; Petersen et al., 1993). Because there is an imperfect association between the (generally arbitrary and sample-specific) cut-offs for depressed mood or depressed syndrome and the diagnosis of a depressed disorder, it is difficult to compare findings across different studies. Although we recognize that meeting criteria for a *DSM* diagnosis is also somewhat arbitrarily defined, it is a widely accepted and agreed-upon standard, permitting cross-study comparisons.

Fourth, like Kovacs et al. (1984), Rao et al. (1995), and Zoccolillo and Rogers (1991), this study uses a longitudinal, prospective design. By avoiding retrospective recall, this study minimizes forgetting and distortion, and prevents contamination from having subjects report on predictor and outcome measures at the same point in time (Henry, Moffitt, Caspi, Langley, & Silva, 1994). By using standardized diagnostic interviews, this study also provides greater confidence in diagnoses than studies which use retrospective rediagnosis of clinical charts, because retrospective diagnoses are constrained by the completeness of charted information.

Fifth, like the studies of Harrington, Fudge, Rutter, Pickles, and Hill (1991), Garber et al. (1988), Kandel and Davies (1986), Rao et al. (1995), Zoccolillo and Rogers (1991), Zoccolillo et al. (1992), and Robins (1986), this study examines multiple outcomes in adulthood. While the homotypic continuity of adolescent depression and conduct disorder has been well-established, Harrington (1989) has called for longitudinal studies to "go beyond the search for continuity of discrete . . . symptomatology and consider the broader aspects of links between early patterns of behavior and later forms of dysfunction" (p. 21). Zoccolillo et al. (1992) stressed the importance of this multiple-outcome approach as potentially providing an explanation for the apparent discontinuity between conduct disorder in childhood and ASPD in adulthood; that is, while nearly all adults with ASPD had conduct disorder, only about one-third of conduct disordered children will be diagnosed with ASPD (Robins, 1978). Zoccolillo proposed that using ASPD as the sole outcome measure of conduct disorder fails to capture other maladaptive behaviors and poor social outcomes in adulthood that are sequelae of conduct disorder in childhood, especially for women whose low base rates of criminal activity preclude their meeting the criminal criteria of an ASPD diagnosis.

In this study, we adopt a life-course perspective to examine the changing, but coherent, expressions of adolescent disorder across the social-developmental transition into young adulthood (Caspi, Bem, & Elder, 1989). The changes during the 6-year interval between the predictor (age 15) and outcome (age 21) periods describe women's transition from dependents in their family of origin to relatively independent social and economic individuals. The outcome measures we chose reflect events and roles that are part of this transition: *mental health and illegal behavior, human capital,* and *relationship and family formation.*

Study questions

In summary, this study extends the investigation of continuity of adolescent depression and conduct disorder into young adulthood. The data were examined to answer four questions of continuity: (1) Is there homotypic continuity of mental disorder from adolescence to adulthood? That is, do depressed girls become depressed women and conduct disordered girls become women with antisocial personality disorder? (2) Is there heterotypic continuity from mental disorder in adolescence to other outcomes in adulthood? That is, does depression (or conduct disorder) in girls predict conceptually related behaviors that are not symptoms of mental disorder? To answer this question, we broadened our outcome base beyond mental health to include domains illustrative of the social roles confronted in young adulthood: illegal behavior, human capital, and relationship and family

formation. (3) What kind of equifinality occurs from adolescent mental disorders to adult outcomes? That is, do both depressed girls and conduct disordered girls share common outcomes in adulthood? (4) What kind of specific continuity occurs from adolescent mental disorders to adult outcomes? That is, do depressed girls and conduct disordered girls follow distinct pathways to arrive at different outcomes in adulthood?

Method

Sample

Subjects for this follow-up study were members of a complete birth cohort that has been studied extensively since birth in the Dunedin Multidisciplinary Health and Development Study. The sample and the history of the study have been described in detail by Silva (1990). Briefly, the study is a longitudinal investigation of the health, development, and behavior of children born between April 1, 1972 and March 31, 1973 in Dunedin, New Zealand, a city of about 120,000. Perinatal data were obtained at delivery. When the children were later traced for follow-up at age 3, 1037 (91% of the eligible births) participated in the assessment, forming the base sample for the longitudinal study. With regard to social origins, the children's fathers were representative of the social class distribution in the general population of similar age in New Zealand. With regard to racial distribution, the sample members are of predominantly European ancestry. Fewer than 7% identify themselves as Maori or Polynesian, which matches the ethnic distribution of New Zealand's South Island where Dunedin is located.

Recent cross-national comparisons lend confidence to the generalizability of findings about social problems from the Dunedin study to other industrialized countries (e.g., Moffitt, Caspi, Silva, & Stouthamer–Loeber, 1995). With respect to substance abuse and psychiatric disorders (Costello, 1989; Kessler et al., 1994; Newman et al., 1996), self-reported delinquency (Junger–Tas, Terlouw, & Klein, 1994), crime victimization (van Dijk & Mayhew, 1992), and family violence (Magdol et al., in press), rates in New Zealand are comparable to rates in other industrialized countries, including the United States.

The Dunedin sample has been assessed with a diverse battery of psychological, medical, and sociological measures at ages 3, 5, 7, 9, 11, 13, 15, 18, and 21. The basic procedure for data collection in the Dunedin study involves bringing each sample member into the research unit within 60 days of his or her birthday for a full day in which various research topics are presented as standardized modules (e.g., mental health interview, Life History Calendar, delinquency interview, social relationships interview, physical examination) by different trained examiners in counterbalanced order throughout the day. The sample members have repeatedly reported to us sensitive topics such a their sexual behavior, illegal behavior, substance abuse, and symptoms of mental disorders. Because there has never been a violation of confidentiality, this sample has become unusually willing to provide frank reports.

This study used data from age 15 (diagnoses of mental disorder) and age 21 (diagnoses of mental disorder, illegal behavior, human capital, and relationship and family formation). In the age 15 follow-up in 1987–88, mental health data were collected for 461 girls (92% of the original cohort of girls). In the age 21 follow-up in 1993–94, data were collected for 470 girls (94% of the original cohort of girls).

Measures of mental health at age 15

Mental health data at age 15 were collected in private interviews using a modified version of the Diagnostic Interview Schedule for Children (DISC-C; Costello, Edelbrock, Kalas, Kessler, & Klaric, 1982). The modifications, psychometric properties, and descriptive epidemiology of the DISC-C in this sample have been described by McGee et al. (1990). Using a reporting period of the past year, the mental health interview at age 15 assessed DSM-III depressive disorders, aggressive and nonaggressive conduct disorder, and oppositional disorder, among other disorders. None of the girls from our sample met the criteria for ag-

gressive disorder at age 15; hereafter, nonaggressive conduct disorder will be referred to simply as conduct disorder.

The girls who, at age 15, met criteria for a depressive disorder, a conduct disorder, or no disorder made up the three groups for this study.[1] Ten girls met criteria for both depression and conduct disorder at age 15, but this was too few for acceptable statistical power. For six girls, depression was clearly the primary disorder, as the girls met only the minimal criteria for conduct disorder (an average of 36% of the highest possible score on a scale of conduct disorder symptoms), but reported extensive symptoms of depression (an average of 72% of the highest possible score on a scale of depression symptoms). These six girls were assigned to the depressed group. This left four girls who were comorbid for depression and conduct disorder and who could not be readily assigned to a primary disorder group. Because this group was too small for reliable study, its data will not be reported here.

The *depression disorder group* ($n = 27$) included all cases of major depressive episode or dysthymia (of which nine were comorbid with anxiety alone, three were comorbid with anxiety and attention deficit disorder, three were comorbid with anxiety and conduct disorder, and three were comorbid with conduct disorder alone). Although including the six girls comorbid for depression and conduct disorder in the depressed group blurs the distinction between comparison groups somewhat, this should exert a conservative influence on our ability to detect outcome differences between the depressed and conduct disordered groups. The *conduct disorder group* ($n = 37$) included all cases of conduct disorder or oppositional disorder (of which one was comorbid with attention deficit disorder and one was comorbid with anxiety). As a *healthy control group* we used the 341 girls who were not diagnosed with any disorder at age 15. In all, 405 girls (of the 461 girls with mental health data at age 15), with either no disorder, a depression disorder, or a conduct disorder, made up the sample for our analyses.

Outcome Measures at Age 21

Measures of mental health and illegal behavior at age 21

Mental health data at age 21 were also collected in private interviews, but at phase 21 a modified version of the Diagnostic Interview Schedule (DIS) (Robins, Helzer, Cottler, & Goldring, 1989) was used. The modifications, psychometric properties, and descriptive epidemiology of the DIS in this sample are described in detail in Newman et al. (1996). Using a reporting period of the past year, the mental health interview at age 21 assessed DSM-III-R disorders including anxiety disorders, mood disorders, substance dependence disorders, and ASPD.

By summating disorders we arrived at a measure of *any disorder*. We also created three groups of disordered study members at age 21: (1) a *depression disorder* group, comprising study members diagnosed with major depressive episode and/or dysthymia; (2) an *anxiety disorder* group, comprising study members diagnosed with any of the following: generalized anxiety disorder, panic disorder, agoraphobia, social phobia, simple phobia, and obsessive–compulsive disorder; and (3) a *substance dependence disorder* group, comprising study members diagnosed with alcohol dependence and/or marijuana dependence. In addition to substance dependence, the number of different types of drugs (excluding alcohol and nicotine) that the respondent used in the past year was recorded via a self-report checklist. This record of *multiple drug use* included marijuana, opiates, stimulants, sedative-hypnotics, and psychedelics.

In addition to the discrete categories pro-

1. Our three groups of adolescent girls varied somewhat by race ($p = .02$), with conduct disordered girls claiming more non-European ancestry, but they did not differ significantly by social class as measured by parental socioeconomic status both at the sample member's birth and at age 15 (*p*s of .13 and .76, respectively). The three groups also did not differ significantly by IQ ($p = .27$) as measured by the Wechsler Intelligence Scale for Children-Revised at age 11.

duced by diagnosed disorders, continuous measures were obtained from the DIS by recording study members' scores on scales of symptom items relevant to each of the following disorders: depression, anxiety, alcohol dependence, marijuana dependence, and ASPD. Because only three women met the criteria for ASPD, only the continuous measure of ASPD symptoms was analyzed.

A measure of illegal behavior was obtained using the standardized survey instrument of *self-report of illegal behavior* developed by Elliott and Huizinga (1989). This instrument, administered during private individual interviews, inquired about 43 different offenses. The psychometric properties and descriptive epidemiology of this instrument in the Dunedin sample are described in detail by Moffitt, Silva, Lynam, & Henry (1994). The score recorded for each study member represents the variety of different offenses committed in the past year.

Measures of human capital by age 21

Measures of human capital by age 21 were obtained in the realms of education, work, and welfare dependence. We used two outcome variables to index high school educational attainment. One measure of educational attainment, *age at leaving school,* came from the Life History Calendar (LHC), which is also the source of several other variables in this outcome study. The LHC is a large gird on which life pathways (e.g., education) are represented as rows, while the columns of the grid denote time units (months) during which events may have occurred (e.g., ending of high school education). The result is continuous, monthly information about life pathways and transition events occurring between each sample member's 15th birthday and age 21 interview. Methodological studies have found that retrospective LHC data are very reliable (Caspi et al., 1996; Freedman, Thornton, Camburn, Alwin, & Young–DeMarco, 1988).

The other measure of educational attainment came from the subject's self-report of *high school attainment,* using a 5-point scale appropriate for the New Zealand school system. This scale ranged from leaving school with no school qualification (did not "sit" the school certificate examinations, which are taken at approximately age 15) to sitting the examinations for the prestigious University Bursaries Entrance Scholarship for university study. By age 21, all study members had left high school, so this measure of attainment was their *final* level of high school attainment.

With respect to work, we used three outcome variables. The measure of *occupational status* of current or most recent job came from a 6-point scale designed for New Zealand occupations (Elley & Irving, 1972), ranging from 1 (professional) to 6 (unskilled labor). For a subjective index of employment quality at the current or most recent job, the *number of opportunities for development at the workplace* came from items of perceived opportunity from Jencks, Perman, and Rainwater's (1988) survey of job characteristics. The *number of months of post-secondary unemployment* (when the study member wanted to work but was neither employed nor enrolled full-time in a school or training program) came from the LHC.

Also under the category of human capital, welfare dependence was measured with subjects' reports of the types of governmental income support they had received in the past year, including family support, accident compensation payments, domestic purposes benefit, unemployment benefit, and sickness or invalid's benefit. Summation of welfare sources used resulted in measures of *any welfare assistance* and *multiple sources of welfare assistance.*

Measures of relationship and family formation by age 21

To chart the transition of sample members from their family of origin toward a family of procreation, we used six outcome variables. The *age at first leaving home* (for one month or more) variable came from the LHC. Most of the women (81% of the sample) had left home by age 21. In computing mean ages at leaving home, we assigned sample members who had not left home by age 21 the value of 22. From the LHC we also obtained social

role change measures of *any cohabitation, multiple (i.e., different) cohabitation partners, marriage,* and *child bearing.* A study member was considered to have cohabited if she lived, for a month or more, with a partner in an intimate but unmarried relationship. In a separate interview about health, women sample members where asked if they had ever been *pregnant* (Dickson, Paul, & Herbison, 1993).

To study the conditions of early relationships, we used the Conflict Tactics Scale (CTS; Straus, 1990) to assess one ultimate measure of a poor relationship: *physical partner violence.* The psychometric properties and descriptive epidemiology of the CTS in the Dunedin sample are described in detail in Magdol et al. (in press). Briefly, study members were asked if during the past year they had been victimized by the following behaviors in a dating, cohabiting, or marital relationship: thrown object at, pushed/grabbed/shoved, slapped, kicked/bitten/hit with fist, hit with object, beaten up, choked/strangled, threatened with knife/gun, used knife/gun. Because of the cyclical nature of violence, we also asked if they had perpetrated any of the above behaviors in their relationships with their partners in the past year. Following previous research (Straus, 1990), an individual was considered to have been victimized by physical partner violence if she had any of the nine construct-relevant behaviors done to her in the past year. Similarly, an individual was considered to have been a perpetrator of physical partner violence if she reported engaging in any of the nine construct-relevant behaviors during the past year. This approach allowed us to identify women who were in mutually violent relationships; that is, women who reported being both victims and perpetrators of physical partner violence.

Results

The longitudinal follow-up results are presented in three sections corresponding to the domains of mental health and illegal behavior, human capital, and relationship and family formation. Table 1 displays the prevalence rates for the age 21 outcomes in each domain.

Mental health and illegal behavior

The prevalence of mental disorder among 21-year-old women in the Dunedin sample showed that women who were depressed or conduct disordered at age 15 were overrepresented in the population of young women who met criteria for any of the DSM-III-R disorders assessed at age 21 ($\chi^2(2) = 14.69$, $p < .001$). To assess the strength of the association between mental health status at age 15 and mental health status at age 21, we calculated relative risk ratios. Depressed girls were 3.5 times more likely ($p < .01$[2], with a 95% confidence interval (CI) of 1.45 to 8.42) to have a mental disorder at age 21 than healthy controls. Conduct disordered girls were 2.6 times more likely ($p < .01$, CI: 1.28 to 5.14) to have a mental disorder at age 21 than healthy controls. Depressed girls and conduct disordered girls did not differ significantly in their likelihood of having a mental disorder at age 21.

Depression. Consideration of the prevalence of specific DSM-III-R disorders at age 21 revealed significant differences between the adolescent groups with respect to age 21 depression ($\chi^2(2) = 14.02$, $p < .001$). Girls who were depressed at age 15 were 4.5 times more likely ($p < .001$, CI: 1.93 to 10.49) to have a depressive disorder at age 21 than healthy controls, and 3.5 times more likely ($p < .05$, CI: 1.18 to 10.67) than conduct disordered girls. Conduct disordered girls and healthy controls did not differ significantly in their likelihood of having a depressive disorder at age 21. To further explore the relation between adolescent disorder and age 21 depression, we compared scores on the scale of depression symptoms derived from the DIS. Analysis of variance revealed a significant main effect, $F(2, 381) = 14.93$, $p < .001$. Follow-up comparisons using the Tukey procedure showed that, at age 21, depressed girls ($M = 19.13$, $SD = 14.17$) had significantly

2. In describing pairwise comparisons of qualitative data, the significance of the Pearson χ^2 statistic is reported except when the expected value of any cell in the contingency table falls below five, in which case we report the more conservative significance value derived from the Fisher's exact test.

Table 1. *Prevalence rates for healthy, depressed, and conduct disordered adolescent girls in their age 21 outcomes*

Age 21 Outcome	Age 15 Diagnosis: No Disorder ($n = 341$)	Depressed ($n = 27$)	Conduct Disordered ($n = 37$)	χ^2
Mental health and illegal behavior (%)				
Any mental disorder	36.4	66.7	59.5	14.69***
Depression	20.8	54.2	25.0	14.02***
Anxiety	20.9	54.2	41.7	19.14***
Substance dependence	7.0	12.5	22.2	9.78**
Multiple drug use	5.8	16.7	29.7	26.13***
Human capital (%)				
No school certificate	6.0	26.9	19.4	19.51***
University bursaries scholarship exam	33.1	19.2	8.3	11.06**
Any welfare dependence	34.7	53.8	45.9	5.19+
Multiple sources of welfare	8.0	7.7	24.3	10.42**
Relationship and family formation (%)				
Any cohabitation	39.6	62.5	78.4	23.46***
Multiple cohabitation partners	6.7	12.5	27.0	17.15***
Pregnancy	18.1	34.8	47.1	17.55***
Child bearing	8.3	19.2	29.7	17.55***
Partner violence victim	23.1	29.2	48.6	10.89**
Mutually violent relationship	17.8	25.0	45.7	15.15***

$+p < .10$; $*p < .05$; $**p < .01$; $***p < .001$.

higher depression scores than both conduct disordered girls ($M = 11.14$, $SD = 14.63$) and healthy controls ($M = 7.32$, $SD = 9.85$). Conduct disordered girls and healthy controls did not differ significantly in their depression scores at age 21.

Anxiety. There were also significant differences between the adolescent groups with respect to age 21 anxiety ($\chi^2(2) = 19.14$, $p < .001$). Depressed girls were 4.5 times more likely ($p < .001$, CI: 1.92 to 10.41) to have an anxiety disorder at age 21 than healthy controls. Conduct disordered girls were 2.7 times more likely ($p < .01$, CI: 1.32 to 5.52) to have an anxiety disorder at age 21 than healthy controls. Depressed girls and conduct disordered girls did not differ significantly in their likelihood of having an anxiety disorder at age 21. Analysis of variance of the adolescent groups' scores on the anxiety scale derived from the DIS revealed a significant main effect, $F(2, 386) = 4.45$, $p < .05$. Follow-up comparisons showed that, at age 21, depressed girls ($M = 5.91$, $SD = 7.90$) had significantly higher anxiety scores than healthy controls ($M = 2.66$, $SD = 5.19$), but their scores did not differ from those of conduct disordered girls ($M = 4.08$, $SD = 6.95$). Conduct disordered girls and healthy controls did not differ significantly in their anxiety scores at age 21.

Substance dependence. There were significant differences between the adolescent groups with respect to age-21 substance dependence (alcohol and/or marijuana) ($\chi^2(2) = 9.78$, $p < .01$). Conduct disordered girls were 3.8 times more likely ($p < .01$, CI: 1.55 to 9.22) to have a substance dependence disorder at age 21 than healthy controls. Neither conduct disordered girls and depressed girls nor depressed girls and healthy controls differed significantly in their likelihood of having a substance dependence disorder. To further explore the relation between adolescent disorder and age 21 substance dependence, we compared scores on the alcohol dependence scale and the marijuana dependence scale, both derived from the DIS. Analysis of variance of scores on the alcohol dependence scale at age 21 revealed a significant main effect, $F(2,$

379) = 3.93, $p < .05$. However, follow-up comparisons at age 21 yielded no statistically significant pairwise differences between depressed girls ($M = 6.71$, $SD = 9.53$), conduct disordered girls ($M = 5.72$, $SD = 5.91$), and healthy controls ($M = 3.81$, $SD = 5.68$). Analysis of variance of scores on the marijuana dependence scale at age 21 also revealed a significant main effect, $F(2, 383) = 4.43$, $p < .05$. Follow-up comparisons at age 21 showed that conduct disordered girls ($M = 2.74$, $SD = 4.95$) had significantly higher marijuana dependence scores than healthy controls ($M = .93$, $SD = 3.66$), but their scores did not differ significantly from those of depressed girls ($M = 2.42$, $SD = 6.54$). Depressed girls and healthy controls did not differ significantly in their marijuana dependence scores.

There were also significant differences between the adolescent groups in multiple drug use in the year before the age 21 interview ($\chi^2(2) = 26.13$, $p < .001$). Conduct disordered girls were 6.9 times more likely ($p < .001$, CI: 2.98 to 16.1) to have engaged in multiple drug use at age 21 than healthy controls. Depressed girls were marginally more likely ($p = .06$) to have engaged in multiple drug use than healthy controls. Conduct disordered girls and depressed girls did not differ significantly in their likelihood of having engaged in multiple drug use at age 21.

Antisocial behavior. Comparison of group scores on an ASPD symptom scale based on DSM-III-R criteria revealed a significant main effect, $F(2, 388) = 39.39$, $p < .001$. Follow-up comparisons showed that, at age 21, conduct disordered girls ($M = 2.46$, $SD = 1.52$) had significantly higher ASPD scores than both depressed girls ($M = 1.54$, $SD = 1.35$) and healthy controls ($M = .94$, $SD = .92$). Depressed girls also had significantly higher ASPD scores than healthy controls at age 21.

In addition to having higher ASPD scores, conduct disordered girls also engaged in more illegal behaviors. Analysis of variance of the adolescent groups' scores on the self-report of illegal behavior scale at age 21 revealed a significant main effect, $F(2, 387) = 27.29$, $p < .001$. Follow-up comparisons showed that, at age 21, conduct disordered girls ($M = 6.59$, $SD = 4.86$) had significantly higher self-reported illegal behavior scores than both depressed girls ($M = 3.96$, $SD = 3.26$) and healthy controls ($M = 2.89$, $SD = 2.60$). Depressed girls and healthy controls did not differ significantly in their self-reported illegal behavior scores at age 21.

Human capital

Education. To explore the relation between adolescent disorder and high school educational attainment, we examined age at leaving school and high school level attained by age 21. Analysis of variance of the age at leaving high school for the three adolescent groups revealed a significant main effect, $F(2, 397) = 15.38$, $p < .001$. Follow-up comparisons showed that conduct disordered girls ($M = 16.8$ years, $SD = 1.08$) left school significantly earlier than healthy controls ($M = 17.6$ years, $SD = .87$), but not significantly earlier than depressed girls ($M = 17.1$ years, $SD = 1.16$). Depressed girls also left school significantly earlier than healthy controls.

An educational disparity emerged between adolescent groups with respect to *minimum* high school qualification; that is, obtaining a New Zealand school certificate ($\chi^2(2) = 19.51$, $p < .001$). Depressed girls were 5.8 times more likely ($p < .01$, CI: 2.18 to 15.42) to have no school certificate than healthy controls. Conduct disordered girls were 3.8 times more likely ($p < .01$, CI: 1.48 to 9.74) to have no school certificate than healthy controls. Depressed girls and conduct disordered girls did not differ significantly in their likelihood of having no school certificate.

There were also significant differences between the adolescent groups with respect to *maximum* high school achievement, that is, "sitting" the examinations for the University Bursaries Entrance Scholarship ($\chi^2(2) = 11.06$, $p < .01$). Healthy controls were 5.5 times more likely ($p < .01$, CI: 1.64 to 18.16) to sit the University Bursaries exams than conduct disordered girls. Neither conduct disordered girls and depressed girls nor depressed girls and healthy controls differed sig-

nificantly in their likelihood of sitting the University Bursaries exams.

Work and social welfare dependence. Analyses of variance of variables in the work domain revealed no significant differences between the three adolescent groups in terms of the perceived number of opportunities for development at the workplace, the number of months of post-secondary unemployment, or the socioeconomic status of their current or most recent jobs at age 21. Because students in tertiary education (e.g., university, polytechnic institutes) often report that their most recent job is a low-status, temporary job (e.g., waitressing), we performed the occupational status analyses again using only nonstudents (69% of the sample); the differences remained nonsignificant.

The prevalence of welfare dependence, a measure of cost to society, among the women in the sample showed marginal differences between adolescent groups with respect to whether or not they sought any social welfare assistance in the year before their age 21 interview ($\chi^2(2) = 5.19$, $p = .07$). However, there were significant differences between adolescent groups with respect to whether or not they had received social welfare assistance from multiple sources ($\chi^2(2) = 10.42$, $p = .01$). Conduct disordered girls were 3.7 times more likely ($p < .01$, CI: 1.58 to 8.62) to have used two or more sources of social welfare assistance than healthy controls. Conduct disordered girls were also more likely to use multiple sources of social welfare assistance than depressed girls, but this difference failed to achieve statistical significance ($p = .11$) because of low power. Depressed girls and healthy controls did not differ significantly in their likelihood of having used multiple sources of welfare assistance at age 21.

Relationship and family formation

Family life. Analyses of variance of the age at first leaving home of the three adolescent groups revealed a significant main effect, $F(2, 397) = 7.76$, $p < .001$. Follow-up comparisons showed that conduct disordered girls ($M = 17.7$ years, $SD = 1.67$) left home significantly earlier than healthy controls ($M = 19.0$ years, $SD = 2.04$), but not significantly earlier than depressed girls ($M = 18.8$, $SD = 2.28$). Depressed girls and healthy controls did not differ significantly in their ages at leaving the parental home.

Many of the women who left home became involved in relationships of cohabitation or marriage. In this sample, by age 21, 45% had cohabited but only 5% had married, the latter group being too small to compare across diagnostic groups. There were significant differences between the adolescent groups with respect to cohabitation (living with a partner in an intimate but unmarried relationship) by age 21 ($\chi^2(2) = 23.46$, $p < .001$). Conduct disordered girls were 5.5 times more likely ($p < .001$, CI: 2.45 to 12.45) to have cohabited by age 21 than healthy controls. Depressed girls were 2.5 times more likely ($p < .05$, CI: 1.08 to 5.97) to have cohabited by age 21 than healthy controls. Conduct disordered girls and depressed girls did not differ significantly in their likelihood of having cohabited by age 21. There were also significant differences between adolescent groups with respect to whether or not they had multiple (two or more) cohabitation partners by age 21 ($\chi^2(2) = 17.15$, $p < .001$). Conduct disordered girls were 5.2 times more likely ($p < .001$, CI: 2.21 to 11.99) to have cohabited with multiple partners by age 21 than healthy controls. Neither conduct disordered girls and depressed girls nor depressed girls and healthy controls differed significantly in their likelihood of having cohabited with multiple partners by age 21.

In this sample, 22% had been pregnant by age 21; the distribution of pregnancies revealed significant differences between adolescent groups ($\chi^2(2) = 17.55$, $p < .001$). Girls who were conduct disordered at age 15 were 4.0 times more likely ($p < .001$, CI: 1.94 to 8.37) to have been pregnant by age 21 than healthy controls. Depressed girls were marginally more likely ($p = .05$) to have been pregnant than healthy controls. Conduct disordered girls and depressed girls did not differ significantly in their likelihood of pregnancy by age 21.

In this sample, 11% had borne a child by

age 21; the distribution of childbirths revealed significant differences between adolescent groups ($\chi^2(2) = 17.55$, $p < .001$). Conduct disordered girls were 4.7 times more likely ($p < .001$, CI: 2.09 to 10.43) to have at least one child by age 21 than healthy controls. Depressed girls were marginally more likely ($p = .07$) to have at least one child than healthy controls. Conduct disordered girls and depressed girls did not differ significantly in their likelihood of having a child by age 21.

Physical partner violence. Consideration of the prevalence of physical partner violence in these women's relationships at age 21 revealed significant differences between adolescent groups with respect to victimization at the hands of a partner in the year before their age 21 interview ($\chi^2(2) = 10.89$, $p < .01$). Conduct disordered girls were 3.1 times more likely ($p < .01$, CI: 1.50 to 6.40) to have been victims of partner violence at age 21 than healthy controls. Neither conduct disordered girls and depressed girls nor depressed girls and healthy controls differed significantly in their likelihood of having been victimized by physical partner violence at age 21. There were also significant differences between adolescent groups with respect to mutual physical partner violence in the year before their age 21 interview ($\chi^2(2) = 15.15$, $p < .001$). Conduct disordered girls were 3.9 times more likely ($p < .001$, CI: 1.88 to 7.99) to have been in a mutually violent relationship in the past year than healthy controls. Neither conduct disordered girls and depressed girls nor depressed girls and healthy controls differed significantly in their likelihood of having been in mutually violent relationships in the past year.

Accumulation of adverse outcomes

A cumulative index of adverse problems from age 15 to 21 yields a summary idea of pervasive maladaptation, as presented in Figure 1. From a list of 10 adverse adult outcomes including depressive disorder, anxiety disorder, antisocial personality disorder, substance dependence disorder, multiple drug use, no high school certification, multiple welfare sources, multiple cohabitation partners, early pregnancy (age 18 or younger), and physical partner violence victimization, we see significantly different profiles for the three adolescent groups, $F(2, 362) = 27.40$, $p < .001$. Healthy girls had on average 1.1 such problems, with a range of 0 to 7 adverse outcomes, depressed girls had on average 2.3 such problems with a range of 0 to 6, and conduct disordered girls had on average 2.7 such problems with a range of 0 to 8. Only 12.1% of the conduct disordered girls and 13.0% of the depressed girls escaped all negative outcomes, as compared to 43.7% of the healthy girls.

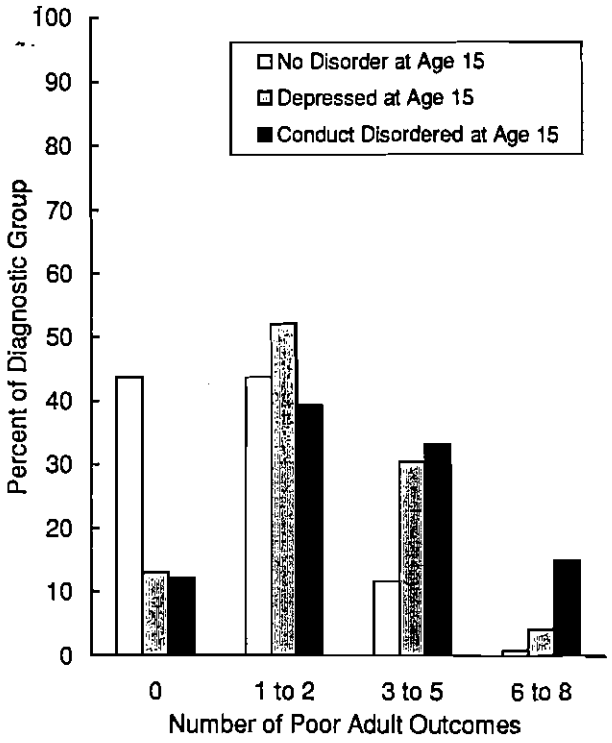

Figure 1. Comparison of the three diagnostic adolescent groups on a cumulative index of poor adult outcomes, including diagnoses of depression, anxiety, antisocial personality, or substance dependence, multiple drug use, no high school certification, multiple welfare sources, multiple cohabitation partners, early pregnancy (age 18 or younger), and victimization by a physically violent partner.

Discussion

The results from this study address four questions about the continuity of mental disorder from adolescence to adulthood. First, we found evidence of homotypic continuity. Depressed girls were significantly more likely to be diagnosed with depression at age 21 than were conduct disordered or healthy girls, whereas conduct disordered girls had elevated ASPD symptomatology relative to depressed

and healthy girls. These findings agree with those from past research (Garber et al., 1988; Harrington et al., 1990; Kandel & Davies, 1986; Kovacs et al., 1984; Rao et al., 1995; Robins, 1966; Robins & Price, 1991; Zoccolillo et al., 1992).

Second, we found evidence of heterotypic continuity. Conceptual ties can be argued between depression and its adult outcomes of early school leaving, low educational attainment, early cohabitation, early child bearing, and multiple drug use. For example, the continuity of depressive features such as diminished interest, inability to concentrate, low self-esteem, and fatigue likely played a role in depressed girls' truncated education. For depressed girls, early cohabitation may be an attempt to feel wanted and connected to others. Similarly, Kandel and Davies (1986) suggest that having "children may represent an attempt by depressed young women to increase their sense of connectedness to and intimacy with others in their social network" (p. 261). Multiple drug use may be an attempt at self-medication to escape from depression.

Likewise, conceptual ties can be argued between conduct disorder and its heterotypic adult outcomes of early school leaving, low educational attainment, early home leaving, multiple cohabitation partners, early pregnancy, early child bearing, and violent victimization by a partner, none of which are diagnostic criteria for conduct disorder. For example, the continuity of conduct disorder features such as rule violation, deceitfulness, and defiant behavior likely curtailed conduct disordered girls' education. The conduct disorder pattern of violating age-appropriate social norms is reflected in their early home leaving, early and multiple cohabitations, early pregnancy, and early child bearing. Some conduct disordered girls left home as early as 15, lived with as many as four different men before age 21, and had more than one baby. The delinquency and drug use that can characterize conduct disorder may have put them in contact with older males who were themselves delinquent and antisocial (Stattin & Magnusson, 1990), thus making conduct disordered girls more vulnerable to violent partnerships. Past research has found similar outcomes for conduct disordered youth in the domains of education (Zoccolillo & Rogers, 1991) and child bearing (Robins & Price, 1991; Zoccolillo & Rogers, 1991).

In addition, we found support for both equifinality and specific continuity. Evidence of equifinality supports the hypothesis that adolescent psychopathology, in general, portends poor adjustment in adulthood. Both depressed and conduct disordered girls were more likely to have some type of mental disorder by age 21, and they shared high rates of anxiety disorder and multiple drug use relative to healthy controls. By age 21, both depressed girls and conduct disordered girls were more likely to lose out in formal education, to have cohabited, to have been pregnant, and to have borne a child than healthy controls.

The evidence of specific continuity supports the hypothesis that different adolescent disorders are uniquely associated with different adult outcomes. In this sample, adolescent depression, but not conduct disorder, predicted an outcome of adult depression, whereas adolescent conduct disorder, but not depression, was associated with elevated ASPD symptomatology, substance dependence, and law breaking. Conduct disordered girls were also uniquely more likely to have not taken the University Bursary exam, to have left their family home early, to depend on several welfare sources, to have lived with more than one partner, and to have been in a physically violent relationship.

To further synthesize the outcome results for the depressed and conduct disordered girls, we present vignettes describing the events and their timing in the typical progression from adolescence to adulthood of the girls with no disorder, depression, or conduct disorder at age 15, as well as the implications of these events.

Healthy girls

Healthy girls appeared to adjust to adulthood successfully. About one third of the healthy girls had developed a mental disorder at age 21, which is consistent with the incidence rate of new disorders after age 15 (Newman et al., 1996). However, healthy 15-year-olds were not overrepresented in any specific DSM-III-R disorder at age 21. Despite strengths in educational attainment, most held jobs at a

"skilled laborer" level at age 21. However, this socioeconomic level is normative for 21-year-olds who are relative newcomers to the work force and, in some cases, completing tertiary education. When healthy girls received governmental financial support, they rarely relied on more than one source. In the relationship realm, about 40% cohabited with a partner, but it was rare for healthy girls to have lived with more than one man or to have borne a child by age 21. In their relationships of the past year, about one fourth reported that they had been a victim of physical partner violence, which, sadly, can be considered a low rate for young women their age in both New Zealand and the United States (Magdol et al., in press). In their mental health, education, work, and social lives, our healthy 15-year-olds seem to well represent normative adjustment to contemporary young adulthood.

Depressed girls

Depressed girls had poor outcomes in the domain of mental health. About two thirds of them still had a mental disorder at age 21 (most commonly a depressive disorder), a prevalence rate that far exceeds what would be expected from epidemiological studies. Although few met full diagnostic criteria for substance dependence, their scores on a continuous measure of substance dependence symptoms suggested alcohol concerns. Schooling outcomes were also poor, with about one fourth of the depressed girls having left school without the minimum school certificate. Like the healthy girls, they held jobs at a "skilled laborer" level and rarely relied on multiple welfare sources. Thus, although their economic situation was not markedly poor at age 21, their early educational disadvantages may hurt their economic futures by limiting their advancement toward higher status jobs.

One fifth of the depressed girls had borne a child, leaving these depressed women with small incomes from entry-level jobs to support their families. Coupled with the fact that these young mothers have high rates of depression and anxiety, early motherhood raises concerns about their parenting of their children.[3] Downey and Coyne's (1990) review of children of depressed parents reports that these children have higher rates of general adjustment problems, which have been hypothesized as markers of risk for depression, thus potentially beginning a cycle of intergenerational transmission. Observational studies indicate that depressed mothers' parenting differs from that of control mothers in ways that may affect children's social development and adjustment. Compared with other mothers, depressed mothers have constricted behavior and affective expression, flat speech, heightened levels of child-directed hostility and negativity, and coercive rather than negotiative parenting styles. Although it is clear that depressed mothers have parenting difficulties and that their children suffer psychological consequences, the connection between these two observations needs to be further explored to account for "contextual factors that might produce spurious relations between the parenting provided by depressed persons and their children's difficulties" (Downey & Coyne, 1990, p. 72). Contextual factors of anxiety, low education, and potential economic stress are all seen in the lives of this study's depressed girls and may, along with depression, contribute to poor parenting. We thus found maternal depression to be embedded in a wider matrix of risk factors.

Conduct disordered girls

Conduct disordered girls, like the depressed girls, had poor outcomes in the domain of mental health, but they had the most diverse and serious adjustment problems in adulthood. About two thirds of the conduct disordered girls had some mental disorder at age 21. About one fifth were dependent on alcohol or marijuana, and one third had tried a variety of illicit drugs. Unlike the healthy and depressed girls, they had pronounced antisocial behavior, as reflected in both ASPD symptomatology and self-reported illegal behavior. Conduct disordered girls also had

3. Examination of the Life History Calendar showed that 98% of young mothers in this sample were rearing their children.

minimal success in schooling, most leaving school before their 17th birthday. Fewer than one tenth of them attempted the University Bursary exams. At age 21, conduct disordered girls' jobs did not differ in status from those of healthy girls but, like the depressed girls, their limited education will likely preclude their attainment of higher status jobs.

The implications of low-status employment are different for the conduct disordered girls than for the healthy girls, given conduct disordered girls' concomitant problems of early motherhood. That conduct disordered girls will likely remain in low-status, low-income jobs due to their weak educational base is problematic because by age 21 about one third of them had already borne a child. More than half of these young mothers had their baby before age 18. Lamb and Elster (1983) report that adolescent mothers tend to engage in less appropriate forms of stimulation and care (e.g., be less responsive, use more physical and fewer verbal exchanges) for their infants than older mothers, and that psychological immaturity, lack of parenting skills, lack of knowledge about child development, and economic stress likely all play a role in the poor quality of premature parenting. This broader context of research on early parenting gives cause for concern about the lives of conduct disordered mothers in our sample and their children.

Quinton, Pickles, Maughan, and Rutter (1993) found that one way conduct disordered girls can "turn around" their lives is through the help of a supportive partner. Unfortunately, especially for those with babies, few of our conduct disordered girls seem to have found supportive, stable partners, as attested by their high rates of dependence on multiple welfare sources and their multiple cohabitations. Furthermore, about one half of the conduct disordered girls have been hit or otherwise physically hurt by a partner. Physical partner violence, while harmful to its victims, might also place the children in such households in danger and set the stage for the intergenerational transmission of violence (Cicchetti & Rizley, 1981; Widom, 1989). Thus, the follow-up picture of conduct disordered girls is distressing, as evidenced by their accumulation of adverse outcomes (see Figure 1). We found many of our conduct disordered girls to be ill-educated, in low-income jobs, with children to support, and with partners who were non-existent, unsupportive, or physically abusive.

Limitations of this study

First, this study was limited by exclusive reliance on self-report measures. Although the Dunedin sample members have grown accustomed to answering questions on sensitive issues without breach of confidentiality, thus increasing our confidence in their frank responses, future studies might seek information from multiple sources. Second, the epidemiological design of this study, while offering advantages of generalizability, also presented some problems due to comorbidity and limited power. One disadvantage was the differential comorbidity in our adolescent groups. Eighteen of the 27 depressed girls were comorbid with a nondepressive DSM-III disorder (mainly anxiety), while only two of the 37 conduct disordered girls were comorbid with another disorder. Since comorbid cases are often more impaired (Cohen & Cohen, 1984), it is possible that the two groups represent not only a difference in type of disorder, but also a difference in severity. Because we described the patterns of disorder as they existed naturally in an unselected birth cohort in the general population, we had to contend with the relative rarity of pure depression.[4] Another

4. In further analyses we divided the depressed group into two subgroups, those with pure depression ($n = 9$) and those comorbid with another disorder ($n = 18$). Using the presence or absence of comorbidity with depression as the independent variable, analysis of variance and χ^2 analyses were performed with the mental health and illegal behavior, human capital, and relationship and family formation outcomes as dependent variables. There were no significant differences between the pure and comorbid depressed groups at outcome. While this reassures us that the presence of comorbidity in the depressed group does not make it an atypical representation of adolescent depression, we recognize that the small groups sizes in this follow-up analysis restricted power to detect differences. Nonetheless, the fact that 15 of 18 comorbid depressed girls were comorbid with anxiety, which like depression is an internalizing disorder, helps to explain why the pure and comorbid depression groups did not differ significantly.

problem derived from our epidemiological design involved the difficulty of finding significant differences between the depressed and conduct disordered girls because of the overlap in the depressed group (some depressed girls had conduct disorder) and the limited power due to the small sizes of the two groups; nonetheless, some group differences were detectable. Because the depression/conduct disorder overlap exists in nature, manipulation to obtain pure groups would be contrived. To solve the problem of low power due to small group size without limiting generalizability, subjects could be drawn from a larger birth cohort.[5]

Implications for research methods and intervention

By going "beyond the search for continuity of discrete . . . symptomatology" as Harrington (1989) suggested, we captured a more complete picture of the connection between adolescent mental disorder and behavior in young adulthood. Only three women met ASPD criteria, which implies that Zoccolillo et al. (1992) were correct in proposing that using ASPD as the sole outcome measure of conduct disorder overlooks other maladaptive behaviors that are conceptually related to conduct disorder. Inclusion of a variety of social outcomes in future research is necessary to fully understand the extent of continuity of mental disorder across time.

The existence of both equifinality and specific continuity in the lives of these young women has implications for prevention. Preventive programs should include, for both depressed and conduct disordered girls, plans for preventing early school leaving and early pregnancy, since these are shared outcomes. However, specificity findings suggest that depressed girls should be specifically targeted to prevent future depression, while programs for conduct disordered girls should be more broadly tailored to address their propensity for future illegal behavior, substance dependence, multiple cohabitation partners, and violent relationships.

Although our equifinality findings point to many common outcomes from general adolescent psychopathology, they imply nothing about the paths leading to the shared outcome. It is important not to confuse similar outcomes with similar processes. For example, while both depressed and conduct disordered girls left school earlier than healthy controls, they likely did so by different routes. The depressed girl might progressively withdraw from classroom activity and peer relations and might lack the energy, interest, and ability to concentrate that would keep her in school. The conduct disordered girl, on the other hand, might be a chronic truant and rule violator; when she is in school she might be so unruly and disruptive and have such a poor academic record that she is eventually asked to leave (Cairns & Cairns, 1994). Similarity in alcohol dependence symptoms may also result from different routes. While the depressed girl might drink alcohol in secret as self-medication, the context of alcohol consumption for a conduct disordered girl is likely to include social and risk-taking features.

This study suggests that adolescents diagnosed with a mental disorder are at substantial risk for serious problems during the transition to adulthood that may persist into their futures. Our study should not be taken to imply that conduct disorder and depression are *causes* of the young adulthood outcomes we studied. Rather, the value of these findings is that they show that conduct disorder and depression are readily observable *markers* that signal risk for a rocky transition to adulthood. One way to address the causal question would be to use intervention as an experimental tool by treating adolescent conduct disorder and depression and then following up to ascertain

5. Consider the case of multiple welfare sources, where the difference between conduct disordered and depressed girls is the same as the difference between conduct disordered and healthy girls, but only the conduct disorder-healthy comparison achieved significance. A power analysis performed with an effect size of 0.2 (the effect size for the conduct disorder-depression comparison on multiple welfare source use) showed that an initial sample of 1360 girls would be needed to achieve adequate power to obtain a statistically significant difference between the conduct disordered and depressed girls on the outcome variable of multiple welfare source use.

whether life outcomes were improved (Kellam, Rebok, Mayer, Ialongo, & Kalodner, 1994). Left unaddressed by our study is the third variable question. That is, what developmental processes produced conduct disorder and depression in adolescent girls in the first place, and are these processes responsible for both the adolescent disorder and poor adult adjustment? Research on the origins of adolescent conduct disorder and depression can inform prevention (McMahon, 1994; Ollendick & King, 1994). If many of the depressed adolescents become depressed young adults, and if many of the conduct disordered adolescents engage in antisocial behavior as young adults, then we need to take such adolescent cases seriously. Rather than hand wave adolescent disorders away as "transient," the consequential nature of these disorders underscores the critical need for early intervention.

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