Psychological Medicine, 1997, **27**, 371–381.

The effects of unemployment on psychiatric illness during young adulthood

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ABSTRACT

Background. The aims of this study were to examine the associations between exposure to unemployment following school leaving and rates of psychiatric disorder using data gathered on a birth cohort of New Zealand young people studied up to the age of 18.

Methods. At age 18 cohort members were assessed on: (*a*) duration of exposure to unemployment from age 16; (*b*) DSM-IV diagnostic criteria for major depression, anxiety disorders, conduct disorder, nicotine dependence, other substance abuse/dependence and attempted suicide. This information was integrated into longitudinal data gathered on the social circumstances, family background and adjustment of the cohort up to the age of 18.

Results. Increasing exposure to unemployment was associated with increasing risks of psychiatric disorder in adolescence. Those exposed to 6 months or more unemployment had rates of disorder that were 1·5 to 5·4 times higher than those not exposed to unemployment. However, most of the elevated risk of disorder among those unemployed was explained by family and personal factors that were present prior to school leaving age. Nonetheless, even after control for these factors those exposed to unemployment had significantly higher rates of anxiety disorder and substance use disorders.

Conclusions. To a large extent the relationships between unemployment and psychiatric disorder seen in this cohort were explained by social, family and personal factors that were present before school leaving age. Nonetheless, young people exposed to unemployment had higher rates of substance use and anxiety disorder.

INTRODUCTION

There has been a large amount of research into the associations between unemployment and health outcomes including psychiatric disorder and crime (for reviews of this evidence see Platt, 1984; Warr, 1987; Forcier, 1988; Ezzy, 1993; Hammarstrom, 1994). In general, it has been found that rates of offending, psychiatric disorder and adjustment problems are higher among the unemployed people and this clearly raises the possibility that unemployment acts as a risk factor that increases individual vulnerability to risks of adjustment problems. However, the extent to which there are direct cause and effect relationships between unemployment and psychopathology remains controversial (Kagan, 1987; Rutter & Smith, 1995). For example, in a recent study of changing trends in psychiatric disorders in young people over the last 50 years, Rutter & Smith (1995) concluded that it was unlikely that changing employment patterns explained changes in rates of disorder. The principal ground on which they drew this conclusion was that rates of disorder had shown their largest increases during periods of declining unemployment and rising affluence.

While Rutter & Smith's (1995) findings show that, at a population level, changes in unemployment do not appear to have any clear

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relationships with levels of psychopathology, it could, nonetheless, be argued that at an individual level, unemployment may increase individual risks of, or predispositions to, psychopathology (Platt, 1984; Warr, 1987; Forcier, 1988; Ezzy, 1993; Hammarstrom, 1994). However, a major threat to the validity of this conclusion comes from the possibility that associations between unemployment and individual adjustment may reflect the fact that those who are predisposed to adjustment problems may be more likely to be unemployed rather than unemployment being a cause of adjustment problems. The best way to examine this issue is clearly to employ a longitudinal design in which the adjustment of individuals before and after exposure to unemployment is examined to determine the extent to which exposure to unemployment increases individual risk.

In general, longitudinal studies have shown that unemployment is associated with increased risks of psychological problems (Stafford *et al*., 1980; Banks & Jackson, 1982; Patton & Noller, 1984; Tiggeman & Winefield, 1984; Hammarstrom *et al*. 1988; Hammarstrom, 1990; Winefield & Tiggeman, 1990; Graetz, 1993; Morrell *et al*. 1994), substance use behaviours (Layne & Whitehead, 1985; Peck & Plant, 1986; Power & Estaugh, 1990; Janlert & Hammarstrom, 1992) and juvenile offending (West & Farrington, 1977; Farrington *et al*. 1986) when due allowance is made for characteristics measured prior to the onset of unemployment. For example, Farrington *et al*. (1986) examined the relationships between unemployment experiences and juvenile crime in a cohort of 400 British males. They found that unemployment was associated with increased rates of property crimes and suggested that these crimes were committed to gain income over periods of unemployment.

While evidence from longitudinal research tends to suggest that unemployment may be associated with increased risks of psychopathology and adjustment problems in young people, the possibility remains that these associations may reflect pre-existing individual, social and other characteristics that are associated with both increased rates of unemployment and increased risks of adjustment problems.

Against this background this paper reports on the results of an 18 year longitudinal study of the relationships between unemployment following school-leaving and risks of psychiatric disorders including mood disorders, anxiety disorders, conduct disorders, substance use disorders and suicidal behaviours. In this study, extensive family, individual and childhood data was gathered prior to the minimum age of school-leaving (16 years) and this makes it possible to examine the extent to which unemployment and psychiatric disorder were associated when due allowance was made for social, family and individual factors that were antecedent to the onset of the individual's first experiences of unemployment. The aims of the present study were: (*i*) to document the associations between first exposure to unemployment and risks of psychiatric disorders during the period from 16 to 18 years; (*ii*) to examine the extent to which risks of unemployment were related to individual, childhood and family factors prior to school leaving age; and (*iii*) to estimate the associations between unemployment and risks of psychiatric disorder taking into account prospectively measured childhood and family factors to determine the extent to which unemployment and risks of disorder were related after such adjustment.

METHOD

The data reported here were collected during the course of the Christchurch Health and Development Study. The Christchurch Health and Development Study is a longitudinal study of a birth cohort of 1265 children born in the Christchurch (New Zealand) urban region during mid-1977. These children have been studied at birth, 4 months, then at annual intervals up to the age of 16 years and again at age 18 years. An overview of the study design has been given previously (Fergusson *et al*. 1989). The data analysed in this report were measured in the following ways.

1 Unemployment (16–18 years)

At age 18 years, respondents were asked a series of questions about their history of unemployment, education and training during the preceding 2 years. These questions included questions on the duration of time for which the young person had been unemployed and seeking

work, whether the young person had ever registered as being unemployed, whether the young person met criteria for being officially unemployed when interviewed and related questions on the timing of unemployment experiences. From these items it was possible to construct an array of definitions of unemployment. These included: (*i*) the young person's reported duration of unemployment; (*ii*) the number of periods of unemployment experienced by the young person since the age of 16; (*iii*) whether or not the young person had been registered as unemployed since the age of 16; (*iv*) whether the young person met criteria for being officially unemployed at age 18. These measures were all significantly related to each other with product moment correlations between different measures of unemployment ranging from 0·29 to 0·79.

To explore the sensitivity of the analysis to differing definitions of unemployment, parallel analyses of the associations between unemployment (measured in different ways) and risks of disorder were conducted. All analyses led to similar conclusions about the relationships between unemployment and risks of disorder. In the interests of brevity the analyses in this paper are based on a measure that appears to provide the most general and robust account of the individual's exposure to unemployment: the duration of the reported unemployment from age 16 to age 18 years. The distribution of duration of unemployment was: 78·2% of the sample reported no exposure to unemployment; 9·3% reported being unemployed for 2 months or less; 5·6% reported durations of unemployment from 3 to 5 months and 6·9% reported having been employed for 6 months or longer.

2 Psychiatric disorder (16–18 years)

Concurrently with the assessment of unemployment, subjects were questioned about their psychiatric symptoms over the period from 16 to 18 years using a questionnaire based upon the Composite International Diagnostic Interview (CIDI; World Health Organization, 1993) supplemented by an instrument based on the Self-Report Delinquency Instrument (SRDI; Elliot & Huizinga, 1989). The CIDI items were used to assess major depression, anxiety disorders and substance use disorders in the sample while the SRDI was used to assess conduct disorder. Assessment of nicotine dependence and suicide attempt was based on custom written survey items.

Using this information DSM-IV (American Psychiatric Association, 1994) criteria were used to construct a series of diagnoses of psychiatric disorder for each subject over the period from 16 to 18 years. These diagnoses included the following.

(*i*) *Major depression*

Subjects were classified as having a major depressive disorder if they met DSM-IV criteria for at least one major depressive episode over the period from 16 to 18 years. Overall, 22·0% of the sample reported at least one major depressive episode during the two year period, with 7·1% meeting DSM-IV criteria for current major depression.

(*ii*) *Anxiety disorders*

Subjects were classified as having an anxiety disorder if they met DSM-IV criteria for generalized anxiety disorder, social phobia, specific phobia, panic disorder or agoraphobia. Overall, 17·1% of the sample were classified as having an anxiety disorder during the period from 16 to 18 years with 2·9% reporting generalized anxiety disorder, 7·7% reporting social phobia, 9·6% reporting a specific phobia, 2·0% a panic disorder and 1·6% agoraphobia.

(*iii*) *Conduct disorder*

Subjects were classified as having a conduct disorder (CD) if they reported 3 or more of the 13 age-appropriate DSM-IV criteria for CD. The criteria relating to 'staying out at night despite parental prohibition' and 'often truants' were not included on the grounds that these items were not appropriate for the assessment of CD in 18-year-olds. The prevalence of CD in the cohort was 4·8%.

(*iv*) *Nicotine dependence*

This was assessed using custom written survey items reflecting relevant DSM-IV criteria. These items included: failure to quit or reduce smoking; irritability when cigarettes were not available; difficulties in going a day without a cigarette; health problems as a result of smoking; feeling addicted to or dependent on cigarettes. Subjects were classified as nicotine dependent if they: (*a*) reported smoking at least five cigarettes

per day; and (*b*) reported two or more additional symptoms of nicotine dependence. On the basis of this definition 13·9% of the sample were classified as nicotine dependent.

(*v*) *Alcohol abuse/dependence*

These diagnoses were assessed using items from the CIDI. Subjects were classified as showing alcohol dependence if they reported experiencing at least three of the following: increased tolerance for alcohol; withdrawal symptoms when alcohol consumption was ceased; heavy drinking and overuse of alcohol; unsuccessful attempts to quit or cut down on drinking; large amounts of time spent in alcohol related activities; restriction of social and other activities as a result of drinking; physical or psychological problems caused by heavy and prolonged drinking. Subjects were classified as showing alcohol abuse if they did not meet criteria for alcohol dependence and reported at least one of the following: alcohol misuse had led to repeated difficulties at school or neglect of schoolwork, difficulties at work or failure to attend work; use of alcohol had placed them at physical hazard from drink driving or they had been injured in a fall or accident as a result of drinking; they had been arrested or stopped by police for alcohol related offending on at least two occasions; they had continued alcohol use despite objections from family or friends or after alcohol use had caused legal, financial or personal problems. Overall, 13·8% of the sample met criteria for alcohol abuse and a further 5·7% met criteria for alcohol dependence during the period from 16 to 18 years.

(*vi*) *Other substance abuse/dependence*

This was based on CIDI items using DSM-IV criteria and was assessed using similar criteria to those for alcohol abuse/dependence. Overall, 9·1% of the sample met criteria for other substance abuse including cannabis abuse (7·1%) and abuse of other substances (excluding nicotine) (2·7%), and 4·9% of the sample met criteria for other substance dependence including cannabis dependence (4·7%) and other substance dependence (excluding nicotine) (1·0%).

(*vi*) *Attempted suicide*

Subjects were questioned about suicidal behaviours over the period from 16 to 18 years. On the basis of this information a measure was constructed reflecting whether the subject had made a suicide attempt during this period. Using this definition 3·6% of the sample reported making a suicide attempt during the interval from 16 to 18 years.

3 Confounding covariates

To assess the extent to which the associations between unemployment and psychiatric disorder at age 18 were independent from the effects of third or confounding covariates that were likely to have been causally antecedent to both unemployment and psychiatric disorder the following control factors were included in the analyses.

(*i*) *Measures of family social background*

These included: (*a*) maternal age; (*b*) maternal education, which was assessed on a three level classification i.e. mother had no formal educational qualifications, mother had secondary level qualifications, mother had tertiary level qualifications; (*c*) family socio-economic status, which was assessed using the Elley & Irving's (1976) scale of socio-economic status for New Zealand; and (*d*) child ethnicity i.e. Maori/Pacific Island *v*. other.

(*ii*) *Measures of family functioning*

(*a*) *Changes of parents*

To measure the extent to which the young person had been exposed to family change an index of change was based on a count of the total number of changes of parents experienced by the young person to the age of 15 years. A change of parents was counted if a parent left the family as a result of family breakdown or entered the family as a result of remarriage or reconciliation.

(*b*) *Parental conflict*

As part of the research parents were questioned annually on three items that described the quality of marital relationships. These items were: whether the parents had engaged in prolonged arguments during the past 12 months; whether the subject's mother reported being assaulted by her spouse in the past 12 months; whether the subject's mother reported experiencing sexual difficulties in the past 12 months. These items were combined to produce a scale measure of

the extent to which the young person was exposed to marital conflict (Fergusson *et al.* 1992).

(*c*) *Parental history of offending*

Information was obtained on whether there was a parental history of criminal offending (assessed when subjects were aged 15 years).

(*d*) *Parental history of alcohol or drug problems*

Information was obtained on whether there was a parental history of problems with alcohol or other drugs (assessed when subjects were aged 15 years).

(*iii*) *Individual factors*

(*a*) *Gender*

(*b*) *Intelligence* (*8 years*)

This was assessed at age 8 years using the Revised Wechsler Intelligence Scale for Children (WISC-R, Wechsler, 1974). For the purposes of this analysis the full scale IQ score was used. The reliability of this scale, assessed using split half methods was 0·93.

(*c*) *Early conduct problems* (*8 years*)

This was assessed using a measure which combined parent and teacher reports of conduct disordered or oppositional behaviours based on items derived from the Rutter (Rutter *et al.* 1970) and Conners (Conners, 1969, 1970) parent and teacher questionnaires (Fergusson *et al.* 1991). The reliability of this scale, as assessed by coefficient alpha was 0·93.

(*d*) *Self-esteem* (*15 years*)

This was assessed using the Coopersmith Self-Esteem Inventory (Coopersmith, 1981).The full scale score was used in this analysis and found to have good reliability ($\alpha = 0{\cdot}89$).

(*iv*) *Measures of parental and peer relationships*

(*a*) *Parental attachment* (*15 years*)

This was assessed at age 15 years using the parental attachment scale developed by Armsden & Greenberg (1987). The full parental attachment scale was used in this analysis and this scale was found to have good reliability ($\alpha = 0{\cdot}87$).

(*b*) *Affiliations with delinquent peers*

At ages 15 and 16 years subjects were questioned about the extent to which their best friend and other friends used tobacco, alcohol, cannabis, truanted or broke the law. These self-report items were then summated for each year to provide a general index of the extent to which the young person affiliated with delinquent or substance using peers at 15 and 16 years (Fergusson & Horwood, 1996). The resulting scales were of moderate internal consistency ($\alpha = 0{\cdot}78$ at age 15 years, $\alpha = 0{\cdot}80$ at age 16 years).

(*v*) *Measures of prior history of psychiatric disorder and substance use* (*14–16 years*)

At age 15 and 16 years subjects were questioned about the extent of their psychiatric symptomatology and substance use during the periods 14–15 years and 15–16 years using questionnaires which closely paralleled the questioning used at 18 years. Using this information it was possible to construct diagnostic criteria for a similar range of psychiatric diagnoses to those measured at 18 years. The methods used to construct these diagnostic groupings have been described elsewhere (Fergusson *et al.* 1993). To summarize the extent of the respondent's prior history of psychiatric disorder and substance use, the following measures were used in the analysis: (*a*) DSM-III-R diagnostic classifications of mood disorder, anxiety disorder, conduct disorder, alcohol abuse, other substance abuse over the period from 14 to 16 years; and (*b*) frequency of cigarette smoking at age 16.

Sample size

The analyses reported in this paper were based on a sample of 1025 respondents. This sample represents 81·0% of the initial cohort of 1265 children and 92·3% of all cohort members still alive and resident in New Zealand at the age of 18 years.

RESULTS

Associations between measures of unemployment and rates of psychiatric disorders at age 16 to 18

Table 1 shows the sample of 1025 subjects studied classified into four groups on the basis of their self-reported duration of unemployment

https://doi.org/10.1017/S0033291796004412 Published online by Cambridge University Press

Table 1. *Rates* (%) *of disorder* (16–18 *years*) *by duration of unemployment* (16–18 *years*)

Measure	Duration of unemployment				
	Never	< 3 Months	3–5 Months	⩾ 6 Months	*P**
Major depression	20·3	17·9	43·9	29·6	< 0·001
Anxiety disorder	14·5	17·9	33·3	32·4	< 0·001
Conduct disorder	2·9	9·5	15·8	11·3	< 0·001
Nicotine dependence	8·9	24·2	33·3	40·9	< 0·0001
Alcohol abuse/dependence	15·7	28·4	36·8	35·2	< 0·001
Other substance abuse/dependence	7·6	21·1	26·3	40·9	< 0·0001
Suicide attempts	2·5	8·4	3·5	9·9	< 0·001
N	802	95	57	71	

* Based on Mantel–Haenszel χ^2 test of linear trend.

Table 2. *Associations between duration of unemployment* (16–18 *years*) *and measures of social, family and individual factors measured prior to school leaving age*

Measure	Duration of unemployment				
	Never (%)	< 3 Months (%)	3–5 Months (%)	⩾ 6 Months (%)	*P*
Family social background					
Mother aged < 25 years at birth of child	36·7	37·9	52·6	57·8	< 0·001
Mother has no formal educational qualifications	46·3	49·5	66·7	64·8	< 0·001
Family of semi-skilled/unskilled socio-economic status	21·6	24·2	38·6	53·5	< 0·0001
Child of Maori/Pacific Island ethnicity	12·6	12·6	17·5	25·4	< 0·005
Family functioning					
> 2 Changes of parents (0–15 years)	14·7	16·1	33·3	42·1	< 0·0001
In upper quartile of parental conflict score (0–10 years)	23·0	30·1	42·3	55·0	< 0·0001
Family history of offending	6·9	11·2	23·6	31·3	< 0·0001
Family history of alcohol or drug problems	14·8	21·4	23·6	45·3	< 0·0001
Individual factors					
Child in lower quartile of IQ distribution (8 years)	23·1	16·9	27·3	40·4	< 0·05
Child in upper quartile of conduct problems score (8 years)	21·7	30·3	45·5	43·9	< 0·0001
Child in lower quartile of self-esteem score (15 years)	20·4	27·0	31·5	38·7	< 0·001
Parent/peer affiliations					
In lower quartile of parental attachment score (15 years)	20·7	31·5	24·1	40·3	< 0·001
In upper quartile of affiliations with deviant peers score (15 years)	23·5	46·1	42·6	41·9	< 0·0001
In upper quartile of affiliations with deviant peers score (16 years)	20·4	39·8	41·5	32·3	< 0·001
Prior history of disorder/substance use					
Mood disorder (14–16 years)	11·6	17·8	20·4	24·6	< 0·001
Anxiety disorder (14–16 years)	28·6	28·9	33·3	36·9	> 0·15
Conduct disorder (14–16 years)	5·7	10·0	22·2	29·2	< 0·0001
Alcohol abuse (14–16 years)	7·9	14·4	16·7	29·2	< 0·0001
Other substance abuse (14–16 years)	2·5	6·7	7·4	16·9	< 0·0001
Smoking daily (16 years)	10·1	23·6	26·4	37·1	< 0·0001

over the period from 16 to 18 years of age. These groups were: (*a*) young people who reported no experience of unemployment; (*b*) those who reported being unemployed for less than 3 months; (*c*) young people who reported being unemployed for between 3 to 5 months and; (*d*) those who reported being unemployed for 6 months or more. For each group the rate (%) of DSM-IV defined major depression, anxiety disorders, conduct disorder, nicotine dependence, alcohol abuse/dependence, and other substance abuse/dependence during the interval from 16 to 18 years of age are shown in Table 1. In addition, the rate of attempted suicide during the period from 16 to 18 years for each of the four groups is also shown. Tests of

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Table 3. *Rates* (%) *of disorder* (16–18 *years*) *by duration of unemployment* (16–18 *years*) *after adjustment for covariates*

Outcome	Duration of unemployment				*P*	Significant covariates*
	Never	< 3 Months	3–5 Months	⩾ 6 Months		
Major depression	19·4	20·6	21·9	23·2	> 0·50	1, 2, 4, 9, 11, 12
Anxiety disorder	14·7	18·4	22·6	27·4	< 0·005	1, 3, 11, 12
Conduct disorder	3·9	4·8	6·0	7·4	< 0·10	1, 5, 6, 8, 9
Nicotine dependence	11·7	14·9	18·5	22·7	< 0·001	8, 10
Alcohol abuse/dependence	14·4	17·1	20·2	23·6	< 0·05	1, 4, 8, 9, 10
Other substance abuse/dependence	9·1	12·9	17·8	24·2	< 0·0001	1, 8, 9, 10, 13
Suicide attempt	3·4	3·5	3·7	3·9	> 0·70	7, 10, 12, 13

* Covariates: 1 = Gender; 2 = Changes of parents; 3 = Family history of offending; 4 = IQ (8 years); 5 = Conduct problems (8 years); 6 = Self-esteem (15 years); 7 = Parental attachment (15 years); 8 = Deviant peer affiliations (15 years); 9 = Deviant peer affiliations (16 years); 10 = Cigarette smoking (16 years); 11 = Mood disorder (14–16 years); 12 = Anxiety disorder (14–16 years); 13 = Other substance abuse (14–16 years).

the significance of the association between the duration of unemployment and outcomes were conducted using the Mantel–Haenszel test of linearity.

The results in Table 1 show a very clear and consistent set of results: with increasing duration of unemployment, there were significant ($P < 0{\cdot}001$) tendencies for rates of major depression, anxiety disorders, conduct disorders, substance use disorders and attempted suicide to increase. For all but one comparison (major depression) young people who had not experienced unemployment had the lowest rate of disorder while rates of disorder among those who had been unemployed for 6 months or longer were between 1·5 to 5·4 times higher than among young people who had not experienced unemployment.

Risk factors associated with unemployment

To examine the extent to which risks of unemployment following school leaving age were related to individual, childhood and family factors measured prior to school leaving age, the bivariate associations between duration of unemployment and a series of factors measured prior to the age of 16 years were calculated. These factors included measures of family social background, family functioning, individual characteristics, parental attachment, peer affiliations, prior history of psychiatric disorder and substance use. The results of this analysis are summarized in Table 2. For ease of data display all measures in Table 2 have been expressed in dichotomous form and the associations between duration of unemployment and the dichotomously scored risk factors have been tested for statistical significance using the Mantel–Haenszel test of linear association. The results in Table 2 lead to the following conclusions.

Family social background

There were significant associations ($P < 0{\cdot}005$) between the duration of unemployment and a series of measures of family social background including maternal age, maternal education, socio-economic status and ethnicity. Young people exposed to unemployment more often had younger, less well educated mothers, more often came from families of lower socio-economic status and were more often of Maori or Pacific Island ethnicity.

Family functioning

There were significant associations ($P < 0{\cdot}001$) between the duration of unemployment and a series of measures of family functioning including changes of parents, parental conflict, family history of offending and family history of alcohol/drug problems. Young people exposed to unemployment more often experienced family change and parental conflict and more often had parents who reported a history of offending or alcohol/drug problems.

Individual factors

Young people who had been exposed to unemployment were significantly ($P < 0{\cdot}05$) more likely to have lower IQ, to display higher rates of conduct problems in middle childhood and to have lower self-esteem at age 15.

https://doi.org/10.1017/S0033291796004412 Published online by Cambridge University Press

Parental attachment and peer affiliations

Increasing duration of unemployment was associated with significantly ($P < 0{\cdot}001$) higher rates of both poor parental attachment and affiliations with delinquent or substance using peers at age 15 and 16 years.

Prior history

Finally, young people who subsequently experienced unemployment had significantly ($P < 0{\cdot}001$) higher rates of mood disorders, conduct disorder, alcohol abuse, other substance abuse and daily tobacco use during the interval from 14 to 16 years of age. There was, however, no significant ($P > 0{\cdot}15$) association between rates of anxiety disorders during the interval from 14 to 16 years and subsequent unemployment.

Associations between unemployment and risks of psychiatric disorder adjusted for antecedent social, family, individual and related factors

To examine the extent to which risks or disorder were related to duration of unemployment when due allowance was made for antecedent social, family and individual factors, a series of multiple logistic regression models was fitted to the data. In these models the log odds of disorder were regressed on the measure of unemployment together with the potentially confounding social, family and individual factors described in Table 2. In fitting all models the covariate factors were not treated in the dichotomous form shown in Table 2 but were scored as described in the Method section. Model fitting was conducted using both forward and backward methods of variable elimination to identify the best fitting and most parsimonious models.

The results of this analysis are given in Table 3, which shows the associations between duration of unemployment and risks of disorder adjusted for the confounding factors. Table 3 shows: (*i*) the adjusted rate of disorder for each level of the duration of unemployment variable; (*ii*) the significance of this association based on the ratio of the unstandardized regression coefficient to its standard error, and; (*iii*) the covariates that were significant in each equation. The results in Table 3 lead to the following conclusions.

1 The effects of adjusting the associations between duration of unemployment and risks of disorder were to reduce these associations substantially. Specifically, before adjustment for confounding covariates young people who had been unemployed for 6 months or longer had rates of disorder that were 1·5 to 5·4 times higher than young people who had not been unemployed. However, after adjustment for confounding covariates, young people who had been unemployed for at least 6 months had rates of disorder that were 1·1 to 2·7 times those of young people who had not been unemployed.

2 Nonetheless, even after adjustment for potentially confounding covariates, significant associations remained between the duration of unemployment and rates of anxiety disorders ($P < 0{\cdot}005$), nicotine dependence ($P < 0{\cdot}001$), alcohol abuse/dependence ($P < 0{\cdot}05$) and other substance abuse/dependence ($P < 0{\cdot}0001$). There was also a marginally significant ($P < 0{\cdot}10$) association between conduct disorder and unemployment. Estimates of the population attributable risk applied to Table 3 suggested that the elimination of unemployment would reduce rates of these conditions in the population by between 8 to 17%.

3 The significant covariates in the equations included a mix of family, social, individual and peer-related factors that were present prior to school leaving age.

The effects of gender and previous disorder on the associations between unemployment and risks of disorder

The preceding analysis presented associations between unemployment and risks of disorder for the entire cohort. However, it might be proposed that these effects could vary with gender with the impact of unemployment differing for males and females. This would imply the presence of statistical interactions between unemployment and gender after adjustment for antecedent childhood factors. To address this issue the logistic models shown in Table 3 were extended to fit a series of nested models in which the regression relationship between duration of unemployment and each outcome was permitted to vary between males and females. This analysis suggested a general absence of interaction between gender, duration of unemployment and rates of disorder.

It could also be proposed that the effects of

unemployment on risks of disorder varied with the extent of psychopathology present prior to school leaving. To examine this possibility, further tests were conducted to examine possible interactions between unemployment, the extent of psychiatric symptoms prior to age 16 and risks of later disorder. No significant interactions were found.

DISCUSSION

In this paper we have used data gathered over the course of an 18-year longitudinal study to examine the extent to which unemployment following school leaving was associated with increased risks of psychiatric disorder in 18-year-olds. The major findings of this study and their implications are examined below.

First, in confirmation of previous research (West & Farrington, 1977; Stafford *et al.* 1980; Banks & Jackson, 1982; Patton & Noller, 1984; Tiggeman & Winefield, 1984; Layne & Whitehead, 1985; Farrington *et al.* 1986; Peck & Plant, 1986; Hammarstrom *et al.* 1988; Hammarstrom, 1990; Power & Estaugh, 1990; Winefield & Tiggeman, 1990; Janlert & Hammarstrom, 1992; Morrell *et al.* 1994), there was evidence of pervasive associations between the duration of reported unemployment during the period from 16 to 18 years and rates of major depression, anxiety disorders, conduct disorder, substance abuse/dependence and attempted suicide over this period. Young people who reported being unemployed for 6 months or longer had rates of these disorders and problems that were 1·5 to 5·4 times higher than those who had not experienced unemployment. This relationship between unemployment status and risks of disorder has been found to be robust to the choice of definition of unemployment.

An important feature of the present study was that extensive information on the characteristics of the cohort had been collected prior to school-leaving and this made it possible to examine the extent to which the apparent associations between unemployment and psychiatric disorder in young people may have arisen from selection processes in which those predisposed to adjustment problems were at greater risk of becoming unemployed. There was considerable evidence to support this hypothesis and examination of the social, individual, family and peer related profile of those exposed to varying durations of unemployment showed the presence of pervasive associations between duration of unemployment and characteristics present prior to school-leaving age. Increasing duration of unemployment was associated with greater family social disadvantage, family dysfunction and instability, the development of adjustment problems and psychiatric disorder prior to school leaving and with the formation of affiliations with delinquent peers.

Multivariate analysis that took into account family, individual and related characteristics prior to school entry suggested that much of the elevated risks of psychiatric disorder among those reporting unemployment was explained by factors that were present prior to school-leaving. After adjustment for these factors the association between unemployment and major depression and attempted suicide became non-significant. There were, however, significant associations between duration of unemployment and rates of substance use disorders (nicotine, alcohol, illicit drugs) and anxiety disorders. In addition, unemployment was associated with a marginally significant ($P < 0{\cdot}10$) increase in risks of conduct disorder. Young people who reported having been unemployed for 6 months or more had rates of these disorders that were between 1·6 to 2·7 times higher than those of young people who had not been unemployed. The presence of these associations between duration of unemployment and these disorders after control for antecedent factors is consistent with the hypothesis that exposure to unemployment may have acted to increase the risks of substance use disorders and anxiety disorders in this cohort and this view is further reinforced by the fact that there were consistent dose/response relationships between the duration of unemployment and risks of disorder.

These findings are generally consistent with the results of previous studies that have examined the relationships between unemployment and psychiatric disorder after controlling for factors that were present prior to school leaving. In particular, in a study of a sample of 1083 Swedish adolescents, Hammarstrom *et al.* (1988) found that unemployment in the 2 years following leaving school was associated with increased psychosomatic and psychological symptoms, increased abuse of alcohol and

narcotics and increased utilization of health care services even after control for background variables. In a longitudinal study of two cohorts of British school-leavers Banks & Jackson (1983) also found that unemployment following school-leaving age was associated with increased rates of psychological ill health. However, these authors used a global measure of disorder which did not distinguish between various types of disorder.

While strong and emotive claims have often been made about the impact of unemployment on the adjustment and psychiatric well-being of young people, the findings from this, and indeed other studies, suggest that unemployment probably does not make a strong contribution to risks of psychiatric disorder in the young population. Estimates of the population attributable risk suggested that variations in unemployment experiences accounted for between 8 to 17% of the risks of substance use and anxiety disorders. The findings of the present study may clarify some of the reasons for the relatively modest role of unemployment. In particular, the analysis reported here suggests the presence of relatively strong continuities between the individual's adjustment prior to school-leaving and adjustment following school-leaving. Given these continuities it seems reasonable to assume that much of individual vulnerability to psychiatric disorder is well established by the time of school leaving and that, as a consequence, experiences that occur following school-leaving such as unemployment are likely to play only a relatively minor role in determining variations in risks of disorder. The relatively modest contribution of unemployment experiences to risks of psychiatric disorder may also explain why unemployment has not emerged from time series analyses (e.g. Rutter & Smith, 1995) as a strong predictor of risks of disorder since it is clear that the relatively modest impact of unemployment on risks of disorder may easily become obscured by other factors that may be associated with employment patterns.

While the results of our study suggest that unemployment following school-leaving is unlikely to act as a major determinant of psychiatric well-being, the results also suggest that prolonged unemployment is associated with moderate increases (1·6–2·7 times) in the risks of anxiety disorders, substance use disorders and (possibly) conduct disorder. These findings clearly underline the need for societies to develop full employment policies for young people. While, in isolation, these policies are unlikely to lead to large reductions in rates of psychiatric disorder in young people, they appear to be an integral part of social and related policies designed to maximize the mental health and well-being of young people.

This research was funded by grants from the Health Research Council of New Zealand, Lottery Health, National Child Health Research Foundation and the Canterbury Medical Research Foundation.

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