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**Effects of Depression Symptoms on Employment and Job Transitions
Among Mothers in Low-Income Families***

Working Paper

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Abstract

Background and Objective: Accumulating evidence has shown that having symptoms of mental disorders is associated with a lower probability of employment and reductions in earnings, conditioning on being employed. Less is known about how mental health influences job turnover, especially among mothers in low-income families, many of whom are current or former welfare recipients. This paper provides evidence regarding the effects of mental health on employment and job exits, using a unique sample of caregivers in poor families. Analyses focus on the effect of symptoms of prevalent mental disorders, which were measured using the 18-item Brief Symptom Inventory, on transition probabilities of exit from continuous employment as well as exit from individual job spells.

Methods: Data are from two waves of interviews from the Welfare, Children, and Families Three-City Study. The analytic sample consists of approximately 1,100 mothers in families with incomes below 200 percent of the Federal Poverty Level, in poor neighborhoods of Boston, San Antonio, and Chicago. All women in the analysis had held at least one job between interviews. Two sets of model specifications are developed. The first uses a Cox proportional hazard specification for the hazard of exiting continuous employment. The second set of models makes use of multiple ordered data on job spells to develop a conditional risk proportional hazard specification for job turnover. This method accounts for within-person correlation of job tenures.

Results: Symptoms of the prevalent psychiatric syndrome of depression may impede stability in employment by increasing the probability of job separation. Other important predictors of job separation included pregnancy, length of time on welfare, having less than a high school education, and using or dealing illegal drugs. Work experience and age were protective factors associated with reductions in the hazard of exit from continuous employment spells and from job spells. The impact of depression symptoms on job turnover varied with age. Among women under age 30, the marginal impact of depression symptoms was relatively small. Younger women appear to face a multitude of barriers to employment retention, and having depression is just one of them. Among women ages 30 and older, having more symptoms of depression was significantly associated with an increased hazard of exit, though the overall exit rate was lower for this group than for younger women.

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Introduction

Following the passage of welfare reform legislation in 1996, the economic status of low-income working women has received greater attention. A rapid decline in welfare caseloads in many states raised a concern that recipients remaining on the welfare rolls are more disadvantaged than those who have left welfare, and that these disadvantages would adversely affect their ability to successfully transition off of welfare. In particular, there may be a risk that low-income women with mental health problems experience even greater difficulty than other low-income women in finding jobs, remaining employed, and in obtaining earnings gains (Callahan, 1999; Loprest, 1999; Loprest and Zedlewski, 1999; Blank and Card, 2000; Danziger et al., 2000; Danziger et al., 2001). These women and their children may be caught in a cycle of poverty and welfare system dependency, or may become so marginalized economically that they are permanently distanced from the labor market and the public income support system.

In this paper, I address some empirical questions which arise out of the current body of literature on the employment prospects of welfare recipients, and the literature on effects of mental disorders on labor market outcomes. First, among a group of low-income women, are there correlations between symptoms of mental disorders and women's employment characteristics? What are the important correlates or stressors related to poor mental health? Second, after controlling for other factors presumed to influence

employment outcomes, do symptoms of mental disorders increase the likelihood of becoming unemployed? And finally, how do symptoms of mental disorders affect job turnover?

I use two waves of survey data from a unique sample of mothers in low-income families living in three diverse urban locales. The Welfare, Children, and Families Three-City Study assessed the post-Welfare Reform experiences of a selective sample of low-income women in urban areas. The survey component of the Three-City Study² provides a wealth of information on employment, income, and welfare participation of the caregivers/respondents, as well as detailed data on the well-being of one focal child in the household. Mental health status of the mothers was assessed with the 18-item Brief Symptom Inventory (BSI-18), an instrument which produces a global measure of general psychological distress. Scoring of the BSI-18 reflects symptoms of prevalent mental syndromes, including depression, anxiety, and panic disorder. Subscales of the BSI-18 allow for analysis of syndromes of anxiety, depression, and somatization.

I use data on job histories retrospectively reported by the caregiver respondents at the second wave of the survey, to construct an employment timeline between two waves of the Three-City Study survey. In this form, the data allow for a longitudinal analysis of the effect of mental health symptoms experienced by low-income women in the labor force on subsequent employment and job transitions.

Plausibly, one might hypothesize that poor mental health leads to lower realized productivity on the job, making the probability of job separation from layoff, discharge, or

² The three sites are Boston, San Antonio, and Chicago.

quitting more likely. For the unemployed or those with little work experience, poor mental health might also lead to a lower likelihood of finding and securing a job. Poor mental health may impede wage growth from job mobility by placing the worker in an unstable cycle of moving from low-paying job to low-paying job, or worse yet, from low-paying job to unemployment. Such a pattern would be evidenced by high employment separation rates, low employment entry rates, and frequent job changes. This paper examines the relationship between the presence of symptoms of mental disorders and (1) the rate of exit from continuous employment, and (2) job turnover.

Evidence from the Published Literature

Cross-sectional analyses have shown that depression is associated with a lower probability of labor force participation; and that among the employed, depression is associated with significant reductions in earnings, especially for women (Ettner et al., 1997; Ettner, 2000; Marcotte and Wilcox-Gok, 2000). These findings are based on populations including workers with higher earnings and greater attachment to the labor force. Little is known about how the mental health of low-income women affects their employment and job mobility.

Pre-Reform data from the National Longitudinal Survey of Youth (NLSY) indicate that there exists a relationship between the presence of depressive symptoms and length of welfare spell (Olson and Pavetti, 1996). Olson and Pavetti (1996) reported that recipients of Aid to Families with Dependent Children (AFDC) who experienced longer spells (5 years or more) were more likely to report symptoms of depression than those with shorter spells (2 to 5 years, and under 2 years). The relationship between substance abuse and

length of welfare spell was much less definitive; however, recipients with longer spells were more likely to exhibit physical indications of problem drinking. Another more recent analysis, which compared former welfare participants to those currently receiving Temporary Assistance for Needy Families (TANF), found that those who had left welfare were slightly less likely to report very poor mental health (18 percent vs. 22 percent); the prevalence of poor mental health among both of the groups, however, was quite high (Loprest, 1999).

Other research corroborates the supposition that being in poor mental health is a potential barrier to employment of welfare participants (Danziger et al., 2000; Danziger et al., 2001; Lennon et al., 2001). A review of the literature suggests that poor self-reported mental health status is an obstacle to employment among welfare recipients. Most studies in this area, in their broad approach, have necessarily sacrificed detail on specific health and mental health conditions for a breadth of knowledge about the many barriers to employment faced by current and former TANF recipients. Few studies have examined the effect on employment of the syndromes of specific mental disorders such as depression, generalized anxiety or panic disorders.

Data and Key Variables

The data used for this paper are from two interview waves of the survey component of The Welfare, Children, and Families Three-City Study, which was implemented to address the questions surrounding whether changes in federal, state, and local welfare policy have improved the lives of low-income families (Winston et al., 1999). The three cities—Boston, San Antonio, and Chicago—were selected on the basis of their diversity in

terms of geography, racial and ethnic diversity, and state and local differences in welfare policy.

Survey data were collected from low-income neighborhoods in each of the three cities using a multistage, stratified probability sampling approach (Ruiz et al., 2002; Cherlin, 1999). In the first stage, Census block groups in each city were ranked by the percentage of children in three racial/ethnic strata (Hispanic, Non-Hispanic Black, and Non-Hispanic White) who were in families with incomes below the Federal Poverty Level (FPL). Of the sampled block groups, over half had more than 40 percent of households with incomes below the FPL; about a third had 20 to 40 percent of households below poverty, and less than one-tenth had fewer than 20 percent of households below the poverty level.

The second stage involved screening for eligibility in the block groups selected in the first stage, and sampling at the household level. The households that met eligibility criteria—having income below 200 percent of the poverty line; female or couple headed; and containing children age birth to 4 or 10 to 14—were sampled at varying rates based on four family characteristics and their distribution in the three cities' populations:

- Three race/ethnicity groups, based on the head of household
- Two income levels: below 100% of poverty and from 100 to 200% of poverty
- Two household types: female-headed and couple-headed
- Two assistance categories: receiving Food Stamps and Medicaid; not receiving either Food Stamps or Medicaid

Conditional selection probabilities yielded sufficient numbers of families for analysis. Just over 2,400 female caregivers responded in the first wave of interviews. Of these, 2,194 also responded at Wave 2; 63 of these respondents had become separated from the focal child by Wave 2 and were followed up for interview. The first wave of interviews was completed in calendar year 1999, and the second wave began after the summer of 2000 and ended in by spring of 2001. The questionnaires elicit data from the caregiver respondents about welfare experiences, income, employment and earnings, demographic characteristics and household structure, and other characteristics of the primary caregiver and one focal child in each household.

This paper relies on data provided by and about the caregiver respondents, all who were mothers in low-income families—with annual incomes less than 200% of the Federal Poverty Level (FPL) at the outset of the survey. The analytic sample includes 1,110 female caregivers who responded to both waves of the survey, held at least one job between interview waves, and had complete data on variables of interest for this study.

The parameter estimates presented in this paper are not weighted to account for the sampling design or for nonresponse, nor are the standard errors adjusted for weighting or clustering. (Regression analyses presented in the paper are, however, stratified by city and race/ethnicity.) After considerable analysis, the Principle Investigators of the Three-City Study determined that adjusting for clustering is likely to have little or no effect on the size of the estimated standard errors.

Results of an attrition analysis³ suggest that dropout was more prevalent in Chicago and less so in San Antonio (White 2004). Thus, the results of an unweighted analysis using respondents from both survey waves may disproportionately reflect the San Antonio population, which was largely Latina. In comparison, the largely African American sample of Chicago may be underrepresented. Dropouts were similar to continuing respondents on most other attributes important from the perspective of this paper—poverty status, welfare status, and employment status at Wave 1.

The objective of this research is to examine the relationship between mental health and employment outcomes among a very limited sample of low-income women who have evidence of labor market attachment, i.e. have some job experience during the study period. Excluding almost half of the women who responded to both surveys leaves a subset of the study sample that may be clustered in one sampling stratum more than others. Limiting the sample to those with evidence of job holding excludes a large group of women who have disproportionately low education levels, little or no work history, and lengthier amounts of time as welfare recipients (White 2004).

Employment Outcomes

The two main employment outcomes of interest here are (1) the rate of exit from an employment spell, and (2) the rate of transition from a job (either to another job or to a period of non-employment).

³ Results of the attrition analysis are not shown here. This analysis was included as part of the author's dissertation (White, 2004) and are available upon request.

Respondents to the survey were asked at Wave 2 about their employment history. With guidance from the interviewer, respondents were asked to identify the start and end dates of each job (up to 10), starting with the most recent job and going back in time to the previous interview. A very small number of women reported multiple job holding; overlapping job spells were excluded from the transition analyses. The start and end dates of each job were then used to construct a data file reflecting the time each respondent spent in each job, starting with the job held at the Wave 1 interview date (if the respondent was in a job at that time) and ending with the current or last job reported at the Wave 2 interview. The number of jobs held ranged from 1 to 4. For job spells spanning the Wave 1 interview date, the interview date was used as the start date of the first job spell. Previous work history, measured as the number of months worked in the two years prior to baseline—was then accounted for in the regression models.

One spell of continuous employment—the first experienced by each respondent—was then constructed from the job spell data. Each respondent’s spell of continuous employment reflects the time elapsed from the start date of the first job to the end date of the last job that was not preceded by a 30-day gap in employment. Subsequent continuous employment spells (of which there were too few to analyze) were not included.

Measurement of Mental Health Symptoms

The Three-City Study was chosen not only because it focuses on low-income families, but also because it provides an opportunity to study the effect of psychological distress on employment outcomes. Embedded in the questionnaire is the BSI-18, an 18-item self-report symptom inventory designed to serve as a highly sensitive screen for

psychological distress and psychiatric disorders in medical and community populations (Derogatis, 2001).

Scoring of the responses to the BSI-18 scale provides a basic indicator of the number and level of symptoms associated with three prevalent psychiatric syndromes—depression, anxiety, and somatization. The total score or Global Severity Index (GSI) is a continuous measure based on a simple sum of responses to each of the 18 items. In addition to the total score and subscores for each of the three dimensions, the instrument can be used to identify clinically relevant cases—those that report a number and level of symptoms meeting defined threshold criteria.

The items in the BSI-18 are split evenly into three groups, with each dimension (somatization, depression, and anxiety) having six items contributing to each subscore. All items were selected with multiple criteria in mind, including prevalence of symptom and factor analyses of the parent instruments to the BSI-18 (Derogatis, 1993; Derogatis, 1994). With the exception of suicidal ideation, all symptoms in the BSI-18 are highly prevalent in syndromes of mental disorders. The depression dimension includes items representing symptoms of anhedonia, disaffection, dysphoric mood, self-deprecation, hopelessness, and suicidal ideation. The somatization dimension measures distress caused by the perception of bodily dysfunction, with several items focusing on certain physiologic systems (e.g., cardiovascular, gastrointestinal). Six symptoms that are prevalent in most anxiety disorders—generalized anxiety and panic disorder, for example—comprise the anxiety dimension of the BSI-18. These include measures of nervousness, tension, motor disturbance, and apprehension, along with symptoms more specific to panic states.

Derogatis (2001) recommends defining a positive risk or “case” based on whether the respondent has a normed GSI score of 63 and two out of three dimension normed scores are 63 or higher.⁴ In clinical settings, the user of the BSI-18 is encouraged to further evaluate positive risk identification in three stages. First, the test user is directed to assess at the global level whether the GSI is 63 or higher; and second, at the subscale level, to determine—in the order of depression, anxiety, then somatization—whether any one of the subscale scores is 63 or higher. If the GSI is slightly below the clinical cutoff of 63 but any one of the other scores are 63 or higher, this is cause for further evaluation. For the analyses in this paper, the variable indicating a threshold level of psychological distress is based on whether the GSI is 63 or higher, or any of the three dimension scores is 63 or higher.

Theoretical Framework

Analyses are organized around the main aims of examining whether poor mental health increases (1) the likelihood of leaving employment, and (2) job turnover. To the extent possible, in the turnover analysis I distinguish between job-to-job changes and exits from a job to a period of non-employment.

This research draws on the structure provided by the theory of job search, specifically the job turnover and unemployment model of Jovanovic (1984). Jovanovic’s theoretical model is based on the view that workers’ movement in the labor market depends on their perceived value of market opportunity. While in a job match, the worker

⁴ A score of 63 corresponds to the 90th percentile of the area T-distribution, which ranges from 28 to 81 and has a mean of 50.

and the firm are equally informed about the quality of the match over job tenure, t . Match quality is described by a production function representing the worker's cumulative output on the job. Let μ denote the average output produced over a period of length t , and let output be normally distributed. $X(t)=x$ is the worker's cumulative output over tenure, t :

$$X(t) = \mathbf{m} + \mathbf{s}_x Z(t)$$

where $\mathbf{s}_x > 0$ is a known constant identical over all matches. $Z(t)$ is a Wiener process, or continuous-time random walk, normally distributed with zero mean and variance t . Assuming an equilibrium wage contract, the firm pays the worker her expected marginal product, $w = E(\mathbf{m} | x, t)$, at each time.

Job offers arrive at rate λ if the individual is working and at rate d if she is not working. Searches both on and off the job yield wage offers that are drawn from a normal distribution $F(w)$. Three reservation wages $\mathbf{f}(w, t)$, $\mathbf{q}(t)$, and \mathbf{y} correspond to the three transitions, respectively: job to job; job to unemployment; and unemployment to job.

In this paper, I am interested in job turnover and job-to-unemployment transitions. For job-to-job transitions, the hazard rate is

$$\hat{I}_j \equiv I[1 - F(\mathbf{f}(w, t))] \tag{1}$$

The job-to-job hazard rate is a function of the current job characteristics, w and t , which may change over time. However, the worker's outside opportunities, represented by \mathbf{q} and F , remain unchanged.

Let $q(t)$ be the lowest wage a worker will accept on her current job and still remain in it. At tenure t a wage lower than $q(t)$ will induce the worker to quit. Characterize the job-to-unemployment transition rate as:

$$\hat{I}_U \equiv 1 - F(q(t)) \quad (2)$$

Incorporating Mental Health in the Theoretical Model

Let d indicate the individual's level of mental distress or depression, with higher values of d representing increasing levels of symptoms. There are two main mechanisms in this model through which d may operate: (1) through the equilibrium wage process; (2) through reservation wages and transition rates. Additionally, d may also affect wage offer arrival rates, although these are assumed to be exogenous in this model.

First, higher levels of mental distress, d , are likely to influence the wage process such that d is negatively related to the equilibrium wage w , which reflects the worker's average productivity output conditioned on cumulative output x , and t (job tenure). There are several avenues by which mental health may influence average productivity, or equivalently, w . First, assume that those with higher levels of depressive symptoms experience lower cumulative output, so that $\partial x / \partial d < 0$. Higher levels of depressive symptoms may negatively influence cumulative output through an effect on the *initial mean value* of productivity among all matches between workers and firms, if depressed workers experience lower average productivity than workers with few or no symptoms.

Higher levels of depressive symptoms may negatively influence *accumulating* evidence about productivity through direct observation of new productivity values. Cumulative output, $X(t)$, is normally distributed with mean μt and variance $s^2 t$. Direct observation about productivity may reveal differences between depressed and non-depressed workers regarding match-specific values of μ , t , or both. If depressed workers exhibit lower match-specific productivity or shorter match-specific job tenures, then on average, cumulative output will be lower among depressed workers. A negative relationship between d and x implies:

$$\frac{\partial E[\mathbf{m} | x, t]}{\partial d} = \frac{\partial w}{\partial d} < 0$$

Incorporating the assumption about how d affects w , we can examine theoretically how levels of depressive symptoms influence the theoretical job-to-job and job-to-unemployment transition rates.

Job-to-job

The theoretical job-to-job transition rate is now

$$\hat{I}_J \equiv I[1 - F(\mathbf{f}(w(d), t))] \tag{3}$$

The job-to-job hazard rate is a function of the current job characteristics, w and t , which may change over time. The theoretical job-to-job hazard is decreasing in w and increasing in t , exhibiting positive duration dependence. Job offer arrivals remain exogenously determined. Conditioned on tenure, the hazard is increasing in d through its

effect on w . Conditioned on the wage, the relationship between depressive symptoms and the hazard is ambiguously defined:

$$\left. \frac{\partial \hat{f}_J}{\partial d} \right|_t = \frac{\partial \hat{f}_J}{\partial w} \cdot \frac{\partial w}{\partial d} > 0$$

$$\left. \frac{\partial \hat{f}_J}{\partial d} \right|_w = \frac{\partial \hat{f}_J}{\partial t} \cdot \frac{\partial t}{\partial d} > \text{or } \leq 0$$

Holding the wage constant, it is unclear how mental distress is related to the hazard because no assumptions are made regarding the relationship between d and t . If d and t are negatively correlated, then the partial effect of d on the hazard, wage held constant, is positive. This result is plausible if workers with mental illness are more likely than others to end up in “bad productivity matches” and experience wage instability across jobs. (Jovanovic suggests that in this context t is an index of future wage stability.) Such a scenario implies more frequent job turnover and potential for “job churning”. In the case of a negative relationship between d and t , the overall effect of depressive symptoms on the job-to-job transition rate would be unambiguously positive, and a “job churning” hypothesis would be supported. If, however, d is positively related to tenure, then higher levels of depressive symptoms, holding wage constant, would result in less job turnover.

It makes intuitive sense that, if a depressed worker experiences less accumulation of transferable human capital, she will face new job offers having less potential for advancement. Jovanovic’s model implies that wages and reservation wages diverge from each other as t increases; $f(w, t) > 0$ for $t > 0$. In words, after an individual has worked at a

job for a while, the worker “would give up a job with a stable wage in favor of a job with a lower initial wage, so long as the new job offered the *possibility* of growth (Jovanovic, 1984).” If depressed workers have lower on-the-job reservation wages, on average, but face new jobs that do not offer potential for growth, then frequent job changes may occur even if the new job offers little possibility for advancement.

Job-to-unemployment

Higher levels of depressive symptoms have a positive effect on the theoretical job-to-unemployment transition rate. At tenure t a wage lower than $q(t)$ will induce the worker to quit and choose unemployment. Assume now that t depends on d such that $\partial t/\partial d < 0$.

We can now characterize the job-to-unemployment transition rate as:

$$\hat{I}_U \equiv I[1 - F(q(t(d)))] \quad (4)$$

Differentiating equation (4) with respect to d yields:

$$\frac{\partial \hat{I}_U}{\partial d} = -I f \left(\frac{\partial q(t(d))}{\partial t} \cdot \frac{\partial t}{\partial d} \right) > 0$$

since $q(t)$ is increasing in t and $\partial t/\partial d < 0$.

Empirical Approach

Before developing an empirical approach to the study of job tenures, I first analyzed continuous spells of employment using a semiparametric Cox proportional hazards model specification for transitions out of single spells of employment:

$$h(t_i) = h_0(t_i) \exp(\mathbf{a}I_i + \mathbf{b}'K_i + \mathbf{g}'P_i + \mathbf{z}W_i + \mathbf{d}D_i + \mathbf{h}S_i) \quad (5)$$

where $i=1,2,\dots,N$ indexes observations on individuals; $h(t_i)$ is the participation hazard for observation i ; $h_0(t_i)$ is the baseline hazard which is left unestimated and captures stochastic variation in the arrival rate of job offers, the mean of the wage offer distribution, and the reservation wage. I is the number of months between the Wave 1 and Wave 2 interview; K is a vector of experience and education variables; P is a vector of personal and family characteristics; W is the number of months on TANF since January 1, 1996; D represents mental health symptoms; and S is a vector of social stressors (e.g., interpersonal violence) and coping mechanisms (e.g., drug use, illegal activities).

Following this, I then estimate the hazard of job exit, using data from multiple ordered spells in a conditional risk set model (Prentice, Williams, and Peterson, 1981). This approach makes use of all available data on jobs while accounting for gaps between jobs and the within-person lack of independence in job tenures. The assumption made in this model is that a subject with multiple ordered events is not at risk of a second event (e.g., leaving a job) until the first event has occurred.

The proportional hazards function for the S th event under the conditional risk set model is:

$$h_s(t, \mathbf{x}, \mathbf{B}_s) = h_0(t - t_{s-1}) \exp(\mathbf{x}' \mathbf{B}_s) \quad (6)$$

where t_{s-1} denotes the time at which the previous event occurred. Time to each event is measured from the previous event rather than time of study entry. The vectors of covariates included in \mathbf{x} are similar to those included in equation (5).

Results

Description of Analytic Sample

Table 1 shows descriptive characteristics of the analytic sample and two subgroups based on whether the caregiver met the BSI case criteria described above. There were some important differences between the distressed and non-distressed groups. Although there were no significant between-group differences in terms of their job characteristics at baseline, women in the distressed group were significantly less likely to be employed at baseline and at follow up (Wave 2). Distressed women also had less work experience in the two years leading up to baseline, working 11.8 months, on average (compared to 13.8 months among the non-distressed group).

In terms of survey sampling strata, there were few differences across groups. There were no observed correlations between race/ethnicity group and symptoms of mental distress. However, women who were not U.S. citizens and respondents who did not speak

English were significantly less likely than their counterparts to have symptom levels high enough to meet case criteria.

There were baseline differences in nonlabor income and welfare participation. At baseline, women in the distressed group derived a larger proportion of their total household income from sources other than their own earnings. That they were also more likely to be on TANF or SSI at some point during the study period suggests that these were two of the main sources of nonlabor income. There were no observed differences in the amount of time on TANF since the federal date of inception of Welfare Reform.

In addition to having less work experience, on average, women in the distressed group were significantly less likely to have graduated from high school. The relatively low level of human capital accumulation among the distressed group is likely to be an important factor influencing future employment opportunity.

Current and future employment opportunity may also depend on the sources of stress leading to depressive or anxiety symptoms. Many of these potential stressors are related to one's job history (e.g., unemployment), or to other economic factors such as low levels of lifetime achievement, persistent poverty, and dependence on public assistance. Social problems such as interpersonal violence, substance abuse, and participation in illegal activities may also influence employment either directly or via their impact on one's mental health, or both.

There were discernible differences between the women who met criteria for mental distress and those who did not, in whether the respondent had engaged in illegal activities⁵, used illegal drugs, or used alcohol excessively. Women who met BSI case criteria were substantially more likely than other women to report experiencing moderate to severe interpersonal violence in the year prior to baseline.⁶

It is likely that there exist unobservable correlates of psychological distress that affect current and future employment opportunities in unknown ways. For example, these data tell us little about the persistence or severity of psychological distress, or about treatment for mental illness; these are important but unobservable factors influencing the relationship between distress and employment.

Table 2 shows summary statistics for continuous employment spells and job spells. For the total sample, the average duration of the first continuous employment spell was 10.8 months (median duration was 12.4 months). Women in the distressed groups exhibited slightly shorter employment spell durations and were more likely to exit employment at some point during the period (40% vs. 30%).

Job spells ending in a change to another job are separated from job spells ending in a period of non-employment. Small cell sizes prevented further multivariate analysis of different types of job exits. The 1,110 women in the sample held 1.3 jobs, on average, during the study period. There were 1,430 job records available for analysis.

⁵ Illegal activities include: use of a phony ID; trouble with police; prostitution; engaging in physical fights at work or school; shoplifting; stealing from others; hitting or seriously threatening to hit another; trying to “con” someone.

⁶ Moderate to severe interpersonal violence is defined by positive responses to any one of a series of questions asking if the respondent had experienced being hit, beaten, burned, choked, threatened with a weapon, or forced to do anything sexual.

Again, women in the distressed group had slightly shorter (but not marked) job tenures, on average. The percentage of job spells ending during the period was much higher among distressed women (62%) compared to the non-distressed women (51%). Most of these job exits ended in periods of non-employment.

Employment Transitions

Table 3 shows hazard ratios from four models, all based on a stratified Cox proportional hazard specification, adjusting for two of the sampling strata (city, and race/ethnicity group). Parameter estimates in the models were robust to changes in model specification. There were virtually no differences in the estimates in models run with and without stratification, or in estimates from models including city and race/ethnicity category as control variables in a specification with no stratification.

Age and work experience were the two variables in the models that were most protective of employment retention. An additional month of previous employment was associated with a 4 percent reduction in the hazard of exit from employment. Controlling for work experience, an additional year of age reduced the hazard of employment exit by 3 percent.

Women who were pregnant at baseline or between interviews were not excluded from the sample if they had evidence of job holding during the period. Pregnancy was, as expected, one of the largest predictors of employment exit, increasing the hazard by 41 to 45 percent, depending on the specification.

Longer lengths of time on welfare were associated with an increased probability of leaving employment during the period. This is a potentially interesting finding that deserves further exploration as women on TANF come up against federal and state time limits. Women who have left welfare because they met time limits may be at risk of economic marginalization if they are more likely than other former welfare recipients to experience problems retaining employment.

Having not attained a high school education was associated with a 24 percent increase in the hazard of exit, although the effect was not statistically significant in the final model, which added variables indicating the use of drugs and participation in illegal activities.

Three different variables for mental health status at baseline were entered into the models. The first variable, an indicator of whether the person met BSI case criteria, was included in the first specification in Table 3. Although the hazard ratio did not meet a level of statistical significance when other more important factors were included in the model, the interpretation of the coefficient is still meaningful. The magnitude of the hazard ratio indicated that meeting case criteria was associated with a 21 percent increase in the instantaneous likelihood of exit from employment. Two other variables, the log of the BSI Global Severity Index, and the log of the BSI Depression Scale were entered in Models 2 and 3, respectively. The Depression Scale variable reached a level of statistical significance, indicating that symptoms of depression syndromes may be more strongly associated with employment outcome than other types of symptoms (e.g., anxiety).

Results using variables for the log of the Anxiety Scale and the log of the Somatization Scale (not shown here) were not meaningful.

Two correlates of depression symptoms (use of marijuana or other drugs, and participation in illegal activities), when entered in Model 4, masked the effect of symptoms on employment outcome. Although drug use was not highly prevalent in this sample, using or dealing drugs was associated with a 54 percent increase in the hazard of exit from employment.

Job Transitions

Results from the conditional risk set models of the hazard of job exit added to the picture provided by the models discussed in the previous section. As in the models of continuous employment spells, age and work experience were protective factors associated with reductions in the likelihood of job exit. In addition, pregnancy and length of time on TANF were important predictors of job exit. However, having not attained a high school education was not a significant predictor of job exit, after controlling for other factors, namely work experience and age.

In these models, non-citizen status was associated with a significant 20 to 25 percent reduction in the hazard of job exit.

The log of the BSI Depression Scale was entered into each of the three model specification, with Model 2 including an additional interaction term for age and depression symptoms, and Model 3 also including variables indicating drug use and participation in illegal activities.

In all three models, the number of depression symptoms was associated with an increase in the hazard of job exit. The addition of an interaction term in Model 2 suggests that depression symptoms may operate in different ways depending on age. Table 5 elaborates on this relationship. In this table, the sample is divided by the median age, which was 30, and job transition summary statistics are presented by BSI case status for women in each of the two age groups. Younger women were much more likely to exit jobs, and the monthly transition rate was over twice that of women over 30 (.069 vs. .031, respectively). The majority of younger subjects left a job during the study period (70%, compared to 38% among women over 30). For older women, meeting criteria for psychological distress was associated with a greater monthly incidence of job exit, but for younger women there was no meaningful difference in the already high rate of job exit. The high incidence rate of job exit among younger women suggests that depression is one of a multitude of factors influencing job retention. Older women may face fewer other barriers to employment retention than younger women, so the effect of mental symptoms on older women's employment takes on relatively greater importance.

Returning to the final model in Table 4, the addition of the variable for participation in illegal activities and the variable for drug use did little to change the observed effect of depression symptoms on job exit. Neither of the two variables was statistically significant in this model, either when entered individually or together. This finding contrasts with the findings from continuous employment spells, which indicated a reduction in the effect of depression symptoms on employment exit after controlling for these other two social factors.

Discussion and Implications

Poor women in the labor force who experience depression symptoms may face an elevated risk of leaving continuous employment compared to other working women. The results above suggest a fairly robust positive relationship between depression symptoms and job turnover, and some evidence, though not marked, that women with symptoms of depression have shorter job tenures, on average. Without further study comparing job-to-job turnover to job-to-unemployment changes, it is not possible to tell whether a “job churning” hypothesis is supported.

The impact of mental health on employment among low-income women is particularly important for several reasons. First is the magnitude of mental health problems in the population. Estimates of prevalence of diagnosable mental disorders and symptoms of mental illness are astoundingly high among low-income populations. Among women on public assistance, 12-month prevalence rates of major depressive disorder, for example, range between 12 and 36 percent (median of 22 percent). Women from low-income groups are about twice as likely as those from higher income groups to be depressed (Lennon et al., 2001). In the Three-City Study, almost one-quarter of those who were on welfare at baseline met case criteria for psychological distress (White, 2004).

For many low-income women, mental health problems pose a significant obstacle to securing employment, and the presence of symptoms may limit the capacity to remain employed. A history of poor quality jobs and unemployment may induce or exacerbate symptoms of depression, which in turn could lead to declines in labor force attachment, joblessness, and potentially social marginalization.

The research presented in this paper showed a moderate to strong relationship between symptoms of depression and subsequent instability in employment. Unstable employment patterns would be evidenced by high employment separation rates (e.g., job loss), low employment entry rates, and frequent job changes, especially frequent job changes not resulting in wage growth or improvement in non-wage job benefits. Questions related to the latter topic have not been addressed here.

Results from the employment transition analyses, along with analyses of the effect of depression symptoms on the probability of employment entry (not shown) shed some light on employment entry and separation rates for the sample of women with a history of job holding. Having symptoms of depression was associated with an increase in the hazard of exit from continuous employment (but not with a decrease in the hazard of entry into continuous employment).

Having symptoms of depression appeared to be strongly related to frequent job changes and increased turnover from jobs to periods of unemployment. Findings from the analysis of job turnover suggest the importance of looking more closely at whether experiencing symptoms of mental disorders impedes wage growth via its effect on job turnover. Although it is not possible to do so with the Three-City Study data, future research should incorporate time-varying covariates to reflect wages on each job, specific job attributes (e.g., health insurance), and if possible, job skills.

A planned third wave of the Three-City Study survey component may create additional opportunity to study of the effects of mental symptoms on job mobility and wage growth. The availability of a measure of mental health status at three points in time

may provide better information on the persistence of mental symptoms and its impact on employment opportunity. It will not be feasible to include time-varying covariates reflecting specific attributes of the jobs retrospectively reported at each interview. However, having three waves of data will provide better longitudinal data on the attributes of the current or last job held by the respondent at the time of the interview.

Although a third wave of data in the Three-City Study would provide additional information on the recent persistence of symptoms, it would be ideal to have additional methods of determining the presence and severity of symptoms of mental disorders. Using a general psychometric rating scale such as the BSI-18, it is not possible to specifically identify potentially diagnosable mental disorders, e.g. major depression. Moreover, the questions included in the depression subscale did not cover some symptoms, such as psychomotor retardation and cognitive difficulty, which would seem to be important in affecting productivity.

New research on screening and assessment of mental disorders can contribute to the selection of different brief sets of question items that might improve the precision of estimates of separate syndromes such as major depression, generalized anxiety disorder, PTSD or other diagnoses. Symptoms of PTSD may be quite high in this population because of the relatively high exposure to domestic and neighborhood violence. In the analyses presented here, the sample cell sizes were too small, and the three domains of the BSI-18 were so highly correlated with one another, that entering the three separate indicators into one regression model was not informative.

A major limitation which has not been mentioned thus far is the lack of data on health care treatment in the WCFS Three-City Study. For this work, it would be important to know if women with symptoms of mental disorders are getting treatment, and if so, whether treatment affects employment outcome. Evidence regarding treatment effects on economic outcomes is an important component of evaluations of welfare-to-work strategies that incorporate referral to or provision of mental health treatment. It would be helpful to have results from survey data to compare to evaluation results. Furthermore, the types of treatment an economically disadvantaged person may receive for mental health problems are varied, and access to treatment is a very real problem. Types of treatment can include, for example, brief screening and referral at a TANF program office; therapy sessions with a social worker; pharmacological treatment given by a primary care physician; or under ideal circumstances—being under the continuous care of a mental health professional.

Finally, one of the major gaps in the literature is our understanding of how the relationship between mental health and employment is affected by past experience with employment and past experience with mental illness, either in the individual or in the individual's family of origin. These issues of endogeneity provide analytic challenges for longitudinal studies as well as cross-sectional analyses; the cumulative effects of one's economic and health history will influence current and future opportunity. Especially in a low-income sample, persistent periods of past unemployment and early barriers to educational and work achievement are likely to have long-lasting impacts. Experience in youth and young adulthood can have large effects on future economic opportunity as well as on self-esteem, motivation, and other aspects of well-being in adulthood. Persistent

threats affecting psychological well-being could lead to more severe symptoms and the development of full-blown syndromes of mental disorders.

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Table 1
Description of Analytic Sample

Variable (baseline status unless specified)	All	Std. Dev.	Not Distressed	Std. Dev.	Distressed	Std. Dev.	
Number of Persons	1,110		938		172		
<i>Job History and Censoring</i>							
First job spell spanned Wave 1 interview	.54		.56		.45		***
Last job spell ended before Wave 2	.32		.30		.40		**
Number of months worked during previous 2 years	13.4	(9.2)	13.8	(9.2)	11.6	(8.9)	***
<i>Characteristics of current/most recent job</i>							
N (with reported data)	611		528		83		
Hourly wage on current/last job	\$8.39	(3.46)	\$8.43	(3.45)	\$8.12	(3.46)	
Usual hours worked	34.4	(11.7)	34.5	(11.6)	34.0	(12.6)	
Health insurance from job	.33		.34		.28		
<i>Survey and Sampling Strata Variables</i>							
Months between interviews	16.4	(2.8)	16.3	(2.8)	16.6	(2.8)	
Site:							
Boston	.37		.37		.35		†
San Antonio	.31		.29		.37		
Chicago	.32		.34		.28		
Racial/ethnic group:							
Non-Hispanic Black	.38		.37		.42		
Hispanic origin	.37		.29		.35		
White/other	.25		.34		.23		
Percent below poverty	.73		.72		.77		

Table 1
Description of Analytic Sample
(continued)

Variable (baseline status unless specified)	All	Std. Dev.	Not Distressed	Std. Dev.	Distressed	Std. Dev.
Number of Persons	1,110		938		172	
<i>Demographic characteristics</i>						
Age	31.1	(8.2)	31.3	(8.3)	30.2	(7.4)
English not spoken language	.29		.30		.23	*
Not a U.S. citizen	.14		.16		.08	**
Partner status:						
Single	.79		.79		.80	
Married	.15		.15		.13	
Cohabiting	.06		.06		.07	
Number of children	2.62		2.60		2.72	
Pregnant or gave birth	.10		.10		.11	
<i>Household Income</i>						
Total monthly income	\$1,047.	(848.)	\$1,054.	(865.)	\$1,010	(750.)
Monthly non-labor income	\$383.	(424.)	\$369.	(427.)	\$455.	(399.) *
<i>Welfare and SSI</i>						
Months on TANF since 1/1/1996	11.8	(14.7)	11.7	(14.6)	12.8	(14.8)
On TANF between interviews	.29		.28		.36	**
Welfare status:						
Current	.31		.30		.33	
Within past 2 years	.23		.23		.26	
In past (>2 years ago)	.21		.21		.23	
Never	.25		.26		.18	
Received SSI at any time in study period	.11		.10		.19	***
<i>Education</i>						
No HS diploma	.32		.31		.40	*
HS graduate/GED	.40		.41		.33	
Post-HS education	.28		.28		.27	

Table 1
Description of Analytic Sample
(continued)

Variable (baseline status unless specified)	All	Std. Dev.	Not Distressed	Std. Dev.	Distressed	Std. Dev.
Number of Persons	1,110		938		172	
<i>Physical and mental health</i>						
Physical or emotional health limits functioning	.11		.08		.27	**
Met BSI case definition	.15		-		-	
BSI Global Severity Index	7.3	(8.6)	4.5	(4.3)	22.4	(10.5) **
BSI Depression Scale	3.0	(3.8)	1.9	(2.1)	9.0	(5.1) **
BSI Somatization Scale	2.1	(2.9)	1.3	(1.5)	6.5	(4.4) **
BSI Anxiety Scale	2.1	(3.2)	1.3	(1.6)	6.9	(4.9) **
<i>Social stressors and coping, in past year</i>						
Experienced moderate-severe interpersonal violence	.35		.31		.53	**
Participated in illegal activities	.31		.28		.47	**
Smoked marijuana	.04		.03		.10	**
Dealt/used “hard” drugs such as cocaine or heroine	.03		.02		.08	**
Was drunk several times	.07		.05		.16	**

*p<.10 ** p<.05 ***p<.01 (Chi-square test for differences in proportions; t-tests for differences in means)

† p=.104

Table 2
Transition Summary Statistics by Mental Health Status

	All	Not Distressed	Distressed
No. Persons	1,110	938	172
Continuous Employment Spells			
No. Employment Spells	1,110	938	172
Average duration of spell, in months	10.80	10.99	9.78
Median duration	12.44	12.65	9.10
Range (Min, Max)	(.03,26)	(.03, 26)	(.4, 23.4)
No. (and percent) failures	352 (32%)	283 (30%)	69 (40%)
Monthly incidence rate	.029	.027	.041
Job Spell Characteristics			
No. Job Spells	1,430	1,207	223
Mean number spells per person	1.29	1.29	1.30
Average duration of spell, in months	12.08	12.22	11.32
Median duration	13.45	13.52	12.78
Subjects with gap	184	156	28
Average time on gap	3.74	3.62	4.43
Median time on gap	2.97	2.96	2.99
<i>All Job Exits</i>			
No. subjects (and percent) failing	590 (53%)	483 (51%)	107 (62%)
Monthly incidence rate	.047	.045	.059
Survival time:			
25%	5.91	5.97	4.60
50%	14.75	15.41	11.96
75%	-	-	22.24
<i>Job Exits: Job-to-job turnover</i>			
No. subjects (and percent) failing	159 (14%)	134 (14%)	25 (15%)
Monthly incidence rate	.013	.012	.014
<i>Job Exits: Job-to-unemployment</i>			
No. subjects (and percent) failing	431 (39%)	349 (37%)	82 (48%)
Monthly incidence rate	.034	.032	.045

Table 3

**Cox Proportional Hazard Ratios for Alternative Model Specifications:
Hazard of Exit from Employment
(Standard Normal Statistics in Parentheses)**

Covariate	1			2			3			4		
Months worked in previous 2 years	.96	(-6.60)	***	.96	(-6.62)	***	.96	(-6.70)	***	.96	(-6.70)	***
Months between interviews	.98	(-1.08)		.98	(-1.13)		.98	(-1.15)		.98	(-1.15)	
Age	.97	(-4.16)	***	.97	(-4.15)	***	.97	(-4.10)	***	.97	(-4.10)	***
Non-citizen	.76	(-1.40)		.75	(-1.49)		.76	(-1.44)		.78	(-1.44)	
Married	.87	(-0.82)		.87	(-0.79)		.87	(-0.79)		.90	(-0.79)	
Cohabiting	1.18	(0.80)		1.18	(0.80)		1.19	(0.81)		1.19	(0.81)	
No. children	.95	(-0.98)		.95	(-0.97)		.95	(-1.00)		.95	(-1.00)	
Pregnant	1.42	(2.26)	**	1.42	(2.25)	**	1.45	(2.35)	**	1.41	(2.35)	**
Months on TANF from January 1996	1.01	(1.76)	*	1.01	(1.68)	*	1.01	(1.56)	*	1.01	(1.56)	*
Less than high school education	1.24	(1.75)	*	1.24	(1.79)	*	1.24	(1.74)	*	1.21	(1.74)	
Met BSI case definition	1.21	(1.38)										
Log of the BSI Global Severity Index				1.07	(1.28)							
Log of the BSI Depression scale							1.13	(1.88)	*	1.08	(1.12)	
Participated in illegal activities										1.19	(1.49)	
Used/dealt drugs										1.54	(2.13)	**

N=1,110

* p<.10 ** p<.05 ***p<.01

Note: All models are based on a stratified Cox proportional hazard specification, with the two strata reflecting the sampling design of the Welfare, Children and Families Three-City Study: (1) Site of study (Boston, Chicago, San Antonio) and (2) race/ethnicity group: Hispanic origin, Non-Hispanic Black, and Non-Hispanic White.

Table 4

**Cox Proportional Hazard Ratios for Conditional Risk Set Models:
Hazard of Job Exit
(Standard Normal Statistics in Parentheses)**

Covariate	1			2			3		
Months worked in previous 2 years	.97	(-6.55)	***	.97	(-6.70)	***	.97	(-6.73)	***
Months between interviews	.98	(-1.18)		.98	(-1.17)		.98	(-1.22)	
Age	.96	(-6.32)	***	.96	(-4.49)	***	.97	(-4.27)	***
Non-citizen	.74	(-2.13)	**	.74	(-2.11)	**	.77	(-1.84)	*
Married	.97	(-0.25)		.97	(-0.26)		.99	(-0.07)	
Cohabiting	.98	(-0.10)		.98	(-0.13)		.98	(-0.13)	
No. children	.97	(-0.91)		.96	(-0.95)		.96	(-0.92)	
Pregnant	1.35	(2.22)	**	1.37	(2.37)	**	1.36	(2.32)	**
Months on TANF from January 1996	1.01	(2.14)	**	1.01	(2.08)	**	1.01	(2.24)	**
Less than high school education	1.14	(1.33)		1.14	(1.35)		1.13	(1.24)	
Log of the BSI Depression scale	1.09	(1.75)	*	1.26	(2.33)	**	1.24	(2.12)	**
Interaction: Age X Log(Depression scale)				.99	(-1.71)	*	.99	(-1.91)	*
Participated in illegal activities							1.33	(1.64)	
Used/dealt drugs							1.16	(1.59)	

Number of subjects = 1,110

Number of job records = 1,430

* p<.10 ** p<.05 ***p<.01

Note: Models are based on a Cox proportional hazard specification, adjusting for correlation within clusters (subjects), and treating job exits as multiple ordered failures. The conditional risk set at time t for event k is made up of all subjects under observation at time t that had event $k-1$.

Table 5

**Job Transition Summary Statistics
By Age and Mental Health Status**

	All	Not Distressed	Distressed
<i>All Job Exits</i>			
No. subjects	1,110	938	172
No. (and percent) failed during period	590 (53%)	483 (51%)	107 (62%)
No. of job spells	1,430	1,207	223
<i>Monthly incidence rate</i>	<i>.047</i>	<i>.045</i>	<i>.059</i>
Survival time:			
25%	5.91	5.97	4.60
50%	14.75	15.41	11.96
75%	-	-	22.24
<i>Job Exits of Women Under Age 30</i>			
No. subjects	516	431	85
No. (and percent) failed during period	361 (70%)	300 (70%)	61 (72%)
No. of job spells	713	598	115
<i>Monthly incidence rate</i>	<i>.069</i>	<i>.068</i>	<i>.075</i>
Survival time in months:			
25%	4.04	4.04	9.85
50%	9.33	9.33	-
75%	19.48	20.27	-
<i>Job Exits of Women Ages 30+</i>			
No. subjects	594	507	87
No. (and percent) failed during period	229 (39%)	183 (36%)	46 (53%)
No. of job spells	717	609	46
<i>Monthly incidence rate</i>	<i>.031</i>	<i>.028</i>	<i>.046</i>
Survival time in months:			
25%	8.38	9.86	6.73
50%	-	-	14.75
75%	-	-	-