Effects of Postpartum Depression on Parents' Relationship Status

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This study will investigate the effects of a specific and relatively common type of mental illness, postpartum depression, on the parents' relationship status. Postpartum depression (PPD), which is defined as moderate to severe depression in a woman after she has given birth, is experienced by 10-20% of all childbearing women within 6 months of delivery (Miller, 2002). Symptoms include despondent mood, changes in sleeping and eating patterns, feelings of inadequacy as a parent, and impaired concentration (Miller, 2002). Previous studies have found evidence of adverse effects of depression on women's employment (Marcotte, Wilcox-Gok, and Redmon; 2000), and of PPD on maternal-infant interactions (e.g., Murray et al., 1996; Field, 2010) and parenting practices (e.g., Field, 2010). However, as far as we know, no previous studies have investigated the effects of PPD on the parents' relationship status or living arrangements, outcomes that a growing literature has shown are important for many dimensions of parent and child well-being.

Most research on mental health and couple relationship status has focused on the effects of marriage on mental health (see Gove, Hughes, & Style, 1983). Evidence on the reverse pathway (from mental health to relationship status) is much rarer and has focused almost exclusively on marriage. Simon (2002) and Wade & Pevalin (2004) used panel data to explore

bi-directional relationships between mental health (depression in Simon; a composite measure in Wade & Pevalin) and changes in marital status. Both Simon and Wade & Pevalin found that mental illness often predates marital dissolution, although Simon pointed out that part of what may be going on is that marital discord is leading to marital dissolution, with the discord causing depression along the way. Simon did not find evidence that depression is associated with subsequent transitions to marriage, and in a similar study, Lamb and colleagues (2003) did not find that depression predicts subsequent marriage or cohabitation. Together, these studies found little evidence that mental illness as they have defined it (generally, depression), leads to specific types of relationship status changes over observation periods of roughly 5-7 years.

Agerbo and colleagues (2004), using Danish registry data, found that schizophrenia decreased the likelihood that individuals entered marital unions over a 25 year period. Studying schizophrenia, although it is a severe disorder and relatively rare, is useful for assessing causality because it is less likely to be caused by social circumstances than many other mental illnesses, including depression (Dohrenwend et al., 1992). However, the findings cannot necessarily be generalized to other mental illnesses.

Bartel and Taubman (1986) considered different classes of diagnoses as well as when during the lifecourse the individual was diagnosed with mental illness. Using panel data on veterans, they examined the effects of psychoses (e.g., schizophrenia), neuroses (e.g., mood disorders), and other mental illnesses on the likelihood of marriage. They found that neuroses that were diagnosed when the individual was young reduced the likelihood of marriage, but that recent diagnoses did not. They found no associations for psychoses or other mental illnesses in their sample of men who had served in the military.

Two studies considered the effects of mental illness on the timing, rather than incidence, of marriage. Forthofer and colleagues (1996) looked at many specific diagnoses and found that affective disorders (particularly depression) and conduct disorder have substantial associations with timing of entry into first marriage for both women and men. In particular, these disorders were positively associated with early first marriage, defined as marriage before age 19. Teitler and Reichman (2008) investigated how a history of mental illness is related to a woman's likelihood of marriage over a 5-year period following a non-marital birth. They found that by 1 year after giving birth, 10 % of the mothers without mental illness had married, compared to 5% of the mothers with mental illness. By 5 years, the respective figures were 26 and 16%; that is, mothers with mental illness were about 40% less likely to have married. Overall, mothers with any diagnosed mental illness were about two thirds as likely as mothers without mental illness to marry during the 5 year observation window.

The evidence from this body of literature suggests that mental illness does affect relationship status but that the effects vary by the type of mental disorder, outcome considered, timing of mental illness relative to the outcome, and the specific population studied. As far as we know, no previous studies of the effects of mental illness on relationship status, which have focused almost exclusively on marriage, have explicitly accounted for the potential endogeneity of mental health. Additionally, studies have rarely considered the effects of mental illness on cohabitation or other more contemporary living arrangements (an exception is the bi-directional study by Lamb and colleagues, 2003, discussed earlier, that considered transitions into both marrital and cohabiting unions). Our study, which focuses on the effects of postpartum depression—a specific and relatively common form of mental illness with clear timing of onset—on parents' relationship status within a clearly defined three year period, will address

those gaps by explicitly addressing the potential endogeneity of mental illness and focusing on parental relationships well beyond a marital/non-marital dichotomy in a sample with high rates of relationship change.

Data

The Fragile Families and Child Wellbeing (FFCWB) study follows a cohort of parents and their newborn children in 20 large cities in the United States. The study was designed to provide information about the conditions and capabilities of new (mostly unwed) parents, the determinants and trajectories of their relationships, and the consequences of welfare reform and other policies. Births were randomly sampled births in 75 hospitals between 1998 and 2000. By design, approximately 75% of the mothers were unmarried. Face-to-face interviews were conducted with 4,898 mothers while they were still in the hospital after giving birth (see Reichman et al., 2001 for a description of the research design). The postpartum (baseline) response rate was 86% among eligible mothers.

Follow-up interviews were conducted over the telephone approximately 1 and 3 years after the birth of the focal child. Eighty nine percent of the mothers who completed postpartum interviews were re-interviewed when their children were 1 year old and 86% of mothers who completed baseline interviews were re-interviewed when their children were 3 years old. As part of an "add on" study to the core survey, data from medical records (from the birth hospitalization) were collected. The availability of medical record data depended, for the most part, on administrative processes of hospitals rather than decisions on the part of survey respondents to make their records available. Medical record data are available for 3,684 (75%) of the 4,898 births in the FFCWB sample.

The FFCWB data are well suited for analyzing the effects of postpartum depression on

parents' relationship status because they were collected as part of a longitudinal birth cohort study, and include: (1) survey questions asked at the 1-year follow-up interview that allow us to characterize postpartum depression; (2) detailed survey questions at all interviews that allow us to characterize parental relationship status and changes; (3) data from hospital medical records, allowing us to construct measures of maternal prenatal mental and physical health; (4) rich data to use for control variables or identifiers for postpartum depression, including the mother's parent's history of depression (see Methodology section below for specifics); and (5) geographic identifiers, which allow us to control for city and state of residence or to attach local contextual measures (such as availability of mental healthcare providers at the zip code level).

Key Measures

Parents' Relationship Status

At baseline (the child's birth), there were five relationship categories describing the parental relationship: married, cohabiting, romantically involved, friends, and little or no relationship. At the follow-up interviews, there was an additional category for separation or divorce. Following Reichman, Corman & Noonan (2004), our primary outcomes will be (1) whether the parents were married or cohabiting at the time of the 3-year follow-up interview, and (2) whether the parents' commitment to the relationship increased or remained the same (versus decreased) between baseline and 3 years. For example, consider a case in which the parents were romantically involved but not living together at baseline: If at follow-up they were "just friends," we will consider the level of commitment to have decreased. If they remained romantically involved, lived together, or got married by follow-up, we consider their relationship commitment

to have "stayed the same or increased."[1] In supplemental analyses, we will (1) consider marriage

as an outcome in its own right, and (2) consider multi-category outcomes (e.g., in multinomial

models that predict marriage, cohabitation, and non-cohabiting romantic involvement, all

compared to little or no relationship).

Postpartum depression

Following Mitchell et al. (2011), who used the FFCWB data to study gene-environment

interactive effects on postpartum depression, we will measure postpartum depression using a

dichotomous indicator for whether, at the time of the 1-year follow-up interview, the mother met

the diagnostic criteria for major depression in the past 12 months according to the Composite

International Diagnostic Interview Short Form (CIDI-SF) Version 1.0 November 1998, which

was embedded in the mother's 1-year follow-up interview. We will use two different validated

measures (FFCWB 2012), one which is "conservative" and one which is "liberal." Each measure

is a count of number of depressive symptoms ranging from 0 to 7, with a major depression

episode defined as the experience of three or more symptoms of dysphoria or anhedonia. The

conservative measure characterizes respondents who reported experiencing symptoms (sad, blue,

depressed or complete loss of interest) for most of the day for a period of at least 2 weeks. The

liberal measure characterizes respondents who reported experiencing symptoms for at least half

the day for a period of at least 2 weeks. About 12% of the mothers in the FFCWB study had

experienced depression in the 12 months prior to their 1-year interviews based on the

conservative measure and 15% had experienced depression in the 12 months prior to their 1-year

interviews based on the liberal measure of depression.

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[1]It is important to note that this measure is simplistic and that it is *not* a measure of the quality of the relationship.

Methodology

First, we will estimate probit models, separately using the two measures of postpartum depression (measured at 1 year) to predict the effects of postpartum depression on the parents' relationship status (measured at 3 years). In certain models, we will control for diagnosed mental illness before the focal child was born (from the mother's prenatal medical record) as well as the grandmother's history of depression. We will also consider measures of "becoming depressed" (not having had any diagnosed mental illness before the focal child was born but screening positive for depression at the 1-year follow-up). Models incorporating multi-category outcomes will be modeled using multinomial probit.

The accuracy of the estimates based on single equation models depends on the degree to which postpartum depression is an exogenous shock. A fairly recent meta-analysis found that postpartum depression is not significantly related to maternal age, marital status, length of relationship with partner, education, number of children, parity, or pregnancy employment status, and that the associations between postpartum depression and both income and occupation, though statistically significant, are small (O'Hara & Swain, 1996). Despite the seeming randomness of postpartum depression based on sociodemographic characteristics, however, the largest risk factor for postpartum depression is past history of psychopathology (O'Hara & Swain, 1996), highlighting the importance of controlling for the mother's and grandmother's history of mental illness.

Despite the evidence presented above that postpartum depression appears to have at least some random component, it will be important to establish that we have truly captured random shocks and to provide convincing evidence that we have been successful at isolating causal effects. As such, we will implement a multipronged estimation strategy that involves including a

rich set of covariates, exploring exogeneity assumptions though "falsification tests," and conducting supplemental analyses using 2-stage modeling techniques.

The FFCWB data allow us to control for a rich set of maternal and family characteristics, measured at baseline whenever possible. We will include maternal age, race/ethnicity, immigrant status, education, prenatal employment status, whether the birth was financed through Medicaid (a proxy for poverty), father's relationship with the mother (married, cohabiting, romantic but not cohabiting, friends, or no relationship), father's education and employment status, and census tract poverty rate. As indicated above, we will control for not only the mother's prenatal mental illness, but also the grandmother's (the mother's mother) history of depression. We will also include family background characteristics of the parents that may be related to both health and social interactions later in the lifecourse; such as the education levels and immigrant status of the focal child's grandparents. We will include variables related to the focal child, including gender, health, and multiple birth, all of which are related to postpartum depression (deTychey et al. 2008; Stowe and Nemeroff 1995; Choi, Bishai & Minkovitz 2009) and may be associated with parents' relationship status (e.g., Reichman, Corman & Noonan 2004 found strong effects of infant health on parents' relationship status one year later). In addition, we will include measures of parity and number of other children in the household. We will estimate both parsimonious models and those with large sets of covariates, and assess robustness of our estimates (to the extent that we have characterized true health shocks, the estimates should be stable).

For falsification tests, we will estimate the impact of having postpartum depression on the parents' relationship status at the time of the birth. The postnatal shock should have no impact on the parents' relationship status pre-shock, controlling for other factors. Finding no associations would support the case that we have indeed captured an exogenous shock.

Finally, we will estimate 2-stage models wherein we will identify postpartum depression with individual-level variables (such as mental health of the baby's grandparents) and/or neighborhood-level variables (such as numbers or concentrations of mental health providers). Given the dichotomous nature of our primary relationship status outcomes, we will use bivariate probit models and/or 2-stage linear probability models. We will select instruments that are both theoretically valid and correlated with the health shock but uncorrelated with the error term in the parent relationship status equation when controlling for the health shock. We will perform appropriate tests to assess the validity of our identifiers (e.g., overidentification tests), run models with alternate sets of identifiers to assess the robustness of our 2-stage estimates, and test our single-stage estimates for consistency. In cases where the outcomes have more than two discrete categories, we will use appropriate extensions of the probit and 2-stage linear probability models.

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