Do depressive symptoms in male and female adolescents predict

unintended birth in emerging adulthood?

A longitudinal analysis

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Context: Unintended pregnancy is a considered a major public health problem in the United States and identifying precursors to unintended pregnancy is critical to its reduction. To date little has been done regarding the relationship between depressive symptoms and unintended pregnancy, and none of this work has looked at both men and women.

Methods: Data from waves 1 and 4 of the National Survey of Adolescent Health was used to examine the relationship between depressive symptoms in adolescence and unintended first pregnancy in emerging adulthood in both women and men.

Results: Both men and women who reported higher levels of depressive symptoms were more than twice as likely to report an unintended pregnancy (OR=1.99, p<.01) when compared to those who had no children, and 27% more likely to report an unintended pregnancy when compared to those reporting an intended pregnancy (OR=1.27, p<.05). These relationships remained significant when background factors were added. The relationship was the same for both men and women.

Conclusions: Adolescent depression is related to later unintended pregnancy. Policies which incorporate treatment of depression into interventions targeted to the middle or high school age group, as well as improved programs for detecting psychological concerns in adolescents may help to reduce the unintended pregnancy rates in the United States.

Unintended birth is considered a major public health problem in the United States[1] with about half of all live births reported as unintended.[2] Unintended birth is typically measured as births that were defined as unwanted or earlier than desired.[2] Among the recognized consequences of unintended births are delayed prenatal care,[3] increased rates of maternal depression,[4] increased child abuse and neglect,[5] reduced mother/child bonding,[6] low rates of breastfeeding,[7] low birth weight,[8] and increased financial strain on the family as a whole.[9] While some of these consequences may be due to the selection of disadvantaged populations such as poor and minority men and women into unintended childbearing, it remains important to address the issue of unintended birth itself in order to reduce the potential problems as disadvantaged populations would benefit from a reduction in unintended childbearing.[10]

Given the known negative consequences, it is critical that a full understanding of the predictors of unintended births be pursued so that appropriate interventions can be designed for women at high risk of experiencing an unintended birth. It is also important to examine the potential effects of depressive symptoms on likelihood of unintended birth as it seems likely that poor mental health could in fact be a contributor to the consequences for both parents and children resulting from an unintended birth. In other words, if a mother or father is depressed prior to a pregnancy and birth it may well lead to many of the consequences typically associated with unintended birth. We expect depressive symptoms to be related to later unintended births for a variety of reasons. Depression has been shown to reduce contraceptive use,[11] and to reduce the likelihood of use of effective contraceptives,[12] both of which are behaviors which likely would lead to increased incidence of unintended childbearing.

Research looking at the relationship between unintended childbearing and depression among adults has largely focused on how unintended pregnancy and birth is related to later depression, either during pregnancy[13] or after the birth of the child.[1] In addition, of the small number of studies that examines depression prior to an unintended pregnancy, no study uses a national longitudinal sample or focuses on first births. Focusing on first births is important because it clarifies the relationship between depression and unintended pregnancy by eliminating the influence of previous pregnancies and existing children on depression levels and intention status. In addition, looking at emerging adults is critical as unintended pregnancy rates for women 18-24 are twice the national *rate* and in addition, the highest *number* of unintended pregnancies occurs in this age group.[14] Importantly, previous studies have focused on women only and have not considered the contributions of depressive symptomology in men to unintended births. While we should bear in mind that research shows that men are not always aware of pregnancies and births and as such may underreport them,[15] it is still important to investigate if the proposed relationship between depressive symptoms in adolescence and unintended birth is the same for both genders *when an unintended birth is reported.*

This study examines first unintended birth in emerging adults, a population with twice the unintended birth rates compared to other populations,[16] and importantly, also examines *both men and women* to determine if the relationship between depressive symptomology adolescence and unintended birth in emerging adulthood differs by gender. As existing studies on this issue focus almost exclusively on women, examining the relationship between depressive symptomology and unintended birth in *both men and women* is critical. Importantly, a fuller understanding of how depression relates to unintended birth will contribute to our understanding of why this remains an issue for both men and women even when they have ready access to contraceptives.

Results described here represent an initial investigation into the relationship between depressive symptoms and subsequent unintended birth. Specifically, this study examines depressive symptoms in adolescence, *prior in time* to all of the unintended births included in the study. This study purposefully omits pregnancies that did not result in a live birth (i.e., miscarriages and abortions) for two reasons: 1) from a policy standpoint, we feel that it is important to examine how early depressive symptoms may contribute to unintended births due to the negative relationship we know exists between unintended births and later child (and parental) well-being; and 2) there is already a body of literature which addresses depression and abortion in some detail.[17] We expect to find that depressive symptoms in adolescence are related to increased incidence of unintended births in emerging adulthood. In addition, we hypothesize that this relationship may differ for men and women primarily because actual pregnancy and birth has a greater physical impact on women than on men, but also because an unintended birth may occur without a man's knowledge.

Background

Existing research has looked at the relationship between depressive symptoms and both unintended pregnancy and unintended birth in specific contexts. All studies identified examined only women. One study examined this relationship in the context of rapid repeat pregnancy and found that depressive symptoms after the birth of a first child were not associated with unintended repeat pregnancies soon thereafter.[18] However, this research did not compensate for the possible effect of the initial pregnancy on depressive symptoms and therefore, the time order of the relationship between depressive symptoms and unintended birth cannot be established as the first birth may have influenced depressive symptoms prior to the second. Lancaster et. al.[13] conducted a meta-analysis of existing studies identifying risk factors for depressive symptoms

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during pregnancy and found a significant relationship between a history of depression prior to pregnancy and depressive symptoms during pregnancy. While this meta-analysis did include analyses of both depressive symptoms prior to pregnancy and pregnancy intention, they examined them as two separate predictors of depressive symptoms during pregnancy and did not address possible links between the two predictors. Only studies looking at women were included in the meta-analysis.

Some other research has investigated the relationship between depression during pregnancy and pregnancy intention, which is the reverse causal relationship from our focus in this paper. One of these studies found that depressive symptoms during pregnancy were predicted by pregnancy intention status, but did not look to see if the depressive symptoms had preceded the pregnancy or not.[1] Another study found higher levels of clinical depression among women who chose to abort rather than carry a pregnancy to term; however, the relationship between depression prior to the pregnancy and pregnancy intention status was not addressed.[19] This work was of a cross-sectional nature and so could not establish if the depressive symptoms preceded the pregnancy or were the result of the pregnancy or other life circumstances. Finally, work looking at mental illness, which included clinical depression, found no association between preexisting psychiatric disorder status and subsequent unintended pregnancy.[20] While this research did examine depressive symptoms prior to pregnancy and pregnancy intention status in a longitudinal context, because depressive symptoms were subsumed under a wide umbrella of psychiatric disorders such as bipolar disease, eating disorders, PTSD, and many others, the effects of depressive symptoms alone are not clear. In addition, their sample included only women.[20]

Finally, there has been some research into the relationship between depressive symptoms and teen pregnancy, which is usually considered to be unintended.[21] However, results have been conflicting. Some studies have found no difference in depressive symptoms among women who experienced an earlier family transition and those who did not. It is important to note that the relationship between depressive symptoms and pregnancy intention status was not explicitly addressed in any of this work.[22] Other research has used longitudinal data to examine the relationship between depressive symptoms and teenaged pregnancy among females and found differences in the relationship depending on SES, with a relationship between depressive symptoms and early childbearing existing for only the poorest of teens.[23] However, this work did not explicitly address intention status of the birth. Other research with female adolescents on this topic has found that depressive symptoms in the 8th grade predicted subsequent teen childbearing.[24] Again, this work did not explicitly address the intention status of the teen birth. As a whole, research on adolescent childbearing has not addressed the relationship between depressive symptoms and intention status of teenage births, but rather the role of depressive symptoms in adolescent births regardless of intention status.

The limited studies discussed above are inconclusive, with some finding a relationship between depressive symptoms and unintended pregnancy or birth and other research finding no relationship. This body of work has focused almost exclusively on women and depressive symptomology and has not examined the role of depressive symptoms and their relationship to subsequent unintended births in men. Furthermore, the number of studies looking at depressive symptoms which precede unintended birth is so small as to be almost non-existent. No study has used longitudinal data in order to assess measures of depressive symptoms which clearly temporally precede both pregnancy and birth, nor has any study used a nationally representative

sample. In addition, no study has examined the role of depressive symptoms in adolescent men and their possible relationship to unintended birth. This paper aims to fill this gap by using Add Health data from wave 1 and 4 to determine if those reporting higher levels of depression at wave 1 are more likely to report an unintended birth during emerging adulthood (between waves 1 and 3 as reported at wave 4).

METHODS

Data

This study used data the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative survey beginning with middle and high school students surveyed in 1994-1995.[25] Researchers sampled 52 middle schools and 80 high schools in the United States. More than 70% of the originally sampled schools participated in the study, and those who refused were replaced with schools from the same community. A subsample of students at each school completed an in-home interview at wave 1 that was followed up one, six, and 12 years later. The primary parent (usually the mother) also completed an interview. The Add Health sample was representative of U.S. schools with respect to urbanicity, region of country, school type, ethnicity, and school size. Oversampling of some populations was conducted, and dropouts were not interviewed. Probability weights allowed researchers to represent the national population of adolescents in grades 7 to 12 in 1994-1995.

Response rates for the four waves varied from 77 to 88 percent. For analyses of depression in the full sample, 14,444 female and male respondents who participated in waves 1 and 4 and were not missing weight, region, or school identifier were eligible for analysis. It should be noted that male respondents may underreport pregnancies and birth as research has shown that they are not necessarily aware when such events occur.[15] Approximately three

percent of these cases were deleted listwise because of missing information. For analyses of depression in a subsample of those reporting a birth by the last wave, 4,200 male and female respondents who participated in waves 1 and 4 and were not missing weight, region, or school identifier were eligible for analysis. Approximately 6 percent of these cases were deleted listwise because of missing information.

Wave 4 reports of births were used in all analyses as recommended by Add Health.[26] The dataset was also limited to first births to establish clear time order with depression measures occurring prior to not just the target birth, but all births. Births occurring within ten months of each wave's interview date were eliminated in the analysis to remove the possibility that the respondent or respondent's partner was pregnant with their first child at the time the depression measures were collected. In addition, the dataset was limited to respondents reporting a first birth between the ages of 18 and 24. This was done to reduce the influence of life course variation in depression levels[27] and to narrow the analysis to the late teens and early twenties, the time period in life when unintended pregnancies are most likely.[16] Although most teen births are thought to be unintended, they were excluded in order to focus specifically on unintended births in emerging adulthood where the greatest numbers of unintended births take place. In addition, teen birth and its relationship to depressive symptomology has been previously examined.[23]

Measures

Depressive Symptomology. The measure of depressive symptomology used a subset of questions from the Center for Epidemiologic Studies "distress scale".[28] The scale asked respondents to report the frequency of specific symptoms in the last week, ranging from "never or rarely" to "most or all of the time." We calculated the mean of the response items, with final values

ranging from 0 to 3. Wave 1 depressive symptomology measures used a 19-item modified scale. Cronbach's alpha for the scale was .91. In order to ensure that *all depressive symptomology was measured prior to births* in emerging adulthood, all measures are at wave 1 and any births occurring before wave 1 or within ten months after wave 1 have been omitted from the dataset. Table 1 reports means for wave 1 depressive symptomology and other variables, as well as differences between those who had an unintended birth, those who had an intended birth, and those who reported no birth between waves 1 and 3.

Unintended Birth. Unintended birth was measured retrospectively in wave 4 (as recommended by Add Health) with the question: "Thinking back to the time just before this pregnancy with (partner name), did you want to have a child then?" While this question was asked of those who experienced a pregnancy regardless of the resolution of the pregnancy, only those responses which pertained to the live birth included in our analyses were used. This question was asked in the same way to both male and female respondents; thus, all results reported reflect their own perception of the intendedness of the target birth, not their partner's. For multivariate analysis a three level variable was used which identified those who reported no birth, those who reported an intended birth, and those who reported an unintended birth.

Social and demographic variables. Independent variables were measured at wave 1 and were chosen because of possible hypothesized relationships to both depression and unintended birth. Wave 1 reports were used in order to ensure that all control variables were measured prior to any reported birth. Gender of the respondent was included in order to look for possible differences between men and women in the relationship between depression and unintended pregnancy. A gender by depression interaction was also entered to determine if the relationship between depression and unintended birth was different for men and women.

Family socioeconomic status was included using measures of the adolescent's responding parents' education in years and parent-reported household income. As in Cubbin et al.,[29] we created dummy variables for income as a percentage of 1994 federal poverty thresholds, controlling for the number of people living in the household (0 to 100%, 101 to 200, 201 to 300, 301 to 400, and > 400). Because there was a large amount of data missing for this measure, we also included an indicator for missing income information. In analyses including only those who reported a birth, age at birth and marital status at birth were also included as control variables. There were a large number of missing cases for marital status at the time of the birth as the question regarding marital status at the birth of the child was not asked unless the respondent reported being married or living with someone at the time of the wave 4 interview when the pregnancy history recommend for use by Add Health was collected. This unknown category would include those who were unmarried at the time of the birth, as well as those who divorced or separated between the time of the birth and the interview at wave 4.

Respondents reported their race/ethnicity (White, African-American, Latino, Asian, and "other" race). Two variables measured factors related to student achievement in school which has been shown to be related to depression levels in students.[30] Student-reported grade point average (GPA) used reported grades in four subjects, which were then averaged into a four-point scale (A = 4, B = 3, C = 2, D or lower= 1). This was then recoded into a series of grouped GPA variables (1 to 3, 3 to 3.49, and 3.5 to 4), with an indicator for those missing GPA information. Finally, we included respondents' reports of having had penile-vaginal intercourse prior to wave 1. This reflects past sexual history during the school years and does not reflect the sexual activity which led to the target pregnancy being examined in this study.

ANALYSIS PLAN

First, we used several comparison groups to examine differences in reported mean depression levels at wave 1. Next we used bivariate analyses to estimate the relationship between wave 1 depressive symptoms and birth, comparing 1) those who reported an unintended birth to those reporting no birth, and 2) those who reported an intended birth to those who reported an unintended birth. It is important to look at the relationship between no birth and unintended birth as well as between intended and unintended birth, as having any birth in the teens or early 20s is considered to be somewhat risky in terms of life chances and is more likely to occur in minority and other disadvantaged groups.[31] Next we estimated multivariate logistic regression analyses to examine the association between reported wave 1 depressive symptoms and all birth groups (no birth, intended birth, and unintended birth) while accounting for background variables. Finally, we added a gender by birth intention status interaction to our multivariate models to allow for differences in the effect of gender on depressive symptoms related to both birth and unintended birth specifically. All analyses used Stata's complex survey design commands and were weighted to make findings representative of adolescents enrolled in grades 7-12 in 1995 when wave 1 data was collected.

RESULTS

Descriptive and Bivariate

Descriptive statistics for the study sample are reported in Table 1. In the overall sample, 14% of the respondents reported an unintended birth between wave 1 and 3. Respondents reported an average depressive symptom rating of .57 (on a 1-3 scale) at wave 1. However, those with no birth between waves 1 and 3 reported lower rates of depressive symptoms at wave 1 (.55) than did those with an intended birth (.61) or an unintended birth (.66). Importantly, those participants reporting an unintended birth had significantly higher reported levels of depressive

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symptomology than either those groups reporting no children or an intended birth. This pattern

of results helps to rule out the alternative explanation that those with higher levels of depressive

symptomology are just more likely in general to have children than those with lower levels of

symptomology. As depressive symptoms were measured at wave 1, well before any pregnancy

or birth occurred in the sample used, differences in depressive symptoms clearly preceded the

target pregnancy and birth. (See Table 1)

Multivariate Analyses

Multinomial logistic regression models were run predicting pregnancy status (none, intended,

unintended) on the basis of depression reported at wave 1, *prior to any birth*. A second model

added background characteristics (GPA, race/ethnicity, gender, sexual activity prior to wave 1,

wave 1 household poverty status and parental education). Model two was a significantly better fit

than model one (F=12.57, p<0.01). A third model adding an interaction between depressive

symptoms and gender did not significantly improve overall model fit (F=0.82, n.s.). The lack of

a significant gender interaction is noteworthy.

Unintended Birth versus No Birth. Comparing those with an unintended birth to those with no

birth at all between waves 1 and 3, depression was significantly predictive of an unintended birth

with a one-standard deviation increase in depressive symptoms preceding both the pregnancy

and birth resulting in a 31% increase in the likelihood of experiencing an unintended birth

(OR=1.31, p<0.01). In other words, those who reported more depression at wave 1 were more

likely to experience an unintended birth between waves 1 and 3 while they were in their late

teens and early 20s. When background characteristics were added to the model, depressive

symptoms remained predictive of unintended birth although the relationship weakened

(OR=1.11, p<0.01), suggesting a partially spurious relationship in which background factors

accounted for a portion of the relationship between depressive symptoms at wave 1 and an unintended birth between waves 1 and 3. This is consistent with work showing that both low-income and minority groups are more likely to report unintended births[16] and also more likely to report depressive symptoms.[32] Along those lines, we found that those reporting unintended births were more likely to be black than white, were more likely to be in poverty at wave 1, and less likely to have a parent with a B.A. A gender by depressive symptoms interaction was added to model three but was not significant: The relationship between depressive symptoms and subsequent unintended birth (compared to no birth by age 24) was not significantly different between men and women. (See table 2)

Unintended Birth versus Intended Birth. Comparing those with an unintended birth to those with an intended birth, depressive symptoms at wave 1 were significantly predictive of unintended birth between waves 1 and 3 with a one standard deviation increase in depressive symptoms resulting in a 10% increased likelihood of an unintended birth (OR=1.10, p<0.05). In other words, those who reported higher levels of depressive symptoms at wave 1 were more likely to experience an unintended birth between waves 1 and 3 as opposed to an intended birth. When background characteristics were added to the model, depressive symptoms remained predictive of unintended birth (OR=1.10, p<0.05), suggesting that the relationship between depressive symptoms and birth intention status is not spurious, at least based on the background characteristics included in this analysis. In addition, those with unintended births were more likely to be black than white, however, no other background characteristics were significant. (See Table 3, Models 1-3)

In addition to the multivariate model described above, a separate model (not shown in tables) was run in which the two groups reporting births were compared directly to one another

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(n=3939), omitting those who did not report a birth between waves 1 and 3. This model allowed for the inclusion of variables specific to those who had a birth, i.e. marital status at the time of the birth and age at birth. In model one we used depressive symptoms at wave 1 to predict birth status for birth between waves 1 and 3. We found that those reporting one standard deviation higher in depressive symptoms at wave 1 were 10% more likely to report an unintended birth between waves 1 and 3 when compared to those reporting an intended birth (OR=1.10, p<.05). However when background characteristics were added to the model, the relationship between depressive symptoms and pregnancy status became marginally significant (OR=1.08, p<0.10) indicating a partially spurious relationship.

Younger age at birth predicted a higher likelihood of reporting unintended birth (p<.01). Marital status at birth was also significant, with those reporting having been unmarried at the time of birth twice as likely to report an unintended birth as those who were married at the time of the birth (OR=1.99, p<.01). This suggests that while depressive symptoms may be more likely to lead to childbearing in general and more specifically to unintended childbearing, at least part of this relationship is due to differences in background characteristics and to marital status and age at birth. As in other models, the gender by depressive symptoms interaction included in model three was not significant. In addition, model two was a significantly better fit over model one (F=6.11, p<0.01) while model three including the gender interaction was not an improvement over model two (F=1.91, n.s.). This again suggests that gender of the individual experiencing an unintended birth is not a factor in understanding the relationship between depressive symptoms prior to the pregnancy and birth, and intention status of that birth. (See table 3, models 4 and 5)

DISCUSSION

This study used a longitudinal national random sample to see if depression prior to birth predicts birth status among emerging adults. We found that there was a *unique depression risk for unintended birth for both women and men* such that those who experienced high levels of depressive symptoms in adolescence prior to any pregnancy and childbearing were more likely to report an unintended first birth between ages 18 and 24 compared, to either not having a child by age 24 or having an intended first birth. This relationship held *above and beyond background factors*. While this relationship was weakened by the inclusion of age and marital status at birth, a marginally significant relationship between depression and first birth intendedness remained.

A particularly interesting finding is that both *men and women* who reported being more depressed during their adolescent years had an increased likelihood of experiencing an unintended pregnancy during emerging adulthood – in other words, *no gender differences were found in the relationship between adolescent depression and unintended pregnancy*. Therefore, depression in adolescence appears to have the same effect on likelihood of unintended pregnancy for both men and women. While it is important to note that men can be unaware of a pregnancy while women cannot, of those who reported an unintended pregnancy occurring, *both* men and women with unintended pregnancies in emerging adulthood were more likely to have experienced higher levels of depression as a teen. This was true when compared to those who had a planned pregnancy in the same time frame, and those who experienced no pregnancy at all. It is important to note that some studies have shown that a significant minority of men are not aware of unintended births and that this analysis reflects only those men who knew an unintended birth had occurred.[33]

Limitations and Future Research

It is important to note that this study examined marital status at birth which may be very different from marital status at conception – particularly if the pregnancy itself encouraged the parents to marry. In other words, while we were not able to measure marital status at conception, it is quite possible that some respondents were married after they found out they were pregnant and *because* of the pregnancy. However, because time-order issues are clearly resolved in this sample with the elimination of any pregnancies and births from the sample which could overlap with the depression measure, we have found that depressive symptoms in adolescence are an important factor in predicting who will have an unintended birth.

In addition, this study did not examine the pathways through which the relationship found may operate. Future research should address why this relationship between adolescent depression and unintended pregnancy exists. One mechanism that has been touched on in the literature is the idea that depression may make men and women less likely to use contraceptives. This work has found that women who report higher levels of depression also report less consistency in their use of contraceptives,[11] and are also more likely to choose no method or an ineffective method.[12] Other possible mechanisms could be that those who are depressed are more likely to engage in sex at all, or that they are less likely to anticipate, or care, about the consequences of unprotected sex. It is also possible that people who are depressed simply have a more negative outlook on life in general and thus may be more likely to remember their pregnancies as unintended. Finally, we examined first *births* and thus did not address the relationship between prior depression and other pregnancy resolutions (i.e. abortion and miscarriage).

Policy Implications

The relationship this work identifies between adolescent depression and unintended birth in emerging adulthood has important policy implications. In the United States, the Center for Disease Control has a stated interest in reducing unintended birth, and the Healthy People 2020 objectives include improvements and family planning and maternal and child health – both related to unintended birth reduction, as well as an interest in adolescent health. How depressive symptoms in adolescence may be related to unintended birth is important because any relationship shown between the two suggests that screening or counseling for depressive symptoms, or other interventions in earlier years, might help prevent later unintended pregnancy. Our analysis of observational data suggests that both of these efforts might be served by incorporating treatment of depression into interventions targeted to the middle or high school age group, as well as improved programs for detecting psychological concerns in adolescents. Efforts of this kind are likely to be particularly effective given that this research shows that the depression-unintended birth relationship holds equally for both *boys and girls*. Future research should move beyond observational data to assess this possibility.

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Demography 49(1):101-124.

Table 1: Weighted means for Variables Used in Analyzing Unintended Births and Pre-Pregnancy Depressive Symptoms, full sample.

	All Respondents		No Birth*			Intended Birth*			Unintended Birth*		
	(N=14,008)		(N=10,069)			(N=2,019)			(N=1,920)		
Depression Before Pregnancy and Birth (scale 0-3)	0.57	(.01)	0.55	(.01)	*	0.61	(.01)	*	0.66	(.02)	*
Unintended Birth	0.14	(.01)	-----	-----		-----	-----		-----	-----	
Grade Point Average (GPA)		(.01)									
<2.9	0.34	(.01)	0.31	(.01)	*	0.41	(.02)	*	0.42	(.02)	*
3.0-3.49	0.23	(.01)	0.24	(.01)	*	0.19	(.01)	*	0.19	(.01)	*
3.5 or Greater[a]	0.43	(.01)	0.45	(.01)	*	0.40	(.01)	*	0.39	(.02)	*
GPA missing	0.18	(.01)	0.16	(.01)	*	0.23	(.01)	*	0.24	(.02)	*
Respondent's race											
White[a]	0.68	(.03)	0.70	(.03)	*	0.67	(.03)		0.62	(.03)	*
Black	0.15	(.02)	0.14	(.02)	*	0.17	(.03)		0.23	(.03)	*
Hispanic	0.12	(.02)	0.11	(.02)		0.13	(.02)		0.11	(.02)	
Other Race	0.05	(.01)	0.05	(.01)	*	0.02	(.01)	*	0.04	(.01)	
Female	0.48	(.01)	0.44	(.01)	*	0.58	(.01)	*	0.58	(.02)	*
Had Sex by Wave 1	0.37	(.02)	0.33	(.02)	*	0.46	(.02)	*	0.47	(.02)	*
Parents Household Poverty Status (% FPL)											
0-100	0.13	(.01)	0.11	(.01)	*	0.18	(.01)	*	0.19	(.02)	*
101-200	0.18	(.01)	0.15	(.01)	*	0.23	(.01)	*	0.24	(.02)	*
201-300	0.17	(.01)	0.17	(.01)		0.18	(.01)		0.17	(.01)	
301-400	0.13	(.01)	0.14	(.01)	*	0.09	(.01)	*	0.09	(.01)	*
>400[a]	0.18	(.01)	0.21	(.01)	*	0.09	(.01)	*	0.10	(.01)	*
Missing Income	0.21	(.01)	0.21	(.01)	+	0.23	(.01)		0.22	(.01)	
Parent's Education											
Less than High School	0.13	(.01)	0.12	(.01)	*	0.17	(.02)	*	0.17	(.01)	*
High School[a]	0.28	(.01)	0.26	(.01)	*	0.33	(.01)	*	0.33	(.02)	
Vocational/Technical	0.10	(.01)	0.10	(.01)		0.12	(.01)		0.10	(.01)	
Some College	0.17	(.01)	0.17	(.01)	+	0.15	(.01)		0.15	(.01)	
BA or more	0.20	(.01)	0.24	(.01)	*	0.10	(.01)	*	0.11	(.01)	*
Missing Education	0.12	(.01)	0.11	(.01)	*	0.13	(.01)		0.14	(.01)	*
Age at Birth	NA	NA	NA	NA		22.12	(.06)		21.41	(.06)	*
Marital Status at Birth											
Married[a]	NA	NA	NA	NA		0.58	0.02		0.38	0.02	*
Unmarried	NA	NA	NA	NA		0.23	0.02		0.35	0.02	*
Unknown Marital Status	NA	NA	NA	NA		0.19	0.02		0.26	0.02	*

Source: National Longitudinal Study of Adolescent Health (1995)

Notes: [a] Reference Category. Numbers in parentheses are standard errors for weighted means.

Weighted means account for sample design effects (stratification and clustering)

* p < 0.05; + p <0.10; adjusted Wald tests comparing means for respondents from each category to the other two

categories combined.

Table 2. Multinomial Logistic Regression Models Predicting Birth Status using Depressive Symptoms prior to birth and controls (N=14,008 Add Health Waves 1, 3, & 4). Unintended Birth versus No Birth.[+]

	Unintended Birth versus No Birth								
	18-24 (n=14008)								
	Model 1			Model 2			Model 3		
	b		se	b		se	b		se
Depressive Symptoms at wave 1 (0-3)	0.69	***	0.09	0.26	**	0.10	0.36	*	0.16
GPA (3.5 or above, ref)									
3.0-3.49				0.73	***	0.13	0.73	***	0.13
2.9 or less				0.31	*	0.12	0.32	*	0.13
Missing				0.84	***	0.13	0.84	***	0.13
Race/ethnicity (White, ref)									
Black				0.26	**	0.10	0.26	**	0.10
Hispanic				-0.17		0.14	-0.17		0.14
Other Race				-0.18		0.18	-0.18		0.19
Female				0.67		0.08	0.76	***	0.14
Had sex by wave 1				0.37		0.08	0.38	***	0.08
Household Poverty Status W1 (% FPL) (400+, ref)									
0-100				0.78	***	0.16	0.79	***	0.15
100-200				0.85	***	0.14	0.85	***	0.14
200-300				0.52	***	0.14	0.52	***	0.14
300-400				0.23		0.14	0.23	+	0.14
Missing				0.33	*	0.15	0.33	*	0.15
Parent's Education (HS, ref)									
less than HS				-0.05		0.15	-0.05		0.15
Vocational/Technical				-0.18		0.15	-0.18		0.15
Some College				-0.21		0.13	-0.21	+	0.13
BA or higher				-0.61	***	0.13	-0.61	***	0.13
Missing				0.11		0.15	0.11		0.15
Gender x Depressive Symptoms at wave 1							-0.15		0.17
Constant	-2.07	***	0.09	-3.16	***	0.20	-3.22	***	0.21
F-test for model fit (df)	31.72	***	(128)	14.37	***	(128)	13.45	***	(128)
F-test compared to previous model	-------			13.29***			0.82		

Source: National Longitudinal Study of Adolescent Health (1995)

Notes: Numbers in parentheses are standard errors for weighted means.

+Results for no pregnancy versus intended pregnancy are not shown.

***p<.001; **p<.01; * p < 0.05; + p <0.10; adjusted Wald tests comparing means for respondents from each category to the other two categories combined.

Table 3. Multinomial Logistic Regression Models Predicting Birth Status using Depressive Symptoms prior to pregnancy and birth and controls (N=14,008 and N=3939 Add Health Waves 1, 3, & 4). Unintended Birth versus Intended Birth.[+]

	Unintended Birth versus Intended Birth														
	18-24 (n=14008, full sample)									18-24 (n=3939, pregnancy sample)					
	Model 1			Model 2			Model 3			Model 4			Model 5		
	b		se	b		se	b		se	b		se	b		se
Depressive Symptoms at wave 1 (0-3)	0.24	*	0.10	0.23	*	0.11	0.42	*	0.19	0.20	+	0.11	0.40	*	0.20
GPA (3.5 or above, ref)															
3.0-3.49				0.13		0.11	0.13		0.11	-0.06		0.12	-0.06		0.12
2.9 or less				0.12		0.12	0.12		0.12	0.04		0.13	0.05		0.13
Missing				0.12		0.16	0.11		0.16	-0.08		0.16	-0.08		0.16
Race/ethnicity (White, ref)															
Black				0.38	**	0.12	0.38	**	0.12	0.12		0.12	0.12		0.12
Hispanic				-0.08		0.12	-0.08		0.12	-0.18		0.13	-0.18		0.13
Other Race				0.63	*	0.29	0.63	*	0.29	0.53	+	0.29	0.53		0.29
Female				-0.01	+	0.10	0.16		0.16	-0.09		0.10	0.09		0.16
Had sex by wave 1				-0.03		0.09	-0.02		0.09	-0.02		0.09	-0.03		0.09
Household Poverty Status W1 (% FPL) (400+, ref)															
0-100				-0.23		0.18	-0.22		0.18	-0.33	+	0.18	-0.32	+	0.18
100-200				-0.17		0.17	-0.17		0.17	-0.20		0.17	-0.19		0.16
200-300				-0.22		0.19	-0.22		0.19	-0.20		0.19	-0.19		-0.19
300-400				-0.14		0.19	-0.14		0.19	-0.14		0.19	-0.13		0.19
Missing				-0.37	+	0.19	-0.37		0.19	-0.43	*	0.19	-0.43	*	0.19
Parent's Education (HS, ref)															
less than HS				-0.04		0.13	-0.04		0.13	0.01		0.13	0.01		0.13
Vocational/Technical				-0.28		0.17	-0.27		0.17	-0.26		0.18	-0.26		0.18
Some College				-0.04		0.12	-0.04		0.12	-0.05		0.13	-0.05		0.13
BA or higher				0.05		0.16	0.05		0.16	0.11		0.16	0.12		0.16
Missing				0.15		0.17	0.15		0.17	0.26		0.18	0.26		0.18
Age at Birth										-0.20	***	0.02	-0.20	***	0.02
Marital Status at Birth (married, ref)															
Unmarried birth										0.69	***	0.11	0.69	***	0.11
Marital staus at birth unknown										0.77	***	0.12	0.77	***	0.12
Gender x Depressive Symptoms at wave 1							-0.27		0.21				-0.30		0.22
Constant	-0.22	**	0.08	-0.15		0.19	-0.26		0.20	4.10	***	0.56	3.97	***	0.56
F-test for model fit (df)	31.72	***	(128)	14.37	***	(128)	13.45	***	(128)	7.71	***	(126)	7.46	***	(126)
F-test compared to previous model	-------			13.29***			0.82			5.78***			1.85		

Source: National Longitudinal Study of Adolescent Health (1995)

Notes: Numbers in parentheses are standard errors for weighted means.

+Results for no pregnancy versus intended pregnancy are not shown.

***p<.001; **p<.01; * p < 0.05; + p <0.10; adjusted Wald tests comparing means for respondents from each category to the other two categories combined.