

Substance Use and the Risk for Sexual Intercourse With and Without a History of Teenage Pregnancy Among Adolescent Females*

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ABSTRACT. Objective: The present study examined the associations between initiation and intensity of substance use and with sexual experience with and without a history of teenage pregnancy. **Method:** Participants were high school females (weighted $n = 3,451$) who participated in the 1999-2003 Youth Risk Behavior Surveillance System, a cross-sectional, nationally representative survey. Multinomial multivariable logistic regression was used to assess the likelihood of being sexually experienced (but never pregnant) and teenage pregnancy (reference group: never had sexual intercourse) as a function of age at substance use initiation (i.e., age 12 or younger, 13-14 years of age, and age 15 or older) and intensity of substance use (i.e., nonuser, experimental/new or nondaily, nonexperimental/daily user) for alcohol, cigarettes, and marijuana, while controlling for race/ethnicity, metropolitan location, symptoms of depression, and illegal drug availability at school.

Results: A major finding of our study is that substance use behaviors across each substance (alcohol, cigarettes, and marijuana) independently contributed to an increased risk in sexual intercourse experience with and without a history of teenage pregnancy (vs. nonsexually experienced females). A dose-response relationship was also observed between an increased likelihood of a teenage pregnancy and marijuana behaviors. Furthermore, the risk for teenage pregnancy was compounded for daily cigarette smokers who initiated use at age 12 or younger. **Conclusions:** Screening substance use behaviors can help to identify girls who may benefit from pregnancy prevention strategies. Targeting cigarette and marijuana behaviors as early as age 12 or younger may provide an added benefit. Prevention strategies should also consider the role of race above and beyond substance use behaviors. (*J. Stud. Alcohol Drugs*, 72, 194-198, 2011)

CHILDREN BORN TO ADOLESCENT MOTHERS are at high risk for premature birth, low birth weight, cognitive deficits, mental health problems, maltreatment, poverty, and death (Fergusson and Woodward, 1999; Overpeck et al., 1998; Siegel et al., 1996). Adolescent mothers, themselves, are also at high risk for educational underachievement, low self-esteem, and poverty (Hofferth et al., 2001; Koniak-Griffin et al., 1996). Adolescents who are potentially at greater risk for teenage pregnancy are those who use substances; yet, the bulk of current pregnancy prevention strategies do little to target or educate youth on the sexual health risks associated with substance use despite growing evidence demonstrating the efficacy of these strategies (Zimmer-Gembeck and Helfand, 2008).

For many young girls, substance use behaviors are not a normal part of adolescent development and are correlated with serious health consequences like teenage pregnancy (Cavazos-Rehg, et al., 2010; De Genna et al., 2007). Earlier age at substance use initiation and higher intensity of use

may be associated with increased risk for teenage pregnancy. However, research has tended to examine teenage pregnancy and associations with only one substance (namely alcohol) or unidimensional construct of substance use. Thus, less is known about the differential initiation and intensity patterns of substance use and how these may affect teenage pregnancy risk.

To illustrate more fully the influence of substance use on pregnancy risk, we analyzed information on onset of substance use and type of user (i.e., experimental/new vs. nonexperimental substance user) across multiple substances (alcohol, cigarettes, and marijuana) to demonstrate how these categories yielded different risk ratios for sexual intercourse experience with and without a history of teenage pregnancy. Although we did not speculate as to which substance increased the risk for teenage pregnancy, we did hypothesize that earlier age at substance use initiation and more intense substance use would be associated with a greater likelihood of sexual intercourse experience and teenage pregnancy. We

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used a nationally representative sample that is designed to increase statistical precision, facilitate generalization, and focus analyses on ethnic groups commonly missing from other studies and most vulnerable to teenage pregnancy (Brener et al., 2004). A better understanding of substance use associations with sexual intercourse with and without a history of teenage pregnancy can improve explanatory models of teenage pregnancy and identify targets for prevention strategies.

Method

Participants

The national Youth Risk Behavior Surveillance System (YRBSS) was established by the Centers for Disease Control and Prevention to measure health-risk behaviors (Brener et al., 2004). For each survey period, the YRBSS uses a three-stage cluster sampling design to produce a representative sample of high school students (9th through 12th grade) attending public and private schools in the United States. To adjust for nonresponse and oversampling of African Americans and Hispanics/Latinos in the sample, each student received a weighting factor. The overall weights were scaled to ensure that the weighted count of students was equivalent to the entire sample size, and the weighted proportions of students in each grade corresponded with the national population proportions for each survey year.

The present study uses 1999-2003 data because questions about teenage pregnancy were not asked after 2003. Only data from female students in the 12th grade (age 16 or older) were included in the analyses to allow enough time to pass during adolescence for prior exposure to substances and reported pregnancies. Data were pooled over 3 years to increase statistical power.

Design

We focused our analysis on females because males tend to provide less reliable reports of pregnancies than females; this is probably the result of some males being unaware of impregnating their partner or their refusal to acknowledge a pregnancy (Lerman, 1993; Rendall et al., 1999). Female participants from the three major ethnic groups found in the United States (Whites, African Americans, and Hispanics) were included in the analyses. Participants from other racial/ethnic groups were excluded from the analyses because of low sample sizes among those who had experienced teenage pregnancy (Asians weighted $n = 17$, American Indian/Alaska native $n = 10$, Native Hawaiian/other Pacific Islander $n = 0$, multiracial $n = 29$). Participants who reported not yet having sexual intercourse but who indicated a history of rape were excluded from the analyses, as were those with missing data on any of the variables. All participants had about the same length of time to initiate substance use and/or engage in

risky sexual behaviors; thus, no participants were excluded based on substance use or sexually active status.

Participants responded to the question, "Have you ever had sexual intercourse?" to measure experience with sexual intercourse. To measure history of pregnancy, the dichotomous dependent variable was based on a positive response (i.e., one or more times) to the question, "How many times have you been pregnant?" Age at alcohol initiation was assessed by the question, "How old were you when you had your first drink of alcohol other than a few sips?" Age at marijuana initiation was measured by the question, "How old were you when you tried marijuana for the first time?" Age at smoking cigarette initiation was measured by the question, "How old were you when you smoked a whole cigarette for the first time?" Participants could respond that they had never initiated the substance, or they could select an age at initiation. Responses were collapsed into age 12 or younger, 13-14 years of age, and age 15 or older to correspond with stages of adolescence (pre-, early, and middle through late adolescence) when initiation might likely occur and because ages at onset were concentrated within this narrow age range (Kosterman et al., 2000).

Participants were grouped into three categories of substance use intensity—nonusers, experimental/new users, and nonexperimental users—based on past research that defines *experimental/new users* as those who report one to nine lifetime substance uses and *nonexperimental users* as those with 10 or more lifetime substance uses modeled after research that has used similar thresholds (Gil et al., 2004; Merrill et al., 1999). Intensity of alcohol use was measured by the item, "During your life, on how many days have you had at least one drink of alcohol?" Intensity of marijuana use was measured by the item, "During your life, how many times have you used marijuana?"

In the YRBSS, number of cigarettes used was not queried for cigarettes. Therefore, an alternative measure of cigarette use behavior was used: "Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?" Participants who answered yes to this item were classified as daily smokers, and those who responded no to this item but provided an age at cigarette use initiation were classified as nondaily smokers (Eppel et al., 2006). All others were classified as nonsmokers.

Additional confounding variables included race/ethnicity; metropolitan location; feeling sad or blue almost every day for 2 weeks in the last 12 months; and being offered, sold, or given illegal drugs at school within the last 12 months. The variables were based on existing literature that correlates them with sexual risk taking among adolescents (Kotchick et al., 2001). Metropolitan status was determined by locations of the participants' school and served as an indicator of risk behaviors that might occur in different metropolitan locations (Levine and Coupey, 2003).

Multivariable multinomial logistic regression was used to assess the relationships between age at substance use initiation and intensity with the likelihood of being sexually experienced (but never pregnant) and teenage pregnancy (reference group: never had sexual intercourse). The final model included the primary substance use variables of in-

terest while controlling for potential confounding variables described above. All analyses were performed using SAS-callable (SAS Institute Inc., Cary, NC) SUDAAN Version 9.0.1 (Shah and Bieler, 2002). Analyses took into account all stages of clustering (year, stratum, and primary sampling unit). Sample weights were also applied to all analyses.

TABLE 1. Characteristics and multinomial logistic regression, 12th grade females, 1999-2003 Youth Risk Behavior Surveillance System

Variable	Descriptives			Multinomial logistic regression ^b	
	Never had sexual intercourse ^a %, 95% CI	Sexually experienced but never pregnant ^a %, 95% CI	Has been pregnant ^a %, 95% CI	Sexually experienced but never pregnant vs. never had sexual intercourse OR, 95% CI	Has been pregnant vs. never had sexual intercourse OR, 95% CI
Substance use					
Alcohol, age at initiation by intensity of use					
Nonuser	29.3, 25.4-33.5	4.9, 3.8-6.2	5.5, 3.6-8.4	Referent	Referent
Experimental/new user					
≥15 years old	22.6, 19.4-26.1	17.0, 14.7-19.5	20.2, 14.8-26.8	3.5, 2.4-5.2	3.5, 1.7-7.1
13-14 years old	4.4, 3.1-6.2	5.0, 3.8-6.5	6.4, 3.1-12.7	5.2, 2.7-9.85	5.4, 2.2-13.2
≤12 years old	3.7, 2.6-5.3	1.8, 1.2-2.6	1.5, 0.7-3.4	1.9 (1.0-3.7) ^c	1.1 (0.4-2.7) ^c
Nonexperimental user					
≥15 years old	18.5, 15.6-21.8	30.3, 27.0-33.9	24.5, 18.9-31.1	5.1, 3.4-7.6	3.6, 1.7-7.2
13-14 years old	14.3, 11.3-17.9	25.5, 22.1-29.2	23.7, 17.8-30.9	4.0, 2.6-6.3	2.6, 1.2-5.7
≤12 years old	7.3, 5.5-9.7	15.5, 13.1-18.3	18.3, 12.4-26.0	4.5, 2.6-7.6	2.0, 1.0-4.3
Marijuana, age at initiation by intensity of use					
Nonuser	73.9, 69.9-77.5	37.7, 34.1-41.5	24.7, 18.7-31.8	Referent	Referent
Experimental/new user					
≥15 years old	13.7, 11.2-16.6	19.0, 16.4-21.9	16.5, 10.7-24.7	1.4, 0.99-2.1	2.2, 1.1-4.6
13-14 years old	2.0, 1.3-3.0	3.9, 3.0-5.0	4.8, 2.9-7.7	2.0, 1.04-3.9	4.2, 1.7-10.2
≤12 years old	0.1, 0.05-0.4	0.6, 0.3-1.1	0.2, 0.04-0.7	3.8 (0.9-15.8) ^c	1.7 (0.2-13.8) ^c
Nonexperimental user					
≥15 years old	5.1, 3.6-7.2	18.9, 16.7-21.4	19.9, 15.0-25.9	3.0, 1.8-4.8	5.1, 2.9-8.9
13-14 years old	4.2, 3.0-5.8	14.9, 12.8-17.3	21.5, 16.2-27.9	2.6, 1.7-4.2	6.6, 3.8-11.5
≤12 years old	1.1, 0.6-2.3	5.0, 3.6-6.8	12.6, 7.8-19.6	2.9, 1.3-6.5	10.7, 4.2-27.5
Cigarettes, age at initiation by intensity of use					
Nonuser	64.7, 60.5-68.7	29.1, 25.7-32.9	27.7, 21.8-34.4	Referent	Referent
Nondaily user					
≥15 years old	14.5, 12.0-17.5	19.9, 17.4-22.7	13.1, 8.8-18.9	1.8, 1.2-2.6	1.3, 0.7-2.7
13-14 years old	7.8, 5.8-10.3	11.5, 9.3-14.3	7.7, 4.5-12.9	1.9, 1.1-3.1	1.5, 0.8-2.8
≤12 years old	4.7, 3.2-6.7	7.4, 6.0-9.0	8.3, 4.7-14.4	1.6, 0.9-2.9	1.8, 0.8-4.4
Daily user					
≥15 years old	2.6, 1.6-4.2	9.5, 7.6-11.8	9.9, 5.9-16.1	3.8, 2.0-7.1	4.1, 1.9-8.8
13-14 years old	3.0, 1.9-4.7	10.9, 9.2-13.0	10.9, 7.8-15.2	3.9, 2.2-6.9	4.5, 2.4-8.6
≤12 years old	2.8, 1.8-4.4	11.6, 9.7-13.9	22.4, 14.1-33.7	3.8, 2.1-7.0	8.0, 3.6-18.1
Race					
White	79.0, 74.7-82.7	73.6, 69.3-77.5	52.8, 45.0-60.4	Referent	Referent
African American	8.6, 6.5-11.4	14.4, 11.2-18.4	29.7, 22.8-37.6	3.6, 2.2-5.9	11.1, 5.6-22.1
Hispanic ^d	12.4, 9.7-15.6	12.0, 9.7-14.8	17.6, 12.5-24.2	1.4, 1.01-1.8	2.7, 1.7-4.4
Metropolitan status					
Suburban	58.2, 48.8-66.9	56.8, 49.2-64.1	52.2, 41.9-62.4	Referent	Referent
Urban	27.0, 20.3-34.9	26.5, 20.9-33.0	38.4, 28.7-49.2	1.0, 0.7-1.2	1.2, 0.7-2.0
Rural	14.9, 9.5-22.6	16.8, 11.9-23.1	9.4, 5.0-16.9	1.4, 0.98-2.0	1.1, 0.6-2.3
Drug availability at school					
No	87.9, 84.9-90.4	76.6, 73.5-79.5	66.5, 56.3-75.3	Referent	Referent
Yes	12.1, 9.6-15.1	23.4, 20.5-26.6	33.5, 24.7-43.7	1.1, 0.8-1.5	1.4, 0.9-2.2
Depression					
No	77.5, 74.2-80.4	65.6, 62.0-69.1	57.1, 49.8-64.4	Referent	Referent
Yes	22.6, 19.6-25.8	34.4, 30.9-38.0	42.9, 35.8-50.2	1.3, 1.0-1.6	1.4, 0.9-2.3

Notes: OR = odds ratio; CI = confidence interval. ^aWeighted $n = 1,239$ females who have never had sexual intercourse, 1,868 females who have never been pregnant but have had sexual intercourse, and 344 females who have been pregnant; ^bmultivariable model controls for all variables listed in this table and survey year; ^cthe extremely small sample size for this category prevents stable odds ratio estimates; ^dincludes multiracial Hispanic.

Results

Participants were 3,451 females. Participants excluded from the study because of missing data on any of the variables ($n = 677$, 16.4%) did not significantly differ from those included in the analysis by age, race, or survey year. Thirty-six percent of the female participants had not yet had sexual intercourse, and 54.1% had experienced sexual intercourse but had never been pregnant. A total of 10.0% of the female participants reported having been pregnant. Reported pregnancy rates were 7.2% of White females, 21.3% of African American females, and 13.8% of Hispanic females. Additional descriptive information is provided in Table 1.

In a multivariable model (Table 1), all alcohol user types were at increased risk of sexual intercourse with and without a history of teenage pregnancy. There did not seem to be a clear pattern of risk by age or intensity of alcohol use. Marijuana users were at increased risk for both levels of outcome (sexual intercourse with and without a history of pregnancy). There appeared to be a dose-response effect by age at marijuana initiation and intensity of marijuana use for the outcome of sexual intercourse *with* a history of pregnancy (odds ratios ranged from 1.7 to 10.7). In addition, the increased risk for regular users of marijuana was larger for the outcome of sexual intercourse *with* a history of pregnancy than for sexual intercourse *without* a history of pregnancy. Experimental cigarette use increased the risk of having sexual intercourse but did not reach significance for pregnancy. However, daily cigarette smokers had an increased risk for both levels of outcome (sexual intercourse with and without a history of pregnancy). The risk for sexual intercourse *with* a history of pregnancy was compounded for daily cigarette smokers who initiated use at age 12 or younger (odds ratio = 8.0). In addition, African American and Hispanic females were significantly more likely to have engaged in sexual intercourse and become pregnant when compared with White females. No significant associations were found between drug availability at school, feeling sad or hopeless, metropolitan status, and sexual intercourse experience with and without a history of teenage pregnancy.

The overall model was significant, Wald $F(54) = 67.4$, $p < .0001$. No corrections for multicollinearity were made because variance inflation factor tests of multicollinearity were 2.6 or less in all cases among the independent variables. We excluded 16.4% of females because of missing data for either the outcome or covariates. Using multiple imputations via PROC MI and MIANALYZE in SAS and accounting for the complex sample (Berglund, 2010) yielded similar overall results as those presented in Table 1.

Discussion

A major finding of our study is that substance use behaviors across each substance (alcohol, marijuana, and

cigarettes) independently contributed to an increased risk in sexual intercourse experience with and without a history of teenage pregnancy (vs. nonsexually experienced females). A dose-response relationship was also observed between an increased likelihood of a teenage pregnancy and marijuana behaviors. Furthermore, the risk for teenage pregnancy was compounded for daily cigarette smokers who initiated use at age 12 or younger. Our findings are distressing because adolescent females who use substances are potentially least prepared for positive parenting roles and place their offspring at risk for detrimental health consequences when pregnant (Agrawal et al., 2010; Cornelius et al., 2002).

Despite the substance use variables we controlled for, being Hispanic or African American remained significantly associated with an increased risk for sexual intercourse experience with and without a history of teenage pregnancy in a multivariable model, which is consistent with the literature (Abma et al., 2004; Finer and Henshaw, 2006). Ethnic minority group status may be a proxy for other variables not measured, such as socioeconomic status or social class. Social and cultural understanding of what is appropriate for and expected of members of different ethnic groups might be influencing our findings. Based on our results, we cannot attribute racial/ethnic differences in risk for teenage pregnancy to substance use behaviors.

The findings of this study were limited by several factors. We were unable to test if substance use occurred before or after teenage pregnancy. However, about 2% of pregnancies occur before age 15 (Kost et al., 2010). Furthermore, the YRBSS is cross-sectional, preventing the determination of causal relationships, and does not provide information on possible explanatory variables that are needed for more in-depth analyses such as low commitment to school and academic failure. YRBSS is a school-based survey that excludes high school dropouts. Therefore, our findings may underestimate the actual risk of teenage pregnancy within the age group studied. We have no data on sexual partner's substance use behaviors; therefore, it may be that the increased risk for adolescent pregnancy is actually driven by the substance use behaviors of the sexual partner instead of the adolescent female's own substance use. Last, the length of recall may have affected measurement accuracy; nonetheless, our use of high school seniors yielded a relatively narrow interval between the age at substance initiation and the age at interview to help reduce the effects of recall bias on our findings.

Findings from this study have relevant implications for prevention and intervention efforts. Race remained a significant risk factor for sexual experience with and without a history of teenage pregnancy above and beyond substance use variables. Regarding substance use behaviors, prevention efforts must recognize that initiation of any substance at any age is associated with a risk for sexual intercourse with and without a history of teenage pregnancy, but a stepwise increase in pregnancy risk occurs when marijuana behaviors

are initiated, especially at an earlier age. In addition, daily cigarette smoking at age 12 or younger may signal a warning to parents and health professionals alike about increased risk for teenage pregnancy. Thus, screening substance use behaviors across all substances (i.e., alcohol, marijuana, and cigarettes) to more efficiently identify and target adolescents with an underlying risk for pregnancy might prove to be a more effective way to intervene and prevent teenage pregnancy. Targeting smoking behaviors (marijuana or cigarettes) as early as age 12 or younger may provide an added benefit, because the risk for teenage pregnancy was even more pronounced for those who initiated marijuana and cigarette use at a young age.

References

- Abma, J. C., Martinez, G. M., Mosher, W. D., & Dawson, B. S. (2004). Teenagers in the United States: Sexual activity, contraceptive use, and childbearing, 2002. *Vital Health Statistics*, 23 (24), 1-48.
- Agrawal, A., Scherrer, J. F., Grant, J. D., Sartor, C. E., Pergadia, M. L., Duncan, A. E., . . . Xian, H. (2010). The effects of maternal smoking during pregnancy on offspring outcomes. *Preventive Medicine*, 50, 13-18.
- Berglund, P. A. (2010, April). *An introduction to multiple imputation of complex sample data using SAS® v9.2* (Paper 265-2010). Paper presented at the SAS Global Forum Conference, April 11-14, 2010, Seattle, WA. Retrieved from <http://support.sas.com/resources/papers/proceedings10/265-2010.pdf>
- Brener, N. D., Kann, L., Kinchen, S. A., Grunbaum, J. A., Whalen, L., Eaton, D., . . . Ross, J. G. (2004). Methodology of the youth risk behavior surveillance system. *Morbidity and Mortality Weekly Report*, 53 (RR-12), 1-13.
- Cavazos-Rehg, P. A., Spitznagel, E. L., Krauss, M. J., Schootman, M., Buchholz, K. K., Cottler, L. B., & Bierut, L. J. (2010). Understanding adolescent parenthood from a multisystemic perspective. *Journal of Adolescent Health*, 46, 525-531.
- Cornelius, M. D., Goldschmidt, L., Day, N. L., & Larkby, C. (2002). Alcohol, tobacco and marijuana use among pregnant teenagers: 6-year follow-up of offspring growth effects. *Neurotoxicology and Teratology*, 24, 703-710.
- De Genna, N. M., Larkby, C., & Cornelius, M. D. (2007). Early and adverse experiences with sex and alcohol are associated with adolescent drinking before and during pregnancy. *Addictive Behaviors*, 32, 2799-2810.
- Eppel, A., O'Loughlin, J., Paradis, G., & Platt, R. (2006). Reliability of self-reports of cigarette use in novice smokers. *Addictive Behaviors*, 31, 1700-1704.
- Fergusson, D. M., & Woodward, L. J. (1999). Maternal age and educational and psychosocial outcomes in early adulthood. *Journal of Child Psychology and Psychiatry*, 40, 479-489.
- Finer, L. B., & Henshaw, S. K. (2006). Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspectives on Sexual and Reproductive Health*, 38 (2), 90-96.
- Gil, A. G., Wagner, E. F., & Tubman, J. G. (2004). Associations between early-adolescent substance use and subsequent young-adult substance use disorders and psychiatric disorders among a multiethnic male sample in South Florida. *American Journal of Public Health*, 94, 1603-1609.
- Hofferth, S. L., Reid, L., & Mott, F. L. (2001). The effects of early childbearing on schooling over time. *Family Planning Perspectives*, 33, 259-267.
- Koniak-Griffin, D., Walker, D. S., & de Traversay, J. (1996). Predictors of depression symptoms in pregnant adolescents. *Journal of Perinatology*, 16, 69-76.
- Kost, K., Henshaw, S., & Carlin, L. (2010). *U.S. teenage pregnancies, births and abortions: National and state trends and trends by race and ethnicity*. New York: Guttmacher Institute. Retrieved from <http://www.guttmacher.org/pubs/USTPtrends.pdf>
- Kosterman, R., Hawkins, J. D., Guo, J., Catalano, R. F., & Abbott, R. D. (2000). The dynamics of alcohol and marijuana initiation: Patterns and predictors of first use in adolescence. *American Journal of Public Health*, 90, 360-366.
- Kotchick, B., Shaffer, A., Forehand, R., & Miller, K. (2001). Adolescent sexual risk behavior: A multi-system perspective. *Clinical Psychology Review*, 21 (4), 493-519.
- Lerman, R. I. (1993). A national profile of young unwed fathers. In R. I. Lerman & T. J. Ooms (Eds.), *Young unwed fathers: Changing roles and emerging policies* (pp. 27-51). Philadelphia, PA: Temple University Press.
- Levine, S. B., & Coupey, S. M. (2003). Adolescent substance use, sexual behavior, and metropolitan status: Is "urban" a risk factor? *Journal of Adolescent Health*, 32, 350-355.
- Merrill, J. C., Kleber, H. D., Shwartz, M., Liu, H., & Lewis, S. R. (1999). Cigarettes, alcohol, marijuana, other risk behaviors, and American youth. *Drug and Alcohol Dependence*, 56, 205-212.
- Overpeck, M. D., Brenner, R. A., Trumble, A. C., Trifiletti, L. B., & Berendes, H. W. (1998). Risk factors for infant homicide in the United States. *The New England Journal of Medicine*, 339, 1211-1216.
- Rendall, M. S., Clarke, L., Peters, H. E., Ranjit, N., & Verropoulou, G. (1999). Incomplete reporting of men's fertility in the United States and Britain: A research note. *Demography*, 36, 135-144.
- Shah, B. V., & Bieler, B. G. (2002). *The SUDAAN user's manual, release 7.5*. Research Triangle Park, NC: Research Triangle Institute.
- Siegel, C. D., Graves, P., Maloney, K., Norris, J. M., Calonge, B. N., & Lezotte, D. (1996). Mortality from intentional and unintentional injury among infants of young mothers in Colorado, 1986 to 1992. *Archives of Pediatrics & Adolescent Medicine*, 150, 1077-1083.
- Zimmer-Gembeck, M. J., & Helfand, M. (2008). Ten years of longitudinal research on U.S. adolescent sexual behavior: Developmental correlates of sexual intercourse, and the importance of age, gender and ethnic background. *Developmental Review*, 28, 153-224.