H.R. 20, the Melanie Blocker-Stokes Postpartum Depression and Care Act

Expanded Testimony of Priscilla K. Coleman, Ph.D.

Submitted to the Health Subcommittee,

Committee on Energy and Commerce

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1. My name is Priscilla Coleman. I am currently an Associate Professor of Human Development and Family Studies at Bowling Green State University in Ohio. My Ph.D. is in life-span developmental psychology and I have published extensively in both national and international peer-reviewed journals on the psychological effects of abortion. The opinions expressed herein are based upon my education, the psychological research I and others have conducted, and my extensive and ongoing review of the world literature on abortion. Thank you for the opportunity to address you today.

2. H.R. 20 pertains to postpartum depression, which has fortunately gained attention in recent years with a few highly publicized cases. The psychological suffering experienced by many women and their families following childbirth has been seriously understudied and this issue is before you today in hopes of expanding research and intervention efforts.

3. In contrast, the psychological suffering endured by many women post-abortion has received minimal focused attention by lawmakers and governmental agencies and the

emotional distress experienced by countless women is often denied or obscured at various levels of society, despite well-documented scientific evidence.

4. Childbirth is the natural conclusion of a human pregnancy; whereas abortion is an unnatural intervention causing the termination of the human fetus. As such, it is reasonable to conclude that the latter might carry increased mental health risks for women, particularly among those who believe they have ended a human life. Indeed, when compared to childbirth, the option of abortion carries an increased risk of depression, anxiety, and other forms of mental illness in addition to substance use/abuse, relationship problems, parenting difficulties, and even suicide. In the text that follows, I will share the contemporary scientific evidence indicating that abortion poses serious psychological risks to a significant percentage of women.

5. Abortion is one of the most common medical procedures in the U.S. and it is experienced at least once by approximately 35% of women by age 45 (Finer & Henshaw, 2006.) There is consensus among most social and medical science scholars that a minimum of 10 to 30% of women who abort suffer from serious, prolonged negative psychological consequences (Adler et al., 1990; Bradshaw & Slade, 2003; Major & Cozzarelli, 1992; Zolese & Blacker, 1992.) With nearly 1.3 million U.S. abortions each year in the U.S. (Boonstra, et al., 2006), the conservative 10% figure yields approximately 130,000 new cases of mental health problems each year.

6. The results of three of the most methodologically sound (i.e., largest record-based) studies in the world have shown that abortion is associated with an increased risk of mental health problems when compared to childbirth. In 1981 David and colleagues reported in *Family Planning Perspectives* that the overall rate of psychiatric admission (a

worst case scenario) was 18.4 and 12.0 per 10,000 for women who had aborted and delivered respectively. For those who were divorced, separated, or widowed, the psychiatric admission rate was 63.8 per 10,000 for women who aborted versus 16.9 for those who delivered.

7. The remaining two studies were conducted in the U.S. using data from over 54,000 low-income women on state medical assistance in California. In the first study published in the *American Journal of Orthopsychiatry*, women who had an abortion in 1989 had significantly higher rates of outpatient psychiatric diagnoses than women with only birth experience and no history of subsequent abortions after eliminating all cases with psychiatric claims 12-18 months prior to the initial pregnancy (Coleman, Reardon, Rue, & Cougle, 2002a). This difference was apparent when data for the full time period were examined (17% higher) and when only data from women with claims filed on their behalf within 90 days (63% higher), 180 days (42% higher), 1 year (30% higher), and 2 years (16% higher) of the pregnancy event were considered.

8. Data from the same sample and focusing on inpatient claims revealed similar findings (Reardon, Cougle, Rue, Shuping, Coleman, & Ney, 2002.) The study was published in 2002 in the *Canadian Medical Association Journal* (CMAJ) and publication resulted in immediate criticism directed at the editors of CMAJ. In response, they published an editorial stating "In light of the passion surrounding the subject of abortion we subjected this paper to especially cautious review and revision." The editors and peer-reviewers obviously came to the conclusion that our study was methodologically sound and worthy of publication in Canada's top medical journal.

9. The CMAJ editors also reminded the readership that scientists continue to play a unique and vital role in understanding the association between abortion and health: “This debate is conducted publicly in religious, ideological and political terms: forms of discourse in which detachment is rare. But we do seem to have the idea in medicine that science offers us a more dispassionate means of analysis. To consider abortion as a health issue, indeed as a medical "procedure," is to remove it from metaphysical and moral argument and to place it in a pragmatic realm where one deals in terms such as safety, equity of access, outcomes and risk–benefit ratios, and where the prevailing ethical discourse, when it is evoked, uses secular words like autonomy and patient choice.” *This letter has been submitted with my testimony.*

10. In addition to these three large scale studies, a proliferation of smaller empirical studies published within the last 10 years in upper echelon peer-reviewed psychology and medical journals has likewise documented the adverse psychological consequences of abortion. One study published in January 2006 by New Zealand researcher David Fergusson and colleagues in the *Journal of Child Psychology and Psychiatry and Allied Disciplines* stands out.

11. Fergusson’s longitudinal study followed 1265 children born in Christchurch in 1977 and is strengthened by the use of comprehensive assessments of mental health using standardized diagnostic criteria, considerably lower estimated abortion concealment rates than in previously published studies, and the use of extensive controls. Variables that were statistically controlled in the primary analyses included maternal education, childhood sexual abuse, physical abuse, child neuroticism, self-esteem, grade point average, child smoking, history of depression, anxiety, and suicidal ideation, living with

parents, and living with a partner.

12. Results of the Fergusson et al. study indicated that while 42% of the women who had aborted reported major depression by age 25, 39% of post-abortive women suffered from anxiety disorders. In addition, 27% reported experiencing suicidal ideation, 7% indicated alcohol dependence, and 12% were abusing drugs. Compared to the pregnant/no abortion group, the abortion group scored significantly higher on all these variables except anxiety. Compared to the never pregnant group, the abortion group scored significantly higher on all variables. For all outcomes (except alcohol dependence) rates of disorder did not differ significantly between the never pregnant and pregnant/no abortion groups.

13. As noted in the *New Zealand Herald*, Fergusson said there is little evidence that abortion improves mental health and he told CNSNews.com "It is a very sensitive and emotive subject. People have cherished beliefs that they don't want challenged" and "There's a distinct possibility – more than a distinct possibility – that abortion may have mental health consequences." Dr. Fergusson was further quoted by the *New Zealand Herald* as saying "If we were talking about an antibiotic or an asthma risk, and someone reported adverse reactions, people would be advocating further research to evaluate risk." And "I see no good reason why the same rules don't apply to abortion."

14. In the published research article, Fergusson, a pro-choice researcher, and colleagues sternly challenged the American Psychological Association's recent conclusion that "well-designed studies of psychological responses following abortion have consistently shown that risk of psychological harm is low," noting that this strong conclusion was based on a small number of studies, which suffer from significant

methodological problems as well as a general disregard for studies showing negative effects. Fergusson et al. concluded: "the present research raises the possibility that for some young women, exposure to abortion is a traumatic life event which increases longer-term susceptibility to common mental disorders." *The Fergusson et al. paper has been submitted with my testimony.*

15. Peer-reviewed scientific evidence also indicates that women who abort are more likely to abuse substances when compare to women who have not previously aborted. Using data from a nationally representative sample, my colleagues and I found that pregnant women with a prior history of abortion, compared to women without a history, were 10 times more likely to use marijuana, 5 times more likely to use various illicit drugs, and were twice as likely to use alcohol. (Coleman, Reardon, Rue, & Cougle, 2002b). *A copy of this article is submitted with this testimony*. In another paper using a national data set, I found that adolescent women who aborted, when compared to those who carried an unintended pregnancy to term, were six times more likely to use marijuana. *For a review of literature linking abortion to substance use, see Coleman (2005), which is included with this testimony.*

16. Studies have further shown that abortion is related to an increased likelihood of sexual dysfunction, partner communication problems, and separation or divorce (Barnett, Freudenberg, Wille, 1992; Freeman, 1980; Lauzon, Roger-Achim, Achim, & Boyer, 2000; Rue, Coleman, Rue, & Reardon, 2004). For example, in a recently published study, we found that 6.2% of Russian women and 24% of American women sampled reported sexual problems that they directly attributed to a prior abortion (Rue et al., 2004).

17. Research suggests that emotional difficulties and unresolved grief responses associated with perinatal loss may hinder effective parenting by reducing parental responsiveness to child needs, by interfering with attachment processes, and /or by instilling anger, which is a common component of grief. Three of our recent studies have linked abortion with compromised parenting (Coleman, Maxey, Rue, & Coyle, 2005; Coleman, Rue, Coyle, & Maxey, 2007; Coleman, Reardon, & Cougle, 2002). *These articles are summarized in Appendix A.*

18. Several large scale studies have revealed a higher risk of suicide associated with abortion compared to childbirth. These studies are summarized in the table below.

	Control group	**Magnitude of effect**
Fergusson, D. M., Horwood, J., & Ridder, E. M. (2006). Abortion in young women and subsequent mental health. *Journal of Child Psychology and Psychiatry*, 47, 16-24.	Those who delivered and were never pregnant used as comparison groups. Statistical controls for maternal education, childhood sexual abuse, physical abuse, child neuroticism, self-esteem, grade point average, smoking, prior history of depression, anxiety, prior history of suicide ideation, living with parents, living with partner	27% of women who aborted reported experiencing suicidal ideation This effect was significant at the >.001 level, meaning there was on a 1 in 1000 chance that the result was due to chance. The risk was 4 times greater for women who aborted compared to never pregnant women and more than 3 times greater than women who for women who delivered
Gilchrist, A. C. et al (1995). Termination of pregnancy and psychiatric morbidity. *British Journal of Psychiatry* 167:243-8	Comparisons included women who were refused abortion and women who chose abortion but changed their minds.	Among women with no history of psychiatric illness, the rate of deliberate self-harm was significantly higher (70%) after abortion than childbirth
Gissler, M., et al. (1996). Suicides after pregnancy in Finland, 1987-94: Register linkage study. *British Medical Journal*, 313, 1431-4	Compared women who aborted to those who delivered, miscarried, and the general population.	Suicide rate was nearly 6 times greater among women who aborted compared to women who gave birth
Gissler, M., et al. (2005). Injury deaths, suicides and homicides associated with pregnancy, Finland 1987-2000. *European Journal of Public Health*, 15, 459-463.	Compared women who aborted to those who delivered, miscarried, and were not pregnant. Distinguished the level of risk associated with suicide and other forms of death.	Abortion was associated with a 6 times higher risk for suicide compared to birth.
Reardon, D. C., et al. (2002). Deaths associated with delivery and abortion among California Medicaid patients: A record linkage study. *Southern Medical Journal*, 95, 834-841	Use of homogenous population. Controlled for prior psychiatric history, age, and months of eligibility for state medical coverage	Suicide risk was 154% higher among women who aborted compared to those who delivered

19. Despite this evidence, claims that abortion mortality rates are lower than maternal mortality are often made. The data employed to make such claims is problematic as different standards and methods of data collection are used to assess death rates associated with abortion and delivery. The National Center for Health Statistics (NCHS) through its National Vital Statistics system provides maternal mortality information and the Center for Disease Control (CDC) provides abortion mortality statistics.

20. Specific problems include the following: 1) When a death is violent, a recent birth may not be recorded and a recent abortion is even more unlikely to be mentioned; 2) The International Classification of Diseases (ICD-9) defines maternal death as one that occurs during pregnancy or within 40 days of the termination of pregnancy, regardless of outcome, with "incidental" deaths excluded. The exclusion requires subjective interpretation and it may be unclear what role the pregnancy played in suicide, homicide, and accidents; 3) Coding rule 12 of the ICD-9 required deaths due to medical and surgical treatments be reported under the complication of the procedure (e.g., infection) rather than the treatment (e.g., elective abortion.)

21. No single study has the power to provide definitive answers to the causal question on a topic of this nature because randomized trials are not possible. Instead examination of the cumulative evidence related to the magnitude of effects and consistency of evidence across the strongest studies linking abortion and adverse mental health enables the best possible answer to the causal question. Thus, the studies reported above must be given considerable weight given the nature of public health and risk prevention.

22. In an extensive review of the literature, Bradshaw and Slade (2003) concluded

"The proportion of women with high levels of anxiety in the month following abortion ranged from 19-27%, with 3-9% reporting high levels of depression. The better quality studies suggested that 8-32% of women were experiencing high levels of distress." (p. 941). *Three recent reviews of evidence are submitted in conjunction with this testimony (Bradshaw & Slade, 2003; Coleman, 2006; Thorp, Hartmann, & Shadigian, 2003.)*

23. My colleagues and I have diligently designed, executed, and published studies that have addressed the flaws of earlier research *(please see Appendix A.)* Among the collective strengths of the studies are the following: (a) use of an appropriate control group (unintended pregnancy carried to term or other forms of perinatal loss); (b) controls for pre-existing psychological problems; (c) controls for personal and situational factors associated with the choice to abort; (d) use of long-term data collection strategies; (e) use of medical claims data (with diagnostic codes assigned by trained professionals, which eliminate the problem of concealment found to be as high as 60% in abortion studies); (f) and large samples (most in the 1000s) many of which were nationally representative. When these studies are viewed in conjunction with the world literature, the conclusion that abortion increases mental health risks is reasonable and scientifically accurate.

24. The need for a large nationally representative, longitudinal study of women faced with an unintended pregnancy has been voiced repeatedly by researchers (e.g., Cougle, Reardon, & Coleman, 2003; Speckard & Rue, 1992; Thorp et al., 2003.) including the former Surgeon General, C. Everett Koop, in the Reagan Administration (January 9, 1989 letter to the President). The design of an extensive study of this form would benefit from an effort to include all the demographic, individual, relationship, situational, social, and

cultural factors with possible relevance to abortion decision-making and adjustment over the long-term. In addition, systematic utilization of the existing data that has accumulated should provide useful direction pertaining to variable selection and design specifics. In a review paper published in 2005, my colleagues and I outlined the most pressing research needs pertaining to the psychology of abortion (Coleman et al., 2005)

25. Given the clarity of research needs for advancing our understanding of the meaning of abortion in women's lives that has been evident for quite some time, the socio-political agendas permeating the design, publishing, funding, and dissemination of research have undoubtedly thwarted progress. However, in the interest of the millions of women who undergo one of the most common surgical procedures currently available in the United States and elsewhere throughout the world, it is clear that more intensive study is warranted. Such research will continue to be the target of political attacks. Nevertheless as Thorp and colleagues (2003) noted "A commitment to such research would seem to be morally neutral common ground upon which both sides of the abortion/choice debate would agree is critical." So too argued Surgeon General Koop in 1989(b): "To do such a study which would be credible to both sides of the abortion argument would consume a great deal of time and would be expensive." (p.8) The time has indeed come.

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Key Points in Coleman Testimony (5.01.07)

- The psychological suffering endured by many women post-abortion has received minimal focused attention by lawmakers and governmental agencies.
- There is consensus among most social and medical science scholars that a minimum of 10 to 30% of women who abort suffer from serious, prolonged negative psychological consequences.
- When compared to childbirth, the option of abortion carries an increased risk of depression, anxiety, and other forms of mental illness.
- Peer-reviewed scientific evidence also indicates that women who abort are more likely to abuse substances when compare to women who have not previously aborted.
- Studies have further shown that abortion is related to an increased likelihood of sexual dysfunction, partner communication problems, and separation or divorce.
- Research suggests that emotional difficulties and unresolved grief responses associated with abortion may hinder effective parenting.
- Several large scale studies have revealed a higher risk of suicide associated with abortion compared to childbirth.
- The need for a large nationally representative, longitudinal study of women faced with an unintended pregnancy has been voiced repeatedly by researchers.
- Given the clarity of research needs for advancing our understanding of the meaning of abortion in women's lives evident for some time, the socio-political agendas permeating the design, publishing, funding, and dissemination of research have undoubtedly thwarted progress.
- In the interest of the millions of women who undergo one of the most common surgical procedures currently available in the United States, it is clear that more intensive study is warranted.

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Appendix A: Psychology of Abortion Studies Published Since 2002

Publication information	***Comparison groups***	***Data source and sample demographics***	***Outcomes examined***	***Controls***	***Positive methodological Features***	***Results***
1) Coleman, P. K., Reardon, D. C., Rue, V., & Cougle, J. (2002). **State-funded abortions vs. deliveries: A comparison of outpatient mental health claims over four years**. *American Journal of Orthopsychiatry, 72,* 141-152	Women who aborted (n=14,297) or delivered a child (n=40,122) while receiving medical assistance from the state of California (Medi-Cal) in 1989 and who had no psychiatric claims for 1 yr prior to pregnancy resolution. Delivery group had no subsequent abortions.	**California Department of Health Services Medi-Cal data** All low–income Delivery: Avg. age: 25.4 Avg. number of mos. of eligibility: 27 Abortion: Avg. age: 24.6 Avg. number of mos. of eligibility: 31	Out-patient mental health claims – total number and numbers for specific diagnoses	- Pre-pregnancy psych-ological difficulties - Age - Months of eligibility	- Used actual claims data, eliminating the concealment problem - Avoids recruitment and retention problems - Eliminated cases with previous psychological claims - With claims data, avoids simplistic forms of assessment - Comparison groups are likely very similar except for the abortion experience - Extended time frame, with repeated measurements enabling more confidence in the causal question	Within 90 days after pregnancy resolution, the abortion group had 63% more total claims than the birth group, with the percentages equaling 42%, 30%, 16%, and 17% for the 1st 180 days, yr 1, yr 2 and across the full 4-yr study period respectively. Across the 4-yrs, the abortion group had 21% more claims for adjustment reactions than the birth group, with the percentages equaling 95%, 40%, and 97% for bipolar disorder, neurotic depression, and schizophrenia respectively.
2) Reardon, D. C., Cougle, J., Rue, V. M., Shuping, M., Coleman, P. K., & Ney, P. G. (2003). **Psychiatric admissions of low-income women following abortion and childbirth.** *Canadian Medical Association Journal*, 168, 1253-1256.	Women who aborted (n=15,299) or delivered a child (n=41,442) while receiving medical assistance from the state of California (Medi-Cal) in 1989 and who had no psychiatric claims for 1 yr prior to pregnancy resolution. Delivery group had no subsequent abortions.	**California Department of Health Services Medi-Cal data** All low–income Delivery: Avg. age: 25.5 Avg. # of mos. of eligibility: 27 Abortion: Avg. age: 24.8 Avg. # of mos. of eligibility: 31	In-patient mental health claims – total number and numbers for specific diagnoses	- Pre-pregnancy psych-ological difficulties - Age - Months of eligibility	- Used actual claims data, eliminating the concealment problem - Avoids recruitment and retention problems - Eliminated cases with previous psychological claims - With claims data, avoids simplistic forms of assessment - Comparison groups are likely very similar except for the abortion experience - Extended time frame, with repeated measurements enabling more confidence in the causal question	Within 90 days after pregnancy resolution, the abortion group had 160% more total claims than the birth group, with the percentages equaling 120%, 90%, 111%, 60%, 50%, and 70% for the 1st 180 days, yr 1, yr 2, yr 3, yr 4, and across the full 4-yr study period respectively. Across the 4-yrs, the abortion group had 110% more claims for adjustment reactions than the birth group, with the percentages equaling 90%, 110%, and 200% for depressive psychosis, single and recurrent episode, and bipolar disorder respectively.

Publication information	***Comparison groups***	***Data source and sample demographics***	***Outcomes examined***	***Controls***	***Positive methodological Features***	***Results***
3) Reardon, D. C., Cougle, J., Ney, P. G., Scheuren, F., Coleman, P. K., & Strahan, T. W. (2002). **Deaths associated with delivery and abortion among California Medicaid patients: A record linkage study.** *Southern Medical Journal, 95*, 834-841	Women who aborted or delivered while receiving medical assistance from the state of California (Medi-Cal) in 1989 and died between 1989 and 1997 (n=1,713)	**California Medi-Cal records and death certificates** All low–income Delivery: Avg. age: 25.6 Abortion: Avg. age: 24.8	Death due to various violent and natural causes	- Pre-pregnancy psych-ological difficulties - Age	- Used actual claims data, eliminating the concealment problem - Eliminated cases with previous psychological claims - Avoids recruitment and retention problems - Comparison groups are likely very similar except for the abortion experience - Covered 8 yrs post-pregnancy	- With adjustments for age, women who aborted when compared to women who delivered were 62% more likely to die from any cause. More specific percentages are given below. Violent causes: 81% Suicide: 154% Accidents: 82% All natural causes: 44% AIDS: 118% Circulatory disease: 187%, Cerebrovacular disease: 446% Other heart diseases; 159% - Fairly similar results were obtained when we controlled for prior psychiatric history as well.
4) Coleman, P. K., Reardon, D. C., Rue, V., & Cougle, J. (2002). **History of induced abortion in relation to substance use during subsequent pregnancies carried to term.** *American Journal of Obstetrics and Gynecology, 187*, 1673-1678.	Women who carried a pregnancy to term with a history of one prior abortion (n=74) were compared to women with one prior birth (n=531) and no prior pregnancies (n=738)	**National Pregnancy and Health Survey** Avg. age: 26.5 yrs Marital status Married: 71.5% Not married: 29.5% Ethnicity Hispanic: 18.4% Black: 11.4% White: 64.3% An avg. of 5 yrs had elapsed since a prior abortion and an avg. of 3.42 yrs since a prior birth.	Substance use of various forms during pregnancy	Results were stratified by potentially confounding factors (marital status, income, ethnicity, and time elapsed since a prior abortion or birth)	- Nationally representative, racially diverse sample - Measured substance use at a time when abortion-related stress is likely to be exacerbated	- Compared with women who had previously given birth, women who aborted were significantly more likely to use marijuana (929%), various elicit drugs (460%), and alcohol (122%) during their next pregnancy. Results with only first-time mothers were similar. - Differences between the abortion group and the prior birth and no prior pregnancy groups relative to marijuana and use of any elicit drug were more pronounced among married and higher income women and when more time had elapsed since the prior pregnancy. - Differences relative to alcohol use were most pronounced among the white women and when more time had elapsed since the prior pregnancy.

Publication information	***Comparison groups***	***Data source and sample demographics***	***Outcomes examined***	***Controls***	***Positive methodological Features***	***Results***
5) Cougle, J., Reardon, D. C., & Coleman, P. K. (2003). **Depression associated with abortion and childbirth: A long-term analysis of the NLSY cohort**. *Medical Science Monitor, 9,* CR105-112.	First pregnancy event of either an abortion (n=293) or delivery (n=1,591) between 1980 and 1992.	**National Longitudinal Survey of Youth** Abortion: Avg. age: 30 Ethnicity: Hispanic: 23% Black: 24% White: 57% Avg. income in 1992: $33,554 Delivery: Avg. age: 30 Ethnicity: Hispanic: 21% Black: 24% White: 55% Avg. income in 1992: $33,969 Avg. of 8 yrs had elapsed since the 1st pregnancy event	- Symptoms of clinical depression	- Prior psych-ological state, age, race, marital status, divorce history, education, and income (stratific-ation by ethnicity, current marital status, and history of divorce)	- Nationally representative, racially - diverse sample - Controlled for prior psychological state and several other variables - Extended time frame	- Women whose 1st pregnancies ended in abortion were 65% more likely to score in the "high-risk" range for clinical depression. - Differences between the abortion and birth groups were greatest among the demographic groups least likely to conceal an abortion (White: 79% higher risk; married: 116% higher risk; 1st marriage didn't end in divorce: 119% higher risk).
6) Coleman, P. K., Reardon, D. C., & Cougle, J. (2002). **The quality of the caregiving environment and child developmental outcomes associated with maternal history of abortion using the NLSY data.** *Journal of Child Psychology and Psychiatry and Allied Disciplines, 43,* 743-758	Mothers with (n=672) and without a history abortion (n=4,172) prior to childbirth, with children between the ages of 1 and 13 yrs	**National Longitudinal Survey of Youth** Post-abortive: Avg. age: 31 Ethnicity: Hispanic: 25% Black: 31% White: 44% Avg. income in 1992: $30,162 Non post-abortive: Avg. age: 31 Ethnicity: Hispanic: 22% Black: 30% White: 48% Avg. income in 1992: $30,325	- Emotional and Cognitive support in the home - Math, reading, and vocabulary tests - Problems behaviors	- Ethnicity - Marital history - Number of children - Child age and gender - Maternal age, depression, and education - Family income	- One of very few studies to consider the effects of maternal history of abortion on children's behavior and development -Large, nationally representative, racially diverse sample -Extended time frame - Controls for several potentially confounding variables	- Lower emotional support in the home among 1st born 1- to 4-year-olds of mothers with a history of abortion. - When there was a history of abortion, children (2nd & 3rd born. 1 to 4-yr-olds) of divorced mothers experienced lower levels of emotional support than children of non-divorced women. Decreased emotional support was not observed among children of divorced women with no history of abortion. - More behavior problems among 5 to 9-yr-olds of mothers with a history of abortion.

Publication information	*Comparison groups*	*Data source and sample demographics*	*Outcomes examined*	*Controls*	*Positive methodological Features*	*Results*
7) Coleman, P. K., Reardon, D. C., & Cougle, J. (2005) **Substance use among pregnant women in the context of previous reproductive loss and desire for current pregnancy.** *British Journal of Health Psychology, 10, 255-268.*	Women with a history of abortion (n=280), miscarriage (n=182), and stillbirth (n=30) were compared to women without the respective forms of loss: no miscarriage, n= 221; no abortion, n=144: no stillbirth, n= 371. Comparisons were also made between women who reported wanting a recent pregnancy (n= 306) and those who reported not wanting it (n=344)	**Washington DC Metropolitan Area Drug Use and Pregnancy Study** Full-sample demographics (1992)**:** Married: 32% Age: 18 or under: 9.3% 19-25: 37.4% 26-34: 40.3% 35 or older: 7.8% Income: Under $10,600: 35% $10,600 - $19,000:16% $19,100 - $30,000:12% $30,100 - $50,000:12% Over $50,000:14% Ethnicity: Black: 79.3%, White: 12.4%, Other:4%	Use of alcohol, illicit drugs, and cigarettes during pregnancy	- Other forms of loss - Age - Marital status - Trimester in which prenatal care was sought -Education -Number in household	- Mostly Black sample (few if any post-abortion studies have focused on this group) - Enabled comparison of various forms of perinatal loss	- No differences were observed in the risk of using any of the substances measured during pregnancy relative to a prior history of miscarriage or stillbirth. - A prior history of abortion was associated with a significantly higher risk of using marijuana (201%), cocaine-crack (198%), cocaine-other than crack (406%), any illicit drugs (180%), and cigarettes (100%). - No differences were observed in the risk of using various substances relative to pregnancy wantedness, with the exception of the risk of cigarette use being higher when pregnancy was not wanted (90%).
8) Reardon, D. C., Coleman, P. K., & Cougle, J. (2004) **Substance use associated with prior history of abortion and unintended birth: A national cross sectional cohort study.** *Am. Journal of Drug and Alcohol Abuse, 26, 369-383.*	Women with prior histories of delivering an unintended pregnancy (n=535), abortion (n=213), or no pregnancies (n-1144)	**National Longitudinal Survey of Youth** Demographics measured in 1988 Delivery: Married: 66.5%, Avg. age: 26, Avg. income: $22,949 Abortion: Married: 43.7%, Avg. age: 26, Avg. income: $27,076 No pregnancies: Married: 35.4%, Avg. age: 26.3, Avg. income: $29,667. An avg. of 4 yrs since the target pregnancy	Use of marijuana, cocaine, and alcohol	- Age - Ethnicity - Marital status - Income - Education - Pre-pregnancy self-esteem and locus of control	- Nationally representative, racially - diverse sample - Controlled for prior psychological state and other variables - Extended time frame - All women were experiencing an unintended pregnancy	- Compared to women who carried an unintended first pregnancy to term, those who aborted were 100% more likely to report use of marijuana in the past 30 days and 149% more likely to use cocaine in the past 30 days (only approached significance). Women with a history of abortion also engaged in more frequent drinking than those who carried an unintended pregnancy to term. - Except for less frequent drinking, the unintended delivery group was not significantly different from the no pregnancy group.

Publication information	***Comparison groups***	***Data source and sample demographics***	***Outcomes examined***	***Controls***	***Positive methodological Features***	***Results***
9) Cougle, J., Reardon, D. C., Coleman, P. K., & Rue, V. M. (2005).**General -ized anxiety associated with unintended pregnancy: A cohort study of the 1995 National Survey of Family Growth.** *Journal of Anxiety Disorders, 19, 137-142.*	First pregnancy event of either an abortion (n=1,033) or delivery (n=1,813). All were unintended pregnancies.	**1995 National Survey of Family Growth** Abortion: Ethnicity: Hispanic: 10%, Black: 26%, White: 61% Avg. income:376% of poverty level Delivery: Ethnicity: Hispanic: 14%, Black: 36%, White: 47% Avg. income: 234% of poverty level Avg. age, both groups: 32 Avg. of 13 yrs since the 1st pregnancy event.	Symptoms of Generalized Anxiety Disorder – lasting for a period of at least 6 months.	- pre-existing anxiety, age, and race (stratification by ethnicity, current marital status, and age)	- Nationally representative, racially - diverse sample - Controlled for prior anxiety - Extended time frame - All women were experiencing an unintended pregnancy	- The odds of experiencing subsequent Generalized Anxiety was 34% higher among women who aborted compared to women who delivered. - Differences between the abortion and birth groups were greatest among the following demographic groups: Hispanic 86% higher risk; unmarried at time of pregnancy: 42% higher risk; under age 20: 46% higher risk.
10) Rue, V. M., Coleman, P. K., Rue, J. J., & Reardon, D. C. (2004). **Induced abortion and traumatic stress: A preliminary comparison of American and Russian women.** *Medical Science Monitor* 10, SR 5-16.	Russian (n=331) and U.S. (n=217) women who had experienced one or more abortions and no other forms of loss.	Data collected in health care facilities (hospitals, clinics, and physician's offices) by Vincent Rue and colleagues Russian: Avg. age: 28, 59% married, 63% employed full-time U.S.: Avg. age: 34, 49% married, 34% worked full-time An avg. of 5.8 yrs had elapsed since the Russian women's abortions, and 10.6 yrs had elapsed since the U.S. women's abortions	Symptoms of Post Traumatic Stress Disorder	- Severe stress symptoms prior to the abortion - Other stressors pre-and post-abortion - Several demographic variables - Psycho-social variables (harsh discipline, sexual, physical, and emotional abuse, parental divorce, etc.)	- Extensive controls for background variables. - One of few cross-cultural comparisons in the literature. -	- U.S. women reported more stress, PTSD symptoms, and other negative effects than Russian women. - Russian women scored higher on the Pearlman Traumatic Stress Institute Belief Scale, indicating more pronounced disruption of basic needs impacted by trauma (safety, trust, self-esteem, intimacy, and self-control). - No differences were observed relative to perceptions of positive effects (improved partner relationships, feeling better about oneself, relief, feelings of control). - The percentages of Russian and U.S. women who experienced 2 or more symptoms of arousal, 1 or more symptom of re-experiencing the trauma, and 1 or more experience of avoidance (consistent with DSM-IV diagnostic criteria) were equal to 13.1% and 65% respectively.

Publication information	*Comparison groups*	*Data source and sample demographics*	*Outcomes examined*	*Controls*	*Positive methodological Features*	*Results*
11) Coleman P, Maxey CD, Rue VM, Coyle CT (2005). **Associations between Voluntary and Involuntary Forms of Perinatal Loss and Child Maltreatment among Low-Income Mothers.** *Acta Paediatrica,94*	The 518 participants included 118 abusive mothers, 119 neglecting mothers, and 281 mothers with no history of child maltreatment Reproductive loss information: 100 women had a history of one abortion and 99 had a history of one miscarriage/stillbirth	**Fertility and Contraception Among Low-Income Child Abusing and Neglecting Mothers in Baltimore MD Study** Marital status: Single (78.8%); Separated (18.9%); Married (2.3%). Avg. age: 27. Avg. # of children: 2.64 Ethnicity: Black (79.9%); White (19.7%); Other (4%) Education: >or= 11 years (59%); High school diploma (32%); 13-16 years (9%)	- Child physical abuse - Child neglect	- Demographic, personal history, and social variables found to be positively correlated with the forms of child maltreatment examined. - The form of loss not being analyzed.	- Use of confirmed cases of child maltreatment - An extended time frame - Diverse sample - Controls for several potentially confounding variables	- Compared to women with no history of perinatal loss, those with 1 loss (voluntary or involuntary) had a 99% higher risk for child physical abuse. - Compared to women with no history of induced abortion, those with 1 prior abortion had a 144% higher risk for child physical abuse. - A history of 1 miscarriage/stillbirth was not associated with increased risk of child abuse. - Perinatal loss was not related to neglect.
12) Coleman, P. K. (2006). **Resolution of Unwanted Pregnancy During Adolescence Through Abortion versus Childbirth: Individual and Family Predictors and Consequences.** *Journal of Youth and Adolescence*.	Adolescents in grades 7-11 who experienced an unwanted pregnancy That was resolved through abortion (n=65) or delivery (n=65).	**National Longitudinal Study of Adolescent Health** Abortion group: 15 to 19 years of age (76.4%); under 15 (23.6%) Parents' marital status: married (51.8%); not married (48.2%) Parental income: under $40,000 (52.8%); $40,000 or more (47.2%) Birth group: 15 to 19 years of age (80.4%); Under 15 (19.6%) Parents' marital status: married (43.6%); not married (56.4%) Parental income: under $40,000 (63.6%); $40,000 or more (36.4%)	- Counseling for emotional problems - Trouble sleeping cigarette smoking - Marijuana use - Alcohol use -Problems with parents because of alcohol use - School problems because of alcohol use	- Demographic, educational, psychological, and family variables found to predict the choice to abort.	- Nationally representative, diverse sample -Exclusive focus on unwanted pregnancies - Implemented controls for several potentially confounding variables - Use of two waves of data - longitudinal	- After implementing controls, adolescents with an abortion history, when compared to adolescents who had give birth, were 5 times more likely to seek counseling for psychological or emotional problems, 4 times more likely to report frequent sleep problems, and they were 6 times more likely to use marijuana.

Publication information	*Comparison groups*	*Data source and sample demographics*	*Outcomes examined*	*Controls*	*Positive methodological Features*	*Results*
13) Reardon, D.C., & Coleman, P. K. (2006). **Relative Treatment Rates for Sleep Disorders Following Abortion and Childbirth: A Prospective Record-Based Study.** *Sleep, 29,* 105-106.	15,345 women who had an induced abortion and 41,479 women who delivered and had no known subsequent history of induced abortion while receiving medical assistance from the state of California (Medi-Cal) in 1989 and who had no sleep claims for 1 yr prior to pregnancy resolution. Delivery group had no subsequent abortions.	**California Department of Health Services Medi-Cal data** All low–income Delivery: Avg. age: 25 Avg. # of mos. of eligibility: 27 Abortion: Avg. age: 25 Avg. # of mos. of eligibility: 31	Sleep disturbances identified by ICD-9 treatment codes for non-organic sleep disorder and sleep disturbances	- Claims for sleep disorders - Age - Months of eligibility	Used actual claims data, eliminating the concealment problem - Avoids recruitment and retention problems - Eliminated cases with previous sleep claims - With claims data, avoids simplistic forms of assessment - Comparison groups are likely very similar except for the abortion experience - Extended time frame, with repeated measurements enabling more confidence in the causal question	- Women were more likely to be treated for sleep disorders following an induced abortion compared to a birth. The difference was most pronounced in the first 180 days post pregnancy resolution and was not significant after the third year. Specifically, there was an 85% higher risk for sleep disorders associated with abortion at 180 days and increased risks of 68%, 40%, 41%, and 29% for the 1st year, 2nd year, 3rd year, and across the full 4 year study period respectively.
14) Coleman P, Rue VM, Coyle CT, & Maxey CD (2007). **Induced Abortion and Child-Directed Aggression Among Mothers of Maltreated Children,** Internet Journal of Pediatrics and	237 mothers who were residents of Baltimore and were receiving Aid to Families with Dependent Children. Women with and without a history of abortion were compared relative to child-directed physical aggression. All of the women had a history of child maltreatment	**Fertility and Contraception Among Low-Income Child Abusing and Neglecting Mothers in Baltimore MD Study** Avg. age: 28.4 Avg. # of children: 3.5 Ethnicity: Black 72.2% White: 27.8% Education: >or= 11 years (72%); High school diploma (23%); 13-16 years (5%)	Frequency of throwing objects, shoving, slapping, kicking/biting, hitting, and beating Frequency of physical punishment in general.	- Non-voluntary perinatal loss - socio-demographic, family of origin, and partner aggression variables associated with the choice to abort.	- Use of controls - Examined a previously under-investigated segment of the population: predominantly poor, Black women	- Abortion history was associated with significantly more frequent maternal slapping, hitting, kicking/biting, beating, and use of physical punishment in general

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Substance Use Associated with Unintended Pregnancy Outcomes in the National Longitudinal Survey of Youth

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ABSTRACT

Abortion is known to be associated with higher rates of substance abuse, but no studies have compared substance use rates associated with abortion compared to delivery of an unintended pregnancy. This study examines data for women in the National Longitudinal Survey of Youth whose first pregnancy was unintended. Women with no pregnancies were also used as a control group. Use of alcohol, marijuana, cocaine,

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and behaviors suggestive of alcohol abuse were examined an average of four years after the target pregnancy among women with prior histories of delivering an unintended pregnancy (n = 535), abortion (n = 213), or those who reported no pregnancies (n = 1144). Controls were instituted for age, race, marital status, income, education, and prepregnancy self-esteem and locus of control. Compared to women who carried an unintended first pregnancy to term, those who aborted were significantly more likely to report use of marijuana (odds ratio: 2.0), with the difference in these two groups approaching significance relative to the use of cocaine (odds ratio: 2.49). Women with a history of abortion also reported more frequent drinking than those with a history of unintended birth. With the exception of less frequent drinking, the unintended birth group was not significantly different from the no pregnancy group. Resolution of an unintended pregnancy by abortion was associated with significantly higher rates of subsequent substance use compared to delivering an unintended pregnancy. A history of abortion may be a useful marker for identifying women in need of counseling for substance use.

Key Words: Unintended pregnancy; Abortion; Substance use; Alcohol abuse; Drug abuse.

INTRODUCTION

Research has shown that a resolution of an unintended pregnancy by induced abortion compared to delivery is associated with higher rates of alcohol consumption (1–9) and illegal drug use (7–16). Women with a history of abortion are also more likely to use drugs and alcohol during later wanted pregnancies (17–21), which places their fetuses at increased risk.

The relationship between abortion and substance abuse has received little notice or discussion among medical practitioners, however, because it has been widely assumed that the association is fully explained by common risk factors for both unintended pregnancy and substance abuse. Further, some researchers have suggested that negative emotional reactions following an abortion are likely to be negligible or at least equivalent to those stemming from carrying an unintended pregnancy to term (22,23). Unfortunately, this hypothesis has not yet been tested.

The purpose of this study was to explore any differences in subsequent substance use between women who carry an unintended pregnancy to term and those who have an induced abortion, while controlling for potential confounding factors including prepregnancy psychological state. To provide further information for the interpretation of the results, a control group of women with no reported pregnancies was also used.

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METHOD

This analysis is based on data collected from 1979 through 1988 from the National Longitudinal Survey of Youth (NLSY), a survey conducted by the Center for Human Resource Research at Ohio State University. The survey began in 1979 and involved the follow-up of 12,686 youths aged 14–21 at the time of the first interview. The cohort used in this study was a carefully selected cross-sectional sample of noninstitutionalized civilian citizens of the United States, born between January 1, 1957, and December 31, 1964, with a supplementary oversample of blacks, Hispanics, and poor whites.

Women in the NLSY sample were queried regarding their childbirth history every year beginning in 1979. Starting in 1984, women were asked about their abortion history every two years by way of a confidential abortion card. All variables regarding abortion and childbirth outcomes were used to construct a reproductive history profile for each woman. Variables regarding intentionality of each pregnancy were constructed from the data across all years by Joyce, Kaestner, and Korenman (24) and were provided for our use in these analyses.

The 1988 interview of the NLSY included 11 items that tap into alcohol abuse symptoms (see Table 1). The dichotomously scored items required respondents to indicate whether or not the behaviors described reflected their own personal situation. The alcohol items were primarily derived from the National Health Interview Survey, conducted by the U.S. Census Bureau. Four additional substance use items from the 1988 data set were used as outcome measures. One item assessed the number of days the subject drank over the course of the last month and the second asked how many drinks the respondent consumed on days when she drank alcohol. The other two questions asked if the respondent had used marijuana or cocaine over the course of the last month.

In order to control for the effects that social support may have on substance abuse, year 1988 variables were extracted related to marital history and frequency of religious service attendance. Women for this study were categorized according to whether they were 1) in their first or second marriage, or if they were 2) never-married or had not remarried after their first or second divorce. Women who had been married three times were excluded from analyses, since data was not available to determine if they were still married ($n = 7$) in 1988. Finally, variables pertaining to age, total family income, total years of formal education, and race were extracted for the year 1988 to enable control for these potentially confounding variables.

The Rosenberg Self-Esteem Scale (25) was included in the NLSY 1980 interview. These scores were incorporated into this study as a means for

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Table 1. Responses to 1988 alcohol abuse scale variables.

Item	Percentage of subjects reporting ''yes'' to item		
	No pregnancy	Unintended birth	Abortion
1. Aggressive/cross while drinking	12.5	11.4	11.0
2. Heated argument while drinking	9.7	8.0	13.6
3. Gotten into fight while drinking	.9	4.2	4.5
4. Tried to cut down/quit but failed.	2.9	4.2	3.2
5. Afraid I'm becoming an alcoholic.	3.7	4.5	8.4
6. It's difficult to stop drinking until I'm intoxicated	1.7	3.5	5.5
7. Don't remember a thing while I'm drunk	7.2	6.2	11.0
8. I take a drink first thing in the morning	.6	1.7	1.3
9. Hands shake a lot the morning after drinking	2.6	3.5	4.5
10. Gotten drunk alone	6.4	9.3	7.1
11. Kept drinking after I promised not to	4.9	4.5	7.1
Answered ''yes'' to 1 item only	10.3	12.5	9.7
Answered ''yes'' to 2 items	5.3	5.9	9.7
Answered ''yes'' to 3 items	4.5	2.8	3.9
Answered ''yes'' to 4 or more items	3.6	4.5	6.5

controlling for psychological state prior to the first pregnancy. Scores range from 10 to 40, with higher scores indicating greater self-esteem. High self-esteem is an accepted component of positive mental health, with low self-esteem often correlating with mental health problems including anxiety and depression (26). Fortunately, self-esteem is not the only measure available to researchers for the assessment of psychological well-being in the NLSY data set. In 1979, respondents were presented with an abbreviated version of the Rotter Internal-External Locus of Control Scale. The suitability of the Rotter as a marker for prior psychological history is confirmed by previous investigations demonstrating a relation between external locus of control and greater depression (27–31). Moreover, a theoretical link has been established between externality and the etiology of depression (32). Scores on the abbreviated 4-item scale range from 4 to 16, with higher scores indicative of a more externally controlled individual, and lower scores suggestive of a more internally controlled individual.

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Table 2. Demographic variables collected in 1988 by group.

	Married	Avg. age (standard deviation)	Avg. # of children (standard deviation)	Average income (standard deviation)	Black or Hispanic
First pregnancy unintended/delivered	66.5%	26.05 (2.16)	1.88 (.87)	$22,949 ($16,967)	46.5%
First pregnancy aborted	43.7%	25.96 (2.20)	.65 (.94)	$27,076 ($20,002)	39.4%
No pregnancies	35.4%	26.28 (2.20)	0	$29,667 ($21,399)	30.0%

To confine our analyses to women with unwanted first pregnancies, we excluded all subjects whose first pregnancy was intended or occurred prior to 1981. The latter condition was imposed so we could control for self-esteem and locus of control. The remaining women were divided into three groups: 1) those whose first pregnancy was unintended (mistimed or unwanted), delivered a child between 1981 and 1988 ($n = 535$), and did not report an abortion; 2) those whose first pregnancy occurred between 1981 and 1988 and was terminated by induced abortion ($n = 213$); and 3) women who had no pregnancies prior to 1988 ($n = 1144$).

Among women who had abortions, the average year of their first abortion was 1984 ($SD = 2.3$). Among women who had an unintended birth, the average year of their first birth was 1983 ($SD = 2.6$). Table 2 shows descriptive statistics collected in 1988 for age, marital status, income, and race. Only three classifications for race are provided in NLSY: black, Hispanic, and not black and not Hispanic. The latter is typically reported as white, but in fact includes Asians and other minorities.

Unfortunately not all of the participants in this subsample of the NLSY were surveyed pertaining to the alcohol variables. However, no significant differences were observed relative to the control variables between those who were administered the alcohol-related items and those who were not.

RESULTS

Table 1 provides the percentages from each group who responded affirmatively to each of the alcohol abuse items. For a majority of the items, the unadjusted scores were highest among the abortion group.

Table 3. ANCOVA results relative to alcohol use outcome measures, with controls for self-esteem, locus of control, age, income, education, marital status, and race.

Dependent variable	Scale range (observed range)	F statistic	Groups	Adjusted means (SE)	95% confidence intervals	Significance of group differences	Power analysis results
# of days drank in last month	0–30 (0–30)	$F(2,1240) = 4.91$, $p = .008$	1) Unintended birth	4.79 (.35)	4.10–5.48	1 and 2 = .006	.807
			2) Abortion	6.36 (.45)	5.49–7.24	2 and 3 = .379	
			3) No pregnancy	5.93 (.20)	5.54–6.32	1 and 3 = .007	
# of drinks consumed on those days she drank	(0–20)	$F(2,1240) = 1.91$, $p = .148$	1) Unintended birth	2.24 (.12)	2.00–2.47	1 and 2 = .056	.416
			2) Abortion	2.60 (.15)	2.31–2.90	2 and 3 = .108	
			3) No pregnancy	2.34 (.07)	2.20–2.47	1 and 3 = .480	

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Table 4. Results of logistic regression analyses pertaining to alcohol abuse associated with pregnancy history, controlling for self-esteem, locus of control, age, income, education, marital status, and race.

	Alcohol use scoring 2 or more on 11-item scale			Alcohol use scoring 4 or more on 11-item scale		
	N	%	OR (95% CI) significance	N	%	OR (95% CI) significance
Unintended birth	38/289	13.1%	1.00	13/289	4.5%	1.00
Abortion	31/154	20.1%	1.72 (.95–3.11) p = .073	10/154	6.5%	1.69 (.65–4.42) p = .283
No pregnancy	109/815	13.4%	1.10 (.70–1.75) p = .675	29/815	3.6%	1.01 (.47–2.19) p = .979

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Table 5. Results of logistic regression analyses pertaining to drug use associated with pregnancy history, controlling for self-esteem, locus of control, age, income, education, marital status, and race.

	Used marijuana in the past 30 days?			Used cocaine in the past 30 days?		
	N	%	OR (95% CI) significance	N	%	OR (95% CI) significance
Unintended birth	42/535	7.9%	1.00	8/535	1.5%	1.00
Abortion	39/213	18.6%	2.00 (1.18–3.39) $p = .010$	10/213	4.8%	2.49 (.84–7.32) $p = .099$
No pregnancy	88/1144	7.9%	.74 (.47–1.17) $p = .197$	23/1144	2.1%	1.37 (.59–3.36) $p = .493$

The pregnancy variable was found to be significantly associated with age [$r(1892) = .05, p < .05$], self-esteem [$r(1892) = .12, p < .001$], locus of control [$r(1892) = -.11, p < .001$], income [$r(1892) = .15, p < .001$], marital status [$r(1892) = -.27, p < .001$], years of education [$r(1892) = .32, p < .001$], and race [$r(1892) = .13, p < .001$]. Therefore, these seven variables were used as covariates in all of the primary analyses. A significant association was not detected between the pregnancy history variable and regularity of religious service attendance [$r(1892) = -.02, p = .339$], measured as a possible indicator of social support.

Two analyses of covariance (ANCOVAs) using the seven control variables listed above were performed with the three pregnancy history groups as the independent variable in each case. The results of these analyses are presented in Table 3. As indicated by the information provided in the table, the overall analysis pertaining to the number of days the respondent reported drinking over the previous 30 days was significant. The univariate F-tests revealed a higher frequency of drinking for the abortion group compared to the unintended pregnancy group and for the no pregnancy group compared to the unintended delivery group. The overall result of the second ANCOVA pertaining to the number of drinks consumed on days when the respondent drank over the past 30 days was not significant. However, examination of the univariate tests revealed that the difference between the abortion group and the unintended delivery

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group approached significance, with the abortion group indicating consumption of more alcohol.

Logistic regression analyses incorporating the seven control variables were conducted to compare the unintended delivery group to the abortion and no pregnancy groups relative to endorsement of any two or more of the alcohol abuse items as well as any four or more of the alcohol abuse items. As indicated in Table 4, only one of the comparisons approached significance, with the postabortion group 72% more likely to endorse two or more items on the alcohol abuse scale in comparison to the unintended delivery group.

Finally, two additional logistic regression analyses were conducted to calculate the adjusted odds ratios using the seven control variables relative to the use of marijuana and cocaine in the past 30 days. These results are provided in Table 5. As indicated by the data presented, abortion was associated with a significantly greater likelihood of having used marijuana (100% higher). The difference between abortion and the unintended birth groups with regard to cocaine usage approached significance (abortion group was 143% more likely to endorse the item). No differences were detected between the unintended birth and the no pregnancy groups on either drug use item.

DISCUSSION

The findings of this study revealed that unintended pregnancies resolved through abortion are associated with an increased risk for various forms of substance use. As in previously cited studies comparing women with a history of abortion to women who deliver, abortion was significantly associated with more frequent drinking and a greater likelihood of using marijuana. Results suggesting potential substance usage problems favoring the abortion group in comparison to the unintended birth group also approached significance relative to the use of cocaine, the number of drinks consumed on days in which the respondent reported drinking, and endorsement of two or more behavioral indicators of alcohol abuse. Only one significant difference was observed between the unintended birth group and the no pregnancy group, with the no pregnancy group reporting more frequent drinking.

The strengths of this study are many, including the use of a carefully selected, national sample, and the use of many controls for several potentially confounding sociodemographic factors as well as prior psychological state. The fact that differences were detected between the groups,

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despite the length of time that had elapsed since the majority of unintended pregnancies were resolved (4–5 years) is consistent with the few available longitudinal studies of postabortion reactions indicating that negative reactions may be observed years after an abortion (1,23,33,34).

A weakness of this study is that the number of abortions reported in the NLSY is only 40% of the expected number compared to national averages (35). As a result, many women in the birth group and the no pregnancies group certainly had undisclosed abortions. Since women who conceal their abortions are more likely to feel greater psychological distress (36), the differences observed in our study are probably diluted by the effect of high concealment rates. Further, the statistical power to detect differences was compromised by the relatively low frequencies of self-reported substance use, particularly with regard to cocaine use.

The findings presented herein are consistent with the hypothesis that resolution of an unintended pregnancy through abortion increases the likelihood of substance use. Additional research is needed, however, to rule out other variables such as personality factors, unstable relationship variables, or changes in lifestyle or attitudes that may be systematically related to both the choice to abort and the use of substances. In this data set, the only prepregnancy psychiatric scales that were available were related to self-esteem and locus of control. A prospective study including a complete psychiatric assessment prior to first pregnancies would be most ideal.

The results of this study are also consistent with self-report investigations in which drug and alcohol use have been found to be related to abortion experience (37,38) and with clinical evidence indicating that some women attempt to cope with negative emotions associated with an abortion by using substances (38,39). It is also known that among women who report no history of abortion prior to their first pregnancy, those who abort are significantly more likely to report subsequent substance abuse (9).

An alternative explanation is that having a child, even if unplanned, may offer the protective effect of reducing substance use due to the increased responsibility associated with parenting or with lifestyle changes necessitated by the demands of caring for a young child. However, a protective hypothesis is only weakly supported by the data, as there were only small, mostly nonsignificant, differences between the unintended birth group and the no pregnancy group.

Given the highly politicized nature of the abortion topic, research identifying any negative associations with abortion is subject to intense scrutiny and criticism (40). A major argument leveled against reports such as this one is that statistical associations do not prove causation. A better explanation for the observed associations between abortion and subsequent

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mental health problems, some have suggested, is that women who are prone to mental illness are simply more likely to choose an abortion and, therefore, subsequent mental illness is incidental to abortion rather than caused or aggravated by it (40). Certainly this explanation is also worthy of additional research. But in our opinion it is premature to adopt a single view regarding explanations for these and similar results.

Those who become fixated on claims and arguments regarding causation appear to be more concerned about politics than treatment and, therefore, may miss the most useful implication of this body of research for health care workers, namely, that a history of abortion is a significant marker for higher rates of substance abuse (1–21), depression (23,41–43), psychiatric treatment (43–45), and suicidal behavior (46–51). While there can be endless disputes about why abortion is a marker for psychological instabilities, it is indisputable that it is a marker and can, therefore, be used to identify patients who may benefit from referrals for counseling.

Clinicians who are alert to a patient's history of pregnancy loss may be better able to identify women who would benefit from a referral for counseling. We recommend that those who counsel women regarding mental health issues and substance abuse should include in their intake routine the neutrally worded question, ''Have you had any history of pregnancy loss: miscarriage, abortion, or stillbirth?'' In many cases, the simple step of posing this question alone may give women permission to discuss unresolved, sensitive issues regarding their pregnancy losses. Obstetricians should also make this question one of their routine inquiries given the evidence that women with a history of abortion are more likely to use drugs and alcohol during subsequent pregnancies they intend to carry to term (17–21). Family planning counselors should also be aware of this information when screening and counseling their clients.

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The psychology of abortion: A review and suggestions for future research

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Abstract
The literature base pertaining to abortion decision-making and adjustment has grown substantially since legalization of abortion in the U.S. 30 years ago. However, the available research has suffered from various theoretical and methodological shortcomings and the findings do not seem to do justice to the complexity of abortion experiences among women residing in a cultural context that continues to exhibit intense conflict over the legality and morality of abortion. The purpose of this review is to summarize previous research, offer suggestions for improving the quality of work on the topic of abortion, and to highlight specific content areas holding considerable promise for enhancing our understanding of the risks and benefits of abortion.

Keywords: *Abortion, decision-making, post abortion adjustment, ecological framework, methodological innovation*

Introduction

Most people living in the U.S. would agree that abortion represents one of the most contentious political, social, and moral issues of the day. Diversity in opinions and

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[†]Thomas Strahan passed away on November 13, 2003. His contributions to this paper and to the post-abortion field in general were extensive. He is sorely missed by those who knew and loved him.

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conflicting messages from groups espousing polarized views regarding the place of abortion in our culture has the unfortunate result of bombarding women facing unintended pregnancies with many mixed messages. Despite the great controversy surrounding abortion, the psychological literature at the level of individual decision-making and adjustment has tended to suggest that the termination of an unplanned pregnancy is an emotionally benign experience for most women. The discrepancy between societal and individual experiences of abortion may represent an accurate view with personal experiences inherently less complicated than those at the broader level of analysis. However, this interpretation seems improbable given that women's lives are inextricably linked to the surrounding environment, as Armsworth (1991) noted "Abortion is an issue that cuts through multiple levels of individual, societal, cultural, and political spheres, all of which seem to have an impact on the individual response" (p. 378). A likely cause for the apparent inconsistency between societal and individual experiences is the theoretical and methodological deficiencies plaguing the area of study, with the available data often missing the complexity and depth of individuals' inner experiences.

When the post-abortion literature is carefully examined, unanswered questions abound, underscoring the need for researchers to step back and take stock of theoretical and methodological shortcomings in order to facilitate more fruitful work in this area. Further, with 43% of American women making the decision to abort at least once prior to age 45 (Henshaw, 1998), approaching this area of study in a focused and substantive manner should be a national priority. Abortion has been legal for three decades in the U.S., rendering the time to put aside political, social, and economic agendas and take an honest look at both the positive and negative aspects of women's experiences with this common medical procedure well overdue.

Motivated by the desire to promote research with the control and depth of exploration needed to more definitively ascertain how women with diverse backgrounds, characteristics, and life circumstances process an abortion experience and continue with their lives, three objectives are pursued in this article: (1) to review the existing literature pertaining to the psychology of abortion; (2) to offer suggestions for introducing more conceptual sophistication and methodological rigor to abortion research; and (3) to consider a few content areas in need of further exploration as this literature base begins to mature.

Overview of the existing literature

Most women view an unintended pregnancy as a stressful personal situation (Adler & Dolcini, 1986; Cohen & Roth, 1984; Olson, 1980), with estimates of the percentage of births in the U.S. resulting from pregnancies considered unwanted (unintended, no child desired), or mistimed (unintended, child desired in the future) at conception ranging from 49 to 60% (Forrest, 1994; Henshaw, 1998; Squires, 1995). Moreover, approximately 77% of births to women over 40 and 86% of births to teenagers are the result of unintended pregnancies (Squires, 1995). Many studies indicate that concerns with becoming a single parent and partner relationship difficulties are among the most common motives for seeking an abortion (Soderberg, Andersson, Janzon & Slosberg, 1997; Torres and Forrest, 1988). Other

frequently cited reasons include the following: (1) concerns that carrying a pregnancy to term will interfere with the continuation of one's current intimate relationship, future education, career, or personal plans (Allanson and Astbury, 1995; Faria, Barrett & Goodman, 1985; Patterson, Hill & Maloy, 1995), (2) age (Faria et al., 1985), (3) not feeling ready for parenting (Faria et al., 1985; Kero, Hoegburg, Jacobsson & Lalos, 2001), (4) insufficient finances (Faria et al., 1985; Glander, Moore, Michielutte & Parsons, 1998), (5) desire to postpone childbirth (Kero et al., 2001; Tornbom, Ingelhammar, Lilja, Moller & Svanberg, 1994), and (6) feeling as though one does not have the time and energy for another child (Kero et al., 2001).

Abortion tends to bring relief and a reduction in women's perceptions of stress (Adler, 1975). However, there is relative consensus among scholars in the field that at least 10–20% of women who have had an abortion suffer from serious negative psychological complications (Adler et al., 1990; Lewis, 1997; Major and Cozzarelli, 1992; Zolese and Blacker, 1992). With over 1.3 million abortions performed annually in the U.S. (Alan Guttmacher Institute, 2000), using the more conservative 10% figure would result in 130,000 new cases of women experiencing related psychological problems each year. Among those who are adversely affected, many stress-related symptoms have been identified, including anxiety (Franco, Tamburrino, Campbell, Pentz & Jurs, 1989; Moseley, Follongstad, Harley & Heckel, 1981; Niswander, Singer & Singer, 1972), depression (Coleman & Nelson, 1998; Cougle, Reardon & Coleman, 2003; Gould, 1980; Moseley et al., 1981; Reardon & Cougle, 2002a, 2002b; Thorp, Hartmann & Shadigian, 2003), sleep disturbances (Barnard, 1990; Gould, 1980), substance use/abuse (Coleman, Reardon, Rue & Cougle, 2002b; Drower & Nash, 1978; Reardon & Ney, 2000; Yamaguchi & Kandel, 1987), and increased risk of suicide (Gissler, Kauppila, Merilainen, Toukomaa & Hemminki, 1997; Reardon et al., 2002). A few recent studies have further identified relations between maternal history of abortion and problematic parenting (Benedict, White & Cornely, 1985; Coleman, Reardon & Cougle, 2002; Ney, Fung & Wickett, 1993).

As noted by Coleman and colleagues (2002a), an abortion history is essentially a package variable comprised of numerous personal, relationship, and situational factors precipitating an unplanned pregnancy and the decision to abort, while carrying the potential to trigger negative psychological effects. Women with a history of abortion and women who decide to continue an unplanned pregnancy may be distinguishable in various ways that are related to mental health. For example, in a study by Bradley (1984) of Canadian women who had recently given birth, women with a history of abortion tended to describe themselves as self-reliant, independent, rebellious, and to enjoy being unattached or unconnected to other people, places, and things. Miller (1992) found that women who abort tend to be unmarried, independent-minded, and are likely to view abortion as both personally acceptable and as acceptable in the eyes of family members. In a study by Skjeldestad (1994), Norwegian women opting to abort usually favored liberal abortion legislation; however, age and occupational status were unrelated to the decision. Research by Russo and Denious (2001) revealed that the statistical association between abortion and psychological problems was reduced considerably when the effect of partner violence was statistically controlled. These results suggested that the experience of violence, which was systematically related to the choice to abort, could be a salient factor responsible for declines in mental health. However, definitive causal

conclusions were precluded by the fact that timing of the experience of violence (before or after the abortion) was not assessed. Clearly, various factors alone or in combination with the abortion experience may lead to distinct post-abortion psychological health outcomes.

Numerous studies have now identified many of the demographic, individual, relationship, and situational characteristics that place women at risk for psychological disturbance in the aftermath of abortion. The available data specifically indicate that women are more prone to post-abortion psychological problems when they have any of the following characteristics: (1) low self-efficacy for coping with the abortion (Major et al., 1990), (2) low self-esteem (Cozzarelli, Karrasch, Sumer & Major, 1994), (3) external locus of control (Cozzarelli, 1993), (4) difficulty with the decision (Bracken, 1978; Osofsky & Osofsky, 1972), (5) when there is emotional investment in the pregnancy (Lyndon, Dunkel-Schetter, Cohan & Pierce, 1996; Remennick & Segal, 2001), (6) perceptions of one's partner, family members, or friends as non-supportive (Major et al., 1990; Major & Cozzarelli, 1992), (7) timing during adolescence, being unmarried, or poor (Adler, 1975; Bracken, Hachamovitch & Grossman, 1974; Campbell, Franco & Jurs, 1988; Franz & Reardon, 1992; Osofsky & Osofsky, 1972), (8) pre-existing emotional problems or unresolved traumatization (Speckhard & Rue, 1992), (9) a poor or insecure attachment relationship with one's mother or a childhood history of separation from one's mother for a year or more before age 16 (Cozzarelli et al., 1998; Kitamura et al., 1998; Payne, Kravitz, Notman & Anderson, 1976), (10) involvement in violent relationships (Allanson & Astbury, 2001; Russo & Denious, 2001), (11) traditional sex-role orientations (Gold, Berger & Anders, 1979), and (12) conservative views of abortion and/or religious affiliation (Bogen, 1974; Osofsky & Osofsky, 1972; Soderberg, Janzon & Slosberg, 1998). Further, adjustment problems have been documented to be more common when a pregnancy is initially intended (Ashton, 1980; Friedman, Greenspan & Mittelman, 1974; Lazarus, 1985; Major et al., 1985; Miller, 1992), abortion occurs during the second trimester (Anthanasiou, Oppel, Michelson, Unger & Yager, 1973), and when women are involved in unstable partner relationships (Llewellyn & Pytches, 1988; Soderberg et al., 1998). Finally, feelings of being forced into abortion by one's partner, others, or by life circumstances, increase the risk for negative post-abortion outcomes (Friedman et al., 1974).

The focus of nearly all of the literature devoted to the psychology of abortion has been on why women seek abortions, the mental health risks associated with the choice, and the demographic, individual, and social predictors of negative emotional responses. Unfortunately the experience of abortion is often studied in isolation from other aspects of women's lives with minimal grounding in an appropriate theoretical framework. There is some evidence in the available literature of theoretical development focusing on specific aspects of abortion decision-making (Bracken, Klerman & Bracken, 1978; Smetana & Adler, 1979) or adjustment processes (Miller, 1992). One of the more ambitious efforts was offered by Miller (1992), who proposed five variations of a basic model whereby the associations among unwanted pregnancy, the decision to abort, and disparate forms of psychological responses are mediated by specific internal and external mechanisms. However, no researcher has offered a truly broad theoretical model to help bring together the existing data in a cohesive manner. A framework for the purpose of integrating the

existing knowledge and for providing guidance pertaining to future research efforts is offered in the next section.

An ecological framework for the study of abortion

Given the many diverse characteristics of individuals opting for abortion as well as the great environmental variability in which decisions are embedded, a framework is needed to incorporate information related to how the following variables might be related to differential experiences: (1) individual difference factors including demographic variables (e.g., age, ethnicity, socioeconomic status, reproductive history, and marital history), history of stressful life experiences, personality variables, intelligence, personal beliefs, and psychological and physical health, (2) relationship history variables including family of origin/attachment dynamics, present family situation, current and past intimate relationships, and friendships, etc., (3) social support systems prior to, during, and after the decision to abort, (4) material and social circumstances surrounding the abortion decision, and (5) cultural values and norms pertaining to abortion. Such a model would generate numerous logical hypotheses related to differential psychological responses to abortion decision-making and adjustment based on a wide range of personal and social characteristics. For example, very little research has explored the associations between normal and abnormal variability in personality characteristics and abortion decision-making and adjustment. Using clinical data alone one might hypothesize that women with narcissistic personality disorder would be more inclined to experience rage and less likely to experience guilt and a full range of emotions in response to the experience when compared to others (Barnard, 1992; Siomopoulos, 1981). Adoption of a well-developed model, however, would offer insights pertaining to how additional individual difference, relationship, situational, social, and cultural factors may influence this general expectation. In addition to including the factors described above, such a model would need to incorporate sensitivity to the complex bi-directional and multi-directional relations among the many personal characteristics and environmental factors influencing the decision to abort and adjustment afterwards.

Brofenbrenner's (1979, 1986, 1989, 1993) bioecological model of human development is well-suited as a perspective for exploring the psychology of abortion decision-making and adjustment in the full contextual richness that the topic deserves. Unlike a more formalized theory, the bioecological framework does not offer the possibility of generating specific predictions relative to the psychology of abortion or any other human experience for that matter. Instead it offers an organized conceptual umbrella for more specified theory development and provides insights regarding the development of research designs likely to generate logically comprehensible data. Although the model has been primarily applied to development during childhood, Brofenbrenner (1998) has emphasized the utility of the model relative to understanding developmental processes across the lifespan. In addition to acknowledging the role of biologically based characteristics and other individual difference factors, the model provides a framework for understanding the role of a wide array of intra-familial and environmental systems in development. Influences stemming from the individual's immediate context microsystem), family members' daily experiences that impact the individual (mesosystems), community settings including schools, places of employment, and churches (exosystem), and the current state of society encompassing

mores, laws, and norms (macrosystem) are conceptualized as mutually interacting to define development over time.

The bioecological model is based on two primary propositions (Brofenbrenner, 1998). First, optimal intellectual, emotional, social, and moral development throughout life is dependent upon active participation in progressively more complex, reciprocal interaction with persons, objects, and symbols in the individual's immediate environment. These enduring forms of interaction in the microsystem comprise the primary driving force in development. Second, the nature and strength of proximal processes are viewed as varying as a function of the characteristics of the developing person and both the immediate and more removed features of his or her environment. The individual's age, historical periods experienced, and the nature of the particular developmental outcome under consideration also factor into a complete understanding of proximal processes. Bronfenbrenner (1989, 1993) has emphasized the "developmentally-instigative" characteristics of the individual, encompassing one's personality characteristics, skills, goals, beliefs, and motivations as powerful determinants of the manner in which contextual elements are experienced by the developing individual.

Conceptualization of the person-in-context with sensitivity to the multiple layers of influence defining the past experiences, current functioning, and prospects for future development seems essential if we are to truly understand the meaning of abortion in women's lives. The comprehensiveness of the bioecological framework is well suited to integration of data from a variety of sources within each of the systems or levels of analysis. Further, research conducted within a bioecological framework offers the possibility of testing interaction effects among components of the various systems including exploration of numerous mediators of relations between personal and environmental factors and adjustment to abortion as well as moderators of adjustment trajectories. The available literature provides evidence of many moderating and mediating factors relevant to the study of abortion and a number of these are reviewed below.

Moderators of post-abortion adjustment

A moderator is any variable that influences the magnitude or direction of an association between a designated independent variable or predictor and a given dependent variable or criterion (Baron & Kenny, 1986). In the general overview of the literature provided above, several moderators of post-abortion adjustment were identified; however due to space limitations, three were selected to highlight the importance of including modifiers in the study of abortion, with a final paragraph briefly covering a few additional moderators (ethnicity, socioeconomic status, and cultural values). Age, emotional investment or attachment to the fetus, and beliefs regarding the humanity of the fetus were specifically chosen based on preliminary research indicating that they carry considerable potential to expand our knowledge regarding distinct emotional trajectories in addition to enhancing our understanding of the contextualization of abortion experience.

Moderation by age. Slightly under 25% of U.S. abortions are performed on women under age 20 (Alan Guttmacher Institute, 1996) and although the data are somewhat

inconsistent, most of the available studies suggest that younger women when compared to older women are more inclined to experience post-abortion difficulties (Adler, 1975; Bracken et al., 1974; Campbell et al., 1988; Franz & Reardon, 1992; Osofsky & Osofsky, 1972). Adolescents are generally much less well-prepared, both emotionally and financially, to assume the responsibilities associated with parenthood, and they are logically the recipients of much greater social pressure to abort. Further, when compared to older women, younger women are more inclined to engage in denial and delay in decision-making, necessitating the use of procedures that are associated with heightened physical and emotional risk (Bracken & Swigar, 1972; Cates & Grimes, 1981; Lemkau, 1988).

The decision to abort during adolescence may have become more conflict ridden over the last 10–15 years compared to earlier periods as adolescents of both sexes have become more inclined to express conservative political views and pro-life attitudes (Broggess & Bradner, 2000; Stone & Waszak, 1992). Even if an individual approves of abortion in the abstract, a personal decision to abort may be more difficult when the peer culture is disapproving and/or if one's partner is opposed to abortion. Studies pertaining to endorsement of abortion tend to focus on females or do not differentiate between male and female respondents; however data from the National Survey of Adolescent Males reported by Broggess and Bradner (2000) revealed that only 24% of U.S. males aged 15–19 years in 1995 agreed that it was right for a female to obtain an abortion for any reason. This represented a significant decrease from a 37% endorsement rate in 1988.

Studies designed to identify predictors of the decision to abort vs. deliver among adolescents are limited and tend to be narrowly focused on demographic variables. For instance, one recent large-scale effort employing data from the 1995 National Survey of Family Growth revealed that the following variables were related to higher rates of abortion compared to birth: discrepancy in age between a woman and her partner (an older male), race (Blacks were most likely to opt for abortion, followed by Whites, and then Hispanics), partner's religious orientation (none or non-protestant), and higher educational attainment of the partner and of the woman's mother (Zavodny, 2001). Another study conducted in Australia showed a strong partner influence in adolescent decisions to abort and those who had a mother or a sister who had aborted were more inclined to abort compared to adolescents without such a familial history (Evans, 2001). Additional work is clearly needed to examine personal, relational, and social predictors of the choice to abort among adolescents.

Adolescents obviously differ from older women undergoing abortion in many ways. For example, their life experiences are more limited, they are more inclined to possess idealized views of the future, they are usually less focused in terms of life goals, and they may have a less supportive social network in addition to being at lower levels of intellectual, moral, and emotional maturity. Further research is needed to identify the mechanisms through which environmental and maturational differences may converge to define distinct post-abortion experiences among women who abort at different stages of life. An added challenge, consistent with a bioecological framework, will be to incorporate individual difference variables such as socioeconomic status and personality characteristics, relationship, and contextual factors into the more global patterns that emerge.

Moderation by attachment to the fetus. The woman's emotional investment in the pregnancy or attachment to the fetus is another variable with potential power to moderate relations between the decision to abort and psychological adjustment relative to abortion. In discussing the fact that researchers have tended to tiptoe around this topic, two Australian researchers note that "given the powerful influences in our culture promoting the sanctity of pregnancy, that is personhood from conception, and abortion as murder at a symbolic level or at the level of the pregnant woman's experienced reality, it is little wonder that consideration of maternal attachment issues in the context of abortion has generally been avoided" (Allanson & Astbury, 2001, pp. 146–147). One small-scale, interview-based study by Patterson et al. (1995) revealed that women who felt more of a bond to the fetus prior to abortion experienced more difficulty afterwards compared to women who did not feel such a bond. In this study, bonding tended to emerge as a function of the participant's awareness and embracement of pregnancy-related physical changes. There are several studies, which have addressed issues related to this topic. For example, pregnancy intendedness, which was mentioned previously (Ashton, 1980; Friedman et al., 1974; Lazarus, 1985; Major et al., 1985; Miller, 1992), meaning attached to the pregnancy (Major et al., 1985; Remennick & Segal, 2001; Zimmerman, 1977), commitment to the pregnancy (Lyndon et al., 1996), and later-term abortions (Cohen & Roth, 1984) have all been found to be associated with more post-abortion distress responses including significant levels of guilt, anxiety, and depression. In each of these circumstances, the probability that women have developed more of an attachment to the fetus is increased. In a recent study by Kero et al. (2001), slightly over one-third of respondents who obtained first-trimester abortions reported positive or slightly positive initial feelings toward the pregnancy indicating that a fairly large segment may form some level of attachment and experience vulnerability to adjustment problems afterwards. Further, in a study of college students' emotional responses to an abortion experience, 30% agreed or strongly agreed with the following statement: "I sometimes experience a sense of longing for the aborted fetus" (Coleman & Nelson, 1998).

There is considerable evidence indicating that many women develop strong emotional connections to the fetus prior to birth (Leifer, 1977; Cranley, 1981; Condon, 1986). In fact, research by Leifer (1977) revealed that attachment to the fetus may begin shortly after conception. Attachment dynamics would be expected to differ based on the degree of emotional investment in the pregnancy and the investment seems likely to be relatively low among women considering an abortion. However, this assumption should be tested in light of work by Kemp and Page (1987), which indicated that in pregnancies considered high risk due to the possibility of serious health complications or even loss of life for the fetus or the woman, women reported comparable levels of attachment to those undergoing uncomplicated pregnancies. More research is needed to address the extent to which feelings of attachment to the fetus are common prior to an abortion and to explore the extent to which the level of attachment is related to negative post-abortion outcomes.

Moderation by beliefs regarding the fetus. When women have not developed any form of attachment to the fetus, their beliefs about the humanity of the fetus may still moderate emotional reactions to the experience. In a study of over 800 women,

Conklin and O'Connor (1995) found that women who believed that the fetus was human and underwent an abortion scored significantly lower than women who had not had an abortion on measures of self-esteem and satisfaction in addition to reporting more negative affect. However, women who had an abortion and did not endorse beliefs pertaining to the humanity of the fetus were indistinguishable from women without a history of abortion in terms of the three post-abortion adjustment measures. Weak beliefs about the humanity of the fetus expressed as only slightly disagreeing with the statement that fetuses are human were sufficient to result in relations between abortion and compromised well-being. The authors pointed out that the results held up even after statistical controls were instituted for various contextual variables and they emphasized the importance of the findings in light of the inherent difficulty in obtaining moderator effects in field research. Clearly the robustness of this association demonstrates the merit of more concentrated attention on the role of women's beliefs regarding the humanity of the fetus in adjustment to abortion. In a comprehensive analysis describing factors leading to pathological mourning following an abortion, Array (1968) pointed out that the defenselessness of the fetus is likely to be a salient factor underlying powerful guilt feelings associated with the loss. Future research efforts should endeavor to dissect women's conceptions of the humanity of the fetus to identify more specific barriers to positive adjustment. In addition to defenselessness, researchers might explore the extent to which the woman's mental image of a fetus resembles a human being physically and psychologically (e.g., is able to experience pain). Longitudinal research is also needed to examine the degree to which women's beliefs in the humanity of the fetus are susceptible to change, the conditions under which changes are inclined to occur (e.g., education regarding fetal development, a religious conversion, etc.), and how shifting beliefs may result in a delayed adverse response to an abortion.

Moderation by culture, ethnicity, and socioeconomic status. Many additional moderators merit more focused research attention; however, in light of space limitations, only three more (cultural attitudes, ethnicity, and socioeconomic status) will be described briefly. Women's psychological responses to abortion are embedded in widely varying cultural contexts. In many nations throughout the world there are strong moral and/or legal sanctions against abortion; whereas in several other countries abortion is a passively accepted medical practice. A few studies have yielded results suggesting that women electing abortion in an anti-abortion social context may be more inclined to experience negative post-abortion emotions (Adler, 1975; Illsley & Hall, 1976; Major et al., 1997; Miller, 1992). A careful analysis of women's responses to abortion in different cultural contexts defined by distinct levels of social acceptance should enable researchers to begin to gauge the extent to which negative responses are socially constructed.

Not only do vastly different attitudes regarding the morality of abortion exist across cultures, but belief systems regarding the acceptability of abortion within the same nation may vary considerably based on ethnic and socioeconomic group affiliations. Although most studies designed to examine attitudes toward abortion and post-abortion adjustment have been conducted with White participants, a number of studies have compared White women with Blacks, Hispanics, Asians, and women of other races. The literature pertaining to Black women is the most well-developed

and will be the focus here. Black women are more likely than White women to have early pregnancies (Presser, 1971), experience an unintended pregnancy (Pratt & Horn, 1985), delay abortion decision-making (Bracken and Swigar, 1972; Kerenyi, Glascock & Horowitz, 1973), and they choose abortion at a rate that is three times that of White women (Centers for Disease Control and Prevention [CDC], 1994). Interestingly, however, many studies conducted over the past several decades have consistently revealed that Black women are less supportive of legalized abortion than White women (Dugger, 1998; Hall & Marx-Ferree, 1986). More research is needed to examine predictors of abortion decision-making and post-abortion adjustment among Blacks, particularly in light of the fact that Black women are a very heterogeneous group divided by numerous variables including class and religiosity among others that influence their ideological stance on abortion (Dugger, 1998). Nevertheless the general disparity between expressed attitudes and behavior relative to abortion among Blacks suggest that Black women may be more inclined than White women to opt for abortion when they believe it is morally wrong and/or without social support for the decision. In this context, Black women may be more vulnerable to post-abortion psychological problems and more research is needed to explore this possibility.

A few studies have indicated that poor women compared to their more financially secure counterparts are more inclined to experience adverse reactions to abortion (Adler, 1975; Osofsky & Osofsky, 1972). However, comparisons between women from different socioeconomic groups relative to post-abortion psychological adjustment are complicated by the fact that many variables that may co-vary with poverty (e.g., low self-esteem, timing during adolescence, involvement in unstable partner relationships, being unmarried, low levels of social support, and feelings of being forced by circumstances to abort etc., reviewed previously) are also predictive of negative post-abortion adjustment difficulties. Studies designed to examine the potential moderating role of socioeconomic factors should incorporate controls for the many possible confounding variables. Future studies should also explore possible differences in abortion attitudes and decision-making based on women's socioeconomic backgrounds as these topics have been neglected in the published literature.

Just as Brofenbrenner's bioecological model lends itself to exploration of a wide array of moderator variables relevant to abortion decision-making and adjustment, it is likewise conducive to examination of mediational processes. This is the topic of the next section.

Mediators of post-abortion adjustment

The study of mediators in psychological processes offers insight pertaining to how characteristics of the individual or experiences are able to partially or fully explain relations between specific predictor variables and outcomes (Baron & Kenny, 1986). More precisely, mediators are defined as pathways through which an independent variable like abortion history has an impact on a dependent variable, such as the experience of positive or negative emotions. Research conducted to explore mediators of relations between factors surrounding or post-dating an abortion and adjustment reactions has tended to focus on a few variables. By far most research to date has dealt with self-efficacy beliefs, with other mediators including the form of blame associated with the abortion experience and reproductive events following the abortion.

Research pertaining to each of these potential mediators is described below, with an emphasis on the more thoroughly studied construct of self-efficacy.

Mediation by self-efficacy beliefs. Bandura (1982) defines self-efficacy as judgments incorporating both knowledge and confidence relative to executing the actions necessary to successfully complete various life tasks. The power of self-efficacy beliefs to mediate the effects of other personal and situational determinants of behavior has been emphasized by Bandura (1989), rendering this construct potentially very useful to a systemic or contextual analysis of women's experiences with abortion. Consistent with the self-efficacy theory, research by Major et al. (1990) suggested that self-efficacy for coping fully mediated the link between perceptions of social support of various forms and positive post-abortion adjustment. More specifically, perceptions of strong social support from three sources: one's partner, family members, and friends were associated with high self-efficacy relative to coping with abortion and enhanced self-efficacy was related to lower depression, more positive mood, and fewer expected negative post-abortion consequences. However, no direct relation was observed between social support and the various indicators of negative adjustment. Other studies have highlighted the central role of self-efficacy in abortion-related coping (Cozzarelli, 1993; Major et al., 1985; Mueller & Major, 1989). These data underscore the importance of including measures reflecting women's perceptions along with environmental factors in efforts to understand responses to abortion, as Bandura (2002, p. 278) recently noted, "personal agency and social structure operate interdependently rather than as disembodied entities."

Future research might explore additional socio-demographic, personal, and experiential antecedents to feelings of efficacy relative to coping with an abortion in addition to examining the extent to which women continue to feel efficacious over several years after the abortion. Bandura's (1989) description of the four primary informational sources that relate to the development of personal efficacy provides a useful direction for such efforts. First, personal accomplishment history (successes and failures) represents the most direct influence on mastery expectations. Women who have successfully coped with similar life experiences (a previous abortion experience or any other form of perinatal loss) would be expected to develop an enhanced sense of self-efficacy relative to coping with an abortion. Second, watching others engage in task-relevant activities can generate vicarious estimations in observers pertaining to their own capacity for mastery. Therefore, women who have observed their acquaintances, friends, and/or relatives work through an abortion experience in an adaptive manner would be expected to have higher self-efficacy relative to coping with an abortion. However, Bandura (1989) emphasized the fact that inferences derived from social comparison are indirect and are theoretically more susceptible to change than those fostered through direct experience. Verbal feedback from others regarding one's potential for coping effectively is the third avenue through which self-efficacy beliefs may develop. Like social comparison, appraisals from others tend to be weaker sources of information in the formation of self-efficacy beliefs than those derived directly from one's own experiences. As noted previously, research does suggest that when others are supportive of one's decision to abort, self-efficacy tends to be higher. However, given the volatile nature of the abortion topic and the resulting diversity of opinions, individuals facing an abortion decision are the likely recipients of conflicting feedback

regarding the probability of effective coping. The fourth mechanism described by Bandura (1989) with relevance to the emergence of self-efficacy beliefs relates to emotional arousal. Individuals anticipate failure when they experience high levels of aversive physiological arousal; whereas lower levels of arousal tend to be linked with success expectancies. Women who experience high levels of personal stress and anxiety manifested physically before the abortion decision may therefore be expected to show lowered levels of self-efficacy for coping during and after the procedure.

Mediation by Attributions of Blame. When faced with negative life events, individuals' abilities to cope with the stress and make positive adjustments often relate to the degree to which they feel the situation may have been modifiable (Abramson, Seligman & Teasdale, 1978; Janoff-Bulman, 1979; Mueller & Major, 1989). Viewing others as the cause of negative events and engaging in self-blame targeting enduring traits tend to be associated with ineffective coping and problematic adjustment (Mueller & Major, 1989). On the other hand, when self-blame for negative events focuses on one's own behavior, which could have theoretically been averted, more positive outcomes are likely (Mueller & Major, 1989). Therefore, women who blame an unintended pregnancy on their partner or an aspect of their own character or personality, such as impulsivity or lack of responsibility, would seem to be inclined to suffer more than women who blame the problem on some personal behavior such as having forgotten to purchase birth control. Research by Mueller and Major (1989) with 283 women who underwent first trimester abortions supported the operation of attributions of blame as a mediator between the experience and adjustment. Those who were low in other-blame and low in self-character blame demonstrated the most positive psychological adjustment at 3-weeks post-abortion.

Mediation by subsequent reproductive events. As an effort is made to conduct more long-term studies of post-abortion functioning, reproduction-related events including having another abortion or other forms of perinatal loss such as a miscarriage or stillbirth, difficulty conceiving or problems with a desired pregnancy, and giving birth may be found to operate as mediators of adjustment several years after the abortion. A few small-scale studies and case reports have indicated that reproductive events often bring back thoughts and emotions associated with the procedure even among women who report no distress at the time of the abortion (Lemkau, 1988; Congleton & Calhoun, 1993; Stotland, 1998). However, more systematic analysis of the topic is needed.

After discussing the bioecological framework as a potentially useful model for bringing clarity and vision to the study of the psychology of abortion, a number of related moderating and mediating variables were considered as potentially fruitful areas for further research. Having outlined these conceptual issues, we now turn our attention to various avenues for enhancing the methodological rigor of research pertaining to the topic of abortion.

Needed methodological innovations in abortion research

Research designed to explore post-abortion emotional responses has generally been wrought with many methodological problems. Most studies have been conducted

with small samples (typically under 300), limited to one geographical area (Speckhard & Rue, 1992; Wilmoth, deAlteriis & Bussell, 1992), and initial consent to participate rates are often as low as 60% (Adler, 1975; Cohen & Roth, 1984), with attrition rates reported to be as high as 60% (Major et al., 1985). Additional limitations of the existing post-abortion literature include the following: (1) insufficient attention to the personal, interpersonal, and contextual complexity of women's choices to abort which carry the potential to produce both positive and negative outcomes, (2) exclusive reliance on self-report data, (3) few prospective, longitudinal investigations, (4) limited use of appropriate control groups, and (5) reliance on non-standardized measures of psychological health (Zolese & Blacker, 1992).

A number of large-scale record-based studies using medical claims data in the United States, Finland, and Canada have successfully avoided many of the methodological limitations of other post-abortion research (Coleman et al., 2002b; David, Rasmussen & Holst, 1981; Ostbye, Wenghofer, Woodward, Gold & Craighead, 2001; Reardon et al., 2002, 2003). In particular, problems of concealment, recruitment, attrition, and inadequate measurement of psychological symptoms are averted in these studies as actual medical claims are used as the data source. Further, all the studies except for the one by Ostbye et al., incorporated data collected over several years in addition to utilizing women who delivered as a comparison group. The results of these studies have consistently revealed that women with a known history of abortion experience higher rates of mental health problems of various forms when compared to women without a known history. However, attempts to infer causality from these record-based investigations are restrained by minimal controls for potentially confounding factors. Only a few demographic and psychosocial variables have been effectively controlled in the record-based studies due to the limited number of variables available to select from.

Although studies conducted in recent years have been designed to overcome a number of the shortcomings, several problems remain and until they are sufficiently addressed definitive answers to the many questions raised over the years regarding the meaning of abortion relative to women's psychological health will be difficult to reach. In this section, we describe four areas wherein methodological innovations are greatly needed to advance our efforts to understand how abortion impacts women's lives: (1) the need for more diversified research strategies, (2) an increased emphasis on longitudinal designs, (3) incorporation of appropriate control groups, and (4) instituting controls for pre-existing psychological state.

The need for more diversified research strategies

Over two decades ago, research led by Kent involving a group of Canadian women, who had previously indicated no problems associated with an abortion, revealed considerable differences between the initial questionnaire data and information subsequently gathered during in-depth psychotherapy sessions (Kent, Greenwood, Loeken & Nichols, 1978; Kent & Nichols, 1981). Moreover, a firm rational decision for an abortion was found to frequently coexist with feelings of deep pain and bereavement. In a major national poll by the *Los Angeles Times*, 56% of women admitting to a past abortion reported a sense of guilt and 26% reported regretting the choice to abortion, suggesting indirectly that the behavioral choice to abort may frequently conflict with beliefs and values (Skelton, 1989). Difficulties assessing and

ultimately understanding the full complexity of women's responses to abortion may be related to self-denial of emotional experiences at the time of the abortion in order to "get through" the procedure once women have made the intellectual decision to abort. A participant in a study by Patterson et al. (1995, p. 687) conveyed this type of response well: "I was in a state of numbness, just really going through whatever motions were required to get this job done." Accurate assessment may also be hindered if negative experiences are expressed less directly in the form of maladaptive behaviors or psychosomatic complaints or if women with underlying ambivalent feelings regarding abortion are reluctant to openly express problems encountered.

Unfortunately, most of the existing post-abortion data are based on the exclusive use of narrowly focused questionnaire-based self-reports. There are many logical ways to expand and diversify the methods used to study the psychology of abortion. Qualitative studies probing women's thoughts and feelings pertaining to personal, relationship, and contextual factors that entered into their decisions to abort as well as postabortion emotions, thoughts, and experiences (personal and professional) are needed to do justice to the inherent complexity of this area of study. The use of open-ended questions posed by empathetic interviewers, who convey the wide range of emotions women may experience in response to an abortion is likely to result in rich data that is less vulnerable than other methodologies to social desirability biases. For example, in a study of Israeli and Russian immigrants by Remennick and Segal (2001) using an interview methodology, widely ranging experiences were reported with comments bordering on exhilaration afterwards "when it was over I felt alive and a boss to myself again" (p. 50) to reactions suggesting profound trauma "I couldn't stop thinking about this, counting what week in pregnancy I'd be by now, and how the baby would have looked, and all that . . . When I saw mothers with babies in the street I winced. In my dreams, I saw the hospital, the nurses, and myself in the stirrups . . ." (p. 50). In a large Swedish study of 854 women one year after an abortion, which incorporated a semi-structured interview methodology requiring 45–75 min to administer, rates of negative experiences were considerably higher than in previously published studies relying on more superficial assessments (Soderberg et al., 1998). Specifically, 50–60% of the women experienced emotional distress of some form (e.g., mild depression, remorse or guilt feelings, a tendency to cry without cause, discomfort upon meeting children), 16.1% experienced serious emotional distress (needing help from a psychiatrist or psychologist or being unable to work because of depression), and 76.1% said that they would not consider abortion again (suggesting indirectly that it was not a very positive experience).

Given the political, social, and moral issues surrounding abortion, disclosure of sensitive, substantive data is likely dependent on the extent to which researchers are able to provide a truly accepting interpersonal context. A study conducted in Tanzania, where pregnancy interruption is prohibited unless continuation is life threatening, demonstrated the salience of the setting for improving data quality (Rasch et al., 2000). When women were admitted to hospitals for incomplete abortions and assured of confidentiality within the context of in-depth personalized dialogues with interviewers, they were much more likely to reveal an induced abortion than when information was gathered in a less empathetic manner. Similarly, Patterson et al. (1995) found that assurances of anonymity, researcher political neutrality, and that researchers would not pass judgment of any kind as they were simply interested in understanding the decision and adjustment processes, gave the participants the

necessary confidence to describe their experiences in very candid detail. One logical method for creating a comfortable environment conducive to generating women's true thoughts and emotions associated with an abortion experience would be to use women who have had abortions themselves and thus are inclined to serve as compassionate interviewers. An alternative is to collect data in a group discussion forum conducted over several sessions, which would enable ample opportunity to generate genuine and substantive discussions among women with a history of abortion. A recent study conducted in Thailand by Whittaker (2002) incorporated a combination of data collection strategies including a survey on reproductive health, in-depth interviews, and vignettes in focus group discussions and revealed that the latter two methods were the most effective means of gathering sensitive, abortion-related data. Focus groups typically include 6–10 participants with a knowledgeable moderator guiding the discussion (Whitaker, 2002). Further, in a study using the newest cycle of the National Survey of Family Growth, a computerized private recording system was employed in addition to the standard interview and the combined methodology produced an abortion reporting response rate which was 59% of the expected rate based on prevalence data (Fu et al., 1998). This represented a considerable increase from the 45% figure previously reported using the interview methodology alone.

In addition to the need for qualitative studies, more research incorporating information from other sources is needed. Data gathered from significant individuals in women's lives (e.g., partners and family members) and/or behavioral assessments (possibly from counselors and other abortion provider personnel or conducted by researchers) should enhance efforts to assess the complexity of women's positive and negative experiences before, during, and after the decision to abort. For example, if the researcher is interested in the effects of abortion on partner relationships or marital quality, information could be derived from the partner, friends or family members who know the couple well, and the researcher might conduct a laboratory assessment of relationship factors such as communication, supportiveness, trust, and/or anger.

As indicated in the literature overview section above, there has been a recent trend in post-abortion research toward conducting large record-based studies with this methodology offering considerable promise relative to avoiding numerous pitfalls associated with post-abortion research. However, the utility of such large-scale efforts relative to enhancing our understanding of the psychology of abortion is necessarily dependent upon the extent to which the records contain demographic and contextual data. Although assessments of pregnancy intendedness and other relevant factors of the abortion experience may not be readily obtained with this methodology, researchers can work with the data in creative ways to construct variables that approximate the constructs of interest. For example, an exclusive focus on women taking birth control pills prior to their births or abortions would result in a sample of women likely to fall into the ''unintended pregnancy'' category. Unfortunately, accessing complete medical records on large populations of people is nearly impossible in the United States. However, this research technique is promising in countries with socialized medicine and centralized records.

Longitudinal research

Most of the existing abortion studies have been conducted within a framework suggesting that an abortion experience, even if experienced as traumatic, will be of

short duration. Data on post-abortion reactions have typically been collected within hours or weeks of the event, with assessments extending beyond six months uncommon. Recent research, however, indicates that women undergoing an abortion may experience long-term negative effects. For example, in a study of women involved in clinical trials of the abortifacient, RU-486, regret increased from 2 weeks to 6–8 months post-abortion and Miller and his colleagues concluded that "the low point following the abortion may not occur for days, weeks, or even months" (Miller, Pasta & Dean, 1998, p. 262). Miller (1992) had previously found evidence of delayed reactions in a study covering three years. More recently, Major and colleagues (2000) analyzed the psychological outcomes of women one hour pre-abortion, and 1 h, 1 month, and 2 years post-abortion. They reported an increase in negative emotions and a decrease in relief and positive emotions between the assessments at 1 and 2 years following the abortion. The results also revealed an increase in depression and a decrease in satisfaction with the abortion decision over time.

Evidence from professionals who work with women who have had abortions and studies incorporating a case study methodology suggest that while abortion may be an effective short-term coping strategy, it may also function as an insidious long-term stressor (Butlet, 1996; De Veber, Ajzenstat & Chisholm, 1991; Joy, 1985; Speckhard & Rue, 1992). Longitudinal research incorporating opportunities for women to express the process whereby the sense of relief might fade and feelings of dissatisfaction with the decision may begin to add stress to their lives is needed. Studies should be of a prospective nature as retrospective feelings and impressions surrounding the events preceding the decision to abort and at the time of the abortion are undoubtedly distorted by life events as well as one's actual emotional and intellectual adjustment to the decision. In many cases, researchers have measured psychiatric variables prior to the abortion (e.g., Major et al., 2000), but rarely is there prospective data available prior to the pregnancy. The use of pre-abortion/post-conception psychological assessments offer poor baseline measures as women who are about to have an abortion are not likely to be in their "normal" psychological state, given the stress associated with the unintended pregnancy and possible concerns regarding the procedure (Adler & Dolcini, 1986; Cohen & Roth, 1984; Olson, 1980). Assessment of pre-conception measures of psychological health would necessitate a large-scale prospective study in order to identify a sufficient number of women opting to abort. There has not yet been a national study designed to prospectively examine psychological adjustment relative to reproductive events.

Finally, research is needed to help differentiate between women who are more or less likely to experience long-term negative effects of abortion. One small study indicated that long-term adverse reactions were more common when women felt they received poor treatment during the abortion, experienced conflict over the meaning of abortion, felt ambivalent about the pregnancy, or experienced a bond to the fetus prior to the abortion (Patterson et al., 1995).

Adequate control/comparison groups

One of the most significant methodological problems facing the post-abortion literature is the fact that very few studies incorporate an appropriate control group. The ideal control group has been suggested to consist of women who wanted an abortion and did not obtain one for personal reasons (e.g., guilt, anxiety, fear, etc.)

or due to external pressures (e.g., from others such as a partner or parents) (Keshen, 2003). Following this line of reasoning, the ideal ''treatment'' group would consist of women who really wanted an abortion and were not behaving against their primary desire or personal belief system. As research reported throughout this review suggests, abortion decisions are often not easily made and are likely to represent the culmination of an array of mixed emotions and external circumstances that are not well understood. Therefore, abortion ''wantedness'' is perhaps best conceptualized on a continuum rather than as a discrete variable, with most women falling somewhere in between the two extremes. Assuming that researchers are able to identify ''clean'' groups by instituting the above inclusion criteria, sample sizes are likely to be reduced considerably and the information obtained will be limited in terms of generalizability. From a practical and conceptual standpoint, women who simply carry an unintended pregnancy to term would therefore seem to represent a more logical comparison group, with studies using this strategy offering greater potential to provide a representative assessment of relative risk than the previously described methodology.

Most of the published work pertaining to post-abortion psychological effects is based on studies that do not address relative-risk and the use of an appropriate control group is often overlooked. However there is an emerging literature using women who have delivered as the comparison group without assessment of wantedness. Small-scale studies comparing psychological reactions within a short period following childbirth or abortion have either reported no significant difference in psychological outcome (Anthanasiou et al., 1973; Zabin, Hirsch & Emerson, 1989) or have revealed a heightened risk of emotional difficulties such as anxiety and depression during pregnancy and the postpartum period among women who abort (Colman & Colman, 1971; Bradley, 1984; Kumar & Robson, 1978, 1984; Linares, Leadbeater, Jaffe, Kato & Diaz, 1992). Large scale investigative efforts using women who delivered as a comparison group (described briefly above) have only been conducted recently. These studies have consistently indicated that abortion is associated with significantly more mental health problems (Coleman et al., 2002b; Cougle et al., 2003; Reardon et al., 2003), higher rates of substance use (Coleman et al., 2002a), and a significantly higher risk of suicide (Gissler et al., 1997; Morgan, Evans, Peter & Currie, 1997; Reardon et al., 2002). For example, the results of the largest U.S. post-abortion study to date comparing over 54,000 low-income women on state medical assistance, indicated that women who had an abortion in 1989 with possible subsequent pregnancies had significantly higher rates of outpatient psychiatric diagnoses than women with only birth experience in the target year and no history of subsequent abortions after eliminating all cases with psychiatric claims 12–18 months prior to the initial pregnancy (Coleman et al., 2002b). This difference was revealed when data for the full time period were examined (17% higher) and when only data from women with claims filed on their behalf within 90 days (63% higher), 180 days (42% higher), 1 year (30% higher), and 2 years (16% higher) of the pregnancy event were considered. Data using the same sample and focusing on inpatient claims revealed similar findings (Reardon et al., 2003). These different rates were observed after controlling for age, months of eligibility for services, and the number of pregnancies. Although pregnancy intendedness was not directly assessed in this study, women living under compromised economic conditions are logically less likely to plan a pregnancy than the average woman.

There is not a sizable body of literature designed to specifically compare women who have had abortions to women who carry unintended pregnancies to term. While there are many studies examining these women as separate groups, few direct comparisons are available. One recent analysis of the National Longitudinal Study of Youth (Reardon & Cougle, 2002a,b) revealed that at an average of 8 years following their first pregnancies, women who aborted a first pregnancy were significantly more likely to be at risk for clinical depression compared to similar women who carried a first unintended pregnancy to term. The risk of depression was most elevated among women who were married and those who had no history of divorce. These results were obtained even after controlling for age, income level, race, and a psychological measure taken prior to the women's first pregnancies. An observed difference such as this between women who deliver and abort becomes more meaningful when viewed relative to the stressfulness associated with carrying an unintended pregnancy to term. New mothers frequently feel vulnerable, inadequate, and depressed after giving birth (Fleming et al., 1990) and an unintended pregnancy seems likely to accentuate some of these feelings. In a recent meta-analysis, postpartum depression was estimated to afflict approximately 13% of women regardless of intendedness status and unplanned pregnancy was found to have a small yet significant association with postpartum depression (Beck, 2001). Work by Leathers and Kelley (2000) similarly revealed that unintended pregnancy was associated with maternal depression. Any differences detected between women who abort and deliver an unintended pregnancy demonstrating more negative outcomes for the women with a history of abortion underscore the potential for abortion to initiate adjustment problems. As potentially useful as the comparison between women with unintended pregnancies resolved though abortion versus delivery is in many ways, it remains possible that pre-existing psychological factors leading to the choice to abort operate as critical factors in determining post-abortion mental health. Moreover, the classification of pregnancies as unintended, untimely, or unwanted introduces a whole complex area of nuance and uncertainty, since these reactions are likely to vary across the pregnancy and are inclined to be influenced by third party responses to a woman's pregnancy.

While non-pregnant women have seldom been used as a control group, this comparison may be useful with the logic for this comparison strengthened by the notion that abortion, in theory should ''return'' a woman to her pre-pregnancy state. A record linkage study conducted in Finland was one of the few studies to employ this type of control (Gissler et al., 1997). The relative risk from death among women who had an abortion the previous year when compared to women who had not been pregnant was equal to 3.7 for suicide, 2.2 for accidents, and 4.3 for homicide. The use of non-pregnant women as a control group is likely to produce the most meaningful results if the sample is restricted to a matched group of never pregnant women and women who abort their first pregnancy. A few comparisons to the general population have also been conducted. For example, a record-based study in Canada compared admission rates for psychiatric hospitalization over a period of 5 years following an abortion to a matched sample of women who had not had abortions, irrespective of other reproductive events (Badgley, Caron & Powell, 1977). The results indicated that 13% of women who had abortions were hospitalized compared to 4% of the control group. Using a much larger sample of Danish women, David et al. (1981) found that the psychiatric admission rate in the first 90 days after an abortion was 2.5 times higher than that of the general population of women.

In other cases, researchers who have not directly utilized control groups have sought to place their findings into the context of the broader literature pertaining to the prevalence of psychological problems in the general population. Since this practice involves comparisons across study designs, researchers need to exercise caution in making comparisons. For example, in a follow-up study of 442 women who had abortions two years earlier, conducted by Cozzarelli et al. (2000), the results revealed that 24.5% of the sample had scores above the cutoff for clinical depression on the Brief Symptom Inventory (BSI). The researchers concluded that the depression rate detected in their study was only slightly over that of American women in general by reference to a study of national prevalence conducted by Blazer et al. (1994), which indicated a 20% lifetime prevalence rate of major depression among women 15–35 years of age. The problem with this comparison is that Cozzarelli and her colleagues were comparing symptoms of depression measured in the most recent month to lifetime prevalence rates. Fortunately, Blazer and colleagues (1994) also report the prevalence of current (30 day) major depression for females aged 15–24 and 25–34, years as 8.2% and 4.3% respectively. This suggests that the depression rates two years after abortion are 3–5 times higher among women who have had an abortion compared to the general population of women.

An additional logical set of comparisons might involve a detailed sociodemographic, psychological, and lifestyle analysis of four groups of women: (1) those who report predominantly positive feelings surrounding their decision to abort and the procedure, and satisfaction with their decision over time, (2) those who experience a preponderance of negative emotions before, during, and in the years following an abortion, (3) those who experience considerable distress before and during the procedure, but heal rapidly and do not report any long-term suffering, and (4) those who are not very distressed prior to and during the abortion, but experience negative reactions afterwards. Previous studies have tended to either target the average woman seeking an abortion (most of the studies cited herein) or have analyzed clinical samples (Reardon, 1997; Speckhard, 1987). However systematic examination of women reporting distinct emotional trajectories within the same report are rare in the published literature. One study by Congleton and Calhoun (1993) compared the experiences of women who reported emotional distress in conjunction with an abortion with women who reported relieving/neutral responses. The groups were similar in terms of many sociodemographic and abortion-related characteristics. An interesting pattern of similarities and differences emerged in the results. Forty-eight percent of the distressed group reported recalling feelings of loss immediately after abortion compared to none in the non-distressed group. Other responses that were considerably more common among the distressed group included the desire to replace the fetus, sadness/grief, behavioral changes such as increased drug use, and depression around the anniversary date of the abortion. However, 20% of the non-distressed group reported depression and 44% of the non-depressed group expressed sadness/grief in conjunction with the experience over time. The majority of women in the distressed group (88%) and in the non-distressed group (72%) reported long-term post-abortion "catalytic" events including childbirth and learning about early fetal development that aroused thoughts or emotions regarding the abortion and both groups (36% of each) reported fantasizing about the fetus prior to the abortion. This study was conducted with a very small sample ($n = 50$) and relied on a retrospective methodology;

however, it does offer a strong impetus for larger scale prospective work adopting similar comparison groups.

A final way to examine the impact of abortion in a manner that enables sensitive exploration of personal and situational determinants of abortion-related adjustment problems while controlling for individual difference factors is to study women who have had more than one abortion and report more emotional difficulties with one of them. The less difficult of the two situations would function as the ''control'' condition. By conducting such a within-subjects design incorporating an extensive analysis of the relationship dynamics and life circumstances surrounding the decision to abort that comprise the context of abortion at two points in time, many individual difference factors are effectively controlled. Obviously attention should also be given to life events occurring before and after each abortion. Although nearly 43% of women who have one abortion will abort again (Henshaw & Silverman, 1988), securing a sample of sufficient size for this strategy could prove problematic, as women who have suffered from one abortion seem inclined to suffer again. Similarly, women who do not have problems the first time around seem unlikely to have difficulties the second time unless they experience emotionally significant and related events before or after the second abortion. Support for the notion of emotional continuity from one abortion to another was provided by Kero et al. (2001), who found that 94% of women with repeat abortion experiences used the same words to describe feelings associated with the two occasions. However sufficient research has not been conducted on the emotional continuity idea and it seems equally probable that responses are cumulative with levels of negative affect differing considerably from one experience to the next, particularly among women who have some level of difficulty handling the first abortion.

Unfortunately, results generated from this within-subjects comparison strategy may lack generalizability to the general population of women undergoing an abortion in light of research suggesting considerable lifestyle and psychological differences between women with a history of one versus two or more abortions. Specifically, women who repeatedly choose abortion when compared to women with one abortion tend to be more sexually active (Berger et al., 1984; Howe, Kaplan & English, 1979), are more inclined to be involved in less satisfying and/or shallow partner relationships (Berger et al., 1984; Fisher, 1986; Szabady & Klinger, 1972), are less likely to live with their partners (Tietze, 1978), express negative feelings more frequently (Leach, 1977), are more often dissatisfied with themselves (Leach, 1977), report less concern about moral or social issues (Bracken & Kasi, 1975), and are less likely to report being religious (Leach, 1977). Women with repeat abortions also experience more sleep problems (Tietze, 1978; Freeman, 1980; Berger et al., 1984), tend to be more immature (Fisher, 1986), are more prone to being emotionally detached (Fisher, 1986), report a lack of nurturing in their families of origin more often (Fisher, 1986; Kitamura, Toda, Shima & Sugawara, 1998), and show significantly higher distress scores on interpersonal sensitivity, paranoid ideation, phobic anxiety, somatization, hostility, and psychoticism (Freeman, 1980).

The above discussion suggests that the selection of an appropriate comparison group in post-abortion research is not an easy, readily discernable process. Moreover, it appears necessary to employ a variety of reasonable control groups, recognizing that while no single comparison is perfect, all can be informative

and each may have advantages in teasing out a clearer picture of abortion's risks and benefits for particular groups of women facing an abortion under various circumstances.

Prior psychological health

With research indicating that pre-existing psychological problems represent a risk factor for post-abortion psychological problems (Anthanasiou et al., 1973; Osofsky et al., 1973; Lask, 1975; Miller, 1992; Major et al., 2000), more research with controls for mental health prior to the abortion is necessary to ascertain the extent to which particular post-abortion psychological problems can be attributed to the experience. The few recent studies that have included controls for prior psychological difficulties or psychological status suggest that abortion is associated with a heightened risk for in-patient and out-patient treatment of various psychological problems, depression, and suicide (Coleman et al., 2002b; Cougle et al., 2003; Reardon et al., 2002, 2003). The contention that only psychologically vulnerable women are inclined to exhibit mental health problems in the aftermath of an abortion can no longer be sustained by the evidence. However, further research should be devoted to a careful analysis of how abortion might exacerbate pre-existing problems. Furthermore, additional research with sociodemographically diverse samples using more extensive controls for pre-existing psychological problems of varying forms and severity that extend back several years prior to the abortion is in order.

There have been a few post-abortion studies that have exclusively focused on psychologically vulnerable women. For example, in one study of women with a prior history of psychiatric problems, none of those who carried to term subsequently committed suicide over an 8–13 year follow-up, whereas 5% of those who aborted did take their lives (Jansson, 1965). Additional research has indicated that pregnancy and childbirth reduce the risk of suicide (Appleby, 1991; Appleby & Turnbull, 1995; Drower & Nash, 1978; Hoyer & Lund, 1993; Jansson, 1965). Further, prior suicidal behavior is apparently not predictive of abortion, nor does it explain the increased risk for suicide attempts after abortion (Morgan et al., 1997). With these findings suggesting that childbirth may reduce the risk of subsequent suicide attempts whereas abortion may aggravate that risk, a greater sense of family obligations and a fear of hurting one's children may account for fewer suicide attempts and suicidal thoughts among those who deliver (Linehan, Goodstein, Nielsen & Chiles, 1983). The same connectedness to family may also help protect women from exacerbation of other mental health problems. More research is needed to directly address this possibility.

Post-abortion content areas in need of attention

In addition to the need for a broad theoretical framework and the many avenues for enhancing the methodological integrity of the post-abortion research, there are several content areas in great need of focused research attention. In keeping with our emphasis on the bioecological framework, we discuss three areas of pressing concern: (1) investigation of the positive effects or benefits of abortion to women's health; (2) the dynamic association between abortion decision-making and adjustment

to the experience; and finally (3) the relevance of domestic violence to understanding abortion decision-making and adjustment.

Positive effects of abortion

The vast majority of studies conducted on the topic of psychological responses to abortion have dealt with potential negative effects. However, abortion is sometimes conceptualized as a maturing experience for women and as an effective means of coping likely to be associated with an enhanced sense of control over one's life, a greater capacity for fulfillment, and high levels of self-esteem (Adler et al., 1990; Armsworth, 1991; Dagg, 1991; Major et al., 1990; Russo & Zierk, 1992; Stotland, 1992, 1993; Wilmoth et al., 1992; Zolese & Blacker, 1992). Others have highlighted the potential for growth through the introspection process frequently associated with abortion decision-making (Baetsen, Rankin, Fuller & Stack, 1985; Lodl, McGettigan & Bucy, 1985). The re-examination of one's needs, values, relationships with others, life goals, etc. that are part of the decision process are proposed to bring women to a state of greater self-understanding. However, this positive growth hypothesis has not been subject to much empirical testing and needs more systematic analysis.

Two studies that incorporated a measure of positive well-being one month post-abortion revealed that women's self-assessed sense of well-being tended to be rather high (Major et al., 1997; Cozzarelli et al., 1998). The measure used in both reports was developed by Ryff (1989) and covered several domains of well-being (autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance). Unfortunately, however, the design did not include a pre-abortion assessment nor did the instructions to the respondents direct them to assess their well-being since the time of the procedure. Simply including a postabortion assessment of well-being does not tell us much, if anything, about the benefits of abortion per se. Although the abortion experience may have theoretically factored into women's assessments of well-being, many other personal and situational factors pre- and post-dating the abortion are also likely to have been significant contributing factors to the variability observed. Russo and Zierk (1992) found that having had an abortion was associated with high self-esteem; however, the effect disappeared after removing the influence of various contextual variables. Further, in a study of 178 women who completed a questionnaire pertaining to post-abortion adjustment, an average of 18 months after an abortion, 46% reported increased energy, 53% reported an improved outlook, and the percentages of women who reported improved relationships with partners, parents, and others equaled 35, 17, and 27%, respectively (Burnell & Norfleet, 1987). Finally, in a two-year follow up survey of 438 women with prior abortion experience, the participants were asked to rate their agreement or disagreement with the statement, ''I think the abortion has had a positive effect on me,'' on a scale of 1 (strongly disagree) to 5 (strongly agree) and the average response was a neutral 3.1 (Major et al., 2000).

Perhaps the most commonly reported benefit of abortion is relief (Adler et al., 1990; Burnell & Norfleet, 1987; Kero et al., 2001; Lemkau, 1988; Major et al., 2000; Osofsky & Osofsky, 1973); however ''relief'' itself is generally undefined. Women who state they felt relief following an abortion may variously mean that they were relieved that they would not have the responsibility of a child to care for, relief that

they had made it beyond the stressful day of the abortion, relief that they were no longer being pressured by others, relief that there was no longer a risk of their parents discovering the pregnancy, relief that the physical symptoms of pregnancy were over, relief that they did not experience any complications from the surgery, or numerous other forms of relief. Moreover, as previously mentioned, reports of relief often diminish with time while negative reactions and dissatisfaction with the abortion decision may increase with time (Major et al., 2000). Future studies incorporating the construct of relief should make a more concerted effort to clearly define the specific type(s) of relief being assessed.

Psychological responses to abortion apparently involve a complex combination of positive and negative emotions and cognitions. A recent study of 211 Swedish women seeking an abortion revealed that two-thirds of the respondents expressed both positive and negative feelings about the abortion, with the remaining one-third reporting only negative feelings (Kero et al., 2001). Anxiety, relief, grief, anguish, and emptiness were the commonly reported emotions. At the close of their report, these authors noted "The relief to be saved from unwanted parenthood did not exclude painful feelings that may reflect experiences of ethical conflicts and feelings of loss. This complexity is seldom recognized in abortion studies" (p. 1489). Other studies have likewise revealed how abortion may serve as a coping strategy ushering in an affective response characterized by a sense of relief while also provoking simultaneous or subsequent negative emotions (Barnard, 1990; Selby, 1990; Vaughan, 1991).

Legalization of abortion 30 years ago was based on the idea that abortion benefits women, yet amazingly, well-designed research specifically documenting how the procedure enhances women's quality of life is generally absent from the professional literature. A few medical researchers have voiced the reminder that the onus of proof lies with those who perform or support any medical intervention to demonstrate beyond a reasonable doubt that the procedure is therapeutic (e.g., Ney, 1993). At the cultural level, there are widely held assumptions that when women are able to avoid undesired childbearing, are free to pursue more highly valued paths, focus on the children they already have, or postpone childbirth until they are physically and psychologically ready to assume the responsibilities and enjoy child rearing, then they are far better off materially and psychologically. Related themes of personal control as described by Gilligan (1982) are commonly echoed in the literature: "relationships that have traditionally defined women's identities and framed their moral judgments no longer flow inevitably from their reproductive capacity but become matters of decision over which they have control" (p. 70).

Given the accumulating data pertaining to the risks associated with abortion, documentation of the presumed benefits is needed to assist women in making well-informed decisions. Micro and macrolevel analyses designed to explore the questions of how women as individuals may benefit from abortion and how females in general may have prospered economically and socially from access to abortion are needed. As suggested by Reardon (1997), an appropriate way to examine the personal benefits of abortion might be to collect prospective data pertaining to why women seek abortions and then follow them over several years to investigate the extent to which the abortion has, in fact, led to fulfilled expectations. For example, are abortion decisions that are based on relationship dynamics, educational, or occupational plans linked with the anticipated benefits? These data could be

subsequently pooled in order to offer a more extensive assessment of how women have benefited generally. Based on the sizable body of research that has accumulated documenting the many possible risk factors for negative post-abortion emotional responses, a systematic examination of the demographic, personal, relationship, and situational factors that is likely to distinguish between women who benefit in definable ways from those who do not is needed. Just as the risks of abortion vary by the characteristics of the individual and other factors, the benefits are also likely to be most common in certain situations or for women meeting particular physical and psychosocial criteria. In the absence of research demonstrating the conditions under which an abortion produces beneficial results, it is difficult to understand how physicians and other health care professionals can fulfill their obligation to give women considering abortions sound medical advice, which is generally assumed to mean advice based on validated, scientific evidence. The trend toward "evidence-based medicine" is a reflection of the need for medical advice to be more solidly grounded in well substantiated benefits as opposed to assumed benefits (Grimes, Bachicha & Learman, 1998).

Abortion decision dynamics and post-abortion adjustment

Studies suggest that decisions regarding how to resolve an unplanned pregnancy are difficult for many women, even when they express an unwavering decision to terminate (Brett & Brett, 1992; Gilchrist, Hannaford, Frank & Kay, 1995; Handy, 1982; Mueller & Major, 1989). Research by Husfeldt, Hansen, Lyngberg, Noddebo and Pettersson (1995) indicated that 44% of the women surveyed had doubts about their decision when the pregnancy was confirmed and 30% continued to express doubts when the abortion date arrived. When Kero et al. (2001) interviewed 221 Swedish women seeking an abortion, 46% revealed that their thoughts regarding termination evoked a conflict of conscience. There is also evidence indicating that many women who initially request an abortion will subsequently opt not to go through with the procedure (Gilchrist et al., 1995; Handy, 1982). Further, the results of a study noted earlier indicated that 76.1% of women who had an abortion would never consider repeating the experience again (Soderberg et al., 1998). Studies also suggest that many women who have an abortion become pregnant again within one year and elect to carry the subsequent pregnancy to term (Tietze, Rowland-Hogue & Cates, 1982). In this situation, the second pregnancy may be a result of women feeling as though the previous abortion was a mistake.

The decision-making process has been identified as one of the primary variables differentiating between women who have post-abortion psychological adjustment problems and those who do not (Adler, 1975; Shusterman, 1979), with decision difficulty found to be specifically associated with post-abortion guilt (Osofsky & Osofsky, 1972), anxiety (Bracken, 1978), and negative emotions such as regret, depression, and anger (Adler, 1975). In particular, when ambivalence regarding the decision to abort is rooted in some pregnancy intendedness or desire to have the child (Ashton, 1980; Friedman et al., 1974; Lazarus, 1985; Lyndon et al., 1996; Major et al., 1985; Miller, 1992; Remennick & Segal, 2001), and/or feelings of pressure or coercion by one's partner (Lemkau, 1991; Miller, 1992), women are more prone to regret their decisions and experience postabortion emotional difficulties. There is considerable evidence indicating that the choice to abort is

often instigated by partners and men frequently play a primary role in women's final decisions (Lieh-Mak, Tam & Ng, 1979; Walter, 1970; Zimmerman, 1977). Delay of an abortion decision beyond the first trimester is likely to be a marker for ambivalence and as noted previously, women who have an abortion during the second trimester have been found to exhibit more post-abortion adjustment problems. Osofsky et al. (1973) found that 51% of women who had a second trimester abortion reported decision difficulty compared to only 12% of women who had a first trimester abortion. As recently pointed out by Kero et al. (2001), very few studies have offered an in-depth analysis of ambivalent abortion decisions. Further, given the centrality of this predictor, more attention should be devoted to examining the quality of decisions and post-abortion reactions among women with diverse backgrounds, characteristics, and abortion-related circumstances. An association between decision ambivalence and ethnicity indicating that Black women tend to be more ambivalent than White women has been reported (Faria et al., 1985).

Very little descriptive research has explored how women conceptualize an unwanted pregnancy in relation to their current life situation and future plans and goals to arrive at the decision to abort. With a large segment of the contemporary female population tending to postpone marriage and childbirth until after they have finished college, technical training, or have achieved some level of financial independence, many women may react very negatively to the sudden prospect of their plans being derailed. Moreover, women who have developed an identity that does not include being a mother may even react with catastrophic thinking characterized by feelings that continuing the pregnancy will ''end their lives.'' As Mathews-Green (1994, p. 34) suggests: ''. . . some hold to their right to regulate reproduction so strongly that the sudden intrusion of motherhood is often perceived as a complete loss of control over their present and future selves, and this can paralyze their ability to think more rationally and realistically.'' Consistent with this idea, Allanson and Astbury (1995) found that the most common argument offered for an abortion was that continuing the pregnancy would jeopardize one's future.

Based on the conceptualization of abortion as a period of personal crisis for many women, Landy (1986) observed that decision-making abilities may indeed be temporarily compromised. Specifically, she described four types of faulty thinking frequently observed in abortion clinics: (1) the ''spontaneous approach'' in which the decision is made rapidly without sufficient time given to explore the options and examine possible conflicting feelings; (2) the ''rational-analytic approach'' which emphasizes practical reasons for pregnancy termination (finances, single parenthood, etc.) and excludes emotional considerations such as attachment to the pregnancy; (3) the ''denying-procrastinating approach'' which involves avoidance of decision-making due to internal conflict pertaining to continuing versus terminating the pregnancy with the likelihood of the conflicts remaining as time pressure necessitates a decision; and (4) the ''no-decision making approach'' characterized by the woman deferring to others to make the decision (partner, parents, a health care professional, etc.). Any of these patterns may result in lower levels of satisfaction postabortion and may precipitate problematic adjustment. In a study of coping strategies, Cohen and Roth (1984), found that women who used denial or avoidance as a means for coping with an abortion reported higher levels of post-abortion anxiety and depression than women who did not adopt such a strategy. Further, those who engaged in approach strategies characterized by behaviors such as contemplating

the procedure and discussing the decision with others experienced greater decreases in anxiety from before to after the abortion when compared to women who did not use such direct means of coping. The results of this study suggest the importance of encouraging women who are considering an abortion to thoughtfully work through the decision and to reach out to others as they explore the pros and cons. However, it is possible that women who tend toward avoidance as opposed to approach are distinguished in other ways that are the critical determinants of distinct adjustment trajectories. More comprehensive studies incorporating a number of potential third variables along with indicators of coping style should lead to more definitive results.

There is evidence to indicate that women confronted with an abortion decision are likely to engage in distorted thinking possibly due to conflicts between their desire to go through with the abortion and personal beliefs tied to moral issues. For example, in a qualitative study by Simonds, Ellertson, Springer and Winikoff (1998) designed to examine how medical abortion methods affect private experiences of abortion, it was common for women to view a medical abortion in a way that distorts the reality of the procedure. Many women described the medically induced abortion as ''more natural'', ''like menstruation'', ''more humane'', and ''less bad'' than surgical abortion. The authors noted that the women's references to abortion as similar to severe menstrual cramps suggested a distorted or wishful conceptualization of the process as ''not-really-abortion'' but as a late period that finally arrives. Further, a study by Foster and Sprinthall (1992) revealed that adolescent and young women's level of reasoning associated with abortion decision-making was significantly lower than their general reasoning abilities. When a decision involves a violation of one's conscience or belief system, which appears to be rather common in the case of abortion as evidenced by high levels of guilt reported in the literature (reviewed above), particularly among adolescent women who abort (Martin, 1973; Perez-Reyes & Falk, 1973), regression in cognitive functioning may represent a way of coping with the decision difficulty. Sadly, however, after the stressfulness of the decision and the abortion are over, women's abilities to distort their experience or rationalize their behavior may become decidedly more challenging as cognitive abilities return to a normal level. More research is needed to explore fluctuations in cognitive functioning prior to and post-dating an abortion, in addition to examining associations between cognitive and emotional responses to abortion decision-making and adjustment.

Although women who seek an abortion are typically provided with information pertaining to how the procedure will affect them physically, criticism leveled against pre-abortion counseling has focused on insufficient assistance with the decision-process (Stites, 1982; Butlet, 1996). The available data described above suggests that professionals will more effectively serve women by helping them to avert a decision that may be regretted later through dissemination of information regarding the risk factors for emotional problems, listening sensitively for any feelings of ambiguity, and offering assistance that facilitates the woman's autonomous decision-making. This idea was emphasized by Miller (1992, p. 91) who stated that ''a woman considering abortion who expresses enjoyment in being pregnant or the desire to have a child to take care of deserves some pre-abortion, exploratory counseling regarding these feelings.'' A related opinion was expressed by, Lemkau (1991, p. 100) who noted ''in a political environment in which a woman's right to choose abortion is constantly challenged, it is easy to forget the importance of the right to choose not to abort.'' Furthermore, professionals working with women

contemplating an abortion need to be encouraged not to interject their own opinions regarding what they perceive to be the best decision for an individual and should help instill confidence in women to not yield to pressures from others as they weigh their options.

Unfortunately, many women who make the decision to abort do so without a thorough understanding of the procedure and research suggests that feelings of having been misinformed or denied relevant information are related to post-abortion difficulties (Congleton & Calhoun, 1993; Vaughan, 1991; Franz & Reardon, 1992). Making accurate information pertaining to fetal development available to women, particularly those who request it, should help to ensure that women feel that they had adequate knowledge to arrive at a decision that is consistent with their beliefs and value systems. Avoiding discussion of fetal development or using terms like ''tissue'' or ''a clump of cells'' to refer to a fetus that is 6-weeks-old or older when counseling women seeking information is undoubtedly viewed by many health care providers as helpful, because it keeps the decision simple and focused on what the woman desires for her life. However, others may see this practice as denying women the respect they deserve and as somewhat deceitful because it obscures women's right to make a fully informed decision. Although obviously very politically charged, this general opinion is one that some in the medical profession have held for years. In a 1980 letter published by the *New England Journal of Medicine*, this position is well-stated by Riggs: ''Women deserve to know exactly what would be removed before they make a decision. The doctor who protects them from the facts to preserve them from anxiety and guilt has made a moral decision on their behalf... and to deprive a woman contemplating abortion of a description of the fetus whether or not she requests is, is to deprive her of truly informed consent'' (p. 350). The focus of most information provided to women today pertains to the known physical risks associated with abortion rather than termination of the developing fetus. However, with states varying considerably relative to the form and extent of information mandated, future studies examining the differential effects of the provision of information pertaining to fetal development on decision-making and psychological responses could be conducted rather easily.

Domestic violence and abortion

Many studies indicate that partner relationship problems are among the most common motives for seeking an abortion (Torres & Forrest, 1988; Russo, Horn & Schwartz, 1992; Soderberg et al., 1997), with the experiences of partner sexual assault frequently found to factor into the choice to abort (Allanson & Astbury, 2001; Borins & Forsythe, 1985; Russo & Pope, 1993). A woman who is a victim of domestic violence may choose to abort for various reasons related to the abuse: (1) because the current or past pregnancies precipitated increased violence, (2) due to fear that the fetus will be harmed by violence, (3) due to coercion from an abuser, (4) because the pregnancy was the result of rape, or (5) based on a lack of personal interest in and/or fears regarding the prospect of having a child with an abuser (Coleman & Maxey, 2004). Although extensive exploration of abortion as a risk factor for domestic violence has not occurred, Hedin and Janson (2000) did report an association between abortion and violence during a subsequent pregnancy.

In addition to operating as a predictor of the choice to abort and as a possible negative outcome of abortion, relationship violence has been identified as a risk factor for negative post-abortion adjustment (Allanson & Astbury, 2001; Llewellyn & Pytches, 1988; Soderberg et al., 1998; Russo & Denious, 2001). Adding to the complexity of relations between partner violence and abortion decision-making and adjustment is the overlap in possible negative outcomes including anxiety, depression, and substance use/abuse among victims of partner violence (Burnam et al., 1988; Goodman et al., 1993a,b; Koss, Koss & Woodruff, 1991) and among women who have had an abortion (Coleman & Nelson, 1998; Coleman et al., 2002a; Cougle et al., 2003; Drower & Nash, 1978; Franco et al., 1989; Gould, 1980; Reardon & Ney, 2000; Reardon & Cougle, 2002a,b; Thorp et al., 2003; Yamaguchi & Kandel, 1987). Finally, the literature on partner violence and abortion is complicated by the fact that both partner violence and unwanted pregnancy are more common among women with particular sociodemographic characteristics including poverty, low levels of formal education, and being unmarried (Adams, 1985; Amaro et al., 1990; Miller, 1992; Russo, 1992; Williams & Pratt, 1990). More research is clearly needed to examine the rather convoluted associations among partner violence, abortion, and mental health, with sensitivity to the socio-demographic context within which abortion decisions are made.

Conclusion

For various political, social, and ideological reasons, the psychology of abortion has probably not received the amount of concentrated scholarly attention that a topic, which touches the lives of so many contemporary women, deserves. Moreover, the body of work that has accumulated throughout the world has proceeded in a predominantly atheoretical manner and has been plagued by numerous methodological shortcomings as well as content gaps. This article represents an attempt to review the existing literature pertaining to the psychology of abortion while providing a thorough assessment of the primary theoretical, methodological, and content developments necessary to propel the research on abortion to a new level of sophistication. First, we advocated for the use of a broad theoretical framework to bring cohesion to past and future research on the topic. Brofenbrenner's bioecological model was recommended as a framework of sufficient scope to include all the demographic, individual, relationship, situational, social, and cultural factors with possible relevance to abortion decision-making and adjustment over the long term. This discussion led to recommendations regarding research on numerous moderators of relations between abortion and psychological outcomes as well as mediators of associations between abortion experience and psychological outcomes. Second, we suggested methodological improvements, emphasizing the need for more diversified research strategies, longitudinal designs, incorporation of appropriate control groups, and controls for pre-existing psychological state. Finally, we considered three distinct content areas holding promise for expanding our understanding of the psychology of abortion (positive outcomes/benefits of abortion, abortion decision-making, and domestic violence). As theoretically driven, methodologically sound assessments are conducted in the years to come, the information gathered should lead to meaningful insights pertaining to abortion decision-making and adjustment among women with widely varying characteristics contemplating abortion under diverse circumstances.

The need for a large nationally representative, longitudinal study of women faced with an unintended pregnancy has been voiced repeatedly by researchers (e.g., Cougle et al., 2003; Speckard & Rue, 1992; Thorp et al., 2003) and is further conveyed by the work reviewed herein. Given the clarity of research needs for advancing our understanding of the meaning of abortion in women's lives that have been evident for some time, the sociopolitical agendas permeating the design, publishing, funding, and dissemination of research have undoubtedly thwarted progress. Strong emotions infiltrating the academic study of this topic render the conduct of research that is free from moral, political, and philosophical biases a difficult, perhaps unattainable goal. However, in the interest of the millions of women who undergo one of the most common surgical procedures currently available in the United States and elsewhere throughout the world, it is evident that more probing and substantive research should be conducted. Such research will continue to be the target of political attacks. However, the comments by the editors of the *Canadian Medical Association Journal*, (2003) in response to readers' criticisms of their decision to publish a study linking abortion and psychiatric hospitalization offers an appropriate reminder that scientists must continually investigate the risks and benefits of one of the most politically charged medical procedures: "This debate is conducted publicly in religious, ideological and political terms: forms of discourse in which detachment is rare. But we do seem to have the idea in medicine that science offers us a more dispassionate means of analysis. To consider abortion as a health issue, indeed as a medical "procedure," is to remove it from metaphysical and moral argument and to place it in a pragmatic realm where one deals in terms such as safety, equity of access, outcomes and risk–benefit ratios, and where the prevailing ethical discourse, when it is evoked, uses secular words like autonomy and patient choice" (p. 93).

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A history of induced abortion in relation to substance use during subsequent pregnancies carried to term

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OBJECTIVE: Previous research has revealed a general association between induced abortion and substance use. The purpose of this study was to examine the correlation when substance use is measured specifically during a subsequent pregnancy.

STUDY DESIGN: A nationally representative sample of women was surveyed about substance use during pregnancy shortly after giving birth. Women with a previous induced abortion, whose second pregnancy was delivered, were compared separately with women with one previous birth and with women with no previous births.

RESULTS: Compared with women who gave birth, women who had had an induced abortion were significantly more likely to use marijuana (odds ratio, 10.29; 95% CI, 3.47-30.56), various illicit drugs (odds ratio, 5.60; 95% CI, 2.39-13.10), and alcohol (odds ratio, 2.22; 95% CI, 1.31-3.76) during their next pregnancy. The results with only first-time mothers were very similar.

CONCLUSION: Psychosocial mechanisms that may explain the findings are discussed. Screening for abortion history may help to identify pregnant women who are at risk for substance use more effectively. (Am J Obstet Gynecol 2002;187:1673-8.)

Key words: Induced abortion, substance use, pregnancy

Induced abortion is perceived generally as a stressful life event,[1] yet available data suggest that only a minority of women (approximately 10%-20%) have serious negative psychologic complications.[2,3] Among women who report negative effects, a wide range of stress-related symptoms have been identified that include anxiety,[4] depression,[5,6] sleep disturbances,[2] grief,[7] and substance abuse.[8,9] Women who have postabortion anxiety and/or depression may also abuse substances in an effort to self-medicate.

Most postabortion studies have examined the incidence of negative effects within weeks or months after the procedure, but recent research indicates that women who undergo an abortion may have delayed reactions.[2,10,11] One logical time for the emergence of delayed responses is during a later pregnancy. Women who have regret, guilt, and other negative emotions that are associated with an induced abortion may conceive again with the intent of carrying the second pregnancy in an attempt to mask the feelings that are associated with the abortion.[12] However, if the negative emotions are not addressed effectively, the physical and psychologic changes that are associated with the second pregnancy may exacerbate abortion-related stress.

Research has revealed that women who have had an abortion, compared with women with no history of abortion, are more likely to have anxiety and depression during pregnancy or after childbirth.[6,13] Given the available evidence that suggests that future pregnancies may trigger emotional reactions to an abortion, the primary goal of the current study was to explore associations between a maternal history of induced abortion and the tendency to use substances that are known to represent unhealthy means of coping.

A history of induced abortion has been associated with enhanced risk for substance abuse after the procedure.[2,8,9,14-17] However, very little research has examined relations between a maternal history of induced abortion and substance use during pregnancy. Most of the available studies have revealed associations between induced abortion and smoking during pregnancy.[18,19] Other studies have also found higher rates of alcohol consumption[20] and use of illicit drugs (such as cocaine, methamphetamines, and opiates)[21-23] among pregnant women with a history of induced abortion compared with pregnant women with no prior abortion.

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Unfortunately, no studies have compared pregnant women with different reproductive histories in terms of various forms of substance use during pregnancy with a racially diverse, nationally representative sample, which was the aim of the current investigation. Based on the literature, our hypothesis was that substance use (in the form of cigarettes, alcohol, marijuana, and any illicit drugs) during pregnancy would be associated with a maternal history of induced abortion.

Material and methods

For the primary analyses, the sample of 607 women was derived from the National Pregnancy and Health Survey completed by 2613 women. This sample was limited to women who had been recently delivered of a child, with either one previous pregnancy with a resolution of an induced abortion (gravida 2, para 1; n = 74) or a live birth (gravida 2, para 2; n = 531) and the necessary background data. Exactly 64.3% of the sample was white (n = 406), 18.4% was Hispanic (n = 116), and 11.4% (n = 72) was African American; specific ethnicity data were not available for the remainder of the sample. The mean age was 26.5 years (SD ±5.07 years; range, 15-44 years). For women with a history of an induced abortion, a mean of 5.03 ± 3.35 years had elapsed since the earlier pregnancy (range, 1-16 years), whereas among the women who had given birth, a mean of 3.42 ± 2.64 years had passed since the previous pregnancy (range, 1-18 years). Most of the respondents were married (71.5%); the remainder indicated living with their partners, never married, widowed, divorced, or separated. Although most of the women worked full-time outside the home (55.9%), 31.5% reported working full-time in the home, 6% were attending school, and 2.7% were unemployed. Finally, 39.1% of the subsample had 12 years of formal education (completed high school), 22.3% had 13 to 15 years of formal education, 12.8% had 16 years of education (completed college), 8.2% had >16 years of formal education, and 17.1% had <12 years of formal education.

A second set of analyses were conducted to compare the women who had had an induced abortion (gravida 2, para 1) with a sample of women without an abortion history who also gave birth for the first time (gravida 1, para 1). From this sample of 738 women, 58.1% was white (n = 429), 19% was Hispanic (n = 140), and 15.4% (n = 114) was African American; specific ethnicity data were not available for the rest of the sample. The mean age was 23.40 ± 5.68 (range, 13-41 years). Most of the respondents were married (56.5%); the remainder indicated being unmarried. Although most of the women worked full-time outside the home at the time of testing (62.3%), 6.2% reported working full-time in the home, 22% were attending school, and 6.1% were unemployed. Finally, 31% of this sample had 12 years of formal education (completed high school); 17% had 13 to 15 years of formal education, 13% had 16 years of formal education (completed college), 7.9% had >16 years of formal education, and 31% had <12 years of formal education.

The survey was sponsored by the US Department of Health and Human Services, the National Institutes of Health, and the Division of Epidemiological and Prevention Research at the National Institute on Drug Abuse for the purpose of providing the first national assessment of licit and illicit drug use and alcohol consumption among pregnant women. The data, collected by Westat, Inc, has been made publicly available for statistical analysis (http://lion.icpsr.umich.edu/SAMHDA/studies.html). To protect the anonymity of respondents, all variables that could be used to identify specific individuals have been collapsed, recoded, or removed from the public use file.

A two-stage sampling procedure within strata was adopted, with the selection of hospitals in the first stage and the selection of individual mothers within the sampled hospitals in the second stage. The sampling frame for the hospitals contained all hospitals in the contiguous United States with ≥200 annual births. Mothers were selected randomly from within the participating hospitals. Of all eligible respondents, 2613 women (78%) completed the questionnaire, which represented 87% of those approached.

Sociodemographic information, obstetric history, and drug and alcohol use data were obtained through a questionnaire answer sheet completed by the respondent and concealed from the interviewer, who presented the questionnaire to the women soon after delivery. With our primary sample restricted to women with one previous pregnancy that resulted in a live birth (gravida 2, para 2) or an induced abortion (gravida 2, para 1), we were unable to conduct analyses that were based on specific forms of illicit drugs other than marijuana because of the low numbers. Analyses were conducted that were relative to the use of any illicit drugs at any point in the pregnancy (marijuana, methadone, heroine, cocaine, methamphetamines, and illicit use of sedatives, tranquilizers, amphetamines, analgesics, and inhalants) and exclusive use of marijuana, alcohol, or cigarettes at any point during the pregnancy.

Results

Primary analyses. Chi-square tests, with the calculation of ORs and the η^2 statistic, were used to examine the strength of associations between previous reproductive outcome and usage of various substances at any point during pregnancy. The results of these analyses (Table I) indicate significantly higher rates of usage for the induced abortion group (gravida 2, para 1) compared with the birth group (gravida 2, para 2), relative to any form of illicit drug use (marijuana, methadone, heroine, cocaine, methamphetamines, and illicit use of sedatives, tranquil-

Table I. Previous reproductive outcome (gravida 2, para 1 vs gravida 2, para 2) and usage of various substances during a recent pregnancy that was carried to term

Group characteristics by substance use during pregnancy	χ^2	*P value*	*OR**	*95% CI*	η^2
Any illicit drugs					
Full sample	19.38	<.0001	5.60	2.39-13.10	0.18
Time elapsed since previous pregnancy					
≤2 y†	3.06	0.08			
3-5 y†	10.54	.001	5.92	1.78-19.7	0.18
Marital status					
Married†	16.52	<.0001	10.25	2.62-40.06	0.19
Not married	1.80	.180			
Income					
Low†	0.96	.327			
High†	24.61	<.0001	10.05	3.36-30.12	0.23
Marijuana					
Full sample	26.05	<.0001	10.29	3.47-30.56	0.21
Time elapsed since previous pregnancy					
≤2 y†	6.14	.013	6.97	1.19-40.81	0.15
3-5 y†	17.50	<.0001	16.40	2.90-92.81	0.23
Marital status					
Married†	24.68	<.0001	37.64	3.81-371.94	0.23
Not married	3.33	.068	3.17	0.87-11.60	0.15
Income					
Low†	2.44	.119			
High†	32.93	<.0001	44.11	5.21-373.43	0.27
Cigarettes					
Full sample	1.08	.299			
Time elapsed since previous pregnancy					
≤2 y	0.06	.806			
3-5 y	0.72	.396			
Alcohol					
Full sample	9.14	<.01	2.22	1.31-3.76	0.12
Time elapsed since previous pregnancy					
≤2 y	0.38	.536			
3-5 y	6.69	<.01	2.67	1.23-5.71	0.14
Ethnicity					
White	12.35	<.0001	2.99	1.59-5.62	0.17
African American†	0.38	.538			
Hispanic†	3.76	.053	4.00	0.90-17.93	0.18

*ORs were computed with the birth group (gravida 2, para 2) as the reference group.
†Cell count <5, interpret cautiously

izers, amphetamines, analgesics, and inhalants), marijuana use, and alcohol consumption. A significant difference was not detected between the groups relative to cigarette smoking. Abortion history explained 18%, 21%, and 12% of the variance in relation to any illicit drugs, marijuana, and alcohol usage, respectively. Moreover, compared with usage rates in the group with a previous live birth, alcohol use was higher in the postabortion group (OR, 2.22; 95% CI, 1.31-3.76), as was marijuana (OR, 10.29; 95% CI, 3.47-30.56), and the use of any illicit drugs (OR, 5.60; 95%CI, 2.39-13.10).

With a significant difference detected between the previous induced abortion and birth groups relative to the amount of time since the earlier pregnancy (t [586] = 4.23, $P < .001$), separate analyses comparing drug, alcohol, and cigarette use were conducted on the basis of time elapsed (≤2 years and 3-5 years). The results of these tests are also provided in Table I. As indicated by the ORs and η^2 statistics, the greatest differences between the previous abortion and birth groups tended to occur with a longer elapsed time.

Additional analyses conducted separately based on levels of potentially confounding factors. After a comparison of the rates of substance use of various forms during pregnancy among women with histories of induced abortion and birth, the data were screened for possible associations between sociodemographic factors and the dependent variables that were significantly related to previous reproductive history. When significant associations were found, comparisons that were based on previous reproductive history were conducted separately for the categories of the particular sociodemographic variables. No significant associations were detected between maternal age, employment status, or educational history and any of the forms of substance use. However, a few significant associations were revealed that were relative to various forms of substance use and marital status, income, and ethnicity. Specifically, the marital status variable (married

Table II. Previous reproductive outcome (gravida 2, para 1 vs gravida 1, para 1) and usage of various substances during a recent pregnancy carried to term

Group characteristics by form of substance use	χ^2	*P value*	*OR**	*95% CI*	η^2
Any illicit drugs					
Full sample	14.27	<.0001	4.00	1.85-8.66	0.13
Marital status					
Married†	9.53	.002	5.68	1.56-19.42	0.15
Not married	4.74	.03	2.90	1.07-7.85	0.12
Marijuana					
Full sample	21.74	<.0001	6.87	2.72-17.39	0.17
Cigarettes					
Full sample	0.26	.608			
Alcohol					
Full sample	13.53	<.01	2.58	1.53-4.33	.13
Marital status					
Married†	2.41	.12			
Not married	17.45	<.0001	4.44	2.12-9.37	0.23
Income					
Low	23.79	<.0001	10.53	3.44-32.21	0.32
High	3.22	.08			
Ethnicity					
White	10.94	.001	2.76	1.48-5.15	0.15
African American†	0.05	.82			
Hispanic†	8.18	.004	7.13	1.54-32.88	0.23
Maternal age (y)					
<25	17.73	<.0001	4.50	2.12-9.56	0.19
≥25	1.15	.284			
Maternal education					
<12th grade	16.17	<.0001	8.60	2.54-29.08	0.26
≥12th grade	4.83	.28	1.90	1.06-3.39	0.09

*Computed with the no induced abortion group (gravida 1, para 1) as the reference group.
†Cell count <5, interpret cautiously.

vs not married) was associated with the use of any illicit drugs (χ^2 [1], 17.72; $P < .0001$; n = 607) and marijuana usage (χ^2 [1], 15.69; $P < .0001$; n = 607) during pregnancy. Those who were unmarried tended to report a more frequent use of drugs. Likewise, the income variable (≤$14,850, ≥$14,851) was related significantly to the use of any illicit drugs (χ^2 [1], 3.95; $P < .05$; n = 607) and marijuana usage (χ^2 [1], 5.01; $P < .05$; n = 607) during pregnancy. Higher income was associated with higher rates of reported drug usage. Ethnicity (white, African American, Hispanic) was associated significantly with alcohol consumption (χ^2 [2], 15.62; $P < .0001$; n = 594). The white respondents reported consumption of alcohol most frequently, with similar rates reported by the Hispanic and black respondents. The results of the relevant separate tests, based on sociodemographic variables, are presented in Table I.

Secondary analyses. A second set of analyses was conducted to compare substance use among postabortive women (gravida 2, para 1) with a sample of women without a history of abortion who were also giving birth for the first time (gravida 1, para 1). These tests removed the likelihood of confounders because of (1) possible lifestyle changes that were necessitated by child care (resulting in lower substance use) in the postbirth group and (2) differences between the postabortion and postbirth groups that might be attributable to discrepant levels of stress that were associated with carrying a first versus a second pregnancy to term.

Chi-square tests, with calculation of ORs and the η^2 statistics were again conducted to examine the strength of associations between abortion history and substance use in first-time mothers. The results of these analyses, which indicated significantly higher rates of usage for the induced abortion group in comparison with the no abortion group relative to any form of illicit drug use, marijuana use, and alcohol consumption, are presented in Table II. A significant difference was not detected between the groups relative to cigarette smoking. Abortion history explained 13%, 17%, and 13% of the variance in the use of any illicit drugs, marijuana, and alcohol consumption, respectively. Further, compared with usage in the no abortion group, higher rates of any illicit drugs (OR, 4.00; 95% CI, 1.85-8.66), marijuana (OR, 6.87; 95% CI, 2.72-17.39), and alcohol (OR, 2.58; 95% CI, 1.53-4.33) were observed in the postabortion group.

As with the primary analyses, using data from the first-time mothers, several additional χ^2 tests were conducted to examine the associations between abortion history and usage of various substances during pregnancy that were based on categories of the sociodemographic variables that were found to be related significantly to the particu-

lar types of substance use. Alcohol use was related to marital status (χ^2 [1], 6.22; $P < .013$; n = 789), income (χ^2 [1], 15.47; $P < .0001$; n = 789), maternal education (χ^2 [1], 26.94; $P < .0001$; n = 789), maternal age (χ^2 [1], 42.31; $P < .0001$; n = 789), and ethnicity (χ^2 [1], 51.03; $P < .0001$; n = 789). Higher rates of consumption were reported by the married, higher income, more educated, and older women. In addition, the white respondents were more likely to report the consumption of alcohol than the Hispanic and African American participants, who were equally inclined to report alcohol use. Marital status was related significantly to the use of any illicit drugs (χ^2 [1], 7.00; $P < .01$; n = 789), with unmarried respondents more inclined to report the use of illicit drugs. The results of the relevant separate tests based on sociodemographic variables are presented in Table II.

Comment

This study was designed to compare the use of illicit drugs, alcohol, and cigarettes during pregnancy among a nationally representative group of women with either a history of an induced abortion or a live birth. Consistent with previous research,[20-23] the results revealed significantly higher rates of consumption associated with a previous abortion, compared with previous birth relative to the use of any illicit drugs (OR, 5.60; 95% CI, 2.39-13.10) and alcohol (OR, 2.22; 95% CI, 1.31-3.76). Although no previous studies have focused specifically on a comparison of marijuana use during pregnancy among women with different reproductive histories, this study revealed rather dramatic differences between women with a history of abortion and women with a history of a live birth that were relative to marijuana use (OR, 10.29; 95% CI, 3.47-30.56). Counter to earlier findings,[18,19] a significant difference in the use of cigarettes was not detected between the abortion and birth groups.

There are several possible explanations for the generally significant findings. Women with a history of abortion may have a greater need to use emotion-altering substances during pregnancy, because the subsequent pregnancy may arouse unresolved feelings related to the abortion. Women with a history of induced abortion, compared with their peers who opt for delivery, also may be more liberal, inclined to take risks, and/or tend to be involved in difficult partner relationships more often. Perhaps women with a history of induced abortion, compared with those without a previous abortion, experienced more domestic violence during pregnancy; there is research support for an association between victimization and substance use during pregnancy.[24] Various factors alone or in combination, as opposed to the abortion itself, may have been the critical variables that were related to the discrepant rates of substance use that was revealed in this report. The core problem is that an abortion history is essentially a package variable composed of many personal and situational factors that lead up to the decision to abort and that embody the potential to trigger negative psychologic effects in some women. To disentangle the logical explanations for higher rates of usage, future work should incorporate more detailed interviews or open-ended questions to gain insight into the thoughts and feelings of women pertaining to the abortion and the use of substances.

The decision to run additional comparisons only with women who were undergoing their first birth was made in an effort to sort out alternate explanations for the findings because of life style changes that were based on discrepant experiences with child care and stress that was associated with a first versus a second pregnancy intended to continue. The use of this sample resulted in very similar general findings, effectively reducing the likelihood of these potential confounds operating.

When comparative analyses were conducted that were based on time elapsed since the initial pregnancy event, the differences between the abortion and birth groups that were relative to the use of any illicit drugs, marijuana, and alcohol were considerably more pronounced when the amount of time was longer (3-5 years as opposed to ≤2 years). This finding is consistent with the few longitudinal studies that indicate increases in negative reactions long after the abortion.[2,10,11]

Unfortunately, most postabortion studies are conducted within a framework that presupposes that an abortion experience, even if construed as traumatic, will be time limited. The results of this study and the previously conducted longitudinal work suggest the need to reconfigure models that pertain to the time associated with possible postabortion adjustment trajectories.

Differences between the abortion and birth groups relative to the rates of any illicit drug use and marijuana use, in particular, were much more pronounced when the women were married and had higher incomes. When the secondary analyses that compared first-time mothers on the basis of abortion experience were conducted, a similar result was detected relative to the use of illicit drugs. Perhaps women who choose to abort despite having the benefits of a spouse and sufficient income are more likely to experience remorse, guilt, or other negative emotions that lead to substance use in a later pregnancy. Further, in view of data reported by Jones and Forrest,[25] which suggest that 74% of married women were likely to report a previous abortion compared with only 30% of unmarried women, it is possible that many of the unmarried women in this sample concealed an abortion.

This study involved comparisons of substance use during a second pregnancy between women with a history of an induced abortion or a birth. Substance use comparisons also were made between first-time mothers on the basis of a history of induced abortion. Although the findings from these two sets of analyses were generally consis-

tent, there were some discrepancies relative to alcohol use. Specifically, for the first-time mothers, stronger differences between the abortion group and the no abortion group (with higher rates for the abortion group) relative to alcohol use were observed for women who had lower incomes, were unmarried, had less formal education, and were ≤25 years old.

The strengths of this study include the use of a carefully selected, nationally representative sample, the opportunity to evaluate possible long-term effects of abortion, and the use of outcomes that were related to many different forms of substance use. However, the data were derived though the exclusive use of self-report measures and the sample of women with one previous pregnancy that ended in abortion was relatively small. A more careful analysis of patterns of drug use in women with different reproductive histories would have been possible if repeated measurements had been obtained from the first pregnancy through the second. More prospective work clearly is needed in this area.

This study has important implications for obstetricians and general practitioners. A history of abortion appears to be a reliable marker for the increased risk of substance abuse in subsequent pregnancies. We would recommend that physicians routinely inquire about previous pregnancy loss, especially when a woman is newly pregnant. Information from histories should not be relied on because an abortion may have occurred in the intervening time and because women may have chosen previously to conceal a past abortion. The simple, nonjudgmental question, "Have you experienced any pregnancy losses such as miscarriage, abortion, adoption, or stillbirth?" will not only produce valuable information, it will also provide women with permission to discuss unresolved issues that are related to previous pregnancy losses. Moreover, a patient's response to this question, including nonverbal clues, will better enable the alert physician to discern if a referral for substance abuse or counseling may be warranted.

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