Report of the APA Task Force on Mental Health and Abortion

Date of this Report: 8/13/2008

APA Task Force on Mental Health and Abortion

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The Task Force on Mental Health and Abortion is charged with collecting, examining, and summarizing the scientific research addressing the mental health factors associated with abortion, including the psychological responses following abortion, and producing a report based upon a review of the most current research.

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Executive Summary

5-07-08

The Council of Representatives of the American Psychological Association charged the Task Force on Mental Health and Abortion (TFMHA) with "collecting, examining, and summarizing the scientific research addressing the mental health factors associated with abortion, including the psychological responses following abortion, and producing a report based upon a review of the most current research." In considering the psychological implications of abortion, the TFMHA recognized that abortion encompasses a diversity of experiences. Women obtain abortions for different reasons; at different times of gestation; via differing medical procedures; and within different personal, social, economic, and cultural contexts. All of these may lead to variability in women's psychological reactions following abortion. Consequently, global statements about the psychological impact of abortion on women can be misleading.

The TFMHA evaluated all empirical studies published in English in peer-reviewed journals post-1989 that compared the mental health of women who had an induced abortion to the mental health of comparison groups of women (*N*=50) or that examined factors that predict mental health among women who have had an elective abortion in the United States (*N*=23). This literature was reviewed and evaluated with respect to its ability to address four primary questions: (1) Does abortion *cause* harm to women's mental health? (2) How prevalent are mental health problems among women in the United States who have had an abortion? (3) What is the relative risk of mental health problems associated with abortion compared to its alternatives (other courses of action that might be taken by a pregnant woman in similar circumstances)? And, (4) What predicts individual variation in women's psychological experiences following abortion?

A critical evaluation of the published literature revealed that the majority of studies suffered from methodological problems, often severe in nature. Given the state of the literature, a simple calculation of effect sizes or count of the number of studies that showed an effect in one direction versus another was considered inappropriate. The quality of the evidence that produced those effects must be considered to avoid misleading conclusions. Accordingly, the TFMHA emphasized the studies it judged to be most methodologically rigorous to arrive at its conclusions.

The best scientific evidence published indicates that among adult women who have an *unplanned pregnancy the* relative risk of mental health problems is

no greater if they have a single elective first-trimester abortion than if they deliver that pregnancy. The evidence regarding the relative mental health risks associated with multiple abortions is more equivocal. Positive associations observed between multiple abortions and poorer mental health may be linked to co-occurring risks that predispose a woman to both multiple unwanted pregnancies and mental health problems.

The few published studies that examined women's responses following an induced abortion due to fetal abnormality suggest that terminating a wanted pregnancy late in pregnancy due to fetal abnormality appears to be associated with negative psychological reactions equivalent to those experienced by women who miscarry a wanted pregnancy or who experience a stillbirth or death of a newborn, but less than those who deliver a child with life-threatening abnormalities.

The differing patterns of psychological experiences observed among women who terminate an unplanned pregnancy versus those who terminate a planned and wanted pregnancy highlight the importance of taking pregnancy intendedness and wantedness into account when seeking to understand psychological reactions to abortion.

None of the literature reviewed adequately addressed the prevalence of mental health problems among women in the United States who have had an abortion. In general, however, the prevalence of mental health problems observed among women in the United States who had a single, legal, first-trimester abortion for nontherapeutic reasons was consistent with normative rates of comparable mental health problems in the general population of women in the United States.

Nonetheless, it is clear that some women do experience sadness, grief, and feelings of loss following termination of a pregnancy, and some experience clinically significant disorders, including depression and anxiety. However, the TFMHA reviewed no evidence sufficient to support the claim that an observed association between abortion history and mental health was caused by the abortion *per se*, as opposed to other factors.

This review identified several factors that are predictive of more negative psychological responses following first-trimester abortion among women in the United States. Those factors included perceptions of stigma, need for secrecy, and low or anticipated social support for the abortion decision; a prior history of mental health problems; personality factors such as low self-esteem and use of avoidance and denial coping strategies; and characteristics of the particular pregnancy, including the extent to which the woman wanted and felt committed to it. Across studies, prior mental health emerged as the strongest predictor of postabortion mental health. Many of these same factors also predict negative psychological reactions to other types of stressful life events, including childbirth,

and, hence, are not uniquely predictive of psychological responses following abortion.

Well-designed, rigorously conducted scientific research would help disentangle confounding factors and establish relative risks of abortion compared to its alternatives, as well as factors associated with variation among women in their responses following abortion. Even so, there is unlikely to be a single definitive research study that will determine the mental health implications of abortion "once and for all" given the diversity and complexity of women and their circumstances.

REPORT OF THE APA TASK FORCE ON MENTAL HEALTH AND ABORTION

4/25/2008

I. Introduction

Although the U.S. Supreme Court legalized abortion in the United States more than 35 years ago (*Roe v. Wade,* 1973), it continues to generate enormous emotional, moral, and legal controversy. Over the last two decades, one aspect of this controversy has focused on the effects of abortion on women's mental health (Bazelon, 2007; Cohen, 2006; Lee, 2003). Public debate on this issue can be traced to 1987, when then-President Ronald Reagan directed then-Surgeon General C. Everett Koop to prepare a Surgeon General's report on the public health effects (both psychological and physical) of abortion. After conducting a comprehensive review of the scientific literature, Dr. Koop declined to issue a report; instead, he sent a letter to President Reagan on January 9, 1989, in which he concluded that the available research was inadequate to support any scientific findings about the psychological consequences caused by abortion (Koop, 1989a). In subsequent testimony before Congress, Dr. Koop stated that his letter did not focus on the physical health risks of abortion because "obstetricians and gynecologists had long since concluded that the physical sequelae of abortion were no different than those found in women who carried to term or who had never been pregnant" (Koop, 1989, p. 195). Dr. Koop also testified that although psychological responses following abortion can be "overwhelming to a given individual," the psychological risks following abortion were "miniscule" from a public health perspective (Koop, 1989b, p. 241).

Dr. Koop's letter and an unofficial draft of his report read into the *Congressional Record* were cited by both abortion opponents and proponents to claim both the presence and absence of scientific evidence showing a detrimental effect of abortion on women's mental health (see Wilmoth, deAlteriis, & Bussell, 1992). Recognizing the importance of this issue, the American Psychological Association (APA) convened a panel of scientific experts in February 1989 to conduct a review of the scientific literature on psychological responses to abortion. The panel focused on studies with the most rigorous research designs, reporting findings on the psychological status of women who had legal, elective, first-trimester abortions in the United States. Based on their review of this literature, the task force concluded that the most methodologically sound studies indicated that "severe negative reactions after legal, nonrestrictive, first-trimester abortion are rare and can best be understood in the framework of coping with a normal life stress" (Adler, David, Major, Roth, Russo, & Wyatt, 1990, pp. 43; see also Adler, David, Major, Roth, Russo, & Wyatt, 1992). The task force recognized that some individual women experience severe distress or psychopathology following abortion. However, the task force also noted that it was not clear that these symptoms are causally linked to the abortion. The

conclusions of Dr. Koop and the 1989 APA Task Force have been widely regarded as the definitive scientific statements on the link between abortion and mental health.

Since publication of Koop's letter and unofficial draft report (1989a, 1989b) and the 1989 Task Force Report (see Adler et al., 1990), a number of new studies have been published in peer-reviewed journals that address the association between abortion and women's mental health. Some of these studies support the conclusions of the 1989 Task Force Report (e.g., Cohan, Dunkel-Schetter, & Lydon, 1993; Gilchrist, Hannaford, Frank, & Kay, 1995; Russo & Dabul, 1997; Russo & Zierk, 1992), whereas others challenge them (e.g., Cougle, Reardon, & Coleman, 2003; Fergusson, Horwood, & Ridder; 2006; Gissler, Kauppila, Merilainen, Toukomaa, & Hemminki, 1997; Reardon & Cougle, 2002a). Reviewers of this emerging literature have reached differing conclusions. Based on their review of the post-1990 literature, for example, Bradshaw and Slade (2003) concluded that "The conclusions drawn from the recent longitudinal studies looking at long-term outcomes following abortion, as compared to childbirth, mirror those of earlier reviews (e.g., Adler et al., 1992; Wilmoth et al., 1992), with women who have abortions doing no worse psychologically than women who give birth to wanted or unwanted children" (p. 948). In contrast, in testimony introduced in support of a law that would have banned all abortions in South Dakota except for those in which the mother's life was in danger, Coleman (2006b) concluded that the scientific evidence shows that "abortion poses significant risk to women's mental health and carries a greater risk of emotional harm than childbirth."

Recognizing the need for a critical review of the recent literature, in 2006 the Council of Representatives of APA established a new Task Force on Mental Health and Abortion (TFMHA) composed of scientific experts in the areas of stigma, stress and coping, interpersonal violence, methodology, women's health, and reproductive health. The APA Council charged the TFMHA with "collecting, examining, and summarizing the scientific research addressing the mental health factors associated with abortion, including the psychological responses following abortion, and producing a report based upon a review of the most current research." This report summarizes the findings of the 2006 TFMHA. This report updates rather than duplicates efforts of the 1989 Task Force. We refer the reader to Adler et al. (1992) for a discussion of APA's involvement in abortion-related issues, the history and status of abortion in the United States, and a methodological critique of the literature on abortion prior to 1990 (see also the fall 1992 issue of the *Journal of Social Issues).*

In preparing this report, the TFMHA recognized that differing moral, ethical, and religious perspectives affect how abortion is perceived. Furthermore, it recognized that members of APA are likely to have a wide range of personal views on abortion. Irrespective of their views on the morality of abortion, however, APA members are united in valuing carefully and rigorously collected

and interpreted scientific evidence. The TFMHA considered its mission not only to review, but also to critically and objectively evaluate the quality of the scientific evidence without regard to the direction of its findings in order to draw conclusions about the mental health implications of abortion based on the best scientific evidence available. This TFMHA report represents the most thorough, current, and critical evaluation of the literature published since 1989 (see Bradshaw & Slade, 2003; Coleman, Reardon, Strahan, & Cougle, 2005; Dagg; 1991; Posavac & Miller, 1990; Stotland, 1997; Thorp, Hartmann, & Shadigian, 2003, for prior published reviews of this literature).

I. A. Overview

We begin this report by defining terms, outlining the scope of the TFMHA report, and specifying the questions that the research literature has been used to address (Section I). Next, we discuss conceptual frameworks important for understanding the empirical literature on abortion and mental health (Section II) and important methodological issues to consider in evaluating this literature (Section III). We then turn to the core of our report (Sections IV and V): a review and evaluation of empirical studies published in English in peer-reviewed journals post-1989 that compares the mental health of women who have had an elective abortion to the mental health of various comparison groups (see detailed inclusion criteria below). We reviewed only peer-reviewed studies in order to include only research findings that stood the test of independent scrutiny of qualified scientific experts. In a following section (Section VI), we review research published post-1989 in the United States that has addressed factors that predict mental health among women who have had an elective abortion. We end with a summary and conclusions based on our review (Section VII).

I. B. Definitions and Scope of Report

There are multiple ways to conceptualize the mental health implications of abortion and many empirical literatures that are relevant to this topic. Studies examining the mental health implications of childbearing, particularly of unwanted childbearing, or of single parenting, for example, are relevant for comparison purposes (see Barber, Axinn, & Thornton (1999) for information on mothers with unwanted births). So, too, are studies of the effects on children of being born unwanted (see David, Dytrych, & Matejcek, 2003) or on women of being denied abortion (see Dagg, 1991). To review all of those literatures in this report, however, would be a massive undertaking beyond the scope and charge of this task force. To keep its task manageable, the TFMHA limited its review and evaluation to the empirical literature on the implications of induced or intentional termination of pregnancy for women's mental health. We do not consider the implications of abortion for the mental health of fathers, other children or family members, or clinic workers. Although these are important questions worthy of study, they are beyond the scope of this report.

Our review is limited to studies examining the mental health implications of *induced abortion.* In some studies, induced termination of pregnancy is not differentiated from spontaneous termination of pregnancy (spontaneous abortion, or miscarriage). Although spontaneous abortion may have mental health consequences, we consider those consequences only when they are compared with those of induced abortion. Other terms used to indicate induced abortion include *elective abortion, voluntary abortion,* and *therapeutic abortion.* These distinctions can be important. Given that abortion involves a medical procedure, the term *therapeutic* would seem to apply to all abortions. However, typically the term is applied to abortions induced for medically related reasons, such as to protect the mother's health or because of severe fetal abnormalities. This term also was used to describe abortions performed for psychiatric reasons prior to legalization of abortion in the United States. Almost all abortions (92% according to the 2002 National Survey of Family Growth) in the United States are of unintended pregnancies, pregnancies that are not induced for therapeutic reasons (Finer & Henshaw, 2006a). A late-term induced abortion of an intended pregnancy may have very different implications for mental health than a first-trimester induced abortion of an unintended pregnancy.

We also limited our review to studies examining the implications of induced abortion for *mental health outcomes*. Other outcomes potentially related to abortion (either as antecedents or consequences), such as education, income, occupational status, marital status, and physical health, are beyond the scope of this report. We conceptualized mental health broadly, relying on the World Health Organization (WHO) definition of mental health as a "state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (World Health Organization [W]HO], 2007). This report thus considers a wide array of outcomes related to mental health, including measures of psychological well-being (e.g., self-esteem, life satisfaction), emotions (e.g., relief, sadness), problem behaviors (e.g., substance abuse, child abuse), and measures of severe psychopathology. In considering the mental health implications of abortion, it is crucial to distinguish between clinically significant mental disorders, such as major depression, generalized anxiety disorder, or posttraumatic stress disorder, and a normal range of negative emotions or feelings one might experience following a difficult decision, such as feelings of regret, sadness, or dysphoria. While the latter feelings may be significant, by themselves they do not constitute psychopathology. In this report, we use the term *mental health problems* to refer to clinically significant disorders assessed with valid and reliable measures or physician diagnosis. We use the term *negative psychological experiences or reactions* to refer to negative behaviors (e.g., substance use) and emotions (e.g., guilt, regret, sadness), and the term *psychological well-being* to refer to positive outcomes, such as self-esteem and life satisfaction. Because most studies published during the review period framed their research in terms of mental health problems and the negative

experiences or reactions of women, this report, of necessity, emphasized these outcomes rather than psychological well-being following abortion.

Our core review and evaluation was also limited to studies that met the following inclusion criteria: (a) empirical research, (b) published in English, (c) in peer-reviewed journals, (d) subsequent to 1989, (e) measuring a mental health relevant outcome subsequent to abortion, and (f) including a comparison group of women (see details on selection criteria, below).

In addition to these core studies, the TFMHA reviewed studies based on U.S. samples that met the above inclusion criteria but did not include a comparison group of women. Because such studies do not include a comparison group, they cannot be used to draw conclusions about relative risks of abortion compared to its alternatives. Nonetheless, these studies provide important insight into sources of variability in women's experiences of abortion in the U.S. context.

I. C. Questions Addressed

When considering the empirical literature on the association between abortion and mental health, it is useful to keep in mind four primary questions that this literature addressed: (1) Does abortion *cause* harm to women's mental health? (2) How prevalent are mental health problems among women in the United States who have had an abortion? (3) What is the relative risk of mental health problems associated with abortion compared to its alternatives (other courses of action that might be taken by a pregnant woman in similar circumstances)? And, (4) What predicts individual variation in women's psychological experiences following abortion? As we discuss below, each of these different questions requires a different research approach. Some of these questions are scientifically testable; others are not.

1. Does abortion *cause* harm to women's mental health? Although this is the question that is posed most often in public debates, this question is not scientifically testable as stated. An adequate answer to this question requires a randomized experimental design that would rigorously define the experimental, control, and outcome variables and specify any limitations in generalizing the results. Unlike many other areas of research, however, the study of abortion is not open to the methodologies of randomized clinical trials. For obvious reasons, it is neither desirable nor ethical to randomly assign women who have unwanted pregnancies to an abortion versus delivery versus adoption group. Thus, although people have frequently used the existing literature to make causal statements, inferences of cause from this literature are inappropriate.

2. How prevalent are mental health problems among women in the United States who have had an abortion? This question focuses attention on the extent to which abortion poses a threat to women's mental health, i.e., is associated with a clinically significant mental disorder (see Wilmoth et al., 1992

for a discussion of this issue). In order to answer this question, research must have several key characteristics. First, the research must be based on samples of women representative of the women to whom one wants to generalize. Thus, to address whether abortion poses a threat to the mental health of women in the United States requires a study based on a nationally representative sample of women in the United States. Highly selected samples, biased samples, samples with considerable attrition or underreporting, or samples of women in other cultures and social contexts are not appropriate for answering this question. As will be discussed below, sampling problems are a serious concern in abortion research. Second, an adequate answer to the prevalence question also requires a clearly defined and agreed-upon definition of a "mental health problem" and a valid, reliable, and agreed-upon measurement of that problem. Feelings of sadness or regret within the normal range of emotion are not clearly defined and agreed-upon mental health problems. Mental health outcomes that meet established criteria for clinically significant disorders are. Third, researchers must know the prevalence of the same mental health problem in the general population of U.S women who share characteristics similar to the abortion group, e.g., women who are of a similar age and demographic profile. Such information is essential for interpreting the significance of findings. For example, if 15% of women in a nationally representative sample who had had an abortion were found to meet diagnostic criteria for depression, the meaning of this would be more a cause for concern if the base rate for clinical depression among women in the general population of a similar age and demographic profile was 5% than if it was 25%.

3. What is the relative risk of mental health problems associated with abortion compared to its alternatives (other courses of action that might be taken by a pregnant woman in similar circumstances)? This question addresses *relative risk.* It focuses attention on the crucially important but frequently overlooked point that the outcomes associated with elective abortion must be compared with the outcomes associated with other courses of action that might be taken by a pregnant woman in similar circumstances (i.e., facing an unwanted pregnancy). *Once a woman is pregnant, there is no mythical state of "unpregnancy."* Questions of relative risk include: How does the mental health of a woman who has an abortion compare to the mental health that a woman in comparable circumstances would experience were she not to have an abortion or were she to be denied an abortion? Are negative feelings that may accompany abortion of an unwanted pregnancy more severe than alternative solutions, such as giving up a child for adoption or raising a child a woman does not want or feels emotionally, physically, or financially unable to care for? Only research designs that include a comparison group that is clearly defined and otherwise equivalent to women who have an elective abortion are appropriate for answering this primary question. Otherwise, any previously existing group differences associated with the outcome variable may bias conclusions. As will be discussed below, few studies examining the mental health implications of abortion include appropriate comparison groups for answering this question.

4. What predicts individual variation in women's psychological experiences following abortion? This last question addresses the substantial individual variation observed in women's psychological experiences following abortion. Rather than focusing on how the "typical" woman responds following a "typical" abortion, this question asks why some women experience abortion more or less favorably than do others. This question is important to address because the proportion of women who have negative mental health issues after having an abortion will vary depending on the characteristics of each woman as well as the characteristics of her circumstances— there is no one answer that applies to all women. Because this question focuses on within-group variability rather than on differences between the abortion group and another group, research designed to answer this question does not require a comparison group of women who do not have abortions, or a nationally representative sample. Research designed to answer this question, however, should at minimum be prospective and longitudinal and use reliable and valid measures of mental health.

I. D. Variability in the Abortion Experience

In considering the psychological implications of abortion, it is important to recognize that the term *abortion* encompasses a diversity of experiences and means different things to different women. Women obtain abortions for a variety of reasons, at different times of gestation, via differing medical procedures, all of which may affect the experience of abortion. Women's responses after abortion do not only reflect the meaning of abortion to her; they also reflect the meaning of pregnancy and motherhood, which varies among women. Furthermore, women obtain abortions within widely different personal, social, economic, religious, and cultural contexts that shape the cultural meanings and associated stigma of abortion and motherhood as well as others' responses to women who have abortion. All of these may lead to variability in women's psychological experiences to their particular abortion experience. For these reasons, global statements about the psychological impact of abortion on women can be misleading.

Women obtain abortions for different reasons. The vast majority of abortions are of unintended pregnancies—either mistimed pregnancies that would have been wanted at an earlier or later date or unwanted pregnancies that were not wanted at that time or at any time in the future (Henshaw, 1998; Torres & Forrest, 1988). Approximately half of women in the United States will face an unintended pregnancy during their lifetime, and about half of those who unintentionally become pregnant resolve the pregnancy through abortion (Finer & Henshaw, 2006a). The reasons that women most frequently cite for terminating a pregnancy include not being ready to care for a child (or another child) at that time, financial inability to care for a child, concern for or responsibility to others (especially concerns related to caring for a future child and/or for existing children), desire to avoid single parenthood, relationship problems, and feeling

too young or immature to raise a child (Finer, Frowirth, Dauphinee, Singh, & Moore, 2005). Some pregnancies are terminated because they are a consequence of rape or incest. Very few (<1%) women cite coercion from others as a major reason for their abortion (Finer et al., 2005). A very small percentage of abortions are of planned and wanted pregnancies. Women who terminate wanted pregnancies typically do so because of fetal anomalies or risks to their own health.

Gestational age at time of abortion varies. The vast majority (over 90%) of abortions in the United States occur in the first trimester of pregnancy (Boonstra, Gold, Richards, & Finer, 2006). Later-trimester abortions occur for a variety of reasons. In some cases, particularly involving teenagers, a woman may be unaware that she is pregnant until the second trimester or must go through legal proceedings (e.g., judicial bypass) in order to obtain an abortion (Boonstra et al., 2006). Later-trimester abortions also are performed after discovery of fetal abnormalities or risks to the mother's health.

Abortion procedures vary as well. Although most first-trimester abortions are performed using electric vacuum aspiration (EVA), nonsurgical methods involving use of a drug or combination of drugs to terminate pregnancy (e.g., mifepristone) are increasingly being used. Nonsurgical abortions comprised 14% of nonhospital abortions in 2005 as compared to 6% in 2001 (Jones, Zolna, Henshaw, & Finer, 2008). Procedures for abortions later than the first trimester include dilation and evacuation and induction of labor.

The experience of abortion may also vary as a function of a woman's ethnicity and culture. The United States is home to a growing number of ethnic and immigrant populations, including Hispanic (13%), African American (12.9%), and Asian and Pacific Islanders (4.2%). According to the 2000 Census data, African American women are more than three times as likely as White women to have an abortion (Dugger, 1998). Latinas are approximately two times as likely as White women to have an abortion, although there are important subgroup differences. Based on estimates from the Hispanic Health and Nutrition Examination Survey, among Latinas, Mexican women used abortion least; Puerto Rican women used abortion more than Mexican women, and Cubans used abortion the most (Erickson & Kaplan, 1998). The overrepresentation of ethnic minority women among those who obtain abortions in the United States may represent the general problem of greater poverty and reduced access to health care, including reproductive health services, among women of color. Although there appears to be a strong influence of traditional African American and Latino cultural and religious values on women's use of abortion, this influence varies by age, country or area of ancestry or origin, level of acculturation, socioeconomic status, and educational and occupational attainment (Dugger, 1998; Erickson & Kaplan, 1998). Thus, it appears that for women of color, moral and religious values intersect with identities conferred by race, class, or ethnicity to influence women's likelihood of obtaining an abortion

and, potentially, their psychological experiences following it. Historical linkages between coercive abortion and sterilization practices and the eugenics movements may lead some poor women and women of color to feel ambivalent on the issue of abortion despite understanding the importance of reproductive choice (Dugger, 1998; Erickson & Kaplan, 1998).

Women's experience of abortion may also vary as a function of the developmental phase of the life cycle in which it occurs. A teenager who terminates her first pregnancy, for example, may experience different psychological effects compared to an adult woman who terminates a pregnancy after giving birth to several children.

Women's experience of abortion may also vary as a function of their religious, spiritual, and moral beliefs and those of others in their immediate social context. There are religious denominational differences in social attitudes toward abortion (e.g., Bolzendahl & Brooks, 2005). Women who belong to religious groups that oppose abortion on moral grounds, such as Evangelical Protestants or Catholics, may be more conflicted about terminating a pregnancy through abortion. Religiosity and religious beliefs are likely to shape women's likelihood of having an abortion, as well as their responses to abortion.

In summary, women's psychological experience of abortion is not uniform, but rather varies as a function of characteristics and events that led up to the pregnancy; the circumstances of women's lives and relationships at the time that a decision to terminate the pregnancy was made; the reasons for, type, and timing of the abortion; events and conditions that occur in women's lives subsequent to an abortion; and the larger social-political context in which abortion takes place. This variability is an important factor in understanding women's psychological experiences following abortion. .

II. Conceptual Frameworks

Much of the research examining the psychological implications of abortion has been atheoretical (Posavac & Miller, 1990). Nonetheless, several different perspectives have shaped understanding of potential associations between abortion and mental health outcomes. These perspectives are not necessarily mutually exclusive and are often complementary. Yet, they lead to different questions and different methodological approaches and can lead to different conclusions.

II. A. Abortion Within a Stress and Coping Perspective

One frequently used framework for understanding women's psychological experience of abortion is derived from psychological theories of stress and coping (e.g., Lazarus & Folkman, 1984). This perspective views abortion as a potentially stressful life event within the range of other normal life stressors (Adler

et al., 1990, 1992). Because abortion occurs in the context of a second stressful life event—a pregnancy that is unwanted, unintended, or associated with problems in some way—a stress and coping perspective emphasizes that it can be difficult to separate out psychological experiences associated with abortion from psychological experiences associated with other aspects of the unintended pregnancy (Adler et al., 1990, 1992). Abortion can be a way of resolving stress associated with an unwanted pregnancy, and, hence, can lead to relief. However, abortion can also engender additional stress of its own.

A hallmark principle of psychological theories of stress and coping is variability (e.g., Billings & Moos, 1981; Lazarus & Folkman, 1984). From this perspective, although unwanted pregnancy and abortion can pose challenges and difficulties for an individual woman, these events will not inevitably or necessarily lead to negative psychological experiences for women. Stress emerges from an interaction between the person and the environment in situations that the person appraises as taxing or exceeding his or her resources to cope. A woman's psychological experience of abortion will be mediated by her appraisals of the pregnancy and abortion and their significance for her life, her perceived ability to cope with those events, and the ways in which she copes with emotions subsequent to the abortion. These are shaped by conditions of the woman's environment (e.g., age, material resources, presence or absence of a supportive partner) as well as by characteristics of the woman herself (e.g., her personality, attitudes, and values). Thus, for example, a woman who regards abortion as conflicting with her own and her family's deeply held religious, spiritual, or cultural beliefs but who nonetheless decides to terminate an unplanned or unwanted pregnancy may appraise that experience as more stressful than would a woman who does not regard an abortion as in conflict with her own values or those of others in her social network.

Research derived from a stress-and-coping perspective has identified several factors that are associated with more negative psychological reactions among women who have had an abortion. These include terminating a pregnancy that is wanted or meaningful; perceived pressure from others to terminate a pregnancy; perceived opposition to the abortion from partners, family, and/or friends; and a lack of perceived social support from others. Other factors found to be associated with more negative postabortion experiences include personality traits (e.g., low self-esteem, a pessimistic outlook, low-perceived control) and a history of mental health problems prior to the pregnancy (see Adler et al., 1992; Major & Cozzarelli, 1992; Major et al., 2000 for reviews).

Importantly, many of the same individual and interpersonal factors that predict how women will appraise, cope with, and react psychologically to abortion are also predictors of how women will appraise, cope with, and react psychologically to other types of stressful life events, including unwanted motherhood or relinquishment of a child for adoption. For instance, low-perceived social support, low self-esteem, and pessimism also are risk factors for

postpartum depression (Beck, 2001; Grote & Bledsoe, 2007; Logsdon & Usui, 2001). Consequently, the same risk factors for adverse reactions to abortion can also be risk factors for adverse reactions to its alternatives.

II. B. Abortion as a Traumatic Experience

Whereas the above framework views abortion within the range of normal life stressors, an alternative perspective views abortion as a uniquely traumatic experience. This perspective argues that abortion is traumatic because it involves a human death experience, specifically, the intentional destruction of one's unborn child and the witnessing of a violent death, as well as a violation of parental instinct and responsibility, the severing of maternal attachments to the unborn child, and unacknowledged grief (e.g., Coleman, Reardon, Strahan, & Cougle, 2005; MacNair, 2005; Speckhard & Rue, 1992). The view of abortion as inherently traumatic is illustrated by the statement that "once a young woman is pregnant.... it is a choice between having a baby or having *a traumatic experience"* (original italics; Reardon, 2007, p. 3). The belief that women who terminate a pregnancy typically will feel grief, guilt, remorse, loss, and depression also is evident in early studies of the psychological implications of abortion, many of which were influenced by psychoanalytic theory and based on clinical case studies of patients presenting to psychiatrists for psychological problems after an abortion (see Adler et al., 1990).

Speckhard and Rue (1992; Rue, 1991, 1995) posited that the traumatic experience of abortion can lead to serious mental health problems for which they coined the term *postabortion syndrome* (PAS). They conceptualized PAS as a specific form of posttraumatic stress disorder (PTSD) comparable to the symptoms experienced by Vietnam veterans, including symptoms of trauma, such as flashbacks and denial, and symptoms such as depression, grief, anger, shame, survivor guilt, and substance abuse. Speckhard (1985,1987) developed the rationale for PAS in her doctoral dissertation in which she interviewed 30 women specifically recruited because they deemed a prior abortion experience (occurring from 1 to 25 years previously) to have been "highly stressful." Forty-six percent of the women in her sample had second-trimester abortions, and 4% had third-trimester abortions; some had abortions when it was illegal. As noted above, this self-selected sample is not typical of U.S. women who obtain abortions. PAS is not recognized as a diagnosis in the *Diagnostic and Statistical Manual of the American Psychiatric Association* (American Psychiatric Association, 2002).

II. C. Abortion Within a Sociocultural Context

A third perspective emphasizes the impact of the larger social context within which pregnancy and abortion occur on women's psychological experience of these events. Unwanted pregnancy and abortion do not occur in a social vacuum. The current sociopolitical climate of the United States stigmatizes some

women who have pregnancies (e.g., teen mothers) as well as women who have abortions (Major & Gramzow, 1999). It also stigmatizes the nurses and physicians who provide abortions. From a sociocultural perspective, social practices and messages that stigmatize women who have abortions may directly contribute to negative psychological experiences post abortion.

The psychological implications of stigma are profound (see Major & O'Brien, 2005, for a review). Experimental studies have established that stigmatization can create negative cognitions, emotions, and behavioral reactions that can adversely affect social, psychological, and biological functioning. Effects of perceived stigma include cognitive and performance deficits (Steele & Aronson, 1995), increased alcohol consumption (Taylor & Jackson, 1990), social withdrawal and avoidance (Link, Struening, Rahav, Phelan, & Nuttbrock, 1997), increased depression and anxiety (Taylor, Henderson, & Jackson, 1991), and increased physiological stress responses (Blascovich, Spencer, Quinn, & Steele, 2001). Societal stigma is particularly pernicious when it leads to "internalized stigma"—the acceptance by some members of a marginalized group of the negative societal beliefs and stereotypes about themselves. Women who come to internalize stigma associated with abortion (e.g., who see themselves as tainted, flawed, or morally deficient) are likely to be particularly vulnerable to later psychological distress.

A sociocultural context that encourages women to believe that they "should" or "will" feel a particular way after an abortion can create a self-fulfilling prophecy whereby societally induced expectancies can become confirmed. Mueller and Major (1989) demonstrated experimentally the effect of expectancies on women's psychological experiences after abortion. They randomly assigned women prior to their abortion to one of three short counseling interventions. One intervention focused on improving women's self-efficacy for coping with abortion (creating positive coping expectancies), another focused on reducing the extent to which women attributed their pregnancy to their character (as opposed to their behavior), and the third focused on birth control. Women exposed to the self-efficacy intervention were significantly less likely to display depressed affect following the abortion than those in the other two conditions. Societal messages that convey the expectation that women will cope poorly with an abortion would be expected to have the reverse effect; i.e., by creating negative coping expectancies, they may cause women to feel bad following an abortion.

Whether or not a particular behavior or attribute is stigmatized often varies across cultures and time (Crocker, Major, & Steele, 1998). Actions that once were viewed benignly can become stigmatized (e.g., smoking), and others that once were highly stigmatized (e.g., sex out of wedlock, divorce, cohabitation) can become less so. As society's views of a behavior change, so too will the appraisals and responses of those who engage in that behavior. Hence, the sociocultural context can shape a woman's appraisal of abortion not only at the time that she undergoes the procedure, but also long after the abortion. Social

messages that encourage women to think about (reappraise) a prior abortion in more negative ways (as a sin, as killing a child) may increase women's feelings of guilt, internalized stigma, and emotional distress about an abortion they had long ago. In contrast, social messages and support groups that encourage women to cognitively reappraise an abortion in a more positive or benign way may lead to improved emotional responses (Trybulski, 2006).

II. D. Abortion and Co-Occurring Risk Factors

A fourth conceptual framework for understanding women's postabortion mental health emphasizes systemic, social, and personal factors that are precursors to unintended pregnancy and, hence, place women at risk for having abortions and/or predispose them to experience mental health problems, regardless of pregnancy and its resolution. From this perspective, mental health problems that develop after an abortion may not be caused by the procedure itself, but instead reflect other factors associated with having an unwanted pregnancy or antecedent factors unrelated either to pregnancy or abortion, such as poverty, a history of emotional problems, or intimate-partner violence. This co-occurring risk perspective emphasizes that aspects of a woman's life circumstances and psychological characteristics *prior* to or co-occurring with her pregnancy must be considered in order to make sense of any mental health problems observed *subsequent* to abortion.

Unwanted pregnancies are not random events. The lives of women who have unwanted pregnancies or abortions differ in a variety of ways from the lives of women who do not have unwanted pregnancies or abortions, and do so before, during, and after pregnancy occurs. These differences may have implications for later functioning apart from any influence from the experience of unwanted pregnancy and/or abortion. The necessity of considering preexisting or co-occurring group differences is widely recognized by researchers who study the consequences of nonmarital and adolescent births (e.g., Moore, 1995). As described below, substantial research literature has shown that systemic and personal characteristics that predispose women to have unintended pregnancies *also* predispose them to have psychological and behavioral problems. Consequently, correlations between abortion status and mental health problems observed after an abortion may be spurious due to their joint association with similar risk factors present prior to the pregnancy. We briefly review evidence consistent with this perspective below.

1. Systemic risk factors. Poverty is a systemic risk factor for unplanned pregnancy and for abortion. Women at particularly high risk for unintentional pregnancy and women who obtain abortions tend to be young, unmarried, poor, and women of color (Finer & Henshaw, 2006a; Jones, Darroch, & Henshaw, 2002a, 2002b; Jones & Kost, 2007). In 2000, women with resources below the federal poverty level represented 57% of all abortions (Jones, Darroch, & Henshaw, 2002b). Exposure to sexual or physical abuse during childhood and

exposure to intimate partner violence including rape also are associated with greater likelihood for both unintended pregnancy and abortion (e.g., Boyer & Fine, 1992; Dietz et al., 1999; Gazmararian, Lazorick, Spitz, Ballard, Saltzman, & Marks, 1996; see Coker, 2007; Pallitto & O'Campo, 2005; Russo & Denious, 1998b for reviews).

From a co-occurring risks perspective, the greater exposure to adverse life circumstances (poverty, abuse, and intimate violence) among the group of women who have abortions compared with other women may underlie a positive correlation observed between abortion and mental health problems. Given the former's greater exposure to adversity, the absence of such an association would be noteworthy.

Indeed, these same systemic factors shown to be associated with increased risk for unintended pregnancy and abortion have also been shown to be associated with increased risk for mental health problems. For example, studies based on nationally representative samples show that poverty is strongly related to an increased likelihood of psychiatric disorder (e.g., Kessler, et al., 1994; Robins & Regier, 1991). Children who grow up in poor neighborhoods are at higher risk for teen pregnancy, substance abuse, obesity, smoking, and dropping out of school, all of which are risk factors for psychological problems (Mather & Rivers, 2006; Messer, Kaufman, Dole, Savitz, & Laraia, 2006). Exposure to domestic (intimate) violence also is a strong and well-documented predictor of physical and mental health problems, including suicide, posttraumatic stress disorder, depression, and substance abuse (see Golding, 1999, for a meta-analysis and review). The more violence-related events a woman has experienced and the more stressful life events she has experienced in general, the greater her risk for developing a mental disorder (Breslau, Kessler, Chilcoat, Schultz, Davis, & Andreski, 1998; Brown & Harris, 1978; Golding, 1999).

2. Personal risk factors. In addition to systemic factors, personality or behavioral factors may also predispose a woman to unplanned pregnancy and abortion, as well as to mental health problems. There is substantial evidence that problem behaviors tend to co-occur among the same individuals. For example, high school students who report engaging in early sexual activity also are more likely to report smoking; using alcohol, marijuana, and hard drugs; minor delinquency; and, to a lesser extent, major aggression and gambling (Willoughby, Chalmers, & Busseri, 2004). Women who have unintended pregnancies and abortions are more likely than other women to have previously engaged in a behaviors such as smoking, using alcohol and illicit drugs, engaging early in sexual intercourse, and having unprotected sexual intercourse (Costa, Jessor, & Donovan,1987).

One explanation for this pattern is that involvement in problem behaviors follows definite pathways in which specific factors place the individual who has

participated in one behavior (e.g., drug use) at risk of initiating another (e.g., early sexual activity), which puts that person at risk for another event (unintended pregnancy), which in turn puts that person at risk for another event (abortion) (e.g., Kandel, 1989). A longitudinal study based on data from the National Longitudinal Study of Youth (NLSY) showed that drug use among young women greatly increased their risk of early sexual activity (before age 16) when other important risk factors were controlled (Rosenbaum & Kandel, 1990). In a subsequent study also based on data from the NLSY, Mensch and Kandel (1992) showed that drug use was *uniquely* predictive of both subsequent premarital teen pregnancy and the decision to terminate a premarital teen pregnancy. To avoid confounding antecedents of pregnancy with its consequences, they restricted their analyses to the youngest birth cohorts in the sample. This ensured that the measurement of the independent variables (e.g., drug use) preceded the events of interest (premarital teen pregnancy and abortion). They found that the risk of premarital teen pregnancy was nearly four times as high for women who had used illicit drugs other than marijuana as it was for women with no history of prior substance involvement. Furthermore, early illicit drug use was the strongest predictor of a later abortion. Another prospective longitudinal study found that women who at age 18 (none of whom had had a pregnancy or abortion) had reported smoking or using drugs had an increased likelihood of a subsequent unplanned pregnancy and, as a result, higher rates of abortion by age 29 compared to women who at age 18 had not reported using these drugs (Martino, Collins, Ellickson, & Klein, 2006).

An alternative explanation for the co-occurrence of problem behaviors is that individuals who engage in problem behaviors such as alcohol or drug use share a set of personality characteristics that predisposes them to engage in risky behaviors that increase the likelihood of other problems (e.g., unplanned pregnancy; Jessor & Jessor, 1977; see Dryfoos, 1990, for a review). For example, scoring high on a measure of “unconventionality” has been found to positively predict both abortion and unplanned pregnancy (Martino, Collins, Ellickson, & Klein, 2006). Personality factors that diminish a person’s ability to regulate negative emotion may also put him or her at risk for engaging in problem behaviors. In a longitudinal study of a representative sample of 1,978 Black and White adolescents, Cooper, Wood, Orcutt, and Albino (2003) found that high impulsivity and an avoidance style of coping with negative emotions were risk factors for involvement in a wide range of problem behaviors, including risky sexual behavior, substance use, delinquent behavior, and educational underachievement. Furthermore, an avoidance coping style prospectively predicted initial or increasing involvement in all of these problem behaviors among individuals with no prior experience with that behavior. Thus, for example, girls high in avoidance coping who had little or no prior sexual experience were subsequently more likely to engage in risky sexual behavior than girls lower in avoidance coping. Because early sexual activity and risky sexual behavior are risk factors for unintended pregnancy, which in turn is a risk factor for abortion,

being high in avoidance styles of coping with negative emotion may be a predisposing risk factor for the experience of abortion.

Importantly, many of these personal characteristics that put women at risk for problem behaviors and unplanned pregnancy also put them at risk for mental or physical health problems, *whether or not a pregnancy is aborted or carried to term*. For example, a number of studies demonstrate that using avoidant forms of coping with negative emotions is associated with poorer mental health and exacerbates adjustment difficulties over time, even after controlling for prior levels of adjustment (Aldwin & Revenson, 1987; Major, Richards, Cooper, Cozzarelli, & Zubek, 1998). The best predictor of mental health problems later in life is a prior occurrence of mental health problems. For example, Kessler, Avenevoli, and Merikangas (2001) reported that 50% of adolescents who had an occurrence of major depression and 90% of adolescents who experienced mania during their adolescence continued to have recurrences of these disorders in adulthood.

II. E. Summary of Conceptual Frameworks

The four perspectives summarized above can be complementary ways of understanding underlying causes of women's psychological experience of abortion. The first perspective regards abortion as a stressful life event similar to other types of stressful life events a woman may experience. According to this perspective, women will vary markedly in how they appraise, cope with, and adjust to unwanted pregnancy and abortion, just as people vary widely in how they respond to other types of stressful life events. A stress-and-coping perspective thus does not rule out the possibility that some women may experience severe negative psychological experiences following abortion, but locates such reactions in women's appraisals and coping processes and the personal and social factors that shape those, rather than in the nature of the event itself. In contrast, the second perspective suggests that due to its unique features, abortion is likely to be experienced as traumatic by most women. Thus, in contrast to other perspectives discussed, this particular framework suggests that most women will have negative psychological experiences subsequent to abortion.

The sociocultural perspective emphasizes that women's psychological experiences of abortion are shaped by the immediate and larger sociocultural context within which the abortion occurs. From this perspective, social and cultural messages that stigmatize women who have abortions and convey the expectation that women who have abortions will feel bad may themselves engender negative psychological experiences. In contrast, social and cultural messages that normalize the abortion experience and convey expectations of resilience may have the opposite effect.

The co-occurring risk perspective emphasizes that preexisting and/or ongoing conditions may account for differences in mental health or problem behaviors observed between women who have had an abortion and women who have not. Unwanted pregnancy and abortion are correlated with preexisting and/or ongoing conditions (e.g., poverty), life circumstances (e.g., exposure to violence), problem behaviors (e.g., drug use), and personality characteristics (e.g., avoidance style of coping with negative emotion) that can have profound and long-lasting negative effects on mental health. These conditions may predispose women to unintended pregnancies and abortion and have negative effects on mental health regardless of reproductive history and outcomes. From this perspective then, mental health and problem behaviors observed after abortion are often a byproduct of conditions and characteristics that preceded or coexist with the unintended pregnancy and abortion.

III. Methodological Issues in Abortion Research

Many scholars have noted that research on the mental health implications of abortion is plagued by numerous methodological problems (see, e.g., Adler et al., 1992; Koop, 1989; Wilmoth et al., 1992).These problems continued to be reflected in most of the studies reviewed by the current task force and limited conclusions that could be drawn from this literature. In the following discussion, we highlight the problems that we encountered most often in our review of the post-1989 literature. We do not recapitulate all of the details presented in previous methodological discussions (see McCall & Appelbaum, 1991, for further discussion of some of these issues). The primary issues we address are those of comparison and contrast groups, co-occurrence of risk factors, sampling, measurement of reproductive history and underreporting, attrition, statistical treatment of data, outcome measurement, and clinical relevance. These issues are not independent of each other. Indeed, the complex interactions among these factors can make it difficult to sort out their separate and combined effects.

III. A. Comparison/Contrast Groups

In order for empirical research to address the relative risk of elective abortion compared to alternative courses of action that a pregnant woman facing an unwanted pregnancy might take, clearly defined and otherwise equivalent comparison groups are essential. Otherwise, any previously existing group differences associated with the outcome variable may badly bias conclusions. One appropriate comparison group would be women who are denied or unable to obtain an abortion and who, hence, must carry to term an unwanted pregnancy. Other appropriate comparison groups would be women who deliver an unwanted pregnancy and either give the child up for adoption or raise it. By at least partly controlling for the “wantedness” of the pregnancy, such comparisons provide assurance that the women being compared face a similar situation. Unfortunately, very few studies used appropriate comparison groups.

One way researchers attempted to solve this problem was by using covariate adjustments to try to make “nonequivalent” groups “equivalent.” The analysis of covariance, however, can be extremely sensitive to violations of its assumptions, and these assumptions are particularly liable to violation when used to try to adjust for initial group differences (see, e.g., Elashoff, 1969). One violation occurs when the covariate(s) are measured after the treatment —a problem characteristic of retrospective studies of abortion, in which the covariates are assessed after the abortion. A second violation occurs when the relationship between the covariate and the outcome differs across groups. A third violation occurs when the relationship between the covariate and the outcome is nonlinear. Unfortunately, tests of the validity of these assumptions were rarely encountered in the published literature on abortion. Consequently, caution should be exercised in accepting the findings of studies in which initially incomparable groups were compared (adjusted for covariates) without a test of the validity of the assumptions.

III. B. Co-Occurring Risk Factors

Unfortunately, very few studies encountered in our review of the literature adequately assessed and controlled for co-occurring risks. As discussed above, there are naturally occurring interrelations among many of the phenomena associated with elective abortion that make it difficult to tease apart the causal chains that might be operating. Elective abortion commonly co-occurs with unwanted or unintended pregnancy, and unwanted/unintended pregnancy is often associated with adverse circumstances and characteristics that may be associated with mental health problems. Because few studies adequately controlled for these co-occurring risks, it is almost impossible from the available literature to distinguish outcomes that flow from abortion *per se* from outcomes that might appear to be associated with abortion, but in actuality have their origins in the unwanted/unintended pregnancy (or some other co-occurring risk), which is more highly represented in the abortion group than in the comparison group. It was particularly difficult to detect these co-occurring conditions and their consequences from secondary data analyses of data sets collected for other purposes because potential confounds that were not of interest in the initial data collection were unlikely to have been adequately assessed.

III. C. Sampling

Problems of sampling characterized most of the studies reviewed. Two basic designs in the abortion literature presented sampling problems. The first occurred when convenience samples of women were recruited specifically for the study without concern for the degree to which they represented a definable population, for example, women seeking pregnancy testing at a health clinic (Cohan, Dunkel-Schetter, & Lydon, 1993), women waiting to see their doctor (Williams, 2001), or pregnant teens residing at a maternity home (Medora, Goldstein, & von der Hellen, 1993). Often the samples were extremely small (<

30; e.g., Cohan et al., 1993). In many cases, little, if anything, was reported about the inclusion rates of the women in either the abortion group or the comparison groups or the context of their situations, information necessary to establish the representativeness and generalizability of the data. Sometimes data were based on volunteer samples of women who responded to mailed questionnaires about their reproductive history (Reardon & Ney, 2000). Such volunteers do not represent an unbiased sample representative of the population as a whole and cannot be used as evidence to establish prevalence rates or normative responses.

The second and equally problematic situation occurred when subsamples were selected for analysis from extant studies that were initially conducted for other purposes. This characterized most of the studies based on secondary analyses of medical records or public survey data sets. Many of the studies with the largest sample sizes that have been used to make claims about the effects of abortion are of this type—e.g., studies based on the National Longitudinal Study of Youth (NLSY) (e.g., Reardon & Cougle, 2002a; Russo & Zierk, 1992), National Survey of Family Growth (NSFG) (e.g., Cougle, Reardon, & Coleman, 2005), or the National Longitudinal Study of Adolescent Health (Coleman, 2006). In these studies, subsets of the complete sample were taken to allow certain comparisons of interest to be made. For example, only women who reported terminating or delivering a first pregnancy might be selected (e.g., Cougle et al., 2003).

There are a number of serious problems with selecting subsamples from the larger data set in this way: (a) The secondary sampling destroys the sampling properties that might have originally characterized the sample, particularly if population-based sampling weights were not properly taken into account. Distorted sampling weights (or non-use of sampling weights) can lead to inaccurate estimations when the results are used to estimate prevalence of mental health problems in the general population following abortion. (b) Sampling on certain characteristics (e.g., first pregnancy; Cougle et al., 2005; Schmiege & Russo, 2005) may affect other characteristics of the sample, thereby compromising generalizability. For example, women who have an abortion on their first pregnancy are more likely to be younger and to be unmarried than women who have their first abortion on a later pregnancy. (c) In some studies, additional sources of nonequivalence between abortion and comparison groups were created by selecting a first “target” pregnancy occurring in a specified time period of data collection (e.g., the latter 6 months of 1989). This was to create abortion and delivery comparison groups without attention to reproductive history differences between these groups, when reproductive history is a factor affecting retention in the population sampled (e.g., Cougle, Reardon, & Coleman, 2003; Reardon & Coleman, 2006; Reardon & Cougle, 2002a). (d) Serious violation of sampling principles also occurs when differential exclusion is used in constructing comparison groups such that one group is advantaged relative to the other (e.g., Coleman et al., 2002; Cougle, et al., 2005).

III. D. Measurement of Reproductive History and Problems of Underreporting

Many of the studies reviewed were characterized by inaccuracy in the information available regarding a woman's reproductive history, particularly her abortion history. In some studies, a woman's abortion status was verifiable (e.g., data were collected at the time that she sought an abortion at a clinic or from her medical records). More typically, however, abortion status was established based on self-report. For example, in all of the studies based on a secondary analysis of survey data, abortion status was established by asking women to indicate, either on a questionnaire or verbally, to an interviewer whether or not they had had an abortion in the past. Women's reports of an earlier abortion were then correlated with current mental health/emotional status, with the latter attributed to the former (e.g., Coleman, Reardon, Rue, & Cougle, 2002a; Cougle et al., 2005).

This approach has many problems. Abortion, like other stigmatized conditions, is typically underreported (Jones & Kost, 2007). It has long been recognized that individuals are unlikely to frankly answer questions that have the potential to be embarrassing, overly self-disclosing, or in other ways reflect negatively on them. One of the earliest applications of a statistical model designed for reducing bias in obtaining answers to sensitive questions—the so-called randomized response methodology—was for estimating the mean number of abortions in an urban population of women (Greenberg, Kuebler, Abernathy, & Horvitz, 1971). The percentage of women reporting an abortion on surveys is consistently lower than the number expected based on estimates made from national provider data, sometimes markedly so (Jones & Forrest, 1992; Jones & Kost, 2007). Absent the use of techniques such as randomized response methodology or the selection of highly disclosing samples, one is likely to obtain biased estimates of prevalence rates. Generally, there are two types of underreporting: failure to acknowledge having had any abortions and having had multiple abortions but reporting only some of them (Jones & Kost, 2007).

Underreporting of abortion in surveys is of particular concern when there is differential underreporting by subgroups of women (Fu, Darroch, Henshaw, & Kolb, 1998; Jones & Forrest, 1992). Women more likely to underreport include those who are unmarried, Black or Hispanic, Catholic, low-income, and aged 20–24 (Jones & Kost, 2007). Underreporting can introduce systematic bias into a study. Only a few studies reviewed attempted to test for possible underreporting biases. For example, Schmiege and Russo (2005) examined and compared the relation of abortion versus delivery to depression (CESD cutoff score) in the NLSY data set among groups known to vary in underreporting (e.g., White married women, unmarried Black women, Catholics). Their analyses suggested that at least in the NLSY data set, underreporting by specific subgroups did not appear to introduce systematic bias into observed associations between abortion and a mental health outcome.

In general, the nature of the potential bias introduced by underreporting (i.e., whether it biases toward overestimating or underestimating adverse impact of abortion) is unclear. It is possible that women who feel most distressed by an abortion are less likely to report it to others; as a consequence, they may be underrepresented in the abortion group, biasing results toward underestimating negative effects. It is also possible that response biases in the other direction may be observed. For example, women who are experiencing distress may view the survey as an opportunity for catharsis and hence be more likely to disclose their abortion than women less distressed. In addition, women most willing to report one "problem" (e.g., depression, anxiety, abuse) may also be those most able to recall or willing to report another "problem behavior" (abortion), biasing results toward overestimating negative effects. Many scholars have noted the problem of selective recall bias in surveys on the part of individuals experiencing a disorder who may (1) more thoroughly scrutinize their history in an effort to explain their disorder and (2) more accurately recall stigmatizing events, such as abortion, than individuals not experiencing a disorder (e.g., Neugebauer & Ng, 1990; Chouinard & Walter, 1994). Recall biases can explain, for example, why a positive relationship between abortion history and breast cancer has been observed in retrospective surveys but is absent in prospective studies (American Cancer Society: http://www.cancer.org/). Specifically, breast cancer patients seeking to understand their disease are thought to be more motivated to search their memories as well as more willing to report socially stigmatizing conditions (such as abortions or sexually transmitted infections) to a health care provider than are healthy women, leading to a spurious relationship.

Measurement of abortion also typically suffers from underspecification. Many studies lack important information about the abortion, such as length of gestation, type of procedure, or whether the abortion was performed for therapeutic reasons, all of which may affect how women respond emotionally and physically after an abortion. For example, abortions performed beyond the first trimester involve a more risky medical procedure and more pain, which may have negative effects. They also occur at a more advanced stage of development, which may change the meaning of the pregnancy, making abortion more stressful (Major, Mueller, & Hildebrandt, 1985). Delay may also reflect ambivalence toward the pregnancy or indicate that a wanted pregnancy was terminated because of discovery of a health problem or fetal defect. It is also unclear to what extent research on earlier surgical methods of abortion applies to newer nonsurgical methods of abortion, which are used at the earliest stages of gestation and differ from traditional methods in other ways as well, although studies suggest comparable postabortion emotional adjustment for women experiencing each method (Ashok, Hamoda, Flett, Kidd, Fitzmaurice, & Templeton, 2005; Howie, Henshaw, Najo, Russell, & Templeton, 1997; Lowenstein et al., 2006; Sit, Rothschild, Creinin, Hanusa, & Wisher, 2007).

III. E. Attrition

Another potentially serious methodological confound encountered was attrition—loss of cases during the course of an investigation. Attrition has been a long-standing concern in the study of abortion (see for example, Adler, 1976). The consequences of attrition range from potentially serious loss of power to biasing of results when attrition is not random (i.e., biased in a specific direction) and differs by group. In the case of abortion, for example, underestimation of the prevalence of distress in the final sample would occur if women who were most upset by the abortion were more likely to be lost to a follow-up than those who were retained in the sample. Similarly, overestimation of the prevalence of distress would occur if women who were least distressed by the abortion were more likely to be lost to a follow-up. Consequently, it is essential that researchers test for biases in attrition. Only a few studies reviewed did so. One study that did test for attrition (Major et al., 2000) found that among women who had a first-trimester abortion, those who were retained in the sample at the 2-year postabortion measurement period did not differ significantly from those who were lost to attrition on any demographic or psychological variable assessed either prior to the abortion, immediately post abortion, or 3 months post abortion. Thus, at least in this sample, no evidence of systematic bias in attrition was observed.

III. F. Outcome Measures: Timing, Source, and Clinical Significance

Problems of outcome measurement also were frequently encountered in this literature. It is vital that the measures of mental health are valid and reliable. In some studies reviewed, claims of mental health impact (or no impact) were made on the basis of psychometrically poor measures, including one-item measures (e.g., Coleman, 2006a; Reardon & Ney, 2000). For example, Reardon and Ney (2000) measured substance abuse with yes/no responses to the single question “Have you ever abused drugs or alcohol?” This is not a reliable measure of substance abuse. A clinically relevant measure (as opposed to a scale score without known clinical relevance) should be the minimal standard for measuring impact. In addition, claims of impact should be accompanied by epidemiologically meaningful effect size indicators such as odds ratios, which provide clinically relevant measures of impact. Odds ratios should be presented in conjunction with data of the rates or proportions of women affected (i.e., a finding of 3 to 1 in 100 women presents a different level of threat than 3 to 1 in 1 million women). Absolute and relative levels of the effect should be clear.

An associated problem encountered in both primary and secondary studies was related to the timing of measurement. Some studies first contacted their participants months or years (or an unspecified time interval) after the target abortion and engaged them in retrospective reporting of their preabortion status (e.g., Bradshaw & Slade, 2005; Cougle et al., 2005) or their mental health/emotional status at selected points after the event (e.g., Kersting et al., 2005). Retrospective reporting is subject to a large number of distortions and biases. There is agreement among methodologists that measures taken nearer

an event are more likely to be accurate than measures taken at a time distant from the event.

Finally, assessing the clinical significance of abortion, as with any other medical procedure, requires asking "what is the benefit?" as well as "what is the harm?" of the procedure. Many of the abortion studies reviewed focused only on negative outcomes. Focusing solely on adverse effects can create a distorted picture of the information needed to provide complete and accurate informed consent. It is akin to focusing on the risks of chemotherapy without addressing its potential benefits for curing cancer. For example, in separate reports based on the same sample, one research team reported a negative association between abortion and mental health (Fergusson, Horwood, & Ridder, 2006) and a positive association between abortion and other life outcomes (e.g., education, employment; Fergusson, Boden, & Horwood, 2007). The authors concluded that there is a "need for further research into the risks and benefits associated with abortion as a means of addressing the issues raised by unwanted or mistimed pregnancies" (Fergusson et al., 2007, p. 11).

III. G. Other Statistical Issues

Many of the studies included in our review were characterized by statistical problems. One frequently encountered problem, especially in the studies based on secondary data analyses, was inflation of the probability of making a Type I error in inference by performing many significance tests at the same level one would if there were to be only a single test. This appeared in two forms. The first form occurred when the initial sample (often a reasonably large sample) was divided into smaller and smaller subsets, and these subsets were then used to test for differences between abortion and nonabortion cases within each subset without any overall control for the number of significance tests conducted (e.g., Coleman, Reardon, & Cougle, 2002; Reardon & Ney, 2000). This practice increases the probability of a statistically significant difference occurring due to chance. The second form encountered was the ad hoc search for covariates. In many studies, especially those based on analyses of secondary data sets, the data analyst began with a set of all possible covariates (usually defined by the measures available in the data set) and tested each covariate for significance (testing the partial regression coefficients for significance). The analyst then proceeded to conduct analyses using only the significant covariates (e.g., Coleman, Maxey, Rue, & Coyle, 2005). Without any correction for chance via alpha-level control, this completely ad hoc, atheoretical approach also capitalizes on chance. Furthermore, the choice of covariates to include in analyses can play a key role in how much variance in the outcome variable is explained by pregnancy outcome.

III. H. Interpretational Problems and Logical Fallacies

In addition to the methodological problems described above, the TFMHA also encountered a number of cases in which data were incorrectly interpreted or generalized, if not in the actual research reports themselves, then in reviews, summaries, and press releases based on that research. Accordingly, the TFMHA felt it important to point out several logical fallacies that must be guarded against in drawing conclusions from this literature.

The first logical fallacy is the tendency to infer causation from correlation. Frequently, significant correlations observed between abortion history and other variables (e.g., substance abuse, depression, higher educational outcomes) were misinterpreted as evidence that abortion caused these variables to occur. Such causal claims are unwarranted, as the relationships may be spurious, the causal direction may be reversed, or the relationship may be due to a third variable that is associated with both abortion and the outcome variable (e.g., poverty). It is sometimes argued that a case for causality is stronger in abortion studies that establish (a) time precedence of the abortion before an outcome variable, (b) covariation of abortion and the outcome variable, and (c) lack of plausible alternative explanations or control of third variables associated with both abortion and the outcome variable. These, however, are only necessary but not sufficient conditions to establish causality. Furthermore, although some of the studies reviewed did meet criteria (a) and (b), the TFMHA could identify no study reporting a significant association of abortion with a mental health outcome that met criterion (c).

A second logical fallacy is the tendency to confuse a risk and a cause. For example, some writers appeared to assume that if a prior history of abortion was found to be a “risk factor” for a certain outcome (e.g., violent death), then a prior history of abortion is a “cause” of violent death. Many things can serve as markers for causes or may be associated with causes without themselves being a part of the causal mechanisms in play. For example, age is the most important known risk factor for Alzheimer’s disease (AD), but it is not the mechanism that *causes* people to develop AD. Rather, age is a statistical predictor in a population of who in that population is at risk, that is, more likely (older versus younger) to develop AD (http://www.nia.nih.gov/Alzheimers/). The steps that link risks and causes must be explicitly developed and demonstrated before one can validly make the assertion that removing a particular risk factor will lead to a desired outcome.

A third and very serious logical fallacy is the “interventionist fallacy”—the belief that if a relationship is observed between two variables, the form or magnitude of the relationship will remain unchanged if an intervention changes some part of the current state of affairs. For example, because there is a substantial positive relationship between family income and children’s school performance, it is tempting to think that increasing family income would lead to improved children’s school performance. Such a conclusion, however, does not logically follow. It might be that what drives the relationship between family

income and school performance is the family expenditure on books. Were one to intervene and supplement family income, it does not necessarily follow that the family would increase its expenditure on books, which are (in this example) the actual component that drives the child's school performance, and, hence, the intervention might fail.

As applied to the case of abortion, one example of the interventionist fallacy would be the belief that if abortion and depression are related, then reducing access to abortion would reduce the prevalence of depression. A change in the availability of elective abortion, however, would have many consequences. It would mean that women who want to terminate an unwanted pregnancy would now be forced to deliver. As a consequence, the characteristics of the population of women who delivered children would change. Characteristics previously prevalent among women who had an abortion (e.g., greater poverty, exposure to violence) would now be prevalent among the delivery group. The portrait of the mental health of mothers might reasonably be expected to be worse. This potential change in the profile of women giving birth does not include any new mental health problems that might develop from stresses associated with raising a child a woman feels unable to care for, or may not want, or from relinquishing a child for adoption. Thus, reducing access to abortion would be likely to result in poorer mental health among women who deliver. Hence, rather than reducing the prevalence of depression among women, this intervention could potentially increase it.

III. I. Summary of Methodological Issues

Most of the studies published on postabortion mental health contain one or more of the methodological or interpretational problems discussed above. Consequently, reviews of the literature that simply count the number of studies that show one effect versus another or that calculate effect sizes without carefully considering and weighing the quality of the evidence that produced the effect are inappropriate and often misleading. It is essential to keep the methodological and interpretational points discussed above in mind when considering the literature on postabortion mental health reviewed below.

It is also important to recognize, however, that not all design problems are equally serious. The extent to which a design flaw affects the merits of a particular study depends in part on the goal of the study. For example, the lack of a comparison group is not overly limiting when the researcher's goal is to understand predictors of response among women who have abortions. Some flaws can be compensated for by limiting generalization or interpretation. However, other flaws are so serious that they limit any conclusions that can be drawn from the study (e.g., differential exclusion of women from one group but not the comparison group on a variable known to be related to the outcome variable).

IV. Review of Scientific Literature

IV. A. Search Strategy and Criteria for Inclusion

In order to evaluate the scientific literature on mental health effects of abortion, the TFMHA searched PsycINFO and Medline for English-language peer-reviewed articles published between 1990 and 2007 based on human subjects. Research conducted with U.S. as well as non-U.S. samples was searched. Keyword combinations paired *abortion* with each of the following words: *anxiety, depression, mental disorders, mental health, trauma, PTSD, domestic violence, drug abuse, emotions, employment, life satisfaction, self-esteem, somatoform, stigma, substance abuse, suicide, acute psychosis, schizophrenia, psychiatric symptoms,* and *psychosocial factors.* In addition*, postabortion syndrome, postabortion adjustment,* and *therapeutic abortion* were also used as search terms. The search results were supplemented by a manual search of reference sections of reviewed articles. This search strategy resulted in an initial set of 216 unique references. Seven additional references were brought to the attention of the task force by reviewers.

Our review process consisted of four steps. In the first step of review, the abstract of each article in the initial set was reviewed independently by two task force members according to the following inclusion criteria: (1) The study reported empirical data of a quantitative nature (qualitative studies were omitted). (2) The study was published in a peer-reviewed journal (dissertations, letters to editors, reviews, book chapters, and conference proceedings were omitted). (3) The study included at least one postabortion measure related to mental health (those that considered only mental health prior to the abortion were omitted). (4) The study focused on induced abortion [those that focused solely on “spontaneous” abortions (miscarriages) or that did not differentiate miscarriage from induced abortion were omitted].

Those articles that appeared to meet all of the above criteria were included for further review. In the second step, a minimum of two task force members independently read all articles identified in our first step. Only articles judged to have met all of the above inclusion criteria were retained. In the third step, all studies that met criteria for inclusion were coded, summarized, and evaluated independently by at least two members of the task force, with the restriction that task force members did not evaluate their own work.

In a final step, articles were categorized according to whether or not they included a comparison group of women who did not have an abortion. Only studies that include a comparison group are capable of addressing the question of relative risk. Accordingly, our core review focused only on studies that included comparison groups. Studies without a comparison group have the potential to address predictors of individual variation in women's responses following abortion. They also are capable of addressing the question of prevalence of

mental health problems among women who have abortions, but only to the extent that they are based on a sample representative of the population to which one intends to generalize. Accordingly, in a separate section we review such studies, but only when based on a U.S. sample.

IV. B. Descriptive Overview of Literature Identified for This Review

Through the process described above, 50 papers were identified that compared psychological experiences of women after abortion to psychological experiences of a comparison group of women. These 50 include studies based on U.S. and international samples. The restriction of empirical studies to those published in English resulted in a relatively narrow slice of international contexts represented in this report. One should not assume that this small set is representative of the global experience of abortion and mental health, as laws, customs, and contexts vary widely. Twenty-five papers compared women who had an abortion to women who had a different reproductive history (e.g., a delivery, miscarriage, no pregnancy) by performing secondary analyses of public data sets or records originally collected for other purposes; 18 of these papers were based on U.S. samples; the remaining papers were based on samples from New Zealand (1) and Finland (6). These are summarized in Tables 1 and 2. A second set of papers (N = 19) described original studies conducted primarily for the purpose of comparing responses of women who had a first-trimester abortion (or an abortion of unspecified gestation) to responses of women who had a different reproductive history. Most of these studies were based on samples collected at clinics or physicians' offices; some were retrospective. Seven were conducted in the United States, the remainder in other countries. These studies are summarized in Tables 3a and 3b. A third set of papers (N=6) consisted of studies comparing psychological experiences of women who had a late-trimester abortion of a pregnancy for reasons of fetal anomaly to another group of women. All but one was conducted on non-U.S. samples. These studies are summarized in Table 4. These 50 papers constitute the core of our review. Our literature search also identified 23 papers based on U.S. samples that did not include a comparison group but met all other inclusion criteria. These papers are summarized in Table 5.

V. Review of Comparison Group Studies

V. A. Record-Based Studies and Secondary Analyses With Comparison Groups

The major change in the scientific literature during the time period encompassed by our review compared to the literature reviewed by the first APA task force was the publication of 25 papers in peer-reviewed journals based on secondary analyses of publicly available data sets. The studies are of two types: (a) analyses of data based on medical records and (b) analyses of data sets collected for purposes other than analyzing the relationship between pregnancy

outcome and mental health. Because publicly available data sets often include questions about reproductive histories, including pregnancy outcomes (abortion, delivery, miscarriage), they provide an opportunity for comparing women who report having had an abortion to other groups of women. Utilizing existing data sets, particularly longitudinal data sets, also has the advantage of being able to ask and answer questions without having to wait the years it takes to conduct a prospective study focused specifically on abortion. Findings based on national probability samples potentially may be generalized more widely than those based on convenience samples and may be more useful for estimating normative effects. Nonetheless, as pointed out above in the methodological issues section of this report, there are many serious limitations of this approach that severely constrain conclusions that can be drawn from these studies (see also McCall & Appelbaum, 1991). In the following discussion, we provide a brief description of these studies, followed by an evaluation of their methodology. Table 1 and Table 2 provide a description of the key methods, measures, and findings of these studies, as well as their limitations.

1. Medical records. Ten papers were published based on medical records. Four papers were based on analyses of medical records from California's state-funded insurance program (Medi-Cal). This program provides health care for low-income children and families, as well as elderly, blind, and disabled persons in the state of California. These "at-risk" women may be facing a wide range of challenges that compromise their physical and mental health. Six reports were based on official health register data drawn from medical records and on the entire population of Finland (See Table 1).

All four Medi-Cal studies focused on an initial target pregnancy event (abortion vs. delivery) in the last half of 1989 and after excluding women with subsequent abortions only from the delivery group, examined the records of the remaining sample of women for subsequent death (Reardon et al., 2002), outpatient admissions (Coleman, Reardon, Rue, & Cougle, 2002b), inpatient admissions (Reardon, Cougle, Rue, Shuping, Coleman, & Ney, 2003), and sleep disturbances (Reardon & Coleman, 2006). All four papers reported higher rates of negative outcomes in the abortion group compared with the delivery group.

In considering the weight of the evidence with regard to the mental health implications of abortion, it should be kept in mind that the Medi-Cal studies are not independent of each other because the samples overlap, and most of the outcomes examined are correlated. Strengths of the Medi-Cal studies include an objectively verifiable abortion history and the use of diagnostic codes for assessing mental illness. Nonetheless, these papers are characterized by a number of methodological limitations that make it difficult to interpret the results. These include differential exclusion of women with subsequent abortions from the delivery group but not from the abortion group, a sampling strategy that both advantaged the delivery group and rendered generalizability of the findings problematic; lack of basic demographic information known to be associated with

mental health, including marital status and race; lack of information about previous reproductive history, lack of adequate assessment of prior mental health history, lack of adequate information about co-occurring risks (e.g., health status, violence exposure), lack of information about critical characteristics of the abortion decision context (e.g., whether the pregnancy was initially intended and terminated because of fetal anomalies), and inclusion of covariates across analyses and studies that varied for unspecified reasons (see Table 1). Yet another problem with this data set is that women who deliver a child are more likely to be eligible for Medi-Cal because they have a baby, independent of their own characteristics. Women who have an abortion may qualify for the abortion, but those who remain on Medi-Cal post abortion (and who hence would be picked up in the follow-up measurement) would have to have other characteristics besides motherhood to qualify (e.g., mental illness, other illness, poverty not associated with parenthood).

The Medi-Cal findings with regard to cause of death (Reardon et al., 2002) can be compared with record-based studies conducted in Finland that are based on the entire population of the nation (Gissler, Hemminki, & Lonnqvist, 1996; Gissler et al., 1997), albeit from a differing cultural context. These studies also found significantly higher rates of pregnancy-associated deaths for natural and violent causes (including accidents, homicide and suicide) in the abortion group compared with a delivery group. Like the Medi-Cal studies, these studies also had methodological limitations, including lack of information about pregnancy wantedness and lack of assessment of other critical variables known to co-vary with both pregnancy outcome and mental health (e.g., prior reproductive history, prior mental health problems, violence exposure, etc).

The largest and most methodologically rigorous Finland study used definitions provided by the American College of Gynecology (ACOG) to analyze direct pregnancy-*related* deaths (deaths occurring within one year of end of pregnancy from causes related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes) separately from pregnancy-*associated* (deaths occurring within one year from end of pregnancy, regardless of cause of death) (Gissler, Berg, Bouvier-Colle, & Buekens, 2004b).These analyses revealed that women in the abortion group had *lower* rates of pregnancy-*related* deaths than women in the delivery group (1.3 vs. 3.9 per 100,000 pregnancies), but higher rates of pregnancy-associated deaths. However, when therapeutic abortions were excluded from the category of pregnancy-*associated* deaths, women in the abortion group no longer had higher pregnancy-associated death rates than women in the delivery group. This study affirms the importance of making a distinction between pregnancy-*related* and pregnancy-*associated* deaths in drawing valid conclusions about the association between abortion (vs. delivery) and subsequent risk for various causes of death and also establishes the importance of separating therapeutic from elective abortions when attempting to draw such conclusions.

The most consistent findings across the Medi-Cal and Finland record-based studies were the higher rates of violent death for women in the abortion group. In the Finland study described above, women in the abortion group had higher rates of violent pregnancy-associated deaths, and a higher proportion of their overall pregnancy-associated deaths were due to violent causes (Gissler et al., 2004b). In interpreting this finding, it is useful to recall the distinction between risk and cause discussed above. Abortion is a marker of risk for violence, not a cause of violence. Thus it is important to control for violence exposure in studies of pregnancy outcome.

2. Secondary analyses of survey data. Fifteen papers based on secondary analyses met inclusion criteria for our review. These were based on nine data sets. Eight data sets were from the United States: Five were based on U.S. national probability surveys, and three were based on local metropolitan area surveys. One paper was based on analyses of the longitudinal New Zealand Christchurch Health and Development survey. Key findings and methodological limitations of these studies are summarized in Table 2.

National Longitudinal Survey of Youth (NLSY). The NLSY has been the data set used most frequently to examine the relationship of abortion to mental health outcomes. The NLSY is a longitudinal national survey of a cohort of males and females aged 14-21 years in 1979. Papers meeting our inclusion criteria assessed the following outcome variables: self-esteem measured in 1987 (2 studies), risk for depression measured in 1992 (3 studies), and substance use measured in 1988 (1 study). This set of papers demonstrates the problems of trying to base conclusions about the mental health effects of abortion on secondary analyses of data sets collected for other purposes. Conclusions of researchers analyzing this same data set and even the same dependent variable varied markedly depending on sampling and analytic strategy.

Self-esteem. The first of the abortion studies to be based on this data set focused on self-esteem as measured by the Rosenberg self-esteem scale (RSE; Rosenberg, 1965). This first study (Russo & Zierk, 1992) analyzed a total sample of 5,295 women (773 of whom reported having at least one abortion). Women who had an abortion had mean RSE scores comparable to those of all women (33.3 vs. 33.2, respectively); women who had one abortion also had significantly higher RSE in 1987 than the other two groups (women with no abortions, women with repeat abortions), although the relationship was extremely small. When contextual variables were controlled (education, income, employment, marriage, number of children, whether the pregnancy was wanted or unwanted), however, neither having one abortion nor repeat abortions was related to subsequent self-esteem. After eliminating from the study women who had an abortion before RSE was measured in 1980, further analyses found that preexisting self-esteem was the most important predictor of 1987 RSE, followed by having more education, higher income, employment, and fewer children.

This study reported a number of relationships that have implications for what should be controlled when analyzing NLSY data, especially the importance of controlling for wantedness of pregnancy and separating women with one abortion from those having repeat abortions. The number of abortions was slightly but significantly and positively correlated with unwanted births (r = .11). Furthermore, repeated unwanted pregnancy, regardless of pregnancy outcome (birth or abortion), was significantly correlated with greater likelihood of living in poverty (r = .15) and lower education (-.13).[1]

Depression risk**.** Using a very different approach, three studies focused on the effects of first pregnancy outcome (abortion vs. delivery) on risk for subsequent depression (measured in 1992 by the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977). Reardon and Cougle (2002a) focused on *unintended* first pregnancy outcome (abortion vs. delivery). After correcting an initial coding error, they reported analyses controlling for age at first pregnancy, race, marital status, and whether the woman was in her first marriage. They also attempted to control for prior mental health by including only women who had completed an abbreviated Internal-External Locus of Control scale (I-E Scale; Rotter, 1966), assessed in 1979, prior to having a first pregnancy. Among all women, 25% of the delivery group exceeded the CES-D cutoff score for depression (>15) compared to 27% of the abortion group, a nonsignificant difference. Among married women in this subsample, a significantly higher percentage of women in the abortion group (26%) than in the delivery group (19%) exceeded the CES-D cutoff score. Among unmarried women in this subsample, the findings were reversed, although not statistically significant (36% vs. 29%).

Cougle et al. (2003) published another paper also focusing on first-pregnancy outcome (abortion vs. delivery) relative to the same outcome variable, 1992 CES-D. This study is based on essentially the same sample as the previous one with the primary difference being that women with wanted pregnancies were also included in the delivery group. Again, a larger percentage of women in the abortion group exceeded the CES-D cutoff score for depression compared with women in the delivery group.

Both of these studies are characterized by a number of problems, the most important of which are the miscoding of the first pregnancy variable and the differential exclusion of women having subsequent abortions only from the delivery group (see Table 2 for details).

In an effort to redress these problems, Schmiege and Russo (2005) reexamined depression risk in the NLSY. Using codes provided by the NLSY staff, they identified a sample of 1744 women as having an unwanted first pregnancy. (They, too, had a coding error in their initial article, but it did not affect the pattern and significance of their findings when corrected. After a series of interchanges in which they addressed criticisms of their approach, we report here

the findings based on the corrected codes verified by the NLSY staff and published with the analyses.) First, Schmiege and Russo found that the sampling strategy that Reardon and Cougle (2002a) and Cougle et al. (2003) had used to control for prepregnancy psychological state (which was to include only those women who had completed the Rotter I-E scale in 1979 prior to their first pregnancy) resulted in excluding from their sample the women who had the highest risk for depression—those who had delivered at a younger age. Significantly more women who had delivered pre-1980 exceeded the CESD cutoff score (33.5%) than who had an abortion pre-1980 (26.5%). Like Cougle et al. (2003), they controlled for age of first pregnancy, race, education, and family income. However, instead of excluding women based on previous marriage, they considered it more appropriate to maximize generalizability by controlling for marital status. When Schmiege and Russo analyzed the full sample (not restricted on the basis of I-E scores), they found no significant differences in depression between the abortion and delivery groups when race, age at first pregnancy, 1992 marital status, education, and family income were controlled: 28.3% of women in the delivery group exceeded the CESD cutoff score compared to 25% of the abortion group, a nonsignificant difference.

They also examined the implications of the practice of differentially excluding all women who had subsequent abortions from only the delivery group (but not from the abortion group) by comparing abortion and delivery groups with women having subsequent abortions excluded from *both* groups. Using this approach, significantly more women in the delivery group (28.1%) than the abortion group (20.7%) exceeded the CESD cutoff score (*p.* <01). These analyses illustrate that the sampling and exclusion strategies researchers use to analyze secondary data sets can dramatically alter the conclusions reached regarding the relative risks for depression accompanying childbirth versus abortion. When attempting to examine the effects of first pregnancy outcome, it is important to control for both number of subsequent abortions and number of subsequent births in both groups.

Substance use. Reardon et al. (2004) used NLSY data to examine substance abuse among 535 women who had terminated a first unintended pregnancy compared with 213 women who had delivered a first unintended pregnancy and 1144 women who had never been pregnant. These researchers again excluded women pregnant before 1980 (i.e., those known to be at a significantly higher risk for depression than other women in the sample and more likely to be found in the delivery group; Schmiege & Russo, 2005). They also excluded women who had subsequent abortions from only the delivery group. In this subsample, controlling for prepregnancy I-E and RSE, age, race, marital status, income, and education, few significant differences were found between groups in reported substance use. The exceptions were that women in the abortion group reported drinking on more days in the last month than the delivery group (6.4 vs. 4.8), but not on more days than the never pregnant group (5.9%). They were also more likely to report using marijuana in the last month (18.6%)

than did women in the delivery (7.9%) or never pregnant (7.9%) groups. These researchers did not control for history of drug use prior to the first pregnancy in their analyses despite the availability of this information in the data set and despite published findings in the literature that linked such drug abuse to later reproductive outcomes including likelihood of having an abortion (Mensch & Kandel, 1992; Rosenbaum & Kandel, 1990).

Evaluation of NLSY studies. Conclusions drawn from the NLSY about the mental health effects associated with abortion vary markedly by analytical strategy. Although the design of NLSY is longitudinal, like all survey data, it is correlational, making causal claims inappropriate. Collectively, these studies have a number of methodological limitations beyond those described above that make it difficult, if not impossible, to interpret the meaning of the correlations that are reported (see Table 2). Perhaps most importantly, none of these studies adequately controls for preexisting mental health or other important co-occurring risk factors prior to abortion or delivery (the Rotter I-E is not a measure of prior mental health), making it difficult to interpret the meaning of correlations observed between abortion and a mental health outcome. Covariates included in analyses varied across studies for unspecified reasons. Likewise, some contextual variables, such as marital status, that were shown in some studies to moderate results were not examined as moderators in other studies, compounding difficulties of comparing across studies. Further, some variables that were present in the NLSY and known to be related to the outcome variable under consideration (e.g., prior substance abuse) were omitted as covariates in analyses of that outcome variable. Analyses were often based on small subgroups or subgroups for which no sample size was provided. On the other hand, the overall large sample sizes used for some analyses mean that small effects that are statistically significant may have little clinical significance.

Although initially based on a national probability sample, the ability to assess prevalence of mental health problems among women who have abortions from this data set is limited because (1) abortion has been underreported in the NLSY compared with national norms; (2) sample weights, required to construct population estimates from the data, were not used in the analyses of any of the studies; and (3) the measurement of mental health outcomes was limited to self-esteem, depression risk, and substance abuse. No actual measures of psychopathology were included.

The potentially strongest designs focused on mental health outcomes associated with unintended first pregnancy. However, the practices of excluding women who became pregnant at a young age (before 1979 or 1980) and differentially excluding women having abortions subsequent to first pregnancy from the delivery group but not the abortion group were shown to bias results toward overestimating adverse effects of abortion in this data set. In the one study focusing on first pregnancy that did not use differential exclusion and was based on codes provided by NLSY staff, the proportion of women who met or

exceeded the CESD cutoff scores did not significantly differ between abortion (25%) and delivery (28.3%) groups (Schmiege & Russo, 2005).

Washington, DC, Metropolitan Area Drug Study. Coleman, Reardon, and Cougle (2005) used this public release data set to examine substance use during pregnancy as a function of reported reproductive history. The initial sample, which consisted of 1,020 women interviewed after giving birth in Washington, DC, area hospitals in 1992, was predominantly never married, Black, of low socioeconomic status, and oversampled for low birth weight and preterm infants, and self-reported drug use. Of these cases, Coleman et al. (2005) selected those who in their interview reported no abortions, one abortion, or multiple abortions prior to their recent pregnancy and examined their reported drug use during their recent pregnancy (see Table 2). Adjusted for age, income, and number of people living in the house, a statistically higher odds ratio was reported for the use of legal and illegal substances during the index pregnancy if the woman had reported one prior abortion compared with no abortions, but not if she had reported multiple abortions compared with no abortions (with the exception of use of cigarettes during pregnancy). Notably, these analyses did not control for history of drug use prior to the pregnancy. They also did not control for the wantedness of the pregnancy, although those data were available in the data set. Because this study is based on a specialized sample, estimates of mental health problems among women in the United States who have an abortion cannot be determined from this study.

National Pregnancy and Health Survey. Coleman, Reardon, Rue, and Cougle (2002a) used data from this survey conducted in 1992 to examine the association between retrospective reports of a previous abortion and use of alcohol, cigarettes, or illicit drugs during the most recent pregnancy. The initial sample consisted of 2,613 women who participated shortly after giving birth in hospitals within the United States. The women wrote down answers in response to interviewer questions; responses were concealed from the interviewer. Samples selected for analysis were limited to three groups who had recently given birth: women with one previous pregnancy resulting in an induced abortion (n = 74), women with one previous pregnancy resulting in live birth (n = 531), and women with no previous pregnancies (n = 738). The majority of the women were White, married, and employed full-time. Dichotomous measures of drug and alcohol use during most recent pregnancy were used as outcome variables. Analyses revealed that women who reported a previous abortion also reported higher rates of any illicit drug use, marijuana use, and alcohol use than did women who had one previous live birth or were first-time mothers. The researchers adjusted for sociodemographic covariates by stratifying those related to substance use outcomes and conducting separate analyses for each level of these variables. Although these analyses identified some differences in the relationship of reproductive history to alcohol and drug use for different levels of marital status, income, and other demographic variables, findings are suspect because of the small number of participants in the abortion group and the failure

to correct for the relatively large number of significance tests. Other limitations include the absence of controls for wantedness of the recent pregnancy, history of drug use prior to the pregnancy, or previous mental health.

Fertility and Contraception Among Low-Income Child Abusing and Neglecting Mothers in Baltimore, MD, 1984-1985 (Baltimore Study). Coleman, Maxey, Rue, and Coyle (2005) analyzed this data set to examine the association between self-reported abortion or miscarriage/stillbirth history and child abuse and/or neglect, as identified by Child Protective Services. The purpose of the original study had been to study family patterns and contraceptive use among maltreating mothers. Samples of 118 physically abusive mothers, 119 neglecting mothers, and 281 mothers without maltreatment offences were selected from a sample of 518 mothers who were receiving Aid to Families With Dependent Children (79.9% Black and 93.2% unemployed). In an in-home interview, 159 of these women reported having had at least one abortion, and 133 reported at least one miscarriage or stillbirth (both occurring on average 6-7 years earlier). Controlling for a large number of single-item covariates found in preliminary analyses to be associated with maltreatment (and that varied depending on their association with the outcome variable, e.g., education was controlled only in the analyses on physical abuse; employment controlled only in the analyses on neglect), women reporting one abortion were not more likely than those reporting no abortions to be in the child neglect group but were significantly more likely to be in the physical abuse group. History of multiple induced abortions, however, was not related to increased risk for either abuse or neglect. In contrast, maternal history of multiple miscarriages and/or stillbirths compared with no history was associated with increased risk of both child physical abuse and neglect. Because this study is based on a highly specialized sample, findings cannot be generalized to the population of women in the United States.

Health of American Women Survey. Russo and Denious (2001) used data from this survey, sponsored by the Commonwealth Fund, to examine correlations among abortion history, violence history, and mental health outcomes. This telephone survey was based on a national sample of men and women 18 years of age or older, with oversampling of ethnic minorities. Among the 2,525 women surveyed, 324 reported having had an abortion to the interviewer. Compared with other women, a larger percentage of women in the abortion group reported experiencing suicidal thoughts in the past year and having a doctor give them a diagnosis of anxiety or depression in the past 5 years. Having an abortion was also slightly but significantly correlated with higher depressive symptoms and lower life satisfaction. When violence history and relevant demographic and partner variables were controlled, however, abortion was no longer significantly related to diagnoses of depression or anxiety, CES-D score, or the life satisfaction measure. This study, like the others of this type, has several limitations. Abortion history was assessed through self-report (in this case over the phone), and the rate of reported abortions was low compared with national

norms, raising concerns about biases associated with underreporting. It cannot be determined from this data set whether the abortion took place before or after the violence occurred, or whether diagnoses of anxiety or depression occurred pre- or post abortion. In addition, sampling weights were not used.

National Survey of Family Growth (NSFG). Cougle et al. (2005) used data from the 1995 NSFG to examine the association between outcome of first-unintended pregnancy (abortion vs. delivery) and an occurrence of “generalized anxiety” lasting more than 6 months (defined by a cutoff score). All variables—reproductive history, episodes of anxiety, as well as the timing of those episodes with respect to pregnancy— were determined retrospectively via self-reports, raising questions about reliability and underreporting of abortion. As in their earlier studies, women with subsequent abortions were differentially excluded from the delivery group but not the abortion group. Controlling for race and age at interview, women in the abortion group were more likely to be classified as having had an episode of generalized anxiety postpregnancy than women in the delivery group (13.7% vs. 10.1%). Sample weights were not used, so these percentages cannot be used for normative estimates. Although information on rape history, known to be related to both unintended pregnancy and anxiety, was in the data set, it was not controlled. The anxiety items were not congruent with the DSM definition of generalized anxiety disorder, raising questions about the clinical significance of the outcome variable.

National Longitudinal Study of Adolescent Health (ADD-Health). Two studies were based on the ADD-Health data set, a longitudinal, nationally representative, school-based survey of adolescents. Coleman (2006a) analyzed data from the ADD-Health to examine the relationship between reproductive history and various problems in adolescents. From a much larger sample of students who had completed an in-school questionnaire at Wave I (N = 90,118) and a computer-assisted home interview at Wave II (N =12,105), Coleman selected adolescents in grades 7 through 11 who had completed both Wave I and Wave II and who reported experiencing a pregnancy they described as "not wanted" or "probably not wanted" that was resolved through abortion (n = 65) or delivery (n = 65). She then examined the likelihood that adolescents who reported abortion versus delivery also reported receiving counseling for psychological or emotional problems, having trouble sleeping during the past year, using cigarettes or marijuana during the past 30 days, using alcohol during the past year, or reported having problems with parents because of alcohol use. All outcomes were assessed with single-item measures. Adjusted for covariates previously shown to differ between the two groups (risk-taking and desire to leave home), girls who reported an abortion were more likely than girls who delivered to say they had ever had counseling, trouble sleeping during the past year, and used marijuana in past 30 days. No differences were observed on frequency of alcohol use or cigarette smoking.

Strengths of this study included the use of a comparison group of girls who delivered unwanted pregnancies, the weighting of design factors in the analyses, and efforts to enhance the accuracy of self-reports of sensitive topics (respondents listened to prerecorded questions through earphones and entered their own answers). Nonetheless, problems of sampling and measurement limit the utility of this study. The extremely small number of girls in the eventual sample analyzed (*N*=130), especially given the very large original sample (of approximately 6,000 girls), raises questions about underreporting, drop-out rates, and exclusion criteria. Given that the sample is school-based, adolescents who drop out of school to care for a child would not be included in the study. The single-item measures of psychological problems are psychometrically weak and clinically suspect. Because the percentages and *N*s for outcome variables were not reported, the frequency with which problems occurred cannot be determined. Furthermore, the measure of counseling asked whether the respondent had *ever* received counseling for psychological or emotional problems—it cannot be determined from this item whether counseling occurred prior or subsequent to the pregnancy.

Hope, Wilder, and Watt (2003) used data from the ADD-Health study (Waves I and II) to examine the relationships among adolescent pregnancy, pregnancy resolution, and delinquent behavior. Although delinquency includes behaviors that are not part of the mental health focus of this review (e.g., lying to parents/guardian, taking part in a fight), one domain of delinquent behavior examined (alcohol use, use of illegal substances) is within the purview of this review. Thus, we focus here on longitudinal analyses examining the relationship between pregnancy resolution and substance use. In a set of prospective analyses focusing on adolescent girls who became pregnant between Wave I and II of the survey, Hope et al. examined the relationship of pregnancy resolution (abortion vs. kept baby) to reports of having smoked cigarettes or marijuana at least 1 day in the past 30 days. These comparisons of the abortion and “kept baby” groups excluded girls who experienced pregnancies prior to Wave I as well as those who miscarried or were still pregnant at Wave II.

Young women who had abortions reported higher rates of cigarette smoking and marijuana use than young women who kept their baby, both prior to their pregnancy (Wave I) and subsequent to their pregnancy (Wave II). Keeping the baby was associated with a decrease in reported cigarette or marijuana use between the two waves of data collection, leading the authors to conclude that adolescent motherhood functions as a social control on delinquent behavior. In contrast, having an abortion was not associated with a change in rates of smoking or marijuana use from Wave I to Wave II, leading the authors to conclude that terminating a pregnancy through abortion does not increase the likelihood of delinquent behavior or substance use.

In addition to strengths and weaknesses of the ADD-Health school-based database described above, this study is limited by single-item measures of

cigarette and marijuana use that are psychometrically weak. Furthermore, despite the large initial sample size of over 6,000 girls, the number of pregnant girls (69 who had abortions, 87 who kept their baby) in the final sample was small.

The Harvard Study of Moods and Cycles. Harlow, Cohen, Otto, Spiegelman, and Cramer (2004) used data from a cross-sectional sample of 4,161 women between 36-45 years of age residing in the Boston metropolitan area to examine the relationship of early life menstrual-cycle characteristics and reproductive history to onset of major depression later in life. They analyzed data from a subsample of 332 women who met DSM criteria for having had major depression and 644 women with no current or past history of major depression. In-person interviews were used to establish mental health status and to gather information on demographic and lifestyle characteristics, menstrual and reproductive history, past and current medical conditions, and use of hormonal and nonhormonal medications. Relevant analyses examined the link between lifetime history of depression and abortion history. There were no significant differences between the proportion of women with a lifetime history of major depression (19.3%) who reported having one abortion and the proportion of women with no history of depression (17.9%) who reported having had one abortion. However, women with a lifetime history of depression were significantly more likely to report having had multiple abortions before their first onset of depression than were nondepressed women, controlling for age, age at menarche, educational attainment, and marital disruption. Direct comparisons between women reporting abortion versus delivery were not conducted. The researchers also reported a strong association between depression and marital disruption, underscoring the importance of controlling for marital status when seeking to assess the independent contribution of abortion to depression risk. The researchers pointed out that the higher proportion of women with multiple abortions found in the depressed versus nondepressed group may reflect a variety of antecedent conditions that were not assessed in the study, including involvement in abusive relationships. A particular strength of this study is its measurement of a clinically significant mental health disorder (depression) with established diagnostic criteria. In addition to the usual issues involved with a cross-sectional study that relies on retrospective self-report, study limitations include the possibility of a selective recall bias on the part of depressed women, and lack of information on pregnancy intention or wantedness, whether or not abortions were for therapeutic reasons, and women’s exposure to violence.

New Zealand Christchurch Health and Development Study. The most comprehensive of the secondary analysis studies in terms of assessment of mental health outcomes was conducted in New Zealand (NZ). Fergusson et al. (2006) analyzed data from a 25-year longitudinal study of a cohort of children (including 630 females) born in 1977 in the Christchurch, NZ, urban region who were studied from birth to age 25 years. Information was obtained on (a) the self-reported reproductive history of participants from 15-25 years (abortion, delivery,

or never pregnant); (b) measures of DSM-IV mental disorders (including major depression, overanxious disorder, generalized anxiety disorder, social phobia, and simple phobia) and suicidal behavior for intervals 15-18, 18-21, and 21-25 years; and (c) childhood, family, and related confounding factors, including measures of child abuse.

In a series of concurrent analyses adjusting for covariates such as greater childhood social and economic disadvantage, family dysfunction, and individual adjustment problems in the abortion group, Fergusson et al. (2006) found that women in the abortion group had significantly higher rates of concurrent depression, suicidal ideation, illicit drug dependence, and total number of mental health problems than the delivery group. Concurrent analyses also indicated that except for alcohol and anxiety disorder, the abortion group had significantly higher rates of these disorders than the never pregnant group. More important, however, are the prospective analyses reported, as these capitalize on the longitudinal strengths of the study. The authors conducted a prospective analysis using reproductive history prior to age 21 years to predict total number of mental health problems experienced from 21-25 years (samples were too small to permit analyses by disorder). Controlling for covariates, the abortion group had a significantly higher number of disorders than the other two groups, which did not differ significantly from each other.

This study is unusual in the quality of measurement of the mental health variables, range of outcomes assessed, and number of co-occurring risk factors controlled. However, several design features limit conclusions that can be drawn from this study. First, neither wantedness nor intentionality of pregnancy was controlled. Second, women with multiple abortions were not separated from women with one abortion (21.6% of the abortion group had more than one abortion).[2] Third, as with other survey studies of this type, comparisons of reported abortions with population data suggest that abortion was underreported in this sample, although not to a great extent. Finally, differing abortion regulations between the United States and NZ also mean that caution should be used in generalizing from these studies to women in general in the United States.

In order to obtain a legal abortion in NZ, a woman must obtain the approval of two specialist consultants, the consultants must agree that either (1) the pregnancy would seriously harm the life or the physical or mental health of the woman, (2) the pregnancy is the result of incest, (3) the woman is severely mentally handicapped, or (4) a fetal abnormality exists. An abortion will also be considered on the basis of the pregnant woman's young age or when the pregnancy is the result of rape.

3. Evaluation of record-based and secondary analysis studies. In weighing the evidence regarding abortion and mental health derived from the record-based and secondary analysis studies reviewed above, it must be kept in mind that the body of evidence is not as large as it appears. The 10 studies based on medical records are based on two data sets, one from the United

States and one from Finland. The 15 studies based on secondary analyses of survey data are based on nine data sets, eight from the United States and one from New Zealand. Given that caution, what can be concluded from examination of these studies? An answer to that question requires considering their methodological quality.

Problems of sampling. First, many of the above studies cannot be generalized to the majority of women in the United States who seek abortions. Some are based on specialized data sets not representative of women in general (e.g., Coleman, Maxey, et al., 2005; Coleman, Reardon, et al 2005), some used screening criteria that eliminated a huge proportion of the larger sample (e.g., all of the Medi-Cal studies), some differentially excluded women from one outcome group but not the other (Reardon & Cougle, 2002a), and some were based on samples of women who obtained abortions under more restrictive regulations (Fergusson et al., 2006). Only one of the above studies based on survey data used sampling weights in its analyses (Coleman, 2006a). The study by Coleman (2006a), which did use sample weights, used a school-based population that did not include the most disadvantaged adolescents—those who dropped out of school to care for a child.

Problems of comparison groups. Although it is necessary to control for wantedness of pregnancy to assess a pregnant woman's mental health risks if she were to choose abortion compared to its alternatives, only three data sets (the NSFG, ADD-Health, and NLSY data sets) included questions about the intendedness or wantedness of pregnancy. Even when this information was available, it was not always used (Cougle et al., 2003). In addition, interpretation of differences observed between the abortion and delivery groups was often compromised by differential exclusions from the delivery group.

Problems in measurement of independent variables. Other than the studies based on medical records, all of the studies reviewed above established abortion history through retrospective self-reports, raising serious reliability concerns. Few of the above studies took adequate steps to enhance the accuracy of reports of sensitive data. Thus, not surprisingly, abortion was underreported relative to national norms in all of the studies based on survey data. Furthermore, because none of these public data sets was designed specifically to identify the mental health effects of abortion compared with its alternatives, none provides adequate information about the characteristics of the abortion experience, such as the length of gestation at time of the abortion, age at which the abortion occurred, the reason for having the abortion (including medical reasons), and wantedness of the pregnancy. This information is not available for the medical record studies either. Such data are essential to understand the psychological implications of abortion.

*Problems in measurement of outcomes. S*tudies based on secondary analysis of survey data typically did not use standard measures of mental health.

Some studies were based on single-item measures of outcomes (e.g., Coleman, 2006a); others used an unvalidated measure of a psychological problem (e.g., Cougle et al., 2005) or only one or two measures of general psychological well-being (e.g., Russo & Zierk, 1992). Only two of the studies based on survey data (Fergusson et al., 2006; Harlow et al., 2004) used psychometrically strong assessments of clinically significant outcomes (i.e. a diagnosis). Further, in some cases, it was impossible to determine whether the "outcome" variable occurred prior or subsequent to the abortion (Coleman, 2006a; Cougle et al., 2005; Russo & Denious, 2001). Although less severe, there are problems with outcome measurement in the Medi-Cal data as well. Only one study (Gissler et al., 2004b) made an attempt to separate out therapeutic abortions from elective abortions, a distinction shown to be critical by the Finnish researchers.

Confounds and co-occurring risks. Researchers relying on secondary analysis of both medical records and survey data collected for other purposes only have access to variables collected in those data sets. As a consequence, key variables that have documented relationships with both pregnancy outcome and mental health and which are thus potential confounders of any observed relationship between those variables may not be included in the data set. These include, for example, measures of prior substance abuse, prior or ongoing exposure to sexual abuse or partner violence, poverty, number of current children, number of prior unwanted pregnancies and prior unwanted births (both of which are correlated with number of abortions), and, most importantly, adequate measures of mental health prior to pregnancy. Only one of the 23 studies reviewed above (Fergusson et al., 2006) contained adequate measures of mental health prior to the pregnancy. In addition, with regard to the studies that focus on low-income populations (Medi-Cal studies, Washington study, Baltimore study), such populations are more likely to be in poor health, which itself is associated with psychological problems. Given that pregnant women who have serious illnesses such as diabetes, AIDS, and heart disease may be advised to have an abortion for health reasons, the correlation of abortion and physical and mental health problems might be expected to be higher in low-income populations.

Problems with statistical analyses. Large public data sets, particularly multiyear data sets, are complex and have an enormous number of variables from which to select for a particular analysis. As seen by the studies above that have published corrections of coding errors (e.g., Reardon & Cougle, 2002b; Schmiege & Russo, 2005), it is easy to make mistakes in the construction of variables. Moreover, it is important to have a conceptual rationale for selecting among the large number of potential variables. The variables researchers select to include in reanalyses of the original data reflect the interests (and sometimes the biases) of the researcher doing the reanalysis. The approach to the data analyses reflected in these studies is also of concern. Large numbers of statistical tests were often performed, increasing the probability of finding significant results when there was in fact no effect. The large sample sizes mean

that effect sizes that are a statistically significant may be clinically meaningless. On the other hand, analyses were often based on small subgroups or subgroups for which no sample size was provided. In addition, results were frequently overinterpreted, with one significant finding emphasized over a number that were not significant or were in the reverse direction.

The selection of covariates in these studies also raised serious concerns. As noted above, the choice of covariates to include in analyses can play a key role in how much variance in the outcome variable is explained by pregnancy outcome. Given the large number of variables often assessed in these data sets, there is considerable room for researcher discretion in selection of covariates. Inclusion of covariates was often based on atheoretical preliminary analyses and often varied for unspecified reasons across analyses, even within the same study. In some studies, key covariates known to be associated with the outcome in question were omitted from the analyses despite their presence in the data set. For example, Reardon et al. (2004) used NLSY data to compare alcohol and drug use of women who aborted a first pregnancy to those who delivered their first pregnancy or were not pregnant. They did not control for history of drug use prior to the first pregnancy in their analyses, despite the availability of this information in the data set and despite prior published studies based on this same data set showing that use of drugs and alcohol predicted onset of early sexual activity (Rosenbaum & Kandel, 1990) and was uniquely predictive of subsequent premarital teen pregnancy as well as the decision to terminate a premarital teen pregnancy (Mensch & Kandel, 1992). As another example, in their analysis of the NSFG, Cougle et al. (2005) did not include items assessing rape history in their analysis, despite the presence of relevant items in the data set and publication of other studies (e.g., Reardon et al., 2002; Russo & Denious, 2001) suggesting that women who have abortions are at higher risk for rape and other forms of violence in their lives.

4. Summary of medical-record and secondary analyses studies.

In sum, our careful evaluation of studies based on secondary analyses of medical records and existing public data sets revealed that in general they were methodologically quite poor. Problems of sampling, measurement, design, and analyses cloud interpretation. Because of the absence of adequate controls for co-occurring risks and prior mental health in these studies, it is impossible to determine whether any observed differences between abortion groups and comparison groups reflect consequences of pregnancy resolution or preexisting differences between groups or methodological artifact. Consequently, these studies do not provide a strong basis for drawing conclusions regarding the relative risks of abortion compared to its alternatives.

V. B. Comparison Group Studies Based on Primary Data

Seventeen studies were conducted between 1990 and 2007 with the primary purpose of comparing women who had a first-trimester abortion (or an

abortion in which trimester was unspecified) to a comparison group of other women on a mental health related variable. These studies resulted in 19 published papers. Details, key findings, and limitations of these studies are summarized in Tables 3a and 3b.
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1. Description of findings: U.S. samples. Seven studies were based on U.S. samples. These studies are summarized in Table 3a. Cohan et al. (1993) examined responses of 33 women 1 month postpregnancy, 21 of whom had terminated their pregnancy and 12 of whom continued their pregnancy. Almost all had reported that their pregnancy was unintended. There were no significant differences between the 21 women who had terminated their pregnancy versus the 12 of those who continued their pregnancy on any of the outcomes assessed (positive and negative affect and decision satisfaction).

Lydon, Dunkel-Schetter, Cohan, and Pierce (1996) assessed initial commitment to a possible pregnancy as well as positive affect and negative affect (Derogatis, 1975) among women just prior to obtaining a pregnancy test at health clinics in the United States and Canada. For the women who received a positive pregnancy result, these variables were reassessed within 9 days (T2) and again at 4-7 weeks (T3) after learning of the positive test result. By the T3 follow-up, 30 women had terminated their pregnancy, and 25 had decided to continue their pregnancy. Initial commitment to the possible pregnancy (assessed at T1) interacted with outcome decision (abort vs. deliver) to predict affect at T3. Among women continuing their pregnancy, those high (*N*=11) and low (*N*=12) in initial commitment to the pregnancy did not differ significantly in affect at T3. Both expressed more positive than negative affect. Among women who had aborted their pregnancy, those who had been initially less committed to the possible pregnancy (*N*=13) did not differ significantly in affect from those deciding to continue their pregnancy. They too expressed more positive than negative affect. The women who had initially indicated somewhat more commitment to the possible pregnancy but who decided to terminate the pregnancy (*N*=14) reported significantly less positive affect and significantly more negative affect than the other three groups. A particular strength of this study is its tracking of commitment and affective state over the time course of first learning of a pregnancy and its resolution. Other strengths are its strong theoretical framework and good measurement of predictor variables. Limitations include the very small sample sizes and absence of measures of clinically significant mental health outcomes.

The remaining four U.S. studies measured abortion history through retrospective self-reporting (see Table 3a). Felton, Parsons, and Hassell (1998) found no significant differences on overall health-promoting behaviors, appraisals of problem-solving effectiveness, or global self-image between 26 adolescents attending a family planning clinic who reported a history of abortion and 26 demographically matched adolescents who reported never being pregnant. Williams (2001) found no significant differences on any of the subscales of the

Grief Experience Inventory between 45 women waiting to see their health care provider who reported a history of abortion and 48 demographically similar women who reported no elective abortions. Medora et al. (1993) found that among a sample of 121 single, never married, pregnant teenagers, the 28 girls who reported a prior abortion had significantly higher self-esteem than the 93 girls who reported no abortion history. Medora and von der Hellen (1997) reported that among a sample of 94 teen mothers, teens who reported a prior abortion did not differ in self-esteem from teens who did not report an abortion (number in each group was not specified). The only U.S. study to report that an abortion group had a poorer outcome than a comparison group was conducted by Reardon and Ney (2000). This study was based on a reproductive history questionnaire mailed to the homes of a large sample of women, only 14.2% of whom responded. In analyses restricted to White women, women who reported having had at least one induced abortion (*N* = 137) were more likely than women who reported having had no abortions (*N* = 395) to also agree with a single yes/no question: “Have you ever abused drugs or alcohol?"

2. Description of findings: Non-U.S. samples. Nine studies were based exclusively on non-U.S. samples. Most were methodologically quite poor (see Table 3b). The most methodologically sound papers were based on a study conducted by Broen and colleagues in Norway (Broen, Moum, Bodtker, Ekeberg, 2004, 2005, 2006) and one conducted jointly by the Royal College of General Practitioners and the Royal College of Obstetricians and Gynecologists in the United Kingdom (Gilchrist et al., 1995).

The study by Broen and colleagues followed two groups of Norwegian women from 10 days to 5 years after a first-trimester induced abortion (*N* = 80) or early miscarriage (< 17 weeks; *N* = 40). Experiences of anxiety and depression, avoidance, intrusion stress reactions (assessed with the Impact of Events scale), subjective well-being, and feelings about the pregnancy termination were assessed at four intervals post abortion. Comparisons between the miscarriage and induced abortion groups, controlling for potential confounders, revealed no significant differences between the two groups in mean anxiety or depression scores or subjective well-being scores at any time point. Women who had an induced abortion reported feeling more guilt, shame, and relief and also more avoidance on the IES scale than women who miscarried. Women who miscarried reported more feelings of grief and loss than those who had an induced abortion in the short term, but this difference disappeared by 5 years post event.

Strengths of this study included its repeated and long-term follow-up, attempt to control for prepregnancy mental health (although this was assessed retrospectively via self-report and psychiatric evaluation post abortion), use of established and reliable outcome measures, and high retention rate (91%), although only 47% of those initially approached agreed to participate in the study. This study is useful for comparing grief reactions among different forms of pregnancy loss. However, the comparison group used in this study is

inappropriate for drawing conclusions about the relative risks of abortion versus its alternatives. A spontaneous miscarriage of a (wanted) pregnancy is not an alternative for women faced with a decision about how to resolve an unintended or unwanted pregnancy.

The strongest study reviewed (Gilchrist et al.,1995) was prospective and longitudinal and employed a large sample size, appropriate comparison groups of women with unplanned pregnancies, and a long postpregnancy/abortion follow-up time. Importantly, this study also controlled for mental health prior to the pregnancy as well as other covariates. Women's medical, psychiatric, and obstetric history prior to the pregnancy was recorded from their medical records or the recruiting physicians' case notes. The final sample consisted of four pregnancy outcome comparison groups: (a) 6,410 women who obtained terminations (85% occurred before 12 weeks of gestation), (b) 6,151 women who did not seek termination, (c) 379 who requested termination but were denied, and (d) 321 who requested termination but changed their mind.

Postdelivery/abortion psychiatric morbidity was assessed using established diagnoses and grouped into three categories in order of severity: (a) psychosis, (c) nonpsychotic illness (e.g., depression, anxiety), and (c) deliberate self-harm (DSH) without other psychiatric illness (e.g., drug overdoses). Similarly, prepregnancy psychiatric history was classified into four categories in order of severity: (a) psychotic episode, (b) nonpsychotic illness, (c) DSH without other psychiatric illness, and (d) no psychiatric illness. The two largest subgroups of prepregnancy history were women with no prepregnancy history of psychiatric problems or DSH prior to the pregnancy (2476 women) and women with a history of nonpsychotic illness (1100 women), followed by women with a history of psychosis (*N*=106) and women with a history of DSH alone (*N*=36). Differences between the delivery reference group and each of the other three comparison groups were examined within each of the four categories of prepregnancy psychiatric history. Age, marital status, smoking, education level, gravidity, and prior history of abortion were controlled in analyses that focused on the overall rate of postpregnancy psychiatric morbidity as well as the rate of each of the three postpregnancy diagnoses among the four comparison groups.

Among women with equivalent past psychiatric histories, there were no significant differences between the four comparison groups in overall rates of psychiatric illness. Rates of specific postpregnancy psychiatric illnesses, however, differed among the comparison groups depending on prepregnancy diagnostic history and diagnostic outcome as follows: (1) With respect to postpregnancy nonpsychotic illness, no significant differences were found between abortion and delivery groups, irrespective of prepregnancy diagnostic history. (2) With respect to postpregnancy psychoses, women who had an abortion were significantly less likely to have a postpregnancy psychotic episode than those who delivered among the subgroup of women with no prepregnancy history of psychotic illness (1.1 vs. 4.1) and among the subgroup

of women with a history of nonpsychotic illness (4.9 vs. 11.8). A similar, but nonsignificant pattern was observed among the subgroup of women with a history of psychosis (28.2 vs. 35.2).[3] (3) Findings with regard to the outcome of deliberate self-harm (DSH) were mixed. Rates of DSH did not significantly differ for abortion versus delivery groups among the categories with the highest DSH rates—women with a past history of psychosis (18.2 vs. 19.3) or past history of DSH (8.4 vs. 13.5). Among women with no previous psychiatric history, however, DSH was significantly higher among women who were refused an abortion (5.1) or who had an abortion (3.0) compared with those who delivered (1.8). Most DSH episodes (89%) were drug overdoses; none were fatal. In sum, the authors concluded that, “Rates of total reported psychiatric disorder were no higher after termination of pregnancy than after childbirth.” Further, they noted that women with a history of previous psychiatric illness were most at risk, irrespective of the pregnancy outcome.

3. Evaluation of primary data comparison group studies. Conclusions that can be drawn from these studies are limited by the methodological problems that characterize the vast majority. Below, we briefly summarize the nature of these problems.

Sampling problems. Most of the studies had one or more sampling problems. Most were based on small sample sizes (fewer than 100 women). Many provided little or no information about the sample recruitment strategy, response rates, or sample representativeness or were based on a sample that clearly is not representative of the population of women who obtain abortions (e.g., Reardon & Ney, 2000). Only six of these studies were conducted in the United States, raising concerns about generalizability. The rest were conducted in Canada (3), the United Kingdom (3), Norway (1), Germany (1), Israel (1), and Brazil (1). The abortion regulations and sociocultural context of abortion in some of these countries differ in important ways from those of the United States. For example, in some countries where abortion is legal, such as Britain, all abortions must be approved by two physicians, usually on grounds that continuation of a pregnancy involves greater risk to the woman's physical or mental health than does termination (although such requirements may be more of a formality than a barrier).[4] Another example is Brazil, where induced abortion is illegal, except in cases where the pregnancy is dangerous to the mother’s health or resulted from rape or incest. Caution must be exercised in drawing conclusions about the responses of women in the United States based on data collected on non-U.S. samples.

Inappropriate comparison groups. With two exceptions (Cohan et al., 1993; Gilchrist et al., 1995), none of these studies used a comparison group that controlled for the occurrence of an unintended or unwanted pregnancy, and hence was able to adequately address the question of relative risk. Comparison groups used included women who reported never being pregnant (Felton, Parsons, Hassell, 1998), women who were currently pregnant (Bailey et al.,

2001; Lydon et al., 1996; Medora et al., 1993; Teichman, Shenhar, & Segal, 1993), women who were not currently pregnant (Bradshaw & Slade, 2005; Teichman et al., 1993), women who reported no elective abortions (Conklin & O'Conner, 1995; Medora et al., 1993; Reardon & Ney, 2000; Williams, 2001), women who had miscarried (Bailey et al., 2001; Broen et al., 2004, 2005a, 2006), women who had participated in a previous public health survey (Lauzon, Roger-Achim, Achim, & Boyer 2000), and women matched on demographic variables (Barnett, Freundenburg, & Wille, 1992).

Co-occurring risk factors. Just as important as the lack of appropriate comparison groups in this set of studies was the absence of measures of mental health and other variables *prior to the pregnancy or abortion* likely to be related to the outcome studied (e.g., co-occurring risk factors such as prior engagement in problem behaviors). Hence, any between-group differences observed post abortion may reflect between-group differences present prior to the pregnancy and/or abortion. With one exception (Gilchrist et al., 1995), none of the studies had adequate measures of preabortion mental health, and thus none could separate problems observed post abortion from those present prepregnancy. Furthermore, few of the studies controlled for important covariates, such as age, marital status, number of children, race, education, and duration of partnership that might be related to outcome variables independently of abortion history.

Measurement problems. In six of the papers, the key event—abortion—was determined from retrospective self-report, with no checks on accuracy of reporting,and no information on how long since the abortion occurred, whether the pregnancy was wanted or not, whether the abortion was first or second trimester, or what the age of the woman was at the time of the abortion (Conklin & O'Conner, 1995; Felton et al., 1998; Medora et al., 1993; Ney, Fung, Wickett, Beaman-Dodd, 1994; Reardon & Ney, 2000; Williams, 2001). As noted above, retrospective self-reports are notoriously unreliable and subject to bias, rendering conclusions of these six papers particularly untrustworthy. In studies where abortion was verified, mental health outcomes were often assessed within only a few weeks or months after the abortion. Only two studies assessed mental health outcomes more than a year post abortion (Broen et al., 2006; Gilchrist et al., 1995).

In several cases a single item of unknown reliability was used as a measure of mental health (Ney et al., 1994; Reardon & Ney, 2000). Only one study assessed clinically significant outcomes, that is, whether participants met diagnostic levels for psychological disorder or had sought psychiatric treatment (Gilchrist et al., 1995). The remainder focused on a variety of mental health-related outcomes, including self-esteem, positive and negative affect, decision satisfaction, life satisfaction, self-reported health-promoting behaviors, relationship quality, sexual attitudes and problems, grief, anxiety or depressive symptoms, and stress responses.

Statistical problems. Some of the studies report numerous analyses capitalizing on chance (e.g., Reardon & Ney, 2000), some used small sample sizes lacking sufficient power to detect potentially meaningful differences (e.g., Cohan et al., 1993), some did not report sample sizes at all (Ney et al., 1994), and some reported no statistical tests of comparisons on postabortion measures but discussed results as if they had (e.g., Lauzon et al., 2000).

V. C. Studies of Abortion for Reasons of Fetal Abnormality

All of the studies reviewed above either were restricted to samples of women undergoing first-trimester abortions or did not differentiate first-trimester from later-trimester abortions. Although the vast majority of abortions in the United States are of unplanned pregnancies that are either mistimed or unwanted (Finer & Henshaw, 2006a), and they occur in the first trimester (Boonstra et al., 2006), the increasing accessibility and use of ultrasound technology and other prenatal screening techniques has increased the likelihood of prenatal diagnosis of fetal anomalies, often in the second and sometimes even in the third trimester. Following such a diagnosis, many couples elect to terminate their pregnancy, especially when informed that the fetal anomaly is lethal or severely disabling (see Statham, 2002, for a review of research in this area).

Abortion under these circumstances is a very different physical and psychological event than an abortion of an unplanned or unwanted pregnancy. Not only does abortion for reasons of fetal anomaly typically occur later in pregnancy, but more importantly, it usually occurs in the context of a pregnancy that was initially planned and wanted. Consequently, the meaning and significance of the pregnancy and abortion are apt to be quite different, as is the extent of loss experienced. Understanding women's psychological experiences following an abortion for fetal anomaly is important. Some authors have speculated that women may feel more responsible for the death of their child when they make an active decision to terminate their pregnancy, leading to more negative long-term psychological sequelae compared with experiencing spontaneous miscarriage or perinatal loss (Salvesen, Oyen, Schmidt, Malt, & Eik-Nes, 1997). A full understanding of this issue requires comparing responses of women who undergo induced termination of a pregnancy due to fetal anomaly to responses of women who experience a miscarriage of a wanted pregnancy in the second or third trimester or experience a neonatal loss (e.g., a stillbirth or death of a newborn) or deliver a child with severe physical or mental disabilities.

Our literature search identified six studies in which women who terminated an initially wanted pregnancy because of fetal anomaly were compared with another group of women. Five were based on non U.S. samples. These studies are summarized in Table 4. We also identified one U.S. study that examined psychological experiences among women who terminated an initially wanted

pregnancy due to fetal anomaly, but the study did not include a contrast group. Findings of this study are summarized in Table 5.

1. Description of findings. Zeanah, Dailey, Rosenblatt, and Saller (1993) compared grief and depression scores of 23 women in the United States who underwent induced termination of a wanted pregnancy because of fetal anomalies to 23 demographically matched women who experienced spontaneous perinatal losses (stillbirth or death of a newborn infant). Controlling for age, there were no significant differences between the induced and spontaneous loss groups in grief, difficulty coping, despair or depression 2 months post abortion, or post spontaneous perinatal loss.

Lorenzen and Holzgreve (1995) compared grief reactions of 35 women in Germany who terminated a pregnancy due to fetal anomalies and 15 women who experienced a spontaneous second- or third-trimester miscarriage. Eight weeks post event, women who had terminated their pregnancy expressed significantly less grief than those who had a spontaneous child loss.

Iles and Gath (1993) compared psychiatric disturbance and grief among 71 women who underwent second-trimester abortion for reasons of fetal anomaly to 26 women who had a second-trimester spontaneous miscarriage. There were no significant differences in psychiatric disturbance (determined by interviews with a trained psychiatrist) between the termination and miscarriage groups or differences in grief between the two groups 4-6 weeks or 13 months post loss. Some signs of normal grief persisted for a full year in some women in both groups.

Kersting et al. (2005) compared stress responses of three groups of women in Germany—83 women who had had an induced late-trimester abortion for reasons of fetal anomaly 2-7 years previously, 60 women who had a late-trimester abortion for fetal anomaly 14 days earlier, and 65 women who delivered a healthy child (time since delivery and abortion history unspecified). Women who delivered a health baby had lower stress scores (assessed with the Impact of Events scale-IES) than women who had a late-term abortion for fetal anomaly, regardless of whether the abortion occurred 14 days or 2-7 years previously. The two abortion groups did not differ in their grief responses. While 88% of the women in the abortion group believed they had made the right decision, 9.6% expressed doubts about their decision, and one woman felt she had made the wrong decision.

Salvesen et al. (1997) compared depression, general health, stress reactions, and anxiety of 24 women in Norway who terminated a pregnancy for fetal anomaly to 29 Norwegian women who experienced a perinatal death or late-trimester spontaneous miscarriage. Immediately after the event, both groups of women reported high intrusion scores on the IES, but the perinatal loss group reported significantly higher depressed affect and had higher scores on the

intrusion and avoidance scales of the IES than did the induced termination group. At later assessments, including at 1 year post abortion, there were no significant differences between the two groups. One woman out of 36 exhibited symptoms of traumatic stress; she was in the perinatal loss group.

Rona, Smeeton, Beech, Barnett, and Sharland (1998) compared depression and anxiety (assessed with the Hospital Anxiety and Depression (HAD) scale) of three groups of women in the United Kingdom. One group consisted of 28 women who received a confirmed diagnosis during their second trimester of a severe fetal heart malformation and terminated the pregnancy. A second group consisted of 40 women in whom a fetal heart malformation was initially diagnosed but later disconfirmed by a specialist. A third group consisted of 40 women whose fetal malformation was not identified and who had given birth to an infant with a severe heart malformation. The HAD scale was administered 6-10 months after the heart malformation was initially diagnosed or post delivery in the latter group. Based on cutoff scores on the HAD ($\geq$ 11), a significantly greater proportion of mothers who had an infant with a severe heart malformation reported clinical levels of anxiety (43%) and depression (18%) compared to women in the other two groups. Among those who had terminated their pregnancy, 32% were categorized as anxious, and 4% as clinically depressed. Among mothers whose initial diagnosis of fetal abnormality was later disconfirmed, the comparable percentages were 15% (anxiety) and 5% (depression). Women who had terminated their pregnancy were more anxious than this latter group of women who had delivered healthy infants. The authors attributed the higher anxiety in the termination group than the latter group to either the experience of therapeutic abortion or to a fear of a subsequent abnormal pregnancy. Younger age was associated with higher anxiety.

2. Evaluation of fetal abnormality studies. All of the above studies are limited by high attrition rates, typically low response rates, and extremely small sample sizes. The small sample sizes restrict power, and, hence, the ability of these studies to detect significant differences between groups. In most studies, the sample also was of unknown representativeness. Despite these methodological limitations, these studies tell a fairly consistent story. Women's levels of negative psychological experiences subsequent to a second-trimester abortion of a wanted pregnancy for fetal anomalies were higher than those of women who delivered a healthy child (Kersting et al., 2005; Rona et al., 1998) and comparable to that of women who experienced a second-trimester miscarriage (Iles & Gath, 1993), stillbirth, or death of a newborn (Salveson et al., 1997; Zeanah et al., 1993). There was no evidence, however, that induced termination was associated with greater distress than spontaneous miscarriage or perinatal loss. Indeed, the one difference observed was that women who terminated a pregnancy because of fetal anomaly experienced significantly less grief than women who miscarried 8 weeks post loss (Lorenzen & Holzgreve, 1995). Nonetheless, grief among both groups was high and appears to persist for some time. The one study that compared the mental health of women who

terminated a pregnancy for fetal abnormality and women who delivered an infant with a severe abnormality found that 6-10 months post event, a greater proportion of women in the delivery group reported clinically significant anxiety and depression compared to women in the abortion group.

VI. Review of Abortion-Only Studies

In addition to the primary research reviewed above, our literature search also identified a set of papers that met all inclusion criteria except that they did not include a comparison group. Studies without a comparison group are not appropriate for addressing questions of relative risk. However, studies focused solely on reactions and feelings of women who have had an abortion can be useful for identifying factors that predict individual variation in women's psychological experiences following abortion. Furthermore, they can potentially address questions related to the prevalence of harm associated with abortion to the extent that their sample is representative of the population to which one wants to generalize. Because differences between the United States and other countries in cultural contexts surrounding abortion and abortion regulations make generalization from non-U.S. samples to U.S. women problematic, the TFMHA reviewed only those noncomparison group studies that met inclusion criteria that were based on U.S. samples.

The TFMHA identified 23 published papers that were based solely on samples of women who had abortions in the United States, but that otherwise met inclusion criteria. These studies are summarized in Table 5. The studies were of two major types: (1) prospective or concurrent studies that usually included preabortion measures of psychological adjustment and risk factors and one or more postabortion assessments of adjustment, and (2) retrospective studies that assessed women's perceived reactions to the event and current level of psychological functioning several years after the abortion. The former provide a wealth of information on predictors of postabortion psychological functioning. The retrospective studies—although supporting many of the conclusions of research prior to 1990—have serious methodological problems that negate their ability to answer questions about psychological experiences following abortion.

VI. A. Prospective Studies

The majority of prospective studies were conducted by one group of investigators, Major and colleagues. Seven papers published since 1990 were based on data from a multisite sample of first-trimester abortion patients in the Buffalo, NY, area (Sample 1). These papers are not independent of each other because they are based on the same sample. Four additional papers were based on three separate samples of women from the same geographic area obtaining first-trimester abortions (Samples 2, 3, and 4). Four of the seven Sample 1 studies analyzed data of 442 women followed for 2 years after a first- trimester abortion for an unintended pregnancy at one of three sites. Assessments took

place at four time points: preabortion and 1-hour, 1-month, and 2-years post abortion. The three other papers based on Sample 1 did not include the 2-year follow-up in their analyses. The other studies by Major and colleagues were based on smaller samples of 291 (Sample 2), 283 (Sample 3), and 247 (Sample 4) women recruited from a single abortion facility who provided preabortion and 30-minute- and 1-month postabortion follow-up data.

Although the lack of comparison groups of women with an unintended pregnancy who carry to term is a significant limitation for assessing relative risk of abortion versus alternatives, as a group, the Sample 1 studies have a number of methodological strengths, including use of standardized measures of psychological experiences, appropriate data collection and analysis procedures, a large sample, reasonably long postabortion follow-up, analyses of changes in abortion reactions over time, and sound social-psychological theory to direct analyses. One potential limitation is the high attrition rate; the 442 women for whom data were available 2 years post abortion represent 50% of the original sample. However, the researchers conducted detailed analyses to show that women who completed the follow-up and those lost to follow-up not did not significantly differ on any demographic or psychological characteristic. A second limitation is the lack of measures of mental health prior to the pregnancy. Strengths and limitations of Samples 2, 3, and 4 are similar to those of Sample 1 with the added caveat that these were smaller samples from a single site followed for a shorter time period.

Analyses based on the Sample 1 data set examined changes over time in women's psychological experiences. Most women reported that they had benefited from their abortion more than they had been harmed by it, and these appraisals did not change from 1 month to 2 years post abortion (Major et al., 2000). Most women also reported that they were satisfied with their decision, although the percentage satisfied decreased from 1 month (79%) to 2 years (72%). Women also reported feeling more relief than positive or negative emotions both immediately and 2 years after their abortion. Over the 2 years, however, relief and positive emotions declined, whereas negative emotions increased. Depression scores were lower, and self-esteem was higher 2 years after the abortion compared with just prior to the abortion.

Collectively, these findings add to knowledge of predictors and mediators of psychological outcomes over a longer follow-up period than earlier abortion-only studies. These studies showed that women at higher risk for negative emotions 2 years post abortion included those with a prior history of mental health problems (Major et al., 2000), younger age at the time of the abortion (Major et al., 2000), low perceived or anticipated social support for their decision (Cozzarelli, Sumer, & Major, 1998; Major, Zubek, Cooper, Cozzarelli, & Richards, 1997), greater personal conflict about abortion (Cozzarelli, Major, Karrasch, & Fueger, 2000), and low self-efficacy about their ability to cope with the abortion (Cozzarelli, Sumer, & Major, 1998; Cozzarelli, 1993; Major et al., 1990).

This research also provided new insight into the role of cognitive mediators, coping, and stigma in postabortion functioning. Two studies investigated the effects of antiabortion picketing on women's postabortion responses. Cozzarelli and Major (1994) found that the greater the number of antiabortion picketers and the more aggressive the picketing that women encountered when entering an abortion clinic (as coded by observers), and the more the women reported feeling upset by the demonstrators, the more depressed affect they reported right after their abortion. These effects were partially mitigated by the presence of prochoice escorts outside the clinic, suggesting that prochoice escorts altered not only the social context, but also the meaning of that context. A later study that included 2-year follow-up assessments concluded the women's encounters with picketers evoke short-term negative psychological reactions but do not appear to have long-term negative psychological effects (Cozzarelli et al., 2000).

Examination of perceived stigma revealed that almost half of the 442 women in the multisite sample (Sample 1) felt that they would be stigmatized if others knew about the abortion, and over 45% felt a need to keep it secret from family and friends (Major & Gramzow, 1999). Secrecy was associated with increases in psychological distress (anxiety and depression) over time, via the mediators of increased thought suppression and decreased emotional disclosure. In particular, Major and Gramzow (1999) found that the more women felt that others would look down on them if they knew about the abortion, the more they felt that they had to keep the abortion a secret from their friends or family. Perceived need for secrecy, in turn, was associated with less disclosure of feelings to family and friends, increased thought suppression and intrusion, and increased psychological distress 2 years post abortion (controlling for initial distress). Thus, feelings of stigmatization led women to engage in coping strategies that were associated with poorer adaptation over time.

This research group also extended earlier knowledge about the role of social support in abortion. One study showed that perceived social support mediated the relationship between cognitive models of attachment and adjustment (Cozzarelli et al., 1998). Another study investigated the joint and interactive effects of perceived social conflict and perceived social support from others surrounding the abortion on negative psychological reactions and well-being (Major et al., 1997). Greater perceived social conflict with the partner predicted increased distress (but not decreased well-being), whereas greater perceived support from partner predicted increased well-being (but not decreased distress). Moreover, for mothers and friends, perceived conflict and support interacted to predict distress, whereas support was a direct predictor of well-being.

Three studies established the importance of cognitive appraisals and self-efficacy as proximal predictors of postabortion adjustment. One study showed that the relationship between social support and adjustment was mediated by

coping appraisals and self-efficacy. Women who perceived more social support from others for their decision felt more able to cope with their abortion prior to the procedure, and these appraisals mediated the positive relationship between perceived social support and postabortion well-being (Major et al., 1990). Two other studies showed that self-efficacy and cognitive appraisals mediated the effects of preabortion personal resources on postabortion coping and adjustment (Cozzarelli, 1993; Major et al., 1998). Women with more resilient personalities (high self-esteem, internal locus of control, and an optimistic outlook on life) felt more capable of coping with their abortion and appraised it more benignly prior to the procedure. Their more positive cognitive appraisals, in turn, were associated with more adaptive forms of coping in the month following the abortion (more acceptance, less avoidance), which in turn were associated with reductions in psychological distress (depression, anxiety) and increases in positive well-being over time.

Two studies specifically compared the responses of minor adolescents and adult abortion patients. They reported very similar findings. Using data from Sample 1 of Major et al. (2000), Quinton, Major, and Richards (2001) found no differences between minors (*N* = 38) and adults (*N* = 404) in psychological distress and well-being 2 years after an abortion, although the adolescents were slightly less satisfied with their decision and perceived less personal benefit from it. In a different sample of 96 women (23 adolescents), Pope, Adler, and Tschann (2001) reported that at 4 weeks post abortion, there were no differences in depression, anxiety, self-esteem, or posttraumatic stress between the younger and older groups, although the adolescents scored slightly lower on “comfort with decision.” Both of these studies are limited by small samples of adolescents. These results appear to conflict with Major et al. (2000), which identified younger age at time of abortion as a risk factor for negative postabortion emotional experiences. However, the latter study examined the association of mental health outcomes with the continuous variable of age among a larger sample.

Miller (1992) examined psychological experiences subsequent to abortion among 64 women who had participated in a larger longitudinal study on the psychology of reproduction in the San Francisco Bay area in the 1970s. All of the 967 women in the larger study were White, English speaking, and between ages 18 and 27 years. At the final interview, the 64 women who reported an abortion during the study were asked a series of one-item questions about how their abortion had affected them. Prospective analyses using responses from earlier interview periods examined predictors of “regret” (the extent to which women said they would choose the abortion again (1 = *no*, 2 = *not sure*, 3 = *yes*)) and “upset” (how emotionally upset the women recalled being in the first few weeks after the abortion). Having a Protestant religious background was associated with less regret, whereas having a traditional gender role orientation was associated with greater regret. Not being married at the time of the abortion was related to greater postabortion upset, whereas a traditional gender-role orientation was

associated with less upset. Other single items measuring reasons for having and not having an abortion (measured at the final interview) were also related to the two outcome variables. Despite its prospective design, this study is severely limited by the single-item measures of the negative psychological reactions to abortion, retrospective reporting of the emotional impact of the abortion, lack of specification of abortion history, probable underreporting of abortions, small sample, and nonrepresentative sample.

Two other prospective studies examined emotional improvement after mifepristone abortions in minors (Phelps, Schaff, & Fielding, 2001) and depression risk after surgical and nonsurgical abortion (Sit et al., 2007). Phelps et al. assessed emotional responses (e.g., perceived stress, fear) of adolescents aged 14-17 years at three time points: when mifepristone was first administered, 4-8 days later, and 4 weeks later. The researchers found little emotional improvement from first visit to 4-7 days later, but greater emotional improvement (e.g., lower perceived stress, lower fear) at 4-week follow-up. This study was limited by small samples (*N*=35), high attrition rates, and other methodological problems.

Sit et al. (2007) compared depression scores preabortion and 1 month post abortion among women obtaining surgical (*N* = 47) versus nonsurgical (mifepristone-misoprostol) abortions (*N* = 31) at less than 9 weeks' gestation. One month post abortion, 17% (7/42) of surgical and 21% (5/24) of medical patients had an EPDS depression score equal to or greater than 10. Both groups experienced a significant decline in depression from pre- to post abortion, and the difference in depression between the two groups was not significant either before or after the abortion. As observed in other studies, women with a history of past psychiatric problems were at higher risk for postabortion depression, irrespective of procedure. Findings of this study are consistent with several others based on non-U.S. samples in suggesting that method of termination during the first trimester does not affect emotional adjustment or psychological experiences after the procedure among women, given a choice of procedure (Ashok et al., 2005; Howie, Henshaw, Naji, Russell, & Templeton, 1997; Lowenstein et al., 2006).

A final U.S. study (Burgoine et al., 2005) examined depression and grief among 49 women who terminated a desired pregnancy during the second trimester. They examined whether responses differed as a function of the abortion procedure they underwent: dilation and evacuation (D&E) or induction of labor (IOL). Levels of depression were relatively high in both groups 4 months and 12 months post abortion, but incidence of clinically significant depression did not differ as a function of abortion procedure. Grief scores did not differ at 4 or 12 months between women choosing either of the two abortion methods.

VI. B. Retrospective Studies

Most of the half dozen retrospective studies of abortion samples had serious methodological flaws and do not warrant further discussion except as examples of poor study designs. In these studies women's current or recalled past mental health or distress often was attributed to an abortion that occurred many years previously (e.g., Franz & Reardon, 1992; Lemkau, 1991; Tamburrino et al., 1990). For instance, Lemkau (1991) queried women about their level of distress experienced 3 months post abortion although the target abortion had occurred an average of 9 years previously. Other limitations include use of one-item unstandardized outcome measures (Coleman & Nelson, 1998; Franz & Reardon, 1992) and small sample sizes (Coleman & Nelson, 1998; Congleton & Calhoun, 1993; Tamburrino et al., 1990). Finally, authors of several papers drew conclusions about prevalence of postabortion mental health problems in the general population from samples of women who had self-identified as having postabortion mental health problems, attributed their psychological problems to having had an abortion, and were members of support groups that foster such attributions (Congleton & Calhoun, 1993; Franz & Reardon, 1992; Tamburrino et al., 1990).

VI. C. Summary and Evaluation of Abortion-Only Studies

Prospective studies of U.S. abortion-only samples have added to knowledge about predictors, mediators, and moderators of psychological experiences subsequent to abortion. The most methodologically strong studies in this group identified personal and social factors that influence how women cognitively appraise and cope with abortion and demonstrated how appraisals and coping processes predict postabortion psychological experiences, both positive and negative. The retrospective studies in this group suffered from methodological limitations that decreased confidence in the results and limited conclusions that can be drawn from them.

VII. Summary and Conclusions

As noted at the beginning of this report, the empirical literature on the association between abortion and mental health has been asked to address four primary questions: (1) Does abortion *cause* harm to women's mental health? (2) How prevalent are mental health problems among women in the United States who have had an abortion? (3) What is the relative risk of mental health problems associated with abortion compared to its alternatives (other courses of action that might be taken by a pregnant woman in similar circumstances)? and (4) What predicts individual variation in women's psychological experiences following abortion? As discussed above, the first question is not scientifically testable from an ethical or practical perspective. The second and third questions obscure the important point that abortion is not a unitary event, but encompasses a diversity of experiences. That said, in the following section we address what the literature reviewed has to say with respect to the last three questions.

VII. A. The Relative Risks of Abortion Compared to its Alternatives

The TFMHA identified 50 papers published in peer-reviewed journals between 1990 and 2007 that analyzed empirical data of a quantitative nature on psychological experiences associated with induced abortion, compared to an alternative. These included 10 papers based on secondary analyses of two medical record data sets, 15 papers based on secondary analyses of nine public data sets, 19 papers based on 17 studies conducted for the primary purpose of comparing women who had first-trimester abortions (or an abortion in which the trimester was unspecified) with a comparison group, and 6 studies that compared women's responses following an induced abortion for fetal abnormality to women's responses following other reproductive events. These studies were evaluated with respect to their ability to draw sound conclusions about the relative mental health risks associated with abortion compared to alternative courses of action that can be pursued by a woman facing a similar circumstance (e.g., an unwanted or unintended pregnancy).

A careful evaluation of these studies revealed that the majority suffered from methodological problems, sometimes severely so. Problems of sampling, measurement, design, and analyses cloud interpretation. Abortion was often underreported and underspecified and in the majority of studies, wantedness of pregnancy was not considered. Rarely did research designs include a comparison group that was otherwise equivalent to women who had an elective abortion, impairing the ability to draw conclusions about relative risks. Furthermore, because of the absence of adequate controls for co-occurring risks, including systemic factors (e.g., violence exposure, poverty), prior mental health (including prior substance abuse), and personality (e.g., avoidance coping style), in almost all of these studies, it was impossible to determine whether any observed differences between abortion groups and comparison groups reflected consequences of pregnancy resolution, preexisting differences between groups, or artifacts of methodology. Given this state of the literature, what can be concluded about relative risks from this body of research?

One approach would be to simply calculate effect sizes or count the number of published papers that suggest adverse effects of abortion and those that show no adverse effects (or even positive effects) of abortion when compared to an alternative course of action (e.g., delivery). Although tempting, such approaches would be misleading and irresponsible, given the numerous methodological problems that characterize this literature, the many papers that were based on the same data sets, and the inadequacy of the comparison groups typically used. Given this state of the literature, the TFMHA judged that the best course of action was to base conclusions on the findings of the studies identified as most methodologically rigorous and sound.

Of the studies based on medical records, the most methodologically rigorous studies were conducted in Finland. The largest and strongest of these

examined the relative risk of death within a year of end of pregnancy associated with abortion versus delivery (Gissler et al., 2004b). It demonstrated that the relative risk differs depending on how cause of death is coded. Compared to women who delivered, women who had an abortion had lower rates of direct pregnancy-related deaths (cause of death was directly related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes) but higher rates of pregnancy-associated deaths (deaths occurring within one year from end of pregnancy, regardless of whether deaths are pregnancy-related). When therapeutic abortions were excluded from the category of pregnancy-associated deaths, however, this latter difference was not significant. Across both the Medi-Cal and Finland record-based studies, a higher rate of violent death (including accidents, homicide, and suicide) was observed among women who had an abortion compared to women who delivered. This correlational finding is consistent with other evidence indicating that risk for violence is higher in the lives of women who have abortions and underscores the importance of controlling for violence exposure in studies of mental health associated with pregnancy outcome.

With respect to the studies based on secondary analyses of survey data, the conclusions regarding relative risk varied depending on the data set, the approach to the design of the study, the covariates used in analyses, the comparison group selected, and the outcome variables assessed. Analyses of the same data set (the NLSY) with respect to the same outcome variable (depression) revealed that conclusions regarding relative risk differed dramatically depending on the sampling and exclusion criteria applied.

The strongest of the secondary analyses studies was conducted by Fergusson et al. (2006). This study was based on a representative sample of young women in Christchurch, NZ, was longitudinal (although Fergusson also reported concurrent analyses), measured postpregnancy/abortion psychiatric morbidity using established diagnostic categories, and controlled for mental health prior to the pregnancy in prospective analyses. Fergusson et al. compared women who terminated a pregnancy to women who delivered or had not been pregnant. The prospective analyses reported by Fergusson et al. are most informative. These analyses compared number of total psychiatric disorders among women who had an abortion prior to age 21 to number of total psychiatric disorders among women who had delivered a child by age 21 or among women who had never been pregnant by age 21, controlling for prepregnancy mental health and other variables that differed initially among the three groups. In these analyses, women who had one or more abortions prior to age 21 had a significantly higher number of total psychiatric disorders by age 25 than women who had delivered or had never been pregnant by age 21. This study thus suggests that women who have one or more abortions at a young age (<21) are at greater relative risk for psychiatric disorder compared to women who deliver a child at a young age or women who do not get pregnant at a young age.

There are several reasons why caution should be used in drawing the above conclusion from this study. First and most importantly, Fergusson et al. (2006) did not assess the *intendedness or wantedness* of the pregnancy. As noted earlier, approximately 90% of pregnancies that are aborted are unintended, compared to only 31% of those that are delivered (Henshaw, 1998). Thus, although these were young women, it is reasonable to assume that at least some of the women in the delivery group were delivering a planned and wanted child. Delivery of a planned and wanted child would be expected to be associated with positive outcomes and is not a viable option for women facing an unintended pregnancy. Second, the other comparison group used by Fergusson et al.—women who had never been pregnant—is not a viable option for women already facing an unintended pregnancy. Third, the prospective analyses were based on only 48 women who had abortions, an extremely small sample. Fourth, the study did not control for number of prior abortions or births. Fifth, the study focused on women who had one or more abortions at a young age (< 21 years), limiting its generalizability to younger women; younger age has been linked in some studies to more negative psychological experiences following abortion (e.g., Major et al., 2000). Finally, this study was conducted in New Zealand, a country with more restrictive abortion regulations than those in the United States. Because the focus of APA is on mental health in the United States, it may thus be less useful as a basis for drawing conclusions about relative risks of abortion for U.S. women.

The TFMHA also reviewed and evaluated 19 papers based on 17 studies conducted for the primary purpose of comparing women who had first-trimester abortions (or an abortion in which trimester was unspecified) with a comparison group on a mental health relevant variable. These studies varied widely in methodological quality and cultural context. Although most of the studies showed no significant differences between the psychological experiences of women who had an induced first-trimester abortion and women in a variety of comparison groups once important covariates (e.g., marital status, age) were controlled, most also were characterized by methodological deficiencies. These included problems of sampling, measurement, design, analyses, and inappropriate comparison groups. Thus, as a group, these studies also do not provide good answers to questions of relative risk or prevalence.

One study, however, stood out from the rest in terms of its methodological rigor. This study was conducted in the United Kingdom by the Royal College of General Practitioners and the Royal College of Obstetricians and Gynecologists (Gilchrist et al., 1995). It was longitudinal, based on a representative sample, measured postpregnancy/abortion psychiatric morbidity using established diagnostic categories, controlled for mental health prior to the pregnancy as well as other relevant covariates, and compared women who terminated an unplanned pregnancy to women who pursued alternative courses of action. In prospective analyses, Gilchrist et al. compared postpregnancy psychiatric morbidity (stratified by prepregnancy psychiatric status) of four groups of women,

all of whom were faced with an unplanned pregnancy: women who obtained abortions, who did not seek abortion, who requested abortion but were denied, and who initially requested abortion but changed their mind. The researchers concluded that once psychiatric disorders prior to the pregnancy were taken into account, the rate of total reported psychiatric disorder was no higher after termination of an unplanned pregnancy than after childbirth.

This study provides high-quality evidence that among women faced with an unplanned pregnancy, the relative risks of psychiatric disorder among women who terminate the pregnancy are no greater than the risks among women who pursue alternative courses of action. What appears to be a discrepancy between the conclusions of this study and those of Fergusson et al. (2006) is likely due to differences in sampling and study design. First and most importantly, Gilchrist et al. (1995) restricted their study to women identified by their family doctor as having an “unplanned” pregnancy, whereas Fergusson et al. did not assess the intendedness of the pregnancy, as noted above. Consequently, the comparison groups used by Gilchrist et al. are more appropriate for addressing the question of relative risk of negative psychological experiences following elective abortion *compared to other courses of action women in similar circumstances (i.e., facing an unplanned pregnancy) might take*. Second, the Gilchrist et al. study was not restricted to women who became pregnant at a young age; hence the sample is more representative of women who seek abortion. Third, differences in abortion sample size were dramatic. The prospective analyses by Gilchrist et al. were based on an abortion sample of 6,410 women, as compared to 48 in the Fergusson et al. study. Fourth, unlike the study by Fergusson et al., the Gilchrist et al. study controlled for number of prior abortions and births. For these reasons, the TFMHA had more confidence in arriving at conclusions about relative risk based on the findings of Gilchrist et al. Nonetheless, it should be noted that the abortion context in the United Kingdom may differ from that in the United States, weakening generalization to the U.S. context.

The TFMHA reviewed six studies that compared women’s responses following an induced abortion for fetal abnormality to women's responses following other reproductive events. These studies were based on extremely small samples often characterized by high attrition rates and low response rates. Nonetheless, these studies suggest that terminating a wanted pregnancy, especially late in pregnancy, can be associated with negative psychological experiences comparable to those experienced by women who miscarry a wanted pregnancy or experience a stillbirth or death of a newborn, but less severe than those experienced by women who deliver a child with a severe abnormality. At least one study also suggests that the majority of women who make this difficult choice do not regret their decision (e.g., Kersting et al., 2005). As a group, these studies of responses to termination of a wanted pregnancy for fetal abnormality underscore the importance of considering the wantedness of the pregnancy, as well as the reason for and timing of the abortion, in studying its psychological implications. Interpretation of prevalence of psychological distress and relative

risk is clouded when researchers lump together under the category of "abortion" women who abort a wanted pregnancy for reasons of fetal anomaly with women who have an elective abortion of an unplanned and unwanted pregnancy.

In summary, although numerous methodological flaws prevent the published literature from providing unequivocal evidence regarding the relative mental health risks associated with abortion per se compared to its alternatives (childbirth of an unplanned pregnancy), in the view of the TFMHA, the *best* scientific evidence indicates that the relative risk of mental health problems among adult women who have an *unplanned pregnancy* is no greater if they have an elective first-trimester abortion than if they deliver that pregnancy (Gilchrist et al., 1995).

The evidence regarding the relative mental health risks associated with multiple abortions is more equivocal. One source of inconsistencies in the literature may be methodological, such as differences in sample size or age ranges among samples. Positive associations observed between multiple abortions and poorer mental health (e.g., Harlow et al., 2004) also may be due to co-occurring risks that predispose a woman to both unwanted pregnancies and mental health problems.

Terminating a wanted pregnancy late in pregnancy due to fetal abnormality appears to be associated with negative psychological experiences equivalent to those experienced by women who miscarry a wanted pregnancy or experience a stillbirth or the death of a newborn.

VII. B. Prevalence of Mental Health Problems Among U.S. Women Who Have an Abortion

A second question this literature has been used to address concerns the prevalence of mental health problems among women in the United States who have had an abortion. As noted at the outset of this report, research capable of adequately addressing this question requires at minimum: (1) a clearly defined, agreed upon, and appropriately measured mental health problem (e.g., a clinically significant disorder, assessed via validated criteria); (2) a sample representative of the population to which one wants to generalize (e.g., women in the United States); and (3) knowledge of the prevalence of the same mental health problem in the general population, equated with the abortion group with respect to potentially confounding factors. None of the studies reviewed met all these criteria and hence provided sound evidence regarding prevalence. Few of the U.S studies assessed clinically significant disorders with valid and reliable measures or physician diagnosis. In those studies that did use clinically relevant outcome measures, sampling strategies were inadequate to address the question of prevalence in the larger U.S. population either because the samples were biased, highly selected, geographically restricted, or failed to use appropriate sampling weights. Furthermore, because of the lack of adequate

control for co-occurring risks, the extent to which the incidence of mental health problems associated with abortion was due to the procedure versus to potentially confounding factors such as poverty, poorer prior mental health, etc., was impossible to establish.

Given these caveats, however, the prevalence of mental health problems observed among women in the United States who had a single, legal, first-trimester abortion for nontherapeutic reasons appeared to be consistent with normative rates of comparable mental health problems in the general population of women in the United States. Consider, for example, the overall prevalence of depression among women in the NLSY, a longitudinal national survey of a cohort of men and women aged 14-21 years in 1979. Among *all* women in the NLSY, irrespective of reproductive history and without controlling for any covariates, 22% met criteria for depression in 1992 (i.e., scored above the clinical cutoff on the CES-D). Among women who reported one abortion, the corresponding percentage was 23%. Among women who reported multiple abortions, however, the percentage was higher; 31% met criteria for depression (see Table 6).[5] A similar pattern was reported by Harlow et al. (2004) in their study of a representative sample of women in the Boston metropolitan area.

To say that women *in general* do not show an increased incidence of mental health problems following a single abortion, however, does not mean that *no* women experience such problems. Abortion is an experience often hallmarked by ambivalence, and a mix of positive and negative emotions is to be expected (Adler et al., 1990; Dagg, 1991). Some women experience beneficial outcomes, whereas others experience sadness, grief, and feelings of loss following the elective termination of a pregnancy. Some women experience clinically significant outcomes, such as depression or anxiety. However, the TFMHA reviewed no evidence sufficient to support the claim that an observed association between abortion history and a mental health problem was caused by the abortion per se, as opposed to other factors. As observed throughout this report, unwanted pregnancy and abortion are correlated with preexisting conditions (e.g., poverty), life circumstances (e.g., exposure to violence, sexual abuse), problem behaviors (e.g., drug use), and personality characteristics (e.g., avoidance style of coping with negative emotion) that can have profound and long-lasting negative effects on mental health. Differences in prevalence of mental health problems or problem behaviors observed between women who have had an abortion and women who have not may be primarily accounted for by these preexisting and ongoing differences among groups.

VII. C. Predictors of Individual Variation in Responses Following Abortion

A third issue addressed in the literature on abortion and mental health concerns individual variation in women's psychological experiences following abortion. The TFMHA reviewed 23 papers based on 15 data sets that were

based solely on samples of women who had abortions in the United States, but that otherwise met inclusion criteria. These noncomparison group studies typically focused on predictors of individual variation in response. They were of two major types: (1) prospective or concurrent studies that usually included preabortion measures of psychological adjustment and risk factors and one or more postabortion assessments of adjustment, and (2) retrospective studies that assessed women's perceived reactions to the event and current level of psychological functioning several years after the abortion. The retrospective studies had serious methodological problems that made interpretation of their findings difficult. The prospective studies, despite limitations of high attrition, geographically limited samples, and potential confounds that were not measured, provided valuable information about sources of variation in individual women's psychological experiences and, to a more limited extent, mental health problems subsequent to abortion.

The most methodologically strong studies in this group showed that interpersonal concerns, including feelings of stigma, perceived need for secrecy, exposure to antiabortion picketing, and low perceived or anticipated social support for the abortion decision, negatively affected women's postabortion psychological experiences. Characteristics of the woman also predicted more negative psychological experiences after first-trimester abortion, including a prior history of mental health problems, personality factors such as low self-esteem and low perceived control over her life, and use of avoidance and denial coping strategies. Feelings of commitment to the pregnancy, ambivalence about the abortion decision, and low perceived ability to cope with the abortion prior to its occurrence also predicted more negative postabortion responses. Across studies, prior mental health emerged as the strongest predictor of postabortion mental health (Major et al., 2000). Type of abortion procedures, at least those used in the first trimester, did not appear to be related to postabortion psychological well-being or mental health.

In considering these risk factors, it is important to recognize that many of the same factors shown to be associated with more negative postabortion psychological experiences also predict more negative reactions to other types of stressful life events, including childbirth (e.g., low perceived social support, low self-esteem, low self-efficacy, avoidance coping). For instance, low perceived social support and low self-esteem also are risk factors for postpartum depression (Beck, 2001; Logsdon & Usui, 2001). Most risk factors are not uniquely predictive of psychological experiences following abortion. Women characterized by one or more such risk factors might be equally (or more) likely to experience negative psychological reactions if they pursued an alternative course of action (motherhood or adoption).

VII. D. Conclusions and Future Research

Based on our comprehensive review and evaluation of the empirical literature published in peer-reviewed journals since 1989, this Task Force on Mental Health and Abortion concludes that the most methodologically sound research indicates that among women who have a single, legal, first-trimester abortion of an unplanned pregnancy for nontherapeutic reasons, the relative risks of mental health problems are no greater than the risks among women who deliver an unplanned pregnancy. This conclusion is generally consistent with that reached by the first APA task force (Adler et al., 1990).

This report has highlighted the methodological failings that are pervasive in the literature on abortion and mental health. This focus on methodological limitations raises the question of whether empirical science is capable of informing understanding of the mental health implications of and public policy related to abortion. Some policy questions cannot be definitively answered through empirical research because they are not pragmatically or ethically possible.

Other questions, however, are amenable to the methods of well-designed, rigorously conducted scientific research. For example, empirical research can identify those women who might be more or less likely than others to show adverse or positive psychological outcomes following an abortion. Well-designed research can also answer questions of relative risk and prevalence. What would this research look like?

Such research would use methods that are prospective and longitudinal and employ exacting sampling methods (including the use of sampling weights that allow proper generalization back to the populations to whom the conclusions are being applied). Careful attention would be paid to adequately assessing preexisting and co-occurring conditions such as marital status, domestic violence, age, socioeconomic status, parity, prior mental health, and prior problem behaviors, as well as other situations that are known to be associated with both differential utilization of abortion and mental health problems. Importantly, comparison groups would be selected so as to be equivalent to the abortion group on all variables other than abortion history. Critical variables such as intendedness and wantedness of the pregnancy would be assessed, and abortion status verified objectively (not only through self-report). Careful use of covariance or similar adjustment techniques (applied to pre-defined covariates) would be employed. Precision of measurement (both in terms of specification of outcome measure and psychometric adequacy of the measurements) would also be guaranteed. Positive psychological responses and experiences as well as negative mental health would be assessed. Repeated assessment of responses over time would be made to assess relevant changes, positive and negative, in the trajectory of responses following abortion. Samples sufficiently large to guarantee adequate power to detect effects that are present would be used, and attention would be paid to effect-size estimation in addition to the simple reliance of null hypothesis statistical testing.

Research that met the above scientific standards would help to disentangle confounding factors and establish relative risks of abortion compared to its alternatives. Even so, there is unlikely to be a single definitive research study that will determine the mental health implications of abortion "once and for all" as there is no "all," given the diversity and complexity of women and their circumstances. Important agendas for future research are to further understand and alleviate the conditions that lead to unwanted pregnancy and abortion and to understand the conditions that shape how women respond to these life events, with the ultimate goal of improving women's lives and well-being.

Footnotes

1. In an attempt to assess whether underreporting of abortion might have biased findings in the NLSY, Russo and Dabul (1997) also undertook a reanalysis of the NLSY data to examine whether the relationship between reproductive outcomes and self-esteem held across racial and religious groups known to vary in underreporting, specifically Black versus White and Catholic versus non-Catholic groups. They again found that neither having one abortion nor having repeat abortions was significantly related to RSE when contextual variables were controlled. They also found that the pattern of relationships did not vary by race or religion. This suggests that differential underreporting by some groups did not introduce systematic bias into the results.

2. Personal communication to NFR from David Fergusson, e-mail, 8/8/2007.

3. Although no women in the subgroup with a previous history of DSH were identified as having a postpregnancy psychotic episode, the number of women in that category (*N* = 36) was too small for reliable analysis by reproductive outcome.

4. Personal communication from Ellie Lee.

5. The TFMHA would like to thank K. C. Blackwell for providing these analyses.

Acknowledgments

Brenda Major's contributions to this report were supported in part by grants from the American Philosophical Society and the James McKeen Cattell Foundation.

Thanks are extended to Julia Cleaver, Rennie Georgieva, and Yelena Suprunova for library assistance.

We'd also like to thank the staff of the APA Women's Programs Office for their support: Tanya Burrwell, Shari Miles-Cohen, Leslie Cameron, Gabe Twose, Liapeng Matsau, and Ashlee Edwards.

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List of Tables

Table 6

Population estimates of proportion of all women and women identified as having been pregnant exceeding CES-D clinical cutoff score, National Longitudinal Survey of Youth: 1992.

Group (*N*)	**CES-D> 15**
All women (unweighted *N*= 4401)	22 %
No abortion ever	21 %
Ever abortion	25 %
One abortion	23 %
Multiple abortions	31 %
All women ever pregnant[+] (unweighted *N*=3503)	23 %
No abortion ever	23 %
Ever abortion	25 %
One abortion	22 %
Multiple abortions	31 %

Notes: [+]Includes pregnancies ending in miscarriages.
No covariates are controlled.